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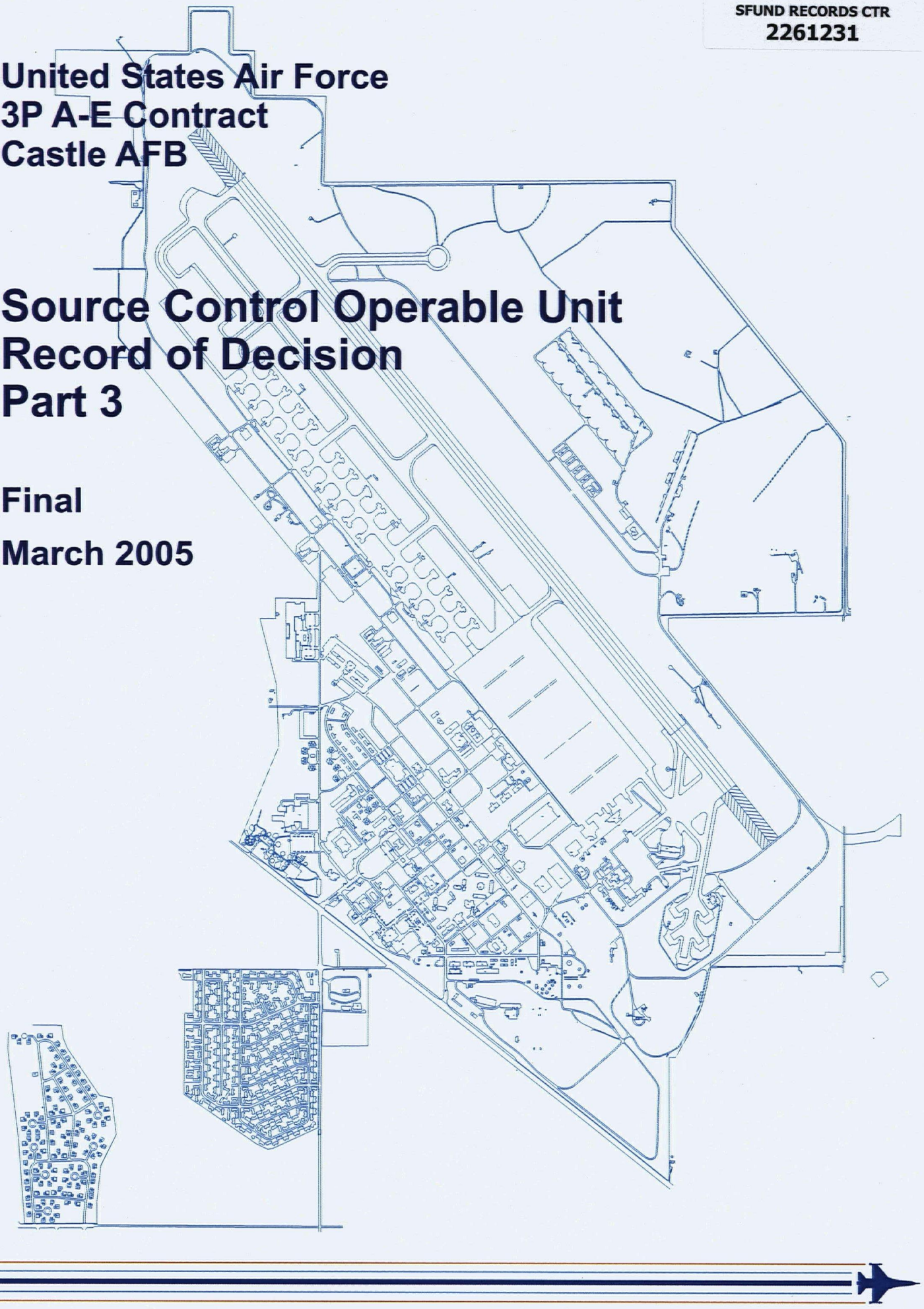
United States Air Force
3P A-E Contract
Castle AFB

# Source Control Operable Unit Record of Decision Part 3

Final

March 2005



**JACOBS**
Western Federal Region
Sacramento Operations
2525 Natomas Park Drive, Suite 370, Sacramento, CA 95833 Telephone (916) 922-8600 Fax (916) 568-4747

Transmittal # 152

# CASTLE AIRPORT TRANSMITTAL

To: Mr. Stanley Pehl*
HQ AFCEE/ERB
3300 Sidney Brooks
Brooks City-Base, TX 78235

Date: 22 March 2005
Contract No.: F41624-00-D-8031
T.O. No.: 0010
Air Force Project No.: DESR 2002-7772
Jacobs Project No.: 05Z01001
Project Name: SCOU ROD 3

From: Campbell McLeod
Castle Program Manager

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| 1. | Report (CDRL A025A) | Final | Source Control Operable Unit Record of Decision 3 | 03/22/05 |

REMARKS:

COPIES TO:

**AFCEE**
Sara Mancillas—BAH

**AFRPA**
Brian Altsman (2; one copy for AFRPA/DD-PM)
Greg Gangnuss
Jay McCain
Geoff Watkin—BAH (2)
Carolyn White
Rod Whitten
AR File

**Bureau of Prisons**
Rodney Anderson (2)

**CIWMB**
Alan Berry

**County of Merced**
John Fowler
Jeff Palsgaard

**EPA**
Lida Tan (2)

**DTSC**
Carolyn Tatoian Cain (2)

**RWQCB**
Duncan Austin/Marcus Pierce (2)

**Jacobs**
Dick Bateman
Campbell McLeod
Document Control

* Transmittal only

DEPARTMENT OF THE AIR FORCE
AIR FORCE REAL PROPERTY AGENCY

MAR 16 2005

AFRPA/DD
1700 N. Moore Str., Ste. 2300
Arlington, VA 22209-2802

Lida Tan
U.S. EPA Region IX
75 Hawthorne Street (SFD-8-3)
San Francisco, CA 94105

Carolyn Tatoian Cain
Dept. of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826-3200

Marcus Pierce
CA Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

SUBJECT: Final (revised) Source Control Operable Unit Record of Decision Part 3

Attached for your agency's review and concurrence is the above-captioned primary document prepared and signed by the Air Force in accordance with the agreed-to document transmittal process. The revised Final SCOU ROD Part 3 specifies the selected remedies for Fire Training Area 1; former skeet ranges ETC-10 and ETC-8; Disposal Pit 9; Landfills 4 and 5, including their associated sites; and ecological risk at all 233 SCOU sites. The Air Force has addressed agency comments received on the Draft Final SCOU ROD Part 3 (issued May 2004) in accordance with the responses to agency comments that were resolved with and approved by the BRAC Cleanup Team.

The only unresolved comment is the DTSC request that the Air Force include a commitment regarding payment of State costs for oversight of land use controls. Regarding future payment of state land use control oversight costs, the Air Force considers these as operating costs that can and will be negotiated outside any ROD(s). As in previous Castle RODs, resolution of such funding is not addressed in the SCOU ROD Part 3. However, recognizing the importance of this issue, the Air Force and the State of California have engaged in discussions to resolve the State oversight payment issue and achieved considerable progress in developing a mutually agreeable solution. We suggest that these discussions continue, but not within the FFA dispute resolution process, avoiding delay in issuance of final Records of Decision while a solution is obtained. Accordingly, we ask that U.S. EPA and the State sign the

attached ROD within 30 days, by which time we hopefully will have completed discussions with DTSC on the State oversight payment issue.

During our final review of the ROD, we discovered the need for a couple of minor revisions. We identified minor inconsistencies in the discussions concerning ecological monitoring. After the approved language from Section 2.9.7.3 ("Monitoring would continue at five-year intervals for 30 years unless the Air Force, EPA, and DTSC are in mutual agreement that monitoring can be discontinued"), the Air Force is adding for clarity the note that a finding of no impact according to the three factors will lead to discontinuance of monitoring. See underlined script.

Section 2.9.7.3: "Under this alternative, five-yearly monitoring would be conducted to ensure that the ecological health of the contaminated wetlands is maintained. Monitoring would continue at five-year intervals for 30 years unless the Air Force, EPA, and DTSC are in mutual agreement that monitoring can be discontinued. To ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued, in mutual agreement with the Air Force, EPA, and DTSC. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives."

Subsequent sections, for consistency with Section 2.9.7.3, now read:

"Long-term ecological monitoring at LF-5 [operable unit reference changes] will consist of wetlands invertebrate and plant surveys every five years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives."

Also, the Air Force modified the 1st sentence, 2nd paragraph, of Section 2.9.7.3 for accuracy (because independently applicable wetland requirement protect wetlands, not monitoring): "This alternative would still allow ~~provide no protection to the wetlands at these sites, in that~~ receptors ~~would still~~ to be in contact with contaminated soils."

If you have any questions, please contact me at (703) 696-5540, or the Castle Base Environmental Coordinator, Mr. Greg Gangnuss at (916) 643-6420x112.

Gerald R. Johnson

Gerald R. Johnson
Acting Division Chief, Division D

Attachment:
As stated

# Environmental Remedial Action-Construction

# Castle Air Force Base

# Source Control Operable Unit Record of Decision Part 3

**Final**

**March 2005**

**Prepared for the**
**Department of the Air Force**
**Castle AFB, CA**

**Prepared by**
**Jacobs**
**2525 Natomas Park Drive, Suite 370**
**Sacramento, CA 95833**

**USAF Contract No. F41624-01-D-8547, Task Order No. 0010**
**Jacobs Project No. 05Z01001**

**Air Force Center for Environmental Excellence**
**Environmental Services Office/Environmental Restoration**
**Brooks City-Base, TX 78235**

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| µg/dL | micrograms per deciliter |
| µg/L | micrograms per liter |
| µg/kg | micrograms per kilogram |
| AFB | Air Force Base |
| AFRPA | Air Force Real Property Agency |
| AR | Administrative Record |
| ARARs | Applicable or Relevant and Appropriate Requirements |
| BCT | BRAC Closure Team |
| Berger | Louis Berger and Associates |
| bgs | below ground surface |
| BoP | Federal Bureau of Prisons |
| BRAC | Base Realignment and Closure |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CB | comprehensive basewide |
| CCR | California Code of Regulations |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act of 1980 |
| CFR | Code of Federal Regulations |
| *cis*-1,2-DCE | *cis*-1,2-dichloroethene |
| cm/sec | centimeters per second |
| COC | contaminant of concern |
| CPCMP | Closure and Post Closure Maintenance Plan |
| CRP | Community Relations Plan |
| DA-# | Discharge Area-number |
| DBF | Detonation and Burn Facility |
| DEHP | di(2-ethylhexyl) phthalate; also *bis*(2-ethylhexyl) phthalate |
| DP-# | Disposal Pit-number |
| DTSC | Department of Toxic Substances Control |
| Earth Tech | Earth Tech, Inc. |
| EPA | U.S. Environmental Protection Agency |
| ERA | ecological risk assessment |
| ETC-# | Earth Technology Corporation-number |
| FFA | Federal Facilities Agreement |

## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| FFS | focused feasibility study |
| FR | Firing Range |
| Freon 11 | trichlorofluoromethane |
| Freon 12 | dichlorodifluoromethane |
| FTA-# | Fire Training Area-number |
| GAC | granular activated carbon |
| HHRA | human health risk assessment |
| HI | hazard index |
| HQ | hazard quotient |
| HSZ | hydrostratigraphic zone |
| IAG | Interagency Agreement |
| IC | institutional control |
| IRP | Installation Restoration Program |
| Jacobs | Jacobs Engineering |
| JP4 | jet propellant type 4 |
| LF-# | Landfill-number |
| LSS | Lower Subshallow (HSZ) |
| LTGSP | Long-Term Groundwater Sampling Program |
| MCL | maximum contaminant level |
| mg/kg | milligrams per kilogram |
| MOU | memorandum of understanding |
| MWH | Montgomery Watson Harza |
| NCP | National Contingency Plan |
| NPL | National Priorities List |
| O&M | operation and maintenance |
| OU | operable unit |
| PAH | polynuclear aromatic hydrocarbon |
| PCE | tetrachloroethene |
| RAB | Restoration Advisory Board |
| RAO | remedial action objective |
| RI/FS | remedial investigation/ feasibility study |
| ROD | record of decision |
| RWQCB | California Regional Water Quality Control Board |

## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| SAC | Strategic Air Command |
| SARA | Superfund Amendment and Reauthorization Act of 1986 |
| SCOU | source control operable unit |
| SDS | storm drain system |
| START | SVE Turn-on And Remediation Test |
| STOP | SVE Termination or Optimization Process |
| SVE | soil vapor extraction |
| SVOC | semivolatile organic compound |
| T&E | technical and economic (evaluation) |
| TBV | threshold background value |
| TCE | trichloroethene |
| TOC | total organic carbon |
| TPH | total petroleum hydrocarbons |
| TEPH | total extractable petroleum hydrocarbons (i.e., diesel) |
| TVPH | total volatile petroleum hydrocarbons (i.e., gasoline) |
| $UCL^{95}$ | 95 percent upper confidence limit |
| USAF | United States Air Force |
| USS | Upper Subshallow (HSZ) |
| VOC | volatile organic compound |
| WET | waste extraction test |
| WPI | Waste Policy Institute |
| WQSA | water quality site assessment |
| $yd^3$ | cubic yard |

# Section 1

# 1 DECLARATION

## 1.1 SITE NAME AND LOCATION

The former Castle Air Force Base (Castle AFB; also known as Castle Airport), Merced County, California (Figure 1-1).

U.S. Environmental Protection Agency (EPA) identification: CA3570024551

## 1.2 STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the selected remedies for the final 11 of 233 Source Control Operable Unit (SCOU) sites at Castle AFB in Merced County, California (Plate 1, Appendix A). The selected remedies to address ecological risks at all 233 SCOU sites are also presented. The selected remedies were all chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The remedial decisions in this SCOU ROD Part 3 are based on the findings of the Castle AFB *SCOU Remedial Investigation/Feasibility Study* (SCOU RI/FS) (Jacobs Engineering [Jacobs], 1997a), the *Comprehensive Basewide Remedial Investigation/Feasibility Study – Part 2* (CB RI/FS – Part 2) (Jacobs, 2002a) and other associated documentation included in the Castle AFB Administrative Record (AR). The AR index is provided in Appendix B. The Air Force and the EPA have jointly selected the remedies in the SCOU ROD Part 3; the State of California concurs. This ROD has been prepared in accordance with *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (EPA, 1999a).

## 1.3 ASSESSMENT OF THE SITES

The remedies selected in this ROD are necessary to protect human health and the environment from actual or threatened releases of hazardous substances and pollutants or contaminants as defined in NCP Part 300.5. The sites addressed in this ROD and their primary contaminants are:

- Landfill 4 (LF-4) with Disposal Pit 5 (DP-5) and DP-6 and LF-5 with DP-8, DP-8A and Landfill 5 Trenches, where municipal wastes (household, commercial and to a lesser extent industrial-type wastes) were historically disposed and non-hazardous/non-designated wastes from five Castle AFB landfills and other SCOU sites were consolidated and capped over pre-existing inactive landfill trenches
- Earth Technology Corporation 8 (ETC-8) and ETC-10 with polynuclear aromatic hydrocarbon (PAH) contamination from clay pigeons
- Fire Training Area 1 (FTA-1) with volatile organic compound (VOC), semivolatile organic compound (SVOC), metals, dioxin and fuel hydrocarbon contamination
- DP-9 with no evidence of contamination
- All 233 SCOU sites to address basewide ecological risks
    - Eight SCOU sites (ETC-10, ETC-12, FTA-1, LF-3, LF-5, DP-8, DP-8A and Landfill 5 Trenches) with metals contamination
    - 225 SCOU sites with no evidence of contamination, where contamination did not cause unacceptable ecological risk or where there was no suitable habitat and therefore no ecological receptors

## 1.4 DESCRIPTION OF SELECTED REMEDIES

The SCOU ROD Part 3 is the last of three SCOU RODs. It selects the remedies for 11 SCOU sites: LF-4 including DP-5 and DP-6; LF-5 including DP-8, DP-8A and Landfill 5 Trenches; DP-9 (associated with LF-5 but treated separately because of a different remedy); ETC-8; ETC-10; and FTA-1 (Figure 1-1). In addition, the SCOU ROD Part 3 establishes the selected remedies to address ecological risks at all 233 SCOU sites. Table 1-1 provides a listing of the SCOU ROD Part 3 sites including their preferred alternative, removal action (if any), selected remedy and remedial status.

The SCOU ROD Part 3 selected remedies are designed to remove or isolate contaminants in soil that pose an adverse risk to human health, groundwater quality or the environment. The soil was contaminated as a result of historical operations at Castle AFB, primarily activities associated with waste disposal and training. Due to their characteristics of mobility and/or toxicity, the source materials that constitute principal threats to human health, groundwater quality and the environment include solvents (VOCs), benzene, SVOCs, dioxins/furans, petroleum hydrocarbons in the gasoline and diesel ranges, PAHs and metals.

- LF-4, DP-5 and DP-6 selected remedy:
  - Cap maintenance and monitoring
  - Institutional controls (ICs)
- LF-5, DP-8, DP-8A and Landfill 5 Trenches selected remedy:
  - Cap maintenance and monitoring
  - ICs
  - Long-term ecological monitoring
- DP-9 selected remedy:
  - No further action
- ETC-8 selected remedy:
  - Excavation and disposal
- ETC-10 selected remedy:
  - ICs
  - Long-term ecological monitoring
- FTA-1 selected remedy:
  - Soil vapor extraction (SVE) and bioventing
  - Cap maintenance and monitoring
  - ICs
  - Long-term ecological monitoring
  - Excavation and disposal
- ETC-12 and LF-3 selected remedy (ecological risk only):
  - Long-term ecological monitoring
- Remaining 225 SCOU sites selected remedy (ecological risk only)
  - No further action

Consolidation and capping at LF-4 and LF-5, SVE and capping at FTA-1 and excavation and disposal at ETC-8 and ETC-10 were previously implemented under removal action authority. Consolidation and capping at LF-4 and LF-5 is complete; post-closure cap maintenance and monitoring, including groundwater monitoring, are ongoing and will be continued as long as required by State landfill regulations. The SVE removal action at

FTA-1 is ongoing. Summaries of the completed and ongoing removal actions are provided in Section 2.8; detailed descriptions of the selected remedies are provided in Section 2.12.

## 1.5 STATUTORY DETERMINATIONS

The selected remedies included in the SCOU ROD Part 3 attain the mandates of CERCLA Section 121 and, to the extent practicable, the NCP. The selected remedies are protective of human health, groundwater and the environment, comply with federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and are cost-effective. To the extent practicable, the remedies utilize permanent solutions and satisfy the statutory preference for treatment as a principal element to reduce toxicity, mobility or volume of hazardous substances, pollutants or contaminants. The SVE removal action at FTA-1 is providing treatment via catalytic oxidation and granular activated carbon (GAC) systems. Catalytic oxidation and bioventing, both part of the selected remedy for FTA-1, are alternative treatment technologies. The relatively low levels of contaminants in wastes/soils at LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); ETC-8 and ETC-10 indicate that treatment would have been technically impractical and, if implemented, would have resulted in extraordinarily high costs for minimal reduction in toxicity, mobility and volume of hazardous substances, pollutants and contaminants.

Per NCP 300.430(f)(4)(ii), a statutory review of remedial actions must be conducted every five years for sites where hazardous substances, pollutants or contaminants remain above levels that allow unlimited use and unrestricted exposure. Accordingly, statutory five-year reviews are necessary for LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and the Landfill 5 Trenches); ETC-10 and FTA-1. The initial five-year review for Castle AFB remedial actions was completed in 1998 and focused primarily on the ongoing groundwater remediation activities. The second five-year review was completed in January 2004 (Jacobs, 2004a) and included a review of ongoing removal and remedial actions for soil and groundwater. The next five-year review for Castle AFB is scheduled for 2008. Ecological monitoring at LF-5, ETC-10, FTA-1, LF-3 and ETC-12 will be conducted concurrent with the five-year review.

## 1.6 ROD DATA CERTIFICATION CHECK LIST

The following information is included in Section 2, Decision Summary of this ROD.

- Contaminants of concern (COCs) and their respective concentrations (Sections 2.8.1.6 (LF-4), 2.8.2.7 (LF-5), 2.8.3.6 (DP-9), 2.8.4.6 (ETC-8), 2.8.5.7 (ETC-10), 2.8.6.7 (FTA-1), 2.8.7.4 (ETC-12) and 2.8.8.4 (LF-3)
- Risk to human health posed by COCs (Section 2.6.1 [general]; site-specific risk assessment results are presented in Sections 2.8.1.4 [LF-4], 2.8.2.4 [LF-5], 2.8.3.4 [DP-9], 2.8.4.4 [ETC-8], 2.8.5.4 [ETC-10] and 2.8.6.4 [FTA-1])
- Ecological risk assessment—Sections 2.6.3 [general], 2.8.2.6 [LF-5], 2.8.5.6 [ETC-10], 2.8.6.6 [FTA-1], 2.8.7.3 [ETC-12] and 2.8.8.3 [LF-3]
- Risk to groundwater posed by COCs (Sections 2.6.2 [general]; site-specific risk assessment results are presented in Sections 2.8.1.5 [LF-4], 2.8.2.5 [LF-5], 2.8.3.5 [DP-9], 2.8.4.5 [ETC-8], 2.8.5.5 [ETC-10] and 2.8.6.5 [FTA-1])
- Remedial action objectives (RAOs) established for COCs and the basis for these levels (Section 2.7)
- Source materials constituting principal threats and how they are addressed (Section 2.11)
- Current and potential future land and groundwater use assumed by the human health risk assessment (HHRA) (Section 2.6.1), the water quality site assessment (WQSA) (Section 2.6.2) and the ecological risk assessment (ERA) (Section 2.6.3)
- Potential future land and groundwater use available as a result of the selected remedies (Section 2.12)
- Cost estimates for selected remedies (Section 2.12)
- Criteria for remedy selection (Sections 2.9 and 2.10)

Page numbers for the sections and tables referenced in the ROD Data Certification Checklist can be found in the Table of Contents. Additional supporting information can be found in the AR for Castle AFB, the index for which is provided in Appendix B.

## 1.7 AUTHORIZING SIGNATURES

This is the signature sheet for the Source Control Operable Unit Record of Decision Part 3 for LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); DP-9; ETC-8; ETC-10; FTA-1 and for ecological risk at all 233 SCOU sites at Castle AFB. The EPA and the State of California had an opportunity to review and comment on the Source Control Operable Unit Record of Decision Part 3 and their concerns were addressed.

Kathryn M. Halvorson — 16 Mar 05

KATHRYN M. HALVORSON
Acting Director
Air Force Real Property Agency
U.S. Air Force

Date

KATHLEEN JOHNSON
Chief, Federal Facilities and Site Cleanup Branch
Region IX, U.S. Environmental Protection Agency

Date

ANTHONY J. LANDIS, P.E.
Chief, Northern California Operations
Office of Military Facilities
Department of Toxic Substances Control
California Environmental Protection Agency

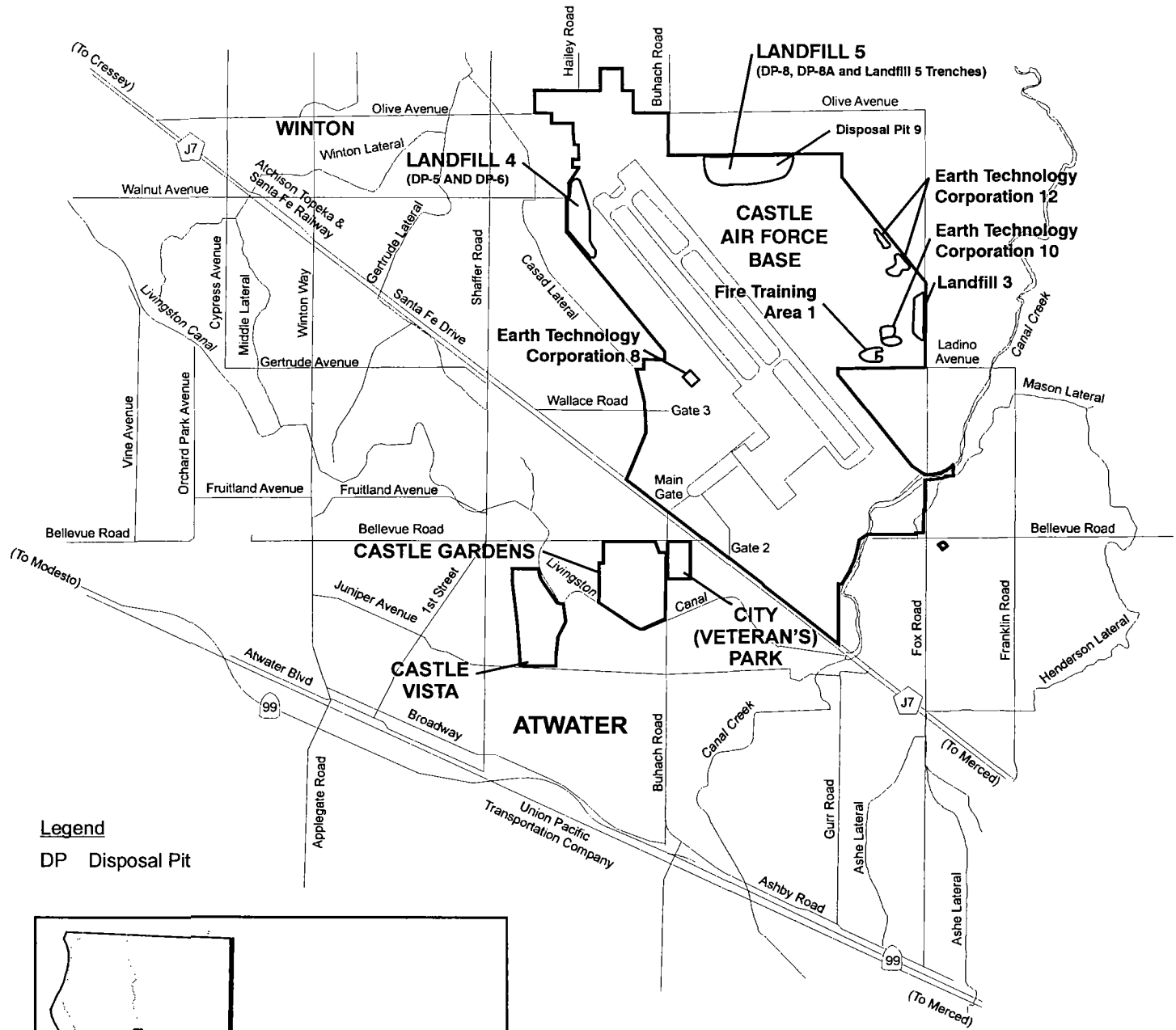
Date

# Tables

## Table 1-1
## Summary of Selected Remedies

| Soil Contamination Sites | |
|---|---|
| ***LF-4, DP-5 and DP-6*** | |
| **Preferred Alternative**[1] | Waste consolidation and capping; long-term maintenance and monitoring and ICs |
| **Removal Action** | Waste consolidation and capping and initiation of long-term maintenance and monitoring |
| **Selected Remedy** | Cap maintenance and monitoring and ICs |
| **Remedial Status** | Waste consolidation and capping completed; long-term maintenance and monitoring ongoing; ICs partially implemented |
| ***LF-5, DP-8, DP-8A and Landfill 5 Trenches*** | |
| **Preferred Alternative**[1,2] | Waste consolidation and capping; long-term maintenance and monitoring; ICs and long-term ecological monitoring |
| **Removal Action** | Waste consolidation and capping and initiation of long-term maintenance and monitoring |
| **Selected Remedy** | Cap maintenance and monitoring; ICs and long-term ecological monitoring |
| **Remedial Status** | Waste consolidation and capping completed; long-term maintenance and monitoring ongoing; ICs fully implemented; long-term ecological monitoring at next 5-year review |
| ***DP-9*** | |
| **Preferred Alternative**[1] | Waste consolidation and capping; long-term maintenance and monitoring and ICs |
| **Removal Action** | None |
| **Selected Remedy** | No further action (see Section 2.14) |
| **Remedial Status** | No further action |
| ***ETC-8*** | |
| **Preferred Alternative**[2] | Excavation and disposal |
| **Removal Action** | Excavation and disposal |
| **Selected Remedy** | Excavation and disposal |
| **Remedial Status** | Partial site excavation completed by removal action; additional excavation and disposal is planned |
| ***ETC-10*** | |
| **Preferred Alternative**[2] | ICs and long-term ecological monitoring |
| **Removal Action** | Excavation and disposal |
| **Selected Remedy** | ICs and long-term ecological monitoring |
| **Remedial Status** | Partial site excavation completed by removal action; ICs fully implemented; long-term ecological monitoring at next 5-year review |
| ***FTA-1*** | |
| **Preferred Alternative**[2] | SVE; bioventing; long-term cap maintenance and monitoring; ICs; long-term ecological monitoring and excavation and disposal |
| **Removal Action** | SVE and bioventing; capping |
| **Selected Remedy** | SVE; bioventing; cap maintenance and monitoring; ICs; long-term ecological monitoring and excavation and disposal |
| **Remedial Status** | SVE removal action ongoing until SVE/bioventing achieves RAOs; cap in place and cap maintenance and monitoring ongoing; groundwater monitoring to be implemented until SVE/bioventing achieves RAOs; ICs fully implemented; long-term ecological monitoring at next 5-year review; excavation and disposal planned |

# Figures




**Castle Air Force Base Vicinity Map**

*SCOU ROD Part 3*

*Castle AFB*

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*09/14/04 rkc*

*FIGURE 1-1*

# Section 2

# 2 DECISION SUMMARY

This decision summary presents an overview of site characteristics for Castle AFB and the CERCLA sites addressed in the SCOU ROD Part 3, the alternatives evaluated for remedial action at the sites, and the detailed and comparative analysis of those alternatives. The decision summary concludes with identification of the selected remedies and the associated statutory determinations supporting the selected remedies.

This decision summary incorporates the format and content recommended by EPA guidance (EPA, 1999a). The recommended outline headings from the guidance and corresponding subsections of this decision summary are listed below.

| EPA-Recommended Subsection | Decision Summary Subsection |
|---|---|
| 1. Site Name, Location, and Description | 2.1 |
| 2. Site History and Enforcement Activities | 2.2 |
| 3. Community Participation | 2.3 |
| 4. Scope and Role of Operable Units | 2.4 |
| 5. Site Characteristics | 2.8 |
| 6. Current and Potential Future Site and Resource Uses | 2.5 |
| 7. Assessment of Site Risks | 2.6 |
| 8. Remedial Action Objectives | 2.7 |
| 9. Description of Alternatives | 2.9 |
| 10. Comparative Analysis of Alternatives | 2.10 |
| 11. Principal Threat Waste | 2.11 |
| 12. Selected Remedy | 2.12 |
| 13. Statutory Determinations | 2.13 |
| 14. Documentation of Significant Changes | 2.14 |

The adjustments to the order of recommended sections were incorporated into this decision summary to accommodate the inclusion of site-specific risk information and RAOs in the Site Characteristics subsection.

## 2.1 SITE NAME, LOCATION AND DESCRIPTION

Castle AFB is located in Merced County, California (Figure 1-1). The site covers an area of 2,777 acres and includes a runway and airfield, industrial areas, housing, recreational facilities, and several non-contiguous parcels. Neighboring communities include Atwater, located immediately to the west, Winton, located to the northwest, and Merced, located approximately 5 miles southeast of Castle AFB.

DP-9, ETC-8, ETC-10, ETC-12, FTA-1, LF-3, LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) locations are shown on Figure 1-1. All Castle AFB SCOU site locations are shown on Plate 1 in Appendix A. All Castle AFB SCOU site locations are listed, by ROD and remedy, in Table 2-1.

## 2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

### 2.2.1 Castle Air Force Base

Castle AFB began as a military air base in December 1941 to train Army aircrews during World War II. The Strategic Air Command (SAC) assumed responsibility for the base in 1946. The 93rd Bombardment Wing occupied the base until closure in September 1995. Fuels, primarily jet propellant type 4 (JP4), solvents, and chemicals were used at the base since the 1940s. Municipal and chemical wastes were also generated as a result of maintenance operations, fuel management, fire training, and other base activities. In the 1950s, expanded industrial activities related to the SAC mission resulted in increased waste generation rates.

Castle AFB was subject to the provisions of CERCLA upon authorization of SARA in 1986. The CERCLA remedial process from site assessment through closure is summarized on Figure 2-1. Castle AFB was proposed for the National Priorities List (NPL) of hazardous waste sites on 22 July 1987. The former base was officially listed as an NPL site on 21 November 1989, and has been assigned EPA identification number CA3570024551. Remedial activities at Castle AFB are funded through the Department of Defense as a component of Base Realignment and Closure (BRAC) Environmental Cleanup. The EPA, California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) and the Air Force signed an inter-agency agreement, known as the Castle Air Force Base Federal Facility Agreement (FFA) on 21 July 1989. The FFA is a

legal/contractual document governing the BRAC Closure Team (BCT) relationships and processes governing cleanup at Castle AFB. The Air Force, EPA, DTSC and the California Regional Water Quality Control Board (RWQCB) Central Valley Region comprise the BCT, with the Air Force serving as lead agency. Decisions regarding site assessment and cleanup at Castle AFB are agreed upon by the BCT.

Following the sampling of several water production wells in 1978, the Air Force determined that groundwater beneath Castle AFB was contaminated with trichloroethene (TCE) and other VOCs. Subsequent sampling provided the impetus for the Air Force's aggressive strategy to address groundwater contamination under the Installation Restoration Program (IRP). The initial phase of the IRP at Castle AFB was conducted in 1981.

In March 1984, the RWQCB issued Cleanup and Abatement Order Number 84-027. This order required Castle AFB to provide users of the base water supply and contaminated off-base wells with additional sources of potable water. Castle AFB was required to implement remedial measures to mitigate groundwater contamination and prevent future groundwater degradation. Groundwater pump-and-treat systems have been installed to control plume migration and to remediate contaminated groundwater. Final decisions for groundwater remediation are documented in the *Record of Decision for Comprehensive Basewide – Part 1 (Groundwater)* (CB ROD – Part 1) (United States Air Force [USAF], 1997).

The basewide SCOU RI/FS was initiated in 1993. A total of 233 sites were investigated during SCOU RI activities. Investigation methods included geophysical surveys and soil and soil gas sampling and analysis. The summary of the SCOU RI/FS was submitted for agency review in February 1995. The 1995 RI/FS was rejected by the agencies and the Air Force was requested to initiate further investigation of 40 SCOU sites. The updated draft final RI/FS was submitted for agency review in January 1997 and finalized in May 1997 (Jacobs, 1997a). However, based on further agency comment, it was determined that 24 of the SCOU sites required further evaluation before a remedial alternative could be selected and one site (FTA-1) required a CERCLA evaluation of alternatives for metals and dioxin contamination.

Sites that required further evaluation fell into two categories, further action data gap sites and technical and economic (T&E) evaluation sites. These sites were either not sampled as part of the RI, or the data collected were not adequate to support remedy selection. There

were a total of 12 further action data gap sites and 12 T&E sites. To address needs for additional data, the Air Force completed data gap and T&E investigations in late 1997 and early 1998. The results were presented in the *Source Control Operable Unit Data Gap Investigation Report*, which was completed in 1999 (Jacobs, 1999a).

The first five-year review for Castle AFB (Jacobs, 1998a) included a summary overview of all SCOU sites. The second five-year review for Castle AFB (Jacobs, 2004a) provided a detailed evaluation of ongoing SCOU removal or remedial actions, including the SCOU ROD Part 3 sites LF-4, LF-5, ETC-10 and FTA-1.

### 2.2.2 Landfill 4 (including Disposal Pits 5 and 6)

LF-4, including DP-5 and DP-6, was an active landfill between 1957 and 1970. Municipal waste and potentially minor amounts of chemical waste were disposed at the site. Prior to the SCOU RI, a soil gas survey (1986) and a solid waste assessment test were conducted. The majority of SCOU RI activities occurred during 1993-1994, followed by a LF-4 data gap investigation in mid-1997. An action memorandum for a consolidation and capping removal action was issued in September 1997. The removal action took place from October 1997 through September 1999. Post-closure cap maintenance and monitoring and groundwater monitoring (detection monitoring) was initiated immediately after completion of the removal action.

### 2.2.3 Landfill 5 (Including Disposal Pits 8, 8A and Landfill 5 Trenches)

LF-5, including DP-8, DP-8A and Landfill 5 Trenches, was an active landfill between 1971 and 1977. Municipal waste, construction waste, demolition debris and potentially minor amounts of chemical waste were disposed at the site. Prior to the SCOU RI, site characterization investigations were conducted in 1985 and in 1988. The majority of SCOU RI activities occurred during 1993-1994, followed by a LF-5 data gap investigation in mid-1997. An action memorandum for a consolidation and capping removal action was issued in October 1998. The removal action took place from November 1998 through September 1999. Post-closure cap maintenance and monitoring and groundwater monitoring (detection monitoring) was initiated immediately after completion of the removal action.

### 2.2.4 Disposal Pit 9

The DP-9 site is located just to the north and east of the easternmost disposal trenches at LF-5. The nature of wastes disposed at DP-9, if any, is uncertain. The majority of SCOU RI activities occurred during 1993-1994, followed by sampling during the LF-5 data gap investigation in mid-1997. The DP-9 site was not affected by the LF-5 removal action.

### 2.2.5 Earth Technology Corporation 8

ETC-8 is a former skeet-shooting range that was active in the early years of base use. ETC-8 was sampled and characterized during the SCOU data gap investigation (1997). An action memorandum for an excavation and disposal removal action at ETC-8 was issued in May 2000. The removal action took place from 30 May through 30 August 2000.

### 2.2.6 Earth Technology Corporation 10

ETC-10 is a former skeet-shooting range that was active until 1995. The majority of SCOU RI activities occurred during 1993-1994, followed by limited data gap sampling. An action memorandum for an excavation and disposal removal action at ETC-10 was issued in October 1996. The removal action took place from 27 July through 10 August 1998.

### 2.2.7 Fire Training Area 1

FTA-1 is a former fire training area that was active from 1955 through 1975. Prior to the SCOU RI, site characterization investigations were conducted in 1988 and 1990. The majority of SCOU RI activities occurred during 1993-1994. Additional sampling to address ecological risk was conducted during March and June 2001. An action memorandum for an SVE/capping removal action at FTA-1 was issued in September 1995. The cap, an engineered alternative to a Class III cap, was installed in 1996. The SVE component of the removal action was initiated in 1996 and is ongoing.

### 2.2.8 Ecological Risk Assessment

Scoping, Phase I and Phase II ERAs were conducted concurrent with the SCOU RI/FS. The Scoping ERA screened out 208 of the 233 SCOU sites as having no potential to impact ecological habitat because they were primarily buildings, pavement or urban lawn. The

Phase I and Phase II ERAs screened out all but eight of the remaining SCOU sites, all wetlands sites (ETC-10, ETC-12, FTA-1, LF-3, LF-5, DP-8, DP-8A and Landfill 5 Trenches).

## 2.3 COMMUNITY PARTICIPATION

The Community Relations Plan (CRP) for Castle AFB was completed in 1990 and updated annually by Castle AFB's Office of Public Affairs from 1994 through 1998. The current CRP is dated October 1998. The DTSC Public Participation Policy requires that the CRP be reviewed and/or revised at least every two years for a long-term project. The Air Force policy is that the CRP be reviewed annually and updated as needed, but at a minimum, within five years of the last update. Concurrent with the signing of the SCOU ROD Part 1 in September 2002, community involvement activities directed toward updating the CRP were initiated. An updated CRP will be issued in 2004.

Consistent with the Base's CRP, the Air Force established a Restoration Advisory Board (RAB) composed of EPA, DTSC, RWQCB, the Air Force, Merced County, and local representatives from adjacent communities. The RAB meets regularly to provide the community representatives with information on recent events. Castle AFB publishes and distributes newsletters (*Castle Cleanupdate*) to inform the community of recent activities.

After completion of the SCOU RI/FS, the *SCOU Proposed Plan* (Waste Policy Institute [WPI], 1997) was submitted 15 August 1997 to the RAB and the public for a 30-day comment period. The SCOU Proposed Plan provided a brief overview of the information contained in the SCOU RI/FS and listed the proposed remedial alternatives for each of the 233 SCOU sites. Responses to comments received during the public hearings and comment period are included in the Responsiveness Summary of the SCOU ROD Part 1, which includes 169 SCOU sites requiring no further action. Responses to public comments specific to LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); DP-9; ETC-8; ETC-10 and FTA-1 are provided in the Responsiveness Summary (Section 3) of this document.

The Air Force subsequently issued the *SCOU Revised Proposed Plan* (Earth Tech Inc. [Earth Tech], 2001) and the *Comprehensive Basewide Proposed Plan – Part 2* (CB Proposed Plan – Part 2) (Jacobs, 2003). The SCOU Revised Proposed Plan was submitted 12 February 2001 to the RAB and the public for a 30-day comment period. A public hearing

was held at the Atwater City Hall Council Chambers on 21 February 2001. The SCOU Revised Proposed Plan updated conditions and presented the preferred alternatives for 50 of the 53 SCOU ROD Part 2 sites. Responses to public comments on the SCOU Revised Proposed Plan are included in the Responsiveness Summary of the SCOU ROD Part 2. The CB Proposed Plan – Part 2 was submitted 3 December 2003 to the RAB and the public for a 30-day comment period. A public hearing was held at the Air Force Real Property Agency (AFRPA) offices on Castle AFB on 10 December 2003. The CB Proposed Plan – Part 2 included updates to the preferred alternatives for ETC-8, ETC-10 and FTA-1 and, for all 233 SCOU sites, the preferred alternatives for addressing ecological risk. Responses to public comments specific to ETC-8, ETC-10, FTA-1 and ecological risk are provided in the Responsiveness Summary (Section 3) of this document.

With this ROD, all 233 SCOU sites are addressed in three SCOU RODs: SCOU ROD Part 1 includes 169 no further action sites: SCOU ROD Part 2 includes 53 SCOU sites; SCOU ROD Part 3 includes 11 SCOU sites and addresses ecological risk for all 233 SCOU sites.

The selected remedies for the SCOU sites addressed in the SCOU ROD Part 3 were chosen in accordance with CERCLA, as amended by SARA and the NCP. The remedial decisions are based on informational documents in the AR. Publicly accessible copies of the AR are available at Castle AFB and at the Merced County Library. The availability of the AR was indicated to the public in the SCOU Proposed Plans. A summary of the AR (AR index) is provided in Appendix B of this ROD. The public participation requirements of CERCLA Sections 113(K)(2)(B)(I-v) and 117 have been substantively satisfied.

## 2.4 SCOPE AND ROLE OF OPERABLE UNITS

Operable units (OUs) are used to group sites having similar contaminants and site conditions. Historically, multiple operable units have been identified at Castle AFB. The Source Control Operable Unit (SCOU) pertains to surface and/or subsurface soil contamination. Three separate RODs (Parts 1, 2 and 3) address the SCOU. Groundwater was originally divided into OU-1 and OU-2 but then was united into a single OU under the CB ROD – Part 1 (Groundwater). Ultimately, the CB ROD – Part 1 and the three SCOU RODs will be summarized for administrative purposes into the *Comprehensive Basewide Record of Decision – Part 2* (CB ROD – Part 2) (draft; Jacobs, 2004b), which will also

identify any additional actions necessary for the protection of human health and the environment. Figure 2-2 indicates how the OUs are incorporated into the RODs at Castle AFB.

## 2.5 CURRENT AND POTENTIAL FUTURE SITE AND RESOURCES USES

Land use within a 2-mile radius of Castle AFB is urban and agricultural. Urban residential areas consisting of former base housing, trailer parks, and recently constructed residential suburban housing, are located west, south, and east of the base. Agricultural areas and rural farm residences are located to the north of the base.

Groundwater is currently pumped locally for irrigation and domestic uses, including use as municipal drinking water. Future groundwater uses should remain the same, but the quantity of groundwater used will likely increase. The selected remedy to contain and remediate contaminated groundwater at Castle AFB is specified in the CB ROD – Part 1 (USAF, 1997) and is being implemented. Monitoring of local domestic and municipal supply wells, as well as local irrigation wells, is conducted in accordance with the CB ROD – Part 1. Where necessary, alternative or treated water supplies have been, and will continue to be, provided for the protection of human health as described in the draft CB ROD – Part 2 (Jacobs, 2004b). The CB ROD – Part 1 selected remedy is expected to result in unrestricted use when completed.

Current and potential future site use for the SCOU ROD Part 3 sites is as follows:

- LF-4 including DP-5 and DP-6: a landfill; current and future use is limited to nonirrigated open space; future uses are limited in accordance with the ICs listed in Section 2.12.
- LF-5 including DP-8, DP-8A and Landfill 5 Trenches: a landfill; current and future use is limited to nonirrigated open space; the Federal Bureau of Prisons (BoP) retains federal ownership of the parcel containing LF-5 and its associated sites; future uses are limited in accordance with the ICs listed in Section 2.12.
- DP-9: an open and grassy area; current and future use is expected to be nonirrigated open space; the BoP retains federal ownership of the parcel containing DP-9; due to proximity of DP-9 to LF-5 (within 1,000 feet), changes in DP-9 use would be subject to LF-5 IC provisions.
- ETC-8: an asphalt-paved parking area and roadway; the parcel containing ETC-8 will be transferred to Merced County for aviation-related activities, aviation support and other non-aviation income generating uses; the selected remedy for ETC-8 will allow for unrestricted future use of the property.

- ETC-10: part of a wetlands preservation area established by the BoP during construction of the federal prison; the BoP retains federal ownership of the parcel containing ETC-10 and is responsible for management of the wetlands preserve; future uses are limited in accordance with the ICs listed in Section 2.12.
- FTA-1: a capped area with no current use; the BoP retains federal ownership of the parcel containing FTA-1 and areas adjacent to the site are currently within the BoP's wetlands preserve; future uses are limited in accordance with the ICs listed in Section 2.12.
- LF-3: clean closed (unrestricted use) and now an open grassy area; the BoP retains federal ownership of the parcel containing LF-3 and the site is currently within the BoP's wetlands preserve.
- ETC-12: an open grassy area; the BoP retains federal ownership of the parcel containing ETC-12 and the site is currently within the BoP's wetlands preserve.

## 2.6 ASSESSMENT OF SITE RISKS

As part of the RI/FS process, the SCOU sites were assessed for potential risk to human health and the environment. The potential risk to human health was evaluated in accordance with EPA *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual Part A, Interim Final* (EPA, 1989). The risk to groundwater quality was evaluated using WQSA methodology (RWQCB, 1992). Ecological risk posed by SCOU sites was evaluated using Scoping, Phase I and Phase II ERAs. Risk to human health was reevaluated in 2001 to account for updated risk and exposure factors established by the EPA and California DTSC (*Evaluation of Changes Affecting the SCOU Baseline Human Health Risk Assessments, Selected Remedies and Remedial Action Objectives*; Jacobs, 2001). Post removal action human health risk at SCOU ROD Part 3 sites was evaluated in the CB RI/FS – Part 2. The ERA for all 233 SCOU sites was also completed in the CB RI/FS – Part 2. The CB ROD – Part 2 will integrate the CB ROD – Part 1 for groundwater with the SCOU ROD Parts 1, 2 and 3 in order to establish and document the basewide remedial actions necessary for the protection of human health and the environment.

The following sections present the general approach used for the SCOU HHRA, WQSA and ERA. Site-specific results are presented in Sections 2.8.1.4 and 2.8.1.5 (HHRA and WQSA for LF-4); 2.8.2.4, 2.8.2.5 and 2.8.2.6 (HHRA, WQSA and ERA for LF-5); 2.8.3.4 and 2.8.3.5 (HHRA and WQSA for DP-9); 2.8.4.4 and 2.8.4.5 (HHRA and WQSA for ETC-8); 2.8.5.4, 2.8.5.5 and 2.8.5.6 (HHRA, WQSA and ERA for ETC-10); 2.8.6.4, 2.8.6.5 and

2.8.6.6 (HHRA, WQSA and ERA for FTA-1); 2.8.7.3 (ERA for ETC-12); and 2.8.8.3 (ERA for LF-3).

### 2.6.1 Human Health Risk Assessment

The baseline HHRA estimates what risks the sites pose if no action were taken. It provides a basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the ROD outlines the general procedures for the SCOU HHRA. The HHRA was originally completed as a component of the SCOU RI/FS (*Source Control Operable Unit Remedial Investigation/Feasibility Study, Part 2, Baseline Human Health Risk Assessment*; Jacobs, 1997b). Subsequent data gap investigation results were also incorporated into the HHRA (Jacobs, 1999a). The SCOU HHRA was updated in 2001 to incorporate revisions to toxicity values, slope factors, and reference doses that had occurred since initial preparation of the HHRA (Jacobs, 2001). For sites where removal actions were completed, the post-removal risk characterization was presented in the CB RI/FS – Part 2 (Jacobs, 2002a).

Potential receptors and exposure pathways were identified during the HHRA and are shown on Figure 2-3. The magnitude of exposure was determined by estimating the amount, or concentration of the contaminant at the point of contact over a specified time period, or exposure duration, as well as the dose, or intake, of the contaminant. Age-adjusted values for soil ingestion, inhalation rates, and dermal exposure were used to determine carcinogenic risk, while non-carcinogenic hazard was conservatively calculated based on exposure to a child. Cancer risks and non-cancer hazard indices were calculated using EPA guidance (EPA, 1989). The HHRA considered both residential and industrial/occupational land use scenarios. Generally, the results of the residential risk scenario were used in the remedial action decision process for SCOU sites in order to protect human health, maximize reuse potential, and avoid ICs that may otherwise be required. The following subsections provide a summary of the HHRA. Table 2-2 lists contaminants of potential concern. Test species and critical effects for contaminants of potential concern are listed in Table 2-3. A summary of updated risk characterization results for the SCOU ROD Part 3 sites is provided in Table 2-4.

#### *2.6.1.1 Human Health Risk Assessment Contaminants of Potential Concern*

In order to quantify site risk, it was necessary to identify the contaminants of potential concern. A total of 104 analytes were identified in soil samples collected during the SCOU RI. Reported chemicals included inorganics (metals and gross alpha and beta radiation); VOCs; SVOCs; pesticides; herbicides; and total petroleum hydrocarbons (TPH) as gasoline, diesel, and JP4.

Not all analytes were selected as contaminants of potential concern for evaluation in the risk assessment. Calcium, copper, iron, magnesium, sodium and zinc were eliminated on the basis that they are essential nutrients and are not toxic at the concentrations detected at Castle AFB. TPH (as gasoline and diesel) and gross alpha and beta radiation were eliminated because they represent classes of compounds, the data for which are not suitable for risk assessment. However, specific TPH constituents detected during the SCOU RI/FS as a result of VOC (such as benzene, toluene, ethylbenzene and xylenes [BTEX]) or SVOC (such as PAHs) analyses were included in the risk assessment. Gross alpha and beta radiation were not detected at any of the sites included in this ROD.

Based on the above evaluations, the HHRA identified 95 chemicals (13 inorganic and 82 organic) as contaminants of potential concern in soils at Castle AFB. The contaminants of potential concern are listed in Table 2-2. Some of the contaminants of potential concern in soils at Castle AFB are considered potential human carcinogens. However, since suspected carcinogens may cause adverse noncarcinogenic health effects, both carcinogenic risks and noncarcinogenic health hazards were evaluated. Identification of COCs based on human health risk is discussed in Section 2.6.1.4, Risk Characterization.

#### *2.6.1.2 Exposure Assessment*

Exposure assessment is the determination of the magnitude, frequency, duration, and route of exposure. Populations that currently or potentially may contact chemicals at Castle AFB were identified along with potential routes of exposure (contact with a chemical). Magnitude is determined by estimating the amount, or concentration, of the chemical at the point of contact over a specified time period, or exposure duration, as well as intake, or dose, of the chemical.

Releases of contaminants at Castle AFB were primarily from routine aircraft operation and maintenance activities, aviation support operations, vehicle and facility maintenance activities, accidental spills and releases, and on-site disposal of hazardous materials. Potential receptors include hypothetical on-base residents, visitors, and on-site workers. Since potential future on-site residents would have the highest frequency of exposure, the residential land use scenario is representative of a reasonable maximum exposure.

For an exposure pathway to be complete, a source, a mechanism of contaminant release, a transport medium, a potential receptor, and an exposure route must be present. Potential exposure to the soils was considered within a conservative depth range of 0 to 15 feet below ground surface (bgs). The exposure pathways considered in the SCOU HHRA were incidental soil ingestion, inhalation of particulates, inhalation of volatiles, dermal contact with contaminants in soil, and ingestion of homegrown produce.

The exposure point concentration is defined as the average concentration contacted at the exposure point(s) over the duration of the exposure period. Use of the arithmetic average coincides with EPA toxicity criteria, which are based upon lifetime average exposures. Since the true mean is generally uncertain, the 95 percent upper confidence limit ($UCL^{95}$) of the arithmetic mean was used. The $UCL^{95}$ was calculated for each analyte and compared to the maximum reported result. The lower of these two values was then selected as the exposure point concentration.

The exposure point concentration in homegrown produce was calculated using simple partitioning models that estimate the contaminant concentration in edible plant tissues resulting from the use of contaminated soil to grow food crops. Soil-to-plant concentration ratios were used to define the contaminant concentration in edible plant parts relative to the contaminant concentration in soil.

The amount of each chemical incorporated into the body is defined as the average daily dose. The average daily dose was calculated differently when evaluating carcinogenic effects versus noncarcinogenic effects. The average daily dose for carcinogens is based on the estimated exposure duration extrapolated over an estimated 70-year lifetime while the average daily dose for noncarcinogens is based on an average over the estimated exposure duration. This approach assumes that toxic injury from noncarcinogens does not occur after exposure ceases.

### *2.6.1.3 Toxicity Assessment*

A toxicity assessment was conducted to estimate the probability and severity of adverse effects as a result of exposure to the contaminants of potential concern. The toxicity assessment was composed of two steps: hazard identification and dose-response assessment. Hazard identification is the process of determining whether exposure to a chemical may result in deleterious health effects in humans. Dose-response assessment characterizes the relationship between the dose and the incidence and/or severity of the adverse effect in the exposed population.

For risk assessment purposes, the contaminants of potential concern are categorized as carcinogenic or noncarcinogenic. Since carcinogens may also yield adverse noncarcinogenic effects, they must also be evaluated as noncarcinogens.

Mathematical models are used to extrapolate from carcinogenic responses observed at high doses to responses expected at low doses. A toxicity value known as the slope factor was developed to quantitatively express the dose-response relationship. The slope factors were calculated from the $UCL^{95}$ of the dose-response curve, and expressed in units of milligrams per kilogram-day. The slope factors are route-specific and are upper-bound estimates of the probability of a carcinogenic response per unit intake of a chemical over a lifetime.

Test species and critical effects for contaminants of potential concern are listed in Table 2-3. Reference doses are the toxicity values used to evaluate noncarcinogenic effects of the contaminants of potential concern, expressed as milligrams per kilogram-day. Reference doses are developed for both subchronic and chronic exposures, and are route-specific (ingestion or inhalation). The reference doses are preferably derived from dose-response data obtained from human studies; however, if such data are lacking, they are derived from animal studies based on pharmacokinetic and metabolic similarities. The reference doses are based on a toxicological threshold (a finite value that can be tolerated without producing a toxic effect for the range of exposures) and incorporate uncertainty factors.

For certain chemicals, toxicity criteria may be lacking for certain routes of exposure, or have no federal or state-derived toxicity criteria. When route-specific slope factors or reference doses are not available, toxicity values are extrapolated across exposure pathways, where

appropriate, as determined by the EPA. Reference doses and slope factors are not available for the dermal route of exposure. Therefore, for evaluating the effects of dermal exposure to contaminants in soil, the oral toxicity values were adjusted from an administered dose to an absorbed dose by accounting for absorption efficiency of the chemical through the skin rather than gastrointestinal absorption.

To reduce the variability in toxicological values used in the risk assessment, a standardized hierarchy of data is used for Superfund sites. The primary source of information is the Integrated Risk Information System database (EPA, 1996). This database consists of reference doses and cancer slope factors regularly updated by the EPA. A secondary source of toxicity information is the EPA Health Effects Assessment Summary Table (EPA, 1994). Additionally, reference doses and slope factors may also be obtained from the EPA Environmental Criteria and Assessment Office and the DTSC Office of Environmental Health Hazard Assessment (slope factors only). For the purposes of the SCOU HHRA, slope factors from each source were compared and the largest value (i.e., the one that would yield the most conservative result) was used.

#### *2.6.1.4 Risk Characterization*

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. Excess cancer risk is calculated from the following equation:

$$\text{Risk} = \text{Lifetime Average Daily Dose} \times \text{Slope Factor}$$

These risks are probabilities of an individual developing cancer that usually are expressed in scientific notation (e.g., $2 \times 10^{-5}$ or 2E-05). An excess lifetime cancer risk of 1E-06 indicates that an individual experiencing the reasonable maximum exposure estimate has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer individuals face from other causes, such as smoking or exposure to too much sun. The chance of an individual developing cancer from all other causes has been estimated to be as high as 1 in 3. EPA's generally acceptable risk range for site-related exposure is 1E-04 to 1E-06. Specific chemicals at a site that contributed equal to or greater than 1E-06 cancer risk were identified as risk-based COCs that required evaluation in the SCOU FS.

The potential for noncarcinogenic effects is evaluated by comparing an exposure level over a specified time period (e.g., lifetime) with a reference dose derived for a similar exposure period. A reference dose represents a level that an individual may be exposed to that is not expected to cause any deleterious effects. The ratio of exposure to toxicity is called a hazard quotient (HQ). An HQ <1 indicates that a receptor's dose of a single contaminant is less than the reference dose, and that toxic noncarcinogenic effects from that chemical are unlikely. The hazard index (HI) is generated by adding the HQs for all COCs that affect the same target organ (e.g., liver) or act through the same mechanism of action within a medium or across all media to which a given individual may reasonably be exposed. An HI <1 indicates that, based on the sum of all HQs from different contaminants and exposure routes, toxic noncarcinogenic effects from all contaminants are unlikely. An HI >1 indicates that site-related exposures may present a risk to human health. The HQ is calculated as follows:

Non-cancer HQ = Average Daily Dose/Reference Dose

Average daily dose and reference dose are expressed in the same units (milligrams per kilogram [mg/kg] of body weight per day and represent the same exposure period (i.e., chronic, subchronic, or short-term). Specific chemicals at a site that contributed a HI of equal to or greater than 1 were identified as risk-based COCs that required evaluation in the SCOU FS.

A summary of updated risk characterization results for the SCOU ROD Part 3 sites is provided in Table 2-4. The risk characterization results presented in Table 2-4 reflect site conditions after any completed removal action and are based on exposure via ingestion, inhalation (volatile emissions or airborne dust particles) and dermal absorption.

The EPA has determined that lead exposure can result in neurotoxic and developmental effects, primarily in children. Reference doses for lead are not established because most human health effects data are based on measured blood-lead concentrations rather than on an estimated external dose. Thus, risks associated with exposure to lead were evaluated using the DTSC blood-lead biokinetic model (DTSC, 2000). The model was used to calculate a blood-lead level in hypothetical child residents and compared with the target blood-lead level of 10 micrograms per deciliter (µg/dL). The results, with and without the ingestion of homegrown produce, are also shown in Table 2-4.

### *2.6.1.5 Uncertainty Analysis*

Risk characterization includes sources of uncertainty inherent to the risk assessment process. The uncertainties are due to limitations in the available site data and methods used to quantify risk. Uncertainty may be compounded and the resulting risk estimates may be overestimated or underestimated by several orders of magnitude. The uncertainties associated with the SCOU HHRA result from limitations in the available information and methods for identification of contaminants of potential concern, exposure assessment, toxicity assessment and risk characterization.

Specific uncertainty relating to identification of contaminants of potential concern includes the designation of all detected organic compounds as contaminants of potential concern, although several could have been eliminated due to very low concentrations (i.e., below detection limit), suspect detections (e.g., contaminated blank samples), and infrequent detections. Limitations in sampling locations, depth, and frequency also result in uncertainty. The SCOU HHRA evaluated complete exposure pathways for human receptors via soil ingestion, inhalation of volatiles, ingestion of homegrown produce and dermal contact. As reported in the SCOU HHRA, there is a high degree of uncertainty associated with the ingestion of homegrown produce. Many of the past, current, and planned land uses at Castle AFB include aviation support or industrial activity. Hence, the use of the residential scenario, with the ingestion of homegrown produce, likely overestimates risk associated with actual human exposures. In addition, the model used to estimate the uptake and incorporation of contaminants into plant tissues is simplified and incorporates conservative assumptions that are likely to overestimate the concentration of contaminants in plant tissues by several orders of magnitude. Therefore, due to the high degree of uncertainty, incorporation of the ingestion of homegrown produce likely overestimates risk to human health.

Toxicity values are typically derived from studies performed on laboratory animals; thus, uncertainty results from potential differences between laboratory animals and humans in the target organs affected, dose-response relationship, and absorption and metabolism. Many uncertainties are introduced into risk characterization by summing the risk or hazard for several substances across multiple pathways at a given site. This ignores possible synergistic or antagonistic effects of multiple chemical exposures. Because of the large number of uncertainties in the risk assessment process, results may be overestimated or underestimated by several orders of magnitude. However, because assumptions used in

risk assessment typically err on the conservative (i.e., health-protective), estimates of risk are usually overestimated.

### 2.6.2 Water Quality Site Assessment

This section addresses the WQSAs performed for the SCOU ROD Part 3 sites. WQSAs were performed based on background water quality analyses and RWQCB guidance (RWQCB, 1992). The WQSA procedure for soils established leachable contaminant concentrations in soil that are protective of groundwater quality. The goal of the WQSAs was to ensure that each SCOU site with potential to adversely affect groundwater quality was given appropriate consideration in the RI/FS.

#### *2.6.2.1 Site Background Levels*

The first step of the WQSA procedure was to establish background levels for known and suspected contaminants. Contaminants evaluated included VOCs, SVOCs and inorganics (metals). The organic contaminants at Castle AFB are anthropogenic and thus, are not found naturally in soil or water. Therefore, the method detection limits for approved analytical methods were established as the background levels.

Determining background levels for inorganic contaminants involved collection and analyses of soil samples from uncontaminated locations at Castle AFB. The background samples were segregated into four soil groups based upon soil type and depth. Statistical analyses were conducted to determine distribution of each inorganic compound in each soil group. The threshold background value (TBV) was then calculated based on the maximum measured concentration within each soil group. Several metals (boron, cadmium, hexavalent chromium, mercury, molybdenum, selenium, and thallium) were not detected in the background samples; therefore, the method detection limit was selected as the TBV. The TBVs for Castle AFB are listed in Table 2-5. The same methodology was used to develop soluble TBVs based on the California waste extraction test (WET). The soluble TBVs are shown in Table 2-6. The TBVs were approved by the BCT in December 1993. Detailed derivation of the TBVs is presented in the *SCOU RI/FS* (Jacobs, 1997a).

#### 2.6.2.2 *Water Quality Site Assessment Contaminants of Potential Concern*

The initial list of contaminants of potential concern was compiled from information obtained through remedial investigations and is provided in Table 2-2. Vadose zone modeling was then used to determine contaminant soil concentrations that were considered protective of groundwater. If the detected concentration of a contaminant in the soil was greater than the protective levels, the contaminant was retained as a WQSA COC. Due to greater mobility, VOCs pose the greatest risk to groundwater quality at Castle AFB, while SVOCs and metals are considered less likely to impact groundwater.

#### 2.6.2.3 *Water Quality Site Assessment Evaluation of Volatile Organic Compounds*

Sites with VOC contamination were assessed using a phased approach. Initially, WQSAs were conducted as specified in *Draft Water Quality Site Assessment for Soils and Ground Water* (RWQCB, 1992). The WQSAs established protective levels for VOCs in soils and were used for identification of potential source areas. A more detailed analysis was performed to further define the potential site contaminants likely to adversely impact groundwater. This process compared soil and soil gas contaminant levels to protective threshold levels that were estimated based on the EPA recommended VLEACH computer modeling program (Ravi and Johnson, 1997). The model used the conservative assumption that each SCOU site was underlain by sand, which is very permeable and offers little resistance to the downward migration of contaminants. Two VLEACH assessments were conducted. The first, VLEACH1, considered contamination leaching to the water table and mixing with groundwater in a 1-foot thick mixing zone. VLEACH1 used the method detection limits as protective levels that could not be exceeded in groundwater due to contaminated leachate from SCOU sites. A second, more conservative estimation of groundwater impact was conducted for the VOC contaminants. The second estimation, VLEACH2, did not consider a mixing zone and used water quality limits as the protective levels that could not be exceeded due to contaminated leachate from SCOU sites. VLEACH2, in general, resulted in lower groundwater protective thresholds than did VLEACH1.

#### 2.6.2.4 *Water Quality Site Assessment Evaluation of Semivolatile Organic Compounds and Metals*

Groundwater protective threshold levels for selected SVOC compounds were developed using the VLEACH1 (mixing zone) and VLEACH2 scenarios. The WQSA evaluation of SVOCs relied on VLEACH modeling of naphthalene. Naphthalene was the most common

and mobile SVOC detected at Castle AFB, and its physicochemical properties suggest that it is the most likely indicator for comparison of mobility with other SVOCs.

The results of subsurface investigations at sites with surface metal contamination indicated that soluble metal transport at Castle AFB was not common. The WQSA screening procedure for metals followed California RWQCB *Designated Level Methodology* (RWQCB, 1989). This process indicates whether metal-bearing leachate poses a threat to groundwater. The designated level methodology procedure compares leachate concentrations with background concentrations in groundwater versus allowable threshold limits (e.g., maximum contaminant levels [MCLs]).

### 2.6.3 Ecological Risk Assessment

The ERA for Castle AFB consisted of three stages: Scoping, Phase I and Phase II ERAs. The Scoping ERA consisted of a qualitative assessment of habitats and identification of complete exposure pathways for plant and animal life at Castle AFB. Phase I consisted of a quantitative screening assessment, involving the selection of target receptors and the calculation of ecological quotients. The ecological quotient measures a receptor's potential risk at a site and is calculated by dividing its exposure concentration by the critical toxicity value. The Phase II ERA involved the verification, validation and refinement of Phase I assumptions and predictions.

The Scoping ERA screened out 208 of the 233 SCOU sites as no further action because they had no potential to impact ecological habitat. These sites consisted primarily of buildings, roads, parking lots and urban lawn. The remaining 25 sites (14 sites plus 11 associated sites) with potential to impact ecological habitat were further evaluated in the Phase I and Phase II ERAs. These 25 sites included 12 wetland sites (Detonation and Burn Facility [DBF]; ETC-10; ETC-12; FTA-1; LF-3; and LF-5 [including DP-7, DP-8, DP-8A, DP-9, DP-10 and the Landfill 5 Trenches]) and 13 non-wetland sites (Discharge Area [DA]-1; ETC-2; ETC-11; Firing Range [FR]; LF-1 [including DP-1, DP-2 and DP-3], LF-2; LF-4 [including DP-5 and DP-6]; and Storm Drain System [SDS]). The locations of these sites and wetlands are presented on Plate 1.

Following the Phase II ERA, a technical working group session was held with representatives of the Air Force, DTSC and EPA to discuss recommendations for addressing ecological concerns at Castle AFB and to identify any remaining data gaps. In

general, all eight non-wetland sites were recommended for no further action due primarily to the fact that removal actions based on human health and WQSA concerns had substantially reduced the potential risks to ecological receptors. In addition, DBF was recommended for no further action because the ERA determined that contaminant concentrations at this wetland site did not represent a potential ecological risk (i.e., ecological quotients for all receptors were less than 1). Three of the sites associated with LF-5 (DP-7, DP-10 and DP-9) were not used for landfill disposal and their selected remedies relative to human health and groundwater quality were established as no further action in the SCOU ROD Part 1 (DP-7 and DP-10) and this ROD (DP-9). Since there was minimal contamination associated with these DPs, they were also excluded from further ecological evaluation. For the remaining wetland sites (ETC-10; ETC-12; FTA-1; LF-3; and LF-5 [including DP-8, DP-8A and Landfill 5 Trenches]) it was decided that additional contaminant characterization and biological survey data were needed before final recommendations could be made for their disposition. These data were collected and then presented in an ecological focused feasibility study (FFS) in the CB RI/FS – Part 2, along with the preferred alternatives for ecological risk at ETC-10; ETC-12; FTA-1; LF-3; and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches).

## 2.7 REMEDIAL ACTION OBJECTIVES

This section describes how RAOs for SCOU sites were generated and applied at Castle AFB. Castle AFB RAOs for the SCOU ROD Part 3 are based on the protection of human health, groundwater quality and the environment. In all cases, the lowest RAO applicable must be attained. On the basis of the Castle AFB RAOs presented in this section and site characterization results, site-specific RAOs for each SCOU ROD Part 3 site are identified in Section 2.8. For sites where hazardous substances are left in place that preclude unrestricted use and unlimited exposure, qualitative RAOs associated with ICs are also identified in Section 2.8.

All human health risk assessment RAOs were calculated during the RI/FS using the methodology outlined in *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual Part A*, Interim Final (EPA, 1989) and updated in 2001 (Jacobs, 2001). The RAOs were generally established at the lowest level of either the concentration that represents a cancer risk of 1E-06, or the concentration that represents a chemical-specific non-cancer HQ of 1. The RAO for lead was established as the level that

would not result in an estimated blood-lead level greater than 10 µg/dL. Summaries of HHRA RAOs for VOCs, SVOCs, and metals are presented in Tables 2-7, 2-8 and 2-9, respectively. The HHRA RAOs are for the residential scenario and represent contaminant concentrations that do not pose an adverse risk to human health, based upon the HHRA results.

The WQSA process described in Section 2.6.2 established groundwater protective soil RAOs. For VOCs, the VLEACH1 and VLEACH2 WQSA thresholds were first used to establish whether there was potential to impact groundwater quality. The VLEACH1 and VLEACH2 WQSA thresholds for soil and soil gas are provided in Table 2-7. When VOC concentrations at a site exceed the VLEACH2 thresholds then SVE, as the presumptive remedy for VOCs in soil, is included in the site remedy. When VOC concentrations are less than VLEACH2 thresholds, then remedial action for VOCs on the basis of groundwater protection is not required. VLEACH2 values were not established as the groundwater protective RAOs due to the technical and economic uncertainty of attaining them. Based on agreement of the BCT, the VOC RAO was established as the lowest level technically and economically achievable that would be protective of human health and the environment, including groundwater quality. Attainment of the groundwater protective RAO for VOCs when VLEACH2 values cannot be attained by SVE is determined by an evaluation of detailed decision criteria agreed upon by the Air Force, EPA, DTSC and RWQCB to terminate SVE activities on a site-specific basis. The termination criteria are referred to as the SVE Termination or Optimization Process (STOP). A STOP description is included in Appendix C.

The groundwater-protective RAOs for SVOCs and metals were established based on the VLEACH1 and designated level methodologies, respectively, presented in Section 2.6.2.4, Water Quality Site Assessment Evaluation of Semivolatile Organic Compounds and Metals. WQSA RAOs for SVOCs and metals are provided in Tables 2-8 and 2-9, respectively.

RAOs developed for the protection of ecological receptors were both qualitative and quantitative and were based on the potential for sites to impact important wetland habitat/species. The qualitative ecological RAO is no adverse impact to wetland habitat and/or species (as determined consistent with procedures established in the ERA). Quantitative RAOs based on ecological toxicity values were then used on a very limited basis (only required at FTA-1; see Section 2.8.6.5) to define areas of contaminated soil

requiring cleanup in addition to that required to meet human health and groundwater-protective RAOs.

## 2.8 SITE CHARACTERISTICS

This section provides the generalized basewide conceptual model for Castle AFB; specific information pertaining to LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); ETC-8; ETC-10 and FTA-1, and ecological characteristics for ETC-12, LF-3 and, as a group, the 225 ecological no further action sites. With the exception of sites for which only ecological characteristics are provided, the site-specific subsections include background information, site characterization data, ecological characteristics, HHRA results, WQSA results, site COCs and RAOs, and descriptions of any completed or ongoing removal actions. Data are taken primarily from the *SCOU RI/FS* (Jacobs, 1997a); the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b); the *Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation/Disposal Sites* (Jacobs, 2000a); the *ETC-10 Removal Action Completion Report* (Jacobs, 1999b); the *FTA-1 Focused Feasibility Study – Volume 1: Final Remedy for Non-VOC Contamination* (Jacobs, 2002c); the *Comprehensive Basewide Scoping and Phase I Ecological Risk Assessment* (Jacobs, 1995); the *Comprehensive Basewide Phase II Ecological Risk Assessment* (Jacobs, 1997c); and the CB RI/FS – Part 2 (Jacobs, 2002a).

Castle AFB is located within the Merced River Valley, which is part of the larger San Joaquin Valley. A basement complex composed of metamorphic and granitic rocks underlies the San Joaquin Valley. In the vicinity of Castle AFB, the basement complex is overlain by a sequence of sedimentary deposits in excess of 350 feet deep. A generalized conceptual model of the subsurface at Castle AFB is presented on Figure 2-4.

Sands dominate the unsaturated zone (vadose zone) beneath Castle AFB and range from poorly graded to well graded with a significant component of silty sands. Clayey sands are encountered to a lesser degree and well-graded sands only occasionally. Silt and clay are also encountered.

Iron- and silica-cemented sands and silts (hardpan) are often encountered between approximately 2.5 feet and 15 feet bgs. This hardpan is discontinuous beneath the base and varies in thickness from a few inches to greater than 5 feet.

The general horizontal groundwater flow direction beneath Castle AFB is west-southwest toward the San Joaquin River. Groundwater zones beneath Castle AFB are heterogeneous and are characterized by laterally discontinuous lenses of channel-fill sands and gravels surrounded by less permeable overbank deposits. These groundwater zones are divided into five hydrostratigraphic zones (HSZs): the Shallow HSZ, Upper Subshallow (USS) HSZ, Lower Subshallow (LSS) HSZ, Confined HSZ, and Deep HSZ (Figure 2-4). Each HSZ is a sequence of sediments with the finer sediments generally occurring at the top and the predominant water-bearing sections or lenses at the bottom. The HSZs do not represent isolated aquifers, but provide the general stratigraphic correlation to guide the installation of monitoring wells within predominant water-bearing units.

There is a small, natural, vertical component of groundwater flow beneath Castle AFB (Jacobs, 1996). Hydrographs indicate a relatively consistent downward vertical gradient between the Shallow and USS HSZs and that these two HSZs are in relatively close hydraulic connection. Cyclic, seasonal water level fluctuations are observed in all HSZs but are strongest in the Confined HSZ due to pumping of groundwater from this and the underlying Deep HSZ for irrigation purposes during the summer and fall.

The SCOU sites addressed in this SCOU ROD Part 3 are listed below. Separate site characterization summaries are provided for LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); DP-9; ETC-8; ETC-10 and FTA-1. DP-9 is addressed separately from LF-5 and its other associated sites because the selected remedy is different. Individual ecological characteristic summaries are provided for ETC-12 and LF-3, and all remaining SCOU sites (225) that are no further action for ecological risk are summarized as a group.

| SCOU ROD Part 3 Sites | |
|---|---|
| **Landfill 4 (LF-4)** | **Disposal Pit 9 (DP-9)** |
| Disposal Pit 5 (DP-5) | **Earth Technology Corporation 10 (ETC-10)** |
| Disposal Pit 6 (DP-6) | **Earth Technology Corporation 8 (ETC-8)** |
| **Landfill 5 (LF-5)** | **Fire Training Area 1 (FTA-1)** |
| Disposal Pit 8 (DP-8) | **Earth Technology Corporation 12 (ETC-12)** |
| Disposal Pit 8A (DP-8A) | **Landfill 3 (LF-3)** |
| Landfill 5 Trenches | **SCOU sites no further action for ecological risk** |

Based on the SCOU RI, the primary concern at LF-4 and LF-5 and their associated sites was contaminants commonly associated with municipal waste. LF-4 and the Landfill 5 Trenches were also impacted by VOCs, which are a potential threat to groundwater. The primary concern at ETC-8 and ETC-10 was contaminants associated with skeet shooting, primarily metals and PAHs, while a variety of contaminants were identified as concerns at FTA-1 (VOCs, SVOCs, dioxins, furans and metals). Metals were the primary concern for ecological risk at all SCOU sites. Consistent with the derivation of HHRA RAOs, the HHRA results provided for each site are for the residential scenario without the ingestion of homegrown produce.

### 2.8.1 Site Summary for Landfill 4 (including Disposal Pits 5 and 6)

#### *2.8.1.1 Site Description*

LF-4, a landfill used between 1957 and 1970, is located in grid G6 (Appendix A, Plate 1), near the northwest boundary of Castle AFB. LF-4, shown on Figure 2-5, occupied approximately 27 acres and contained approximately 93,200 cubic yards ($yd^3$) of municipal waste. Minor amounts of chemical wastes may have been disposed of in LF-4. LF-4 was a trench-and-fill style landfill operation. The northern one-third of the landfill (previously part of an agricultural field) was incorporated into LF-4 between 1957 and 1961. Twelve trenches in the southern two-thirds of the landfill were excavated to approximately 16 feet bgs prior to receiving waste materials. Disposal pits DP-5 and DP-6 were located at the southern end of LF-4 across one of the trenches (Figure 2-5). These pits reportedly received industrial wastes from base operations between 1954 and 1970. Wastes may have included solvents, oils and miscellaneous chemicals.

LF-4 was a large, unpaved open area. Subsurface sediments at LF-4 consist predominately of silts and silty sands overlying sands. Sand layers are present at nominal starting depths of 5 to 40 feet bgs throughout LF-4.

#### *2.8.1.2 Site Characterization*

A soil gas survey was conducted at LF-4 in 1986. Total hydrocarbon concentrations up to 45,000 micrograms per liter (µg/L) were detected in the soil gas samples. A solid waste assessment test was conducted at LF-4 in 1990, and two soil borings were drilled and sampled. No organic compounds were detected in soil samples with the exception of

di(2-ethylhexyl) phthalate (DEHP), a common laboratory contaminant. Numerous metals were detected, but none was at elevated levels when compared to applicable TBVs.

During the Phase 1 SCOU RI, a geophysical survey was conducted at LF-4 to locate the trenches/disposal pits and identify underground objects (e.g., buried drums) for further investigation. The survey confirmed the presence of buried metallic debris at LF-4. Based on the results of the geophysical survey, drilling and soil/soil gas sampling locations were selected along the periphery of the identified disposal trenches so as to avoid drilling into any buried drums or unstable waste/backfill material. The intent of this drilling/sampling program was to characterize the extent of the trenches and contaminant concentrations in soil immediately adjacent to the trenches to better define the total volume of waste and contaminated soil that would need to be excavated and consolidated under a cap. A soil gas survey was also performed at LF-4 using a sampling grid. During the Phase 2 RI, additional soil and soil gas samples were collected from step-out soil borings to determine the extent of VOC contamination. Soil and soil gas sampling locations for the LF-4 site during the SCOU RI are shown on Figure 2-5. A summary of the number and types of samples, analyses, and maximum detections during the SCOU RI is presented below.

**LF-4 SCOU RI Sampling Summary**

| Site Location | Soil Borings | Soil Sediment/Scrape Locations | Soil Gas Probes | Soil Samples | Soil Gas Samples |
|---|---|---|---|---|---|
| DP-5 | 0 | 0 | 17 | 0 | 17 |
| DP-6 | 0 | 0 | 5 | 0 | 10 |
| LF-4 | 7 | 6 | 34 | 27 | 51 |
| **Totals** | **7** | **6** | **56** | **27** | **78** |

| LF-4 SCOU RI Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Analyses** | |
| VOCs | SW8260 |
| SVOCs | SW8270 |
| Petroleum Hydrocarbons | CA8015/TVPH & TEPH |
| Metals | SW6010 |
| Lead | SW7421 |
| Arsenic | SW7060 |
| Mercury | SW7471 |
| Selenium | SW7740 |
| TOC | Walkley-Black |
| pH | SW9045 |
| **Soil Gas Analyses** | |
| VOCs | SGVOC |
| | TO-14 |

| LF-4 SCOU RI Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1, 2]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| VOCs | Methylene chloride | 0.006 | 0-0.5 | mg/kg |
| | 1,2-Dichloroethane | 0.001 | 0-0.5 | mg/kg |
| | Freon-11 | 0.002 | 0-0.5 | mg/kg |
| | Xylenes | 0.003 | 19-20 | mg/kg |
| | 1,4-Dichlorobenzene | 0.006 | 19-20 | mg/kg |
| SVOCs | Di-n-butyl phthalate | 0.33 | 39-45.5 | mg/kg |
| | Benzo(a)pyrene | 0.062 | 0-0.5 | mg/kg |
| | Phenanthrene | 0.37 | 0-0.5 | mg/kg |
| | Pyrene | 0.29 | 0-0.5 | mg/kg |
| Metals | Silver | 0.58 (0.45) | 19-20 | mg/kg |
| | Beryllium | 1.0 (0.89) | 18.5-19.5 | mg/kg |
| | Cadmium | 1.7 (0.5) | 0-0.5 | mg/kg |
| | Molybdenum | 1.1 (0.59) | 0-0.5 | mg/kg |
| | Lead | 58.6 (7.4) | 0-0.5 | mg/kg |
| | Antimony | 8.6 (6.7) | 18.5-19.5 | mg/kg |
| | Zinc | 332 (46.9) | 0-0.5 | mg/kg |
| **Soil Gas Results** | | | | |
| VOCs | Vinyl Chloride | 187 | 10 | µg/L |
| | Toluene | 397 | 10 | µg/L |
| | Freon-12 | 3,398 | 10 | µg/L |
| | Xylenes | 144 | 10 | µg/L |

**Notes**
[1] Corresponding TBVs are listed in parentheses.
[2] Lesser values than the maximums detected may exceed WQSA thresholds due to the depth-specific nature of the thresholds.

Chlorinated and aromatic VOCs were detected in soil samples to a depth of approximately 40 feet bgs. SVOCs and metals (>TBVs) were detected in soil samples to a depth of approximately 40 feet bgs. Chlorinated and aromatic VOCs were detected in soil gas samples to a depth of approximately 40 feet bgs. The estimated extent of VOC contamination in soil gas is shown on Figure 2-5.

Based on the SCOU RI, the BCT agreed that the LF-4 site was sufficiently characterized to support selection of an appropriate remedy, but decided that additional sampling and analysis would be required prior to or during the remedial action to refine estimates of the extent of VOC contamination in soil gas, primarily chlorofluorocarbons, halogenated VOCs and BTEX. To meet this requirement, a data gap sampling program, consisting of drilling and sampling of seven additional soil gas borings, was completed in June 1997 (Jacobs, 1997d). Data gap soil gas sampling locations are included on Figure 2-5. A summary of the number and types of samples, analyses and maximum detections during the LF-4 data gap study is presented below.

| LF-4 Data Gap Sampling Summary | |
|---|---|
| **Soil Gas Borings** | **Soil Gas Samples** |
| 7 | 42 |

| LF-4 Data Gap Sampling Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Gas Analyses** | |
| VOCs | TO-14 |

| LF-4 Data Gap Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Gas Results** | | | | |
| VOCs | Benzene | 0.08 | 61.3-61.5 | µg/L |
| | Freon-11 | 0.05 | 51.3-51.5 | µg/L |
| | Freon-12 | 2.46 | 31.3-31.5 | µg/L |
| | Toluene | 0.15 | 61.3-61.5 | µg/L |
| | Vinyl Chloride | 0.05 | 61.3-61.5 | µg/L |
| | Xylenes | 0.21 | 51.3-51.5 | µg/L |

**Note**
[1] Lesser values than the maximums detected may exceed WQSA thresholds due to the depth-specific nature of the thresholds.

A complete presentation of RI activities and results for the LF-4 site, including DP-5 and DP-6, is provided in Section 7.6.3 of the SCOU RI/FS (Jacobs, 1997a). Results of the LF-4 data gap sampling program are presented in *Project Note No. 010 – Data Gap Soil Gas Survey – Landfill 4* (Jacobs, 1997d).

### *2.8.1.3 Removal Action*

The BCT designated LF-4 as one of the consolidation landfills for Castle AFB, whereby wastes at LF-4 would be consolidated into a smaller area, waste excavated from other Castle AFB sites (primarily but not exclusively landfills) would be taken to LF-4 for disposal and the consolidated landfill would be capped. This work was conducted under removal action authority. An action memorandum was submitted in September 1997 (*Action Memorandum–Removal Action for Castle Vista Landfills A and B and Castle Airport Landfills 2 and 4*; Jacobs, 1997e). The removal action for LF-4 is described in the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b) and is summarized in the following subsections. The recently completed Five-Year Review Report (Jacobs, 2004a) determined that the combined removal action (consolidation and capping) and the SCOU ROD Part 3 remedy (cap maintenance and monitoring and ICs) are protective of human health and the environment.

#### 2.8.1.3.1 Waste Consolidation

The removal action at LF-4 took place from October 1997 through September 1999. Elements of the removal action included site preparation, excavation of waste from

perimeter trenches, consolidation of LF-4 wastes and waste materials excavated from other authorized Castle AFB sites, confirmation sampling, backfilling excavated trenches, and installation of the cap. Approximately 6,600 $yd^3$ of waste was excavated from perimeter trenches at LF-4 and placed in the area to be capped; approximately 260,000 $yd^3$ of waste material and contaminated soil meeting landfill acceptance criteria (Castle AFB RAOs) was imported from other Castle AFB SCOU sites and placed in the area to be capped. None of the waste material and contaminated soil consolidated at LF-4 met or exceeded criteria defining hazardous or designated waste. Sources and volumes of waste material and contaminated soil from other sites consolidated at LF-4 are listed in Table 2-10.

Confirmation samples were collected from the excavated LF-4 trenches and analyzed for VOCs, SVOCs and metals. All results were less than updated residential human health RAOs and a single zinc detection marginally exceeded its WQSA RAO. Zinc was reported at a concentration of 332 mg/kg in a single confirmation sample (Trench J; confirmation sample LF-4TJSC01). This reported concentration exceeds the WQSA RAO of 319 mg/kg. However, the designated level methodology used to derive the WQSA RAO assumes a depth interval of 40 to 65 feet bgs while the confirmation sample in question was taken at approximately 10 feet bgs. The Air Force and the regulatory agencies agreed that the reported concentration of zinc, which is just over the WQSA RAO of 319 mg/kg for the 40 to 65 feet bgs interval, would be protective of groundwater due to the additional environmental attenuation afforded by the minimum 30 feet of additional soil column available. Accordingly, the removal action achieved all updated RAOs. Confirmation sample results for LF-4 are presented in the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b).

#### 2.8.1.3.2 Landfill Capping

Following receipt of confirmation sample results, the excavations were backfilled with soil stockpiled on site (overburden) and soil imported from LF-1 and off-site sources. The consolidated waste and soil was then covered with an engineered alternative to a Class III cap. Two separate landfill cells were constructed, each covered by an engineered cap consisting of a gas collection layer, a flexible membrane liner (low-permeability layer), a drainage layer and a vegetative cover. The only difference between the engineered caps and a standard Class III cap is the flexible membrane liner or low-permeability layer. California regulations call for a clay liner with a hydraulic conductivity of 1E-06 centimeters per second (cm/sec) or less; the flexible membrane liner installed has a hydraulic

conductivity of 1E-11 to 1E-12 cm/sec. Locations of the two capped areas at LF-4 are shown on Figure 2-5. As part of the removal action, fencing, access gates and warning signage were placed around the capped landfill area. Details of the caps and associated features of the closed landfill are shown on Figure 2-6.

#### 2.8.1.3.3 Post-Closure Monitoring

In accordance with California regulations, a post-closure maintenance and monitoring program for the caps and a post-closure monitoring program for landfill gas and groundwater beneath the landfill have been designed and implemented for LF-4. Cap maintenance and monitoring activities are conducted in compliance with the approved *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills* (Jacobs, 1997f). Cap maintenance and monitoring activities for LF-4 consist of semiannual inspections of the cap and controlled area (area inside perimeter fence), reporting of inspection results and completion of any necessary repairs. Inspection activities include visual inspections of the final cover, security fence, access roads and drainage ditches. To date, the only maintenance required has been minor repairs/cleaning of drainage features and repair of minor erosional damage and filling of rodent burrows in the vegetative layer of the caps.

Post-closure landfill gas and groundwater monitoring is conducted In compliance with the approved *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills* (Jacobs, 1997f), the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update* (Jacobs, 2000b) and the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update – Revision 1* (Jacobs, 2004c). The landfill gas monitoring system consists of perimeter probes or gas wells and passive gas vents. The groundwater sampling network, consisting of several Shallow HSZ monitoring wells, is used to detect releases to groundwater (leachate) from beneath the landfill cap. Gas well and gas vent locations are shown on Figure 2-6; groundwater monitoring well locations in the vicinity of LF-4 are shown on Figure 2-7.

The post-closure landfill gas monitoring program at LF-4 began in August 1999 for the perimeter gas wells and in November 1999 for the passive gas vents. The perimeter gas wells were sampled a second time in November 1999 concurrent with the initial sampling of the passive gas vents. Another round of sampling of both the perimeter gas wells and the passive gas vents occurred during October 2000. Results from these monitoring events (Jacobs, 2002b) showed stabilization of the landfill gas flow pattern and reductions in

methane concentrations and lower explosive limit readings. Quarterly monitoring results reported in the *Landfill Inspection and Monitoring Report, Annual Report 2003* (Montgomery Watson Harza [MWH], 2004) indicate that gas levels have stayed well below regulatory limits and that landfill gas is not migrating from the site.

The post-closure groundwater monitoring program for LF-4 consists of two components: corrective action monitoring, which addresses contaminants already in groundwater that were derived from historic landfill releases (releases prior to capping) and detection monitoring, which addresses any new releases from the landfill (releases subsequent to capping). Corrective action monitoring is conducted in accordance with the CB ROD – Part 1. Detection monitoring is structured in accordance with post-closure monitoring requirements contained in California Code of Regulations (CCR), Title 27 (27 CCR), Subchapter 3, Article 1 and Code of Federal Regulations (CFR), Title 40, Part 258 (40 CFR 258). Corrective action and detection monitoring wells for LF-4 are shown on Figure 2-7.

Detection monitoring results are compared with concentration limits established based on background conditions to determine whether "measurably significant" evidence of a new landfill release is indicated. The procedure used to establish concentration limits for the detection monitoring program is described in detail in the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update* (Jacobs, 2000b). Updates/modifications to the process and to concentration limits for LF-4 are provided in recent long-term groundwater sampling program (LTGSP) annual and semiannual reports and will be formalized in the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update – Revision 1* (Jacobs, 2004c). No measurably significant evidence of a landfill release has been indicated by the detection monitoring program.

#### 2.8.1.3.4 Reporting Requirements

All corrective action and detection monitoring results for LF-4 are presented in a separate landfill post-closure groundwater monitoring subsection within each LTGSP annual and semiannual report. These reports are currently submitted in February (annual) and August (semiannual) of each year. To date (Q4/03), there has been no "measurably significant" evidence of a continuing or new release from LF-4.

#### *2.8.1.4 Human Health Risk Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) calculated human health risk for LF-4 (including DP-5 and DP-6) based on post removal action detections (confirmation sample results from the floor and sidewalls of excavated trenches). For the purposes of estimating residual or post removal action risk, the engineered cap at LF-4 was assumed to eliminate all human exposure pathways to capped waste. Therefore, only in areas outside the cap, from which materials were excavated and consolidated under the cap, would there be a potential for residual exposure. Although there may be adverse risk associated with waste under the cap, the installed cap eliminates the potential exposure routes.

Methodology was the same as that used during the SCOU RI/FS as updated in 2001 and described in Section 2.6.1. Risk assessment results for LF-4 are provided in Table 2-4. The adult residential cancer risk for soil without the ingestion of homegrown produce was 4E-06 and the HI was 0.1. Lead was not detected above TBVs in confirmation samples. The primary risk drivers were cadmium (49 percent) at a reported concentration of 1.66 mg/kg, well below the human health RAO of 4.4 mg/kg, and arsenic (41 percent) at a concentration of 2.74 mg/kg, well below the TBV and HHRA RAO of 9.9 mg/kg. Based on these results, the LF-4 site does not pose an adverse risk to human health.

#### *2.8.1.5 Water Quality Site Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) updated the WQSA for LF-4 (including DP-5 and DP-6) based on post removal action detections (confirmation sample results from the floor and sidewalls of excavated trenches). No wastes exceeding WQSA RAOs or thresholds were consolidated into LF-4. Reported VOC concentrations in the capped area exceed VLEACH2 but not VLEACH1. An SVE Turn-On and Remediation Test (START) evaluation was not performed because, similar to the assessment of post removal action human health risk, it was assumed that the engineered cap at LF-4 would eliminate leachate migration and only in areas from which materials were excavated outside of the cap would there be a potential for risk to groundwater. As noted in Section 2.8.1.3.1, outside of the capped area only a single zinc detection exceeded its WQSA RAO and there was concurrence that this one marginal exceedance did not pose a threat to groundwater. Based on these results, the LF-4 site (including DP-5 and DP-6) does not pose an adverse risk to groundwater quality.

There is uncertainty regarding the threat to groundwater due to the nature of landfill waste disposal and the lack of subsurface soil samples from within the trenches and waste. Given these conditions, it is possible that higher concentrations of identified contaminants and/or additional contaminants may be present at LF-4. However, non-VOCs were analyzed in surface and deep soil samples (20 to 40 feet bgs) and VOCs were characterized adjacent to each trench. In addition, all waste material and soil consolidated into LF-4 was sampled and analyzed for acceptance and none exceeded WQSA criteria (all consolidated materials were non-designated, non-hazardous waste). Finally, all waste material is presently capped and the potential for leachate generation is minimal.

#### *2.8.1.6 Site Contaminants of Concern and Remedial Action Objectives*

Based on post-removal action conditions, there are no identified human health or WQSA COCs for the LF-4 site, including DP-5 and DP-6. As reported in Section 2.8.1.2 Site Characterization, hazardous substances were detected within the vadose zone at LF-4 but not at concentrations determined to be an adverse risk to human health and the environment. However, State landfill closure laws and regulations do establish maintenance requirements for LF-4. Thus, the Air Force considers the following to be qualitative RAOs specific to the LF-4 site, including DP-5 and DP-6:

- Prevent contact with landfill waste and gases
- Prevent or minimize migration of landfill contents to the vadose zone and to groundwater
- Protect remedial system from damage and protect the integrity of the caps and associated systems
- Prohibit activities that would limit access to any equipment and systems associated with monitoring and maintenance.

### 2.8.2 Site Summary for Landfill 5 (including Disposal Pits 8 and 8A and Landfill 5 Trenches)

#### *2.8.2.1 Site Description*

LF-5, a landfill used between 1971 and 1977, is located in grids E10-E12 and F10-F12 (Appendix A, Plate 1), near the northern boundary of Castle AFB. LF-5, shown on Figure 2-8, was unlined and contained approximately 100,000 $yd^3$ of municipal wastes, construction wastes and demolition debris. Based on aerial photographic interpretation and

interviews, LF-5 was a trench-and-fill style landfill operation. LF-5 contained 12 trenches (A through L; Landfill 5 Trenches) and five disposal pits (DP-7, DP-8, DP-8A, DP-9 and DP-10). Trench F was within the boundaries of DP-8. DP-8 also intersected Trench E and DP-8A intersected Trench G. The trenches extended to approximately 15 feet bgs. DP-7 and DP-10 are no further action sites in the SCOU ROD Part 1 and are not discussed further in this ROD. DP-9 is addressed separately in this ROD (Section 2.8.3) because the selected remedy differs from that for LF-5. DP-8, DP-8A and the Landfill 5 Trenches are assessed herein as part of the LF-5 site. A construction waste and demolition debris area was located immediately west of the LF-5 cap. The Merced County Department of Public Health issued a notice of violation for the area in April 2003. In June 2003, EPA, DTSC and the Air Force issued a joint letter identifying the construction and demolition debris area as being the responsibility of the BoP and not subject to CERCLA requirements. BoP subsequently took action to address the noted violations. The Merced County Department of Public Health has since documented that the BoP has abated the construction and demolition debris area and that the area is now in compliance with State regulations.

LF-5 was a large, unpaved open area with wetlands within, south and east of the site (Figure 2-8). A natural hardpan layer is present at 8 feet bgs. The subsurface soil is composed predominantly of silts and sandy silts to 60-70 feet bgs. A sand layer is present at 20-30 feet bgs in the western portion of the landfill (DP-8A). A silty sand layer is present at 45-55 feet bgs near DP-8 and DP-8A.

Specific records of wastes disposed were not available, but in addition to the obvious disposal of municipal and construction wastes and demolition debris, the trenches and disposal pits were reportedly used for the disposal of 55-gallon drums and uncontained liquid chemical wastes from base operations.

LF-5 is located within the northeastern grasslands area of Castle AFB, but the associated wetlands are the most significant ecological feature. There are several small wetlands within the site and large wetlands areas to the south and east (Plate 1 and Figure 2-8). Surface runoff from the site has the potential to affect all of these wetlands.

#### *2.8.2.2 Site Characterization*

In 1985, a Phase 2, Stage 1 investigation was performed at LF-5, including a geophysical survey to delineate disposal areas and locate buried drums. Results of the geophysical

survey indicated the possible presence of drums in two trenches (B and J) and other metallic debris throughout LF-5, but did not produce definite drum locations. In 1988, a Phase 2, Stage 2 investigation was conducted, including a soil gas survey. Low VOC concentrations, including TCE (up to 0.3 µg/L), were reported in soil gas samples collected near Trench J. In 1991, a solid waste assessment test was conducted at LF-5 and soil samples were collected. Low VOC concentrations were detected in the soil samples.

During the Phase 1 SCOU RI, a geophysical survey was conducted at LF-5 to delineate the trenches/disposal pits and locate buried objects (55-gallon drums) for further investigation. The survey confirmed the presence of concentrated metallic objects buried in Trenches B, C, D, G, J and K, with scattered debris in the other disposal pits/trenches. Numerous 5-gallon paint cans were also found at the surface in Trench B. Based on the results of the geophysical survey, drilling and soil/soil gas sampling locations were selected along the periphery of the identified disposal trenches so as to avoid drilling into any buried drums or unstable waste/backfill material. The intent of this drilling/sampling program was to characterize the extent of the trenches and contaminant concentrations in soil immediately adjacent to the trenches to better define the total volume of waste and contaminated soil that would need to be excavated and consolidated under a cap. A soil gas survey was also performed at LF-5 using a sampling grid. During the Phase 2 RI, additional soil and soil gas samples were collected from step-out soil borings to determine the extent of VOC and other contamination. Surface scrape samples were also collected for the ERA. Test pits were excavated within trenches B and K to 13-16 feet bgs in an effort to locate buried drums, but no buried drums were found.

RI activities directly related to assessment of ecological risk included the collection of 11 surface scrape and sediment samples. Three of these samples were from the landfill area but were not directly associated with a wetland; two samples were from the wetland near DP-7; two samples were from the wetland between DP-8 and DP-9; and two samples were from the wetland south of DP-10 (Figure 2-8). All of the samples were analyzed for metals; selected samples were also analyzed for VOCs and SVOCs.

Soil and soil gas sampling locations for the LF-5 site during the SCOU RI are shown on Figure 2-8. A summary of the number and types of samples, analyses, and maximum detections during the SCOU RI is presented below (the number of samples for DP-7, DP-9 and DP-10 are listed because all SCOU RI sample locations are shown on Figure 2-8).

| LF-5 SCOU RI Sampling Summary | | | | | |
|---|---|---|---|---|---|
| **Site Location** | **Soil Borings** | **Soil Sediment/Scrape Locations** | **Soil Gas Probes** | **Soil Samples** | **Soil Gas Samples** |
| DP-7 | 17 | 0 | 19 | 51 | 52 |
| DP-8 | 17 | 0 | 18 | 55 | 49 |
| DP-8A | 15 | 0 | 24 | 29 | 55 |
| DP-9 | 17 | 0 | 17 | 42 | 50 |
| DP-10 | 14 | 0 | 17 | 29 | 31 |
| LF-5 | 12 | 11 | 23 | 43 | 71 |
| LF-5TA | 0 | 0 | 5 | 0 | 9 |
| LF-5TB | 0 | 0 | 6 | 0 | 11 |
| LF-5TC | 0 | 0 | 4 | 0 | 8 |
| LF-5TD | 0 | 0 | 6 | 0 | 11 |
| LF-5TE | 0 | 0 | 6 | 0 | 10 |
| LF-5TG | 0 | 0 | 4 | 0 | 8 |
| LF-5TH | 0 | 0 | 2 | 0 | 4 |
| LF-5TI | 0 | 0 | 4 | 0 | 8 |
| LF-5TJ | 0 | 0 | 5 | 0 | 10 |
| LF-5TK | 0 | 0 | 5 | 0 | 10 |
| LF-5TL | 0 | 0 | 4 | 0 | 8 |
| **Totals** | **92** | **11** | **169** | **249** | **405** |

| LF-5 SCOU RI Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Analyses** | |
| VOCs | SW8260 |
| SVOCs | SW8270 |
| Dioxins/Furans | SW8280 |
| Petroleum Hydrocarbons | CA8015/TVPH & TEPH |
| Metals | SW6010 |
| Lead | SW7421 |
| Organic Lead | CA338 |
| Arsenic | SW7060 |
| Selenium | SW7740 |
| TCLP/Metals | DIWET/SW6010 |
| Anions | E300 |
| TOC | Walkley-Black |
| pH | SW9045 |
| Radioactivity (Alpha/Beta) | SW9310 |
| **Soil Gas Analyses** | |
| VOCs | SGVOC, E18 |
| | TO-14 |

| LF-5 SCOU RI Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1, 2]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| VOCs | Toluene | 3.3 | 10-10.5 | mg/kg |
| | Ethylbenzene | 1.6 | 10-10.5 | mg/kg |
| | Naphthalene | 2.1 | 10-10.5 | mg/kg |
| | 1,2-dichloroethane | 34 | 10-10.5 | mg/kg |
| | 1,2,4-Trimethylbenzene | 4.0 | 10-10.5 | mg/kg |
| | Xylenes | 7.2 | 10-10.5 | mg/kg |
| | 1,4-Dichlorobenzene | 2.7 | 10-10.5 | mg/kg |
| | p-Isopropyltoluene | 0.036 | 14.5-15 | mg/kg |
| SVOCs | *bis*(2-Ethylhexyl) phthalate | 1.9 | 14.5-15 | mg/kg |
| Petroleum Hydrocarbons | Gasoline | 3.8 | 14.5-15 | mg/kg |
| | Diesel | 430 | 14.5-15 | mg/kg |
| Metals | Silver | 0.99 (0.45) | 0-0.5 | mg/kg |
| | Arsenic | 19.7 (9.9) | 9-10 | mg/kg |
| | Barium | 299 (109) | 0-0.25 | mg/kg |
| | Beryllium | 1.2 (0.89) | 14.5-15.5 | mg/kg |
| | Cadmium | 0.59 (0.5) | 14.5-15.5 | mg/kg |
| | Chromium | 36.5 (29.4) | 19.5-20.5 | mg/kg |
| | Cobalt | 26 (12.8) | 9.5-10.5 | mg/kg |
| | Molybdenum | 1.1 (0.59) | 9-10 | mg/kg |
| | Lead | 16.6 (7.4) | 19.5-20.5 | mg/kg |
| | Nickel | 45.2 (29.6) | 14.5-15.5 | mg/kg |
| | Thallium | 50 (40) | 14.5-15.5 | mg/kg |
| | Vanadium | 76.2 (70.2) | 14.5-15.5 | mg/kg |
| | Zinc | 121 (70.2) | 19.5-20.5 | mg/kg |
| Metals (Leachable) | Chromium | 0.038 (0.0067) | 14 | mg/L |
| | Cobalt | 0.0021 (ND) | 14 | mg/L |
| **Soil Gas Results** | | | | |
| VOCs | Benzene | 7.3 | 10 | µg/L |
| | *cis*-1,2-DCE | 0.19 | 10 | µg/L |
| | Vinyl Chloride | 225 | 5 | µg/L |
| | Toluene | 538 | 10 | µg/L |
| | Freon-12 | 1,091 | 21.5-22 | µg/L |
| | PCE | 48 | 10 | µg/L |
| | TCE | 31 | 10 | µg/L |
| | Xylenes | 227.4 | 10 | µg/L |

**Note**

[1] Corresponding TBVs are listed in parentheses.

[2] Lesser values than the maximums detected may exceed WQSA thresholds due to the depth-specific nature of the thresholds.

Aromatic VOCs (BTEX), halogenated VOCs, SVOCs, petroleum hydrocarbons (primarily total extractable petroleum hydrocarbons [TEPH]) and metals were detected in soil samples to approximately 20 feet bgs. Thirteen metals, including cadmium, cobalt, chromium, lead, nickel, selenium and zinc, were detected in soil at concentrations exceeding TBVs. Chlorinated and aromatic VOCs, including chlorofluorocarbons, were detected in soil gas samples to approximately 65 feet bgs.

Based on the SCOU RI, the BCT agreed that the LF-5 site was sufficiently characterized to support selection of an appropriate remedy, but decided that additional sampling and analysis would be required prior to or during the remedial action to refine estimates of the extent of soil gas contamination. To meet this requirement, a data gap sampling program, consisting of the installation and sampling of 10 borings to 60 feet bgs was conducted during June 1997. Data gap sampling locations are included on Figure 2-8. A summary of the number and type of samples, analyses and maximum detections during the LF-5 data gap study is presented below.

| LF-5 Data Gap Sampling Summary | |
|---|---|
| **Soil Gas Borings** | **Soil Gas Samples** |
| 10 | 60 |

| LF-5 Data Gap Sampling Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Gas Analyses** | |
| VOCs | TO-14 |

| LF-5 Data Gap Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Gas Results** | | | | |
| VOCs | Benzene | 6.69 | 51.3 | µg/L |
| | *cis*-1,2-dichloroethene | 3.05 | 51.3 | µg/L |
| | Ethylbenzene | 86.7 | 11.3 | µg/L |
| | Freon-11 | 3.42 | 31.3 | µg/L |
| | Freon-12 | 222.1 | 11.3 | µg/L |
| | TCE | 5.89 | 61.3 | µg/L |
| | Toluene | 563.9 | 21.3 | µg/L |
| | Vinyl Chloride | 15.56 | 51.3 | µg/L |
| | Xylenes | 338.1 | 11.3 | µg/L |

**Note**

[1] Lesser values than the maximums detected may exceed WQSA thresholds due to the depth-specific nature of the thresholds.

Results of the data gap investigation (Jacobs, 1997g) documented that soil gas containing VOCs (dichlorodifluoromethane [Freon 12]; TCE; vinyl chloride; *cis*-1,2-dichloroethene [*cis*-1,2-DCE]; and BTEX) was present to the north, east and southeast of the proposed cap. Freon 12 and BTEX generally occurred at only relatively shallow depths, suggesting a recent local and near-surface source, presumably the waste disposal trenches and DP-8 and DP-8A. TCE, vinyl chloride and *cis*-1,2-DCE were detected throughout the area sampled, but primarily at 40 feet bgs or greater depths. This suggested a source unrelated to recent waste disposal at LF-5, possibly the residual from a historical release from the landfill. These conditions suggest deep vadose zone contamination resulting from declining water levels in the Shallow HSZ and/or off-gassing or smear-zone contamination from underlying groundwater contaminated by a historical release, rather than an ongoing shallow vadose zone source.

A complete presentation of RI activities and results for the LF-5 site, including DP-8, DP-8A and the Landfill 5 Trenches, is provided in Section 7.3.1 of the SCOU RI/FS (Jacobs, 1997a). Results of the LF-5 data gap sampling program are presented in *Project Note No. 019 – Data Gap Sampling Results – Landfills 1, 3, 4, and 5* (Jacobs, 1997g). Results of sampling related to ecological risk assessment are presented in the *Comprehensive Basewide Scoping and Phase I Ecological Risk Assessment* (Jacobs, 1995).

### *2.8.2.3 Removal Action*

Based on the same rationale as for LF-4 (Section 2.8.1.6), the BCT designated LF-5 as one of the consolidation landfills for Castle AFB. As at LF-4, wastes at LF-5 would be consolidated into a smaller area, waste excavated from other Castle AFB sites (primarily but not exclusively landfills) would be taken to LF-5 for disposal and the consolidated landfill would be capped. This work was conducted under removal action authority. An action memorandum was submitted in October 1998 (*Action Memorandum for Landfills 1, 3 and 5*; Jacobs, 1998b). The removal action for LF-5 is described in the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b) and is summarized in the following subsections. The recently completed Five-Year Review Report (Jacobs, 2004a) determined that the combined removal action (consolidation and capping) and the SCOU ROD Part 3 remedy (cap maintenance and monitoring and ICs) are protective of human health and the environment.

#### 2.8.2.3.1 Waste Consolidation

The removal action at LF-5 took place from November 1998 through September 1999. Elements of the removal action included site preparation, excavation of waste from perimeter trenches, consolidation of LF-5 wastes and waste materials excavated from other authorized Castle AFB sites, confirmation sampling, backfilling excavated trenches, and installation of the cap. Approximately 19,000 $yd^3$ of waste was excavated from perimeter trenches at LF-5 and placed in the area to be capped. It is noted that no waste material was excavated from DP-9 because of the minimal risk associated with contaminants detected there in soil and soil gas (see Section 2.8.3). Approximately 100,000 $yd^3$ of waste material and contaminated soil meeting landfill acceptance criteria (Castle AFB RAOs) was imported from other Castle AFB SCOU sites and placed in the area to be capped. None of the waste material and contaminated soil consolidated at LF-5 met or exceeded criteria defining hazardous or designated waste. Sources and volumes of waste materials and contaminated soil from other sites consolidated at LF-5 are listed in Table 2-10.

A total of 15 confirmation soil samples and four shallow soil gas samples were collected from the floors and sidewalls of the excavated LF-5 trenches and analyzed for VOCs, SVOCs and metals (soil) and VOCs (soil gas). A single soil sample result marginally exceeded the residential human health RAO for cadmium, while distributed manganese detections and a single mercury detection exceeded WQSA RAOs. The maximum beryllium

result exceeded its TBVs (0.963 mg/kg compared to TBVs of 0.39 mg/kg [sand] and 0.89 mg/kg [silt]) but did not exceed human health or WQSA RAOs. The single cadmium result only marginally exceeded the RAO (4.63 mg/kg vs. 4.4 mg/kg) and represented a very limited area of contamination that did not justify additional excavation. The maximum manganese result was 547 mg/kg, compared to TBVs of 228 mg/kg (sand) and 1,100 mg/kg (silt) and a WQSA RAO of 228 mg/kg. Manganese was eliminated as a concern because no detected concentrations exceeded the maximum TBV. The maximum mercury result was 0.313 mg/kg, compared to the TBV and WQSA RAO of 0.1. Mercury was detected above the RAO at only one of the 15 sample locations (LF-5TBSC02-01); however, because the mercury detection measurably exceeded the TBV, additional soil was removed from the sample area and disposed off site. A second surface-scrape sample was then collected and analyzed for mercury. Mercury was not detected in the re-scraped sample. All shallow soil gas results were less than human health and WQSA thresholds. The removal action achieved all updated RAOs. Confirmation sample results for LF-5 are presented in the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b).

#### 2.8.2.3.2 Landfill Capping

Following receipt of confirmation results, the excavations were backfilled with soil stockpiled on site (overburden) and soil imported from off-site sources. The consolidated waste and soil was covered with an engineered alternative to a Class III cap. The cap, of the same design as those installed at LF-4, consists of a gas collection layer, a flexible membrane liner, a drainage layer and a vegetative cover. Location of the capped area at LF-5 is shown on Figure 2-8. As part of the removal action, fencing, access gates and warning signage were placed around the capped landfill area. Details of the cap and associated features of the closed landfill are shown on Figure 2-9.

#### 2.8.2.3.3 Post-Closure Monitoring

In accordance with California regulations, a post-closure maintenance and monitoring program for the cap and a post-closure monitoring program for landfill gas and groundwater beneath the landfill have been designed and implemented for LF-5. Cap maintenance and monitoring activities are conducted in compliance with the approved *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills 1, 3 and 5* (Jacobs, 1998a). Cap maintenance and monitoring activities for LF-5 consist of semiannual inspections of the cap and controlled area (area inside perimeter fence), reporting of inspection results and

completion of any necessary repairs. Inspection activities include visual inspections of the final cover, security fence, access roads and drainage ditches. To date, the only maintenance required has been minor repairs/cleaning of drainage features and repair of minor erosional damage and filling of rodent burrows in the vegetative layer of the cap.

Post-closure landfill gas and groundwater monitoring is conducted In compliance with the approved *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills 1, 3 and 5* (Jacobs, 1998c); the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update* (Jacobs, 2000b); and the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update – Revision 1* (Jacobs, 2004c). The landfill gas monitoring system consists of perimeter probes or gas wells and passive gas vents. The groundwater sampling network, consisting of several Shallow HSZ monitoring wells, is used to detect releases to groundwater (leachate) from beneath the landfill cap. Gas well and gas vent locations are shown on Figure 2-9; groundwater monitoring well locations in the vicinity of LF-5 are shown on Figure 2-10.

The post-closure landfill gas monitoring program at LF-5 began in August 1999 for the perimeter gas wells and in November 1999 for the passive gas vents. The perimeter gas wells were sampled a second time in November 1999, concurrent with the initial sampling of the passive gas vents. Another sampling round of both the perimeter gas wells and the passive gas vents occurred during October 2000. Results from these monitoring events (Jacobs, 2002b) show stabilization of the landfill gas flow pattern. Methane concentrations at LF-5 remained low, which is a reflection of the type of waste, i.e., high in construction debris and low in organic matter such as municipal waste. Quarterly monitoring results reported in the *Landfill Inspection and Monitoring Report, Annual Report 2003* (MWH, 2004) indicate that gas levels have generally stayed below the State regulatory compliance limit of 5 percent methane at the property boundary, as established in 27 CCR 20921. Methane had been detected in gas monitoring well LF5SVE-C at levels slightly exceeding the regulatory limit of 5 percent (maximum detected is 5.8 percent) each quarter since mid-2003. Because the monitoring location is approximately 240 feet from the property boundary, two additional gas monitoring wells were installed at the property boundary. Methane has not been detected at these two wells since their installation. The detection of methane in excess of 5 percent and the installation and monitoring of the two additional wells was reported to, and coordinated with the County of Merced, the local enforcement

agency. The most recent (August and September 2004) methane monitoring results for LF5SVE-C (4.2 and 4.6 percent, respectively) were below 5 percent methane.

The post-closure groundwater monitoring program for LF-5 consists of two components: corrective action monitoring, which addresses contaminants already in groundwater that were derived from historical landfill releases (releases prior to capping) and detection monitoring, which addresses any new releases from the landfill (releases after capping). Corrective action monitoring is conducted in accordance with the CB ROD – Part 1. Detection monitoring for LF-5 is structured in accordance with post-closure monitoring requirements contained in 27 CCR, Subchapter 3, Article 1 and 40 CFR 258. Corrective action and detection monitoring wells for LF-5 are shown on Figure 2-10.

Detection monitoring results are compared with concentration limits established based on background conditions to determine whether "measurably significant" evidence of a new landfill release is indicated. The procedure used to establish concentration limits for the detection monitoring program is beyond the scope of this document but is described in detail in the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update* (Jacobs, 2000b). Updates/modifications to the process and to concentration limits for LF-4 and LF-5 are provided in recent LTGSP annual and semiannual reports and will be formalized in the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update – Revision 1* (Jacobs, 2004c). No measurably significant evidence of a release has been indicated by the detection monitoring program.

#### 2.8.2.3.4 Reporting Requirements

All corrective action and detection monitoring results for LF-5 are presented in a separate landfill post-closure groundwater monitoring subsection within each LTGSP annual and semiannual report. These reports are currently submitted in February (annual) and August (semiannual) of each year. To date (Q4/03) there has been no "measurably significant" evidence of a continuing or new release from LF-5.

### *2.8.2.4 Human Health Risk Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) calculated human health risk for LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) based on post removal action detections (confirmation sample results from the floor and sidewalls of excavated trenches). For the

purposes of estimating residual or post removal action risk, the engineered cap at LF-5 was assumed to eliminate all human exposure pathways to capped waste. Therefore, only in areas outside the cap, from which materials were excavated and consolidated under the cap, would there be a potential for exposure. Although there may be adverse risk associated with waste under the cap, the installed cap eliminates the potential exposure routes.

Methodology was the same as that used during the SCOU RI/FS as updated in 2001 and described in Section 2.6.1. Risk assessment results for LF-5 are provided in Table 2-4. The adult residential cancer risk for soil without the ingestion of homegrown produce was 4E-06 and the HI was 0.1. The post removal action blood-lead concentration was 2.5 µg/dL. The primary risk driver (84 percent) was the single cadmium detection of 4.63 mg/kg, which was determined not to represent site contamination. Based on these results, LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) does not pose an adverse risk to human health.

#### *2.8.2.5 Water Quality Site Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) updated the WQSA for LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) based on post removal action detections (confirmation sample results from the floor and sidewalls of all excavated trenches). No wastes exceeding WQSA RAOs or thresholds were consolidated into LF-5. Similar to the assessment of post removal action human health risk, it was assumed that the engineered cap at LF-5 would eliminate leachate migration and only in areas from which materials were excavated outside of the cap would there be a potential for risk to groundwater. As noted in Section 2.8.2.3.1, distributed manganese detections exceeded its WQSA RAO, but manganese was not considered a site contaminant (WQSA COC) because no detected concentrations exceeded the maximum TBV. All shallow soil gas confirmation sample results were less than WQSA thresholds.

As noted in Section 2.8.2.2, the LF-5 data gap investigation detected the VOCs Freon 12 and BTEX (primarily benzene) in shallow soil gas and TCE, vinyl chloride and *cis*-1,2-DCE in deep soil gas (greater than 40 feet bgs) in areas to the north, south and east of the area to be capped. Several reported concentrations of these VOCs exceeded VLEACH2 but not VLEACH1 criteria. Because VLEACH2 thresholds were exceeded and the consolidation and capping removal action did not eliminate or treat this soil gas contamination, a START evaluation was conducted to determine the need for SVE. A full discussion of the LF-5

START evaluation is presented in Appendix I of the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b); results are briefly summarized below.

The START evaluation indicated that without any active remediation, there would be minimal near-term increases in TCE concentrations in groundwater followed by slowly diminishing concentrations, with some migration to the southwest. Similar conclusions were made for vinyl chloride and *cis*-1,2-DCE. The short half-life of benzene in groundwater, estimated to be about 80-100 days at Castle AFB based on available monitoring data, supported the conclusion that the limited detections of benzene above VLEACH2 but below VLEACH1 thresholds were not a threat to future groundwater quality. Given the simulated results, and considering (1) that residual VOCs in the vadose zone are largely at depths greater than 50 feet bgs, (2) that reported concentrations do not greatly exceed VLEACH2 thresholds, and (3) that TCE concentrations in groundwater were predicted to soon be below the MCL, it was determined that SVE was not warranted at LF-5. Based on removal action confirmation sampling and the START evaluation, LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) does not pose an adverse risk to groundwater quality.

There is uncertainty regarding the threat to groundwater due to the nature of landfill waste disposal and the lack of subsurface soil samples from within the trenches and waste. Given these conditions, it is possible that higher concentrations of identified contaminants and/or additional contaminants may be present at LF-5. However, non-VOCs were analyzed in surface and deep soil samples (20 to 40 feet bgs) and VOCs were characterized adjacent to each trench. In addition, all waste material and soil consolidated into LF-5 was sampled and analyzed for acceptance and none exceeded WQSA criteria (all consolidated materials were non-designated, non-hazardous waste). Finally, all waste material is presently capped and the potential for leachate generation is minimal.

#### *2.8.2.6 Ecological Risk Assessment*

The Scoping and Phase I ERAs identified LF-5, including DP-7, DP-8, DP-8A, DP-9, DP-10 and the Landfill 5 Trenches as part of 25 Castle AFB SCOU sites with the potential to impact ecological habitat (Jacobs, 1995). The Phase II ERA determined that metals contamination in wetlands soils at LF-5 represented a potential risk to a limited number of target receptors (i.e., ecological quotients exceeded 1) (Jacobs, 1997c). However, as noted previously, three of the sites associated with LF-5 (DP-7, DP-10 and DP-9) were not used for landfill disposal and their selected remedies relative to human health and groundwater

quality were established as no further action in the SCOU ROD Part 1 (DP-7 and DP-10) and this ROD (DP-9). Since there was minimal contamination associated with these DPs, they were excluded from further ecological evaluation. Following the Phase II ERA, the Air Force, EPA and DTSC determined that additional contaminant characterization (metals) and biological survey data were needed to support ecological remedy selection. These data were collected during March and June 2001, respectively, and the results presented in the CB RI/FS – Part 2 (Jacobs, 2002a). Although biological survey results indicated that metals contamination has not affected the ecological health of the wetland communities, analytical data, including toxicity analysis and bioassays, indicated that contaminants within the wetlands associated with LF-5, including DP-8, DP-8A and the Landfill 5 Trenches, represent a potential adverse risk to ecological receptors.

#### *2.8.2.7 Site Contaminants of Concern and Remedial Action Objectives*

Based on post-removal action conditions, there are no identified human health or WQSA COCs for LF-5 (including DP-8 and DP-8A and Landfill 5 Trenches). As reported in Section 2.8.2.2 Site Characterization, hazardous substances were detected within the vadose zone at LF-5 but not at concentrations determined to be an adverse risk to human health and the environment. However, State landfill closure laws and regulations do establish maintenance requirements for LF-5; thus, the Air Force considers the following to be qualitative RAOs specific to the LF-5 site, including DP-8 and DP-8A and Landfill 5 Trenches:

- Prevent contact with landfill waste and gases
- Prevent or minimize migration of landfill contents to the vadose zone and to groundwater
- Protect remedial system from damage and protect the integrity of the caps and associated systems
- Prohibit activities that would limit access to any equipment and systems associated with monitoring and maintenance.

In addition to the above, a qualitative ecological RAO of no adverse impact to wetland habitat or species (as determined consistent with procedures established in the ERA) applies to LF-5 (including DP-8, DP-8A and Landfill 5 Trenches).

### 2.8.3 Site Summary for Disposal Pit 9

#### *2.8.3.1 Site Description*

DP-9 is located within the LF-5 site, along the extreme northern boundary of Castle AFB in grid E12 (Appendix A, Plate 1). As described in Section 2.8.2.1, LF-5 was used for the disposal of wastes from base operations between 1971 and 1977. Wastes, reportedly including drummed and uncontained liquid chemical wastes, were disposed in trenches and five disposal pits (DP-7, DP-8, DP-8A, DP-9 and DP-10). DP-7 and DP-10 are no further action sites and were addressed in the *SCOU ROD Part 1* (WPI, 2002). DP-8 and DP-8A are addressed in this ROD as part of LF-5 (Section 2.8.2).

The DP-9 site is located just to the north and east of the easternmost waste disposal trenches at LF-5. The site is circular, about 200 feet in diameter. Similar to DP-7 and DP-10, DP-9 is located outside of the area capped during the LF-5 removal action (Figure 2-8). Although there is presently no surface expression of DP-9, review of aerial photographs of Castle AFB from 1958 and 1967 document a circular area of disturbed soil (depression?) and possible trenches at the DP-9 location, as shown on Figure 2-8.

#### *2.8.3.2 Site Characterization*

During the 1991 solid waste assessment test at LF-5, one boring (SWAT-3; see Figure 2-8) was advanced near DP-9 (Kleinfelder, Inc., 1991). Flame ionization detector headspace readings of soil samples from this boring ranged from 360 parts per million by volume to over 1,000 parts per million by volume, possibly indicating significant VOC soil contamination. However, analytical results from soil samples collected from the SWAT-3 boring at 16.5, 21 and 26.5 feet bgs indicated minimal organic contamination. The highest reported VOC and SVOC concentrations were 0.01 mg/kg of TCE at 21 feet bgs and 1.7 mg/kg of DEHP at 16.5 feet bgs. These results are similar to the low levels of organic contaminants detected later at DP-9, during the SCOU RI (see following in-text tables).

DP-9 was investigated as part of the LF-5 SCOU RI. Soil and soil gas sampling locations for DP-9 during the SCOU RI are shown on Figure 2-8. Soil borings at DP-9 did not encounter waste material or odors that indicate chemical waste disposal. There were no discontinuities or interfaces in the lithologies penetrated that might indicate excavation and backfilling. Lithologies encountered were those typical of the shallow vadose zone

throughout Castle AFB (i.e., silty sand with interbedded thin sands and silts). Eleven of the 22 soil borings do note a soil color description of brown gray or light gray at 15 to 20 feet bgs that is not typical for Castle AFB, and may be the result of chemical waste disposal. A summary of the number and types of samples, analyses, and the maximum detections during the SCOU RI is presented below.

| DP-9 SCOU RI Sampling Summary | | | | | |
|---|---|---|---|---|---|
| **Site Location** | **Soil Borings** | **Soil Sediment/Scrape Locations** | **Soil Gas Probes** | **Soil Samples** | **Soil Gas Samples** |
| DP-9 | 17 | 0 | 17 | 42 | 50 |

| DP-9 SCOU RI Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Analyses** | |
| VOCs | SW8260 |
| SVOCs | SW8270 |
| Dioxins/Furans | SW8280 |
| Petroleum Hydrocarbons | CA8015/TVPH & TEPH |
| Metals | SW6010 |
| Lead | SW7421 |
| Organic Lead | CA338 |
| Arsenic | SW7060 |
| Selenium | SW7740 |
| TCLP/Metals | DIWET/SW6010 |
| Anions | E300 |
| TOC | Walkley-Black |
| pH | SW9045 |
| Radioactivity (Alpha/Beta) | SW9310 |
| **Soil Gas Analyses** | |
| VOCs | SGVOC, E18 |
| | TO-14 |

| DP-9 SCOU RI Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| VOCs | Benzene | 0.00045 | 15.5-16.5 | mg/kg |
| | Freon 11 | 0.0018 | 20.5-21.5 | mg/kg |
| | Methylene chloride | 0.0082 | 20.5-21.5 | mg/kg |
| | TCE | 0.0032 | 20.5-21.5 | mg/kg |
| SVOCs | *bis*(2-Ethylhexyl) phthalate | 0.74 | 0-0.5 | mg/kg |
| | di-n-butyl-phthalate | 0.66 | 20.5-21.5 | mg/kg |
| Petroleum Hydrocarbons | TEPH (Diesel) | 22.0 | 0-0.5 | mg/kg |
| Metals | Silver | 0.99 (0.45) | 20.5-21.5 | mg/kg |
| | Arsenic | 10.8 (9.9) | 15.5-16.5 | mg/kg |
| | Cadmium | 50.3 (0.5) | 20.5-21.5 | mg/kg |
| | Cobalt | 14.5 (12.8) | 20.5-21.5 | mg/kg |
| | Chromium | 36.5 (29.4) | 20.5-21.5 | mg/kg |
| | Molybdenum | 0.79 (0.59) | 15.5-16.5 | mg/kg |
| | Nickel | 35.0 (29.6) | 20.5-21.5 | mg/kg |
| | Lead | 8.4 (7.4) | 15.5-16.5 | mg/kg |
| | Zinc | 78.10 (70.2) | 20.5-21.5 | mg/kg |
| **Soil Gas Results** | | | | |
| VOCs | Toluene | 39.54 | 21.5-22 | µg/L |
| | Freon-12 | 79.0 | 21.5-22 | µg/L |
| | TCE | 0.0043 | 21.5-22 | µg/L |

**Note**
[1] Corresponding TBVs are listed in parentheses.

The only organics detected above reporting limits in soil samples from DP-9 were di-n-butyl phthalate and an unverified concentration of methylene chloride, both common laboratory contaminants. Methylene chloride was detected at less than reporting limits in thirty other soil samples. All of these results were considered laboratory contamination and were not deemed site contamination. Toluene, tetrachloroethene (PCE), trimethylbenzenes and xylenes were present in soil samples, but all at concentrations below reporting limits. The maximum TCE concentration reported was 3.2 micrograms per kilogram (µg/kg). Trichlorofluoromethane (Freon 11) was detected in a single soil sample at 1.8 µg/kg, while benzene was detected in a different single soil sample at 0.45 µg/kg. One surface soil sample contained TEPH (diesel) at 22 mg/kg. Toluene and Freon 12 were the primary VOCs detected in soil gas samples. Several metals were reported at concentrations

exceeding TBVs. None of the reported concentrations occurred in a pattern or were sufficiently elevated in comparison to TBVs to be considered site contamination. Two samples contained arsenic at concentrations (10.0 mg/kg and 10.8 mg/kg) marginally exceeding the Castle AFB TBV of 9.9 mg/kg. One sample from 20.5 feet bgs contained cadmium at a concentration of 50.3 mg/kg.

Based on the SCOU RI, the BCT agreed that the LF-5 site, including DP-9, was sufficiently characterized to support selection of an appropriate remedy, but decided that additional sampling and analysis would be required prior to or during the remedial action to refine estimates of the extent of soil gas contamination. To meet this requirement, an LF-5 data gap sampling program, consisting of the installation and sampling of 10 borings to 60 feet bgs, was conducted during June 1997. Because of the detections of Freon 12 and toluene in soil gas samples from DP-9 during the SCOU RI, two of the data gap borings were advanced adjacent to DP-9, one immediately to the north and one immediately to the south (Figure 2-8). A summary of the number and type of samples, analyses and maximum detections during the LF-5 data gap study for the two borings adjacent to DP-9 is presented below.

| LF-5 Data Gap Sampling Summary for DP-9 | |
|---|---|
| **Soil Gas Borings** | **Soil Gas Samples** |
| 2 | 12 |

| LF-5 Data Gap Sampling Analysis Summary for DP-9 | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Gas Analyses** | |
| VOCs | TO-14 |

| LF-5 Data Gap Maximum Detections for DP-9 | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Gas Results** | | | | |
| VOCs | Benzene | 0.03 | 11.3 | µg/L |
| | Ethylbenzene | 0.05 | 41.3 | µg/L |
| | Freon-12 | 0.54 | 31.3 | µg/L |
| | Freon-11 | 0.06 | 41.3 | µg/L |
| | TCE | 0.013 (est.) | 41.3 | µg/L |
| | Toluene | 0.17 | 41.3 | µg/L |
| | Xylenes | 0.10 | 41.3 | µg/L |

A complete presentation of RI activities and results for the DP-9 site is provided with the description for LF-5 in Section 7.3.1 of the SCOU RI/FS (Jacobs, 1997a). LF-5 data gap sampling program results, which include the results for the two borings adjacent to DP-9, are presented in *Project Note No. 019 – Data Gap Sampling Results – Landfills 1, 3, 4, and 5* (Jacobs, 1997g).

#### *2.8.3.3 Removal Action*

The LF-5 removal action (see Section 2.8.2.3) did not affect the DP-9 site. The cap does not cover DP-9 and nothing was excavated from DP-9 for placement under the cap.

#### *2.8.3.4 Human Health Risk Assessment*

The updated SCOU HHRA (Jacobs, 2001) applies because the LF-5 capping removal action did not affect DP-9. Risk assessment results for DP-9 are provided in Table 2-4. The adult residential cancer risk for surface soil without the ingestion of homegrown produce was 1E-07 and the HI was 0.1. The adult residential cancer risk for subsurface soil was 2E-07 and the HI was 0.1. Updated child residential blood-lead concentrations were all below 10 µg/dL. Based on these results, DP-9 does not pose an adverse risk to human health.

#### *2.8.3.5 Water Quality Site Assessment*

A single cadmium detection at DP-9 exceeded the WQSA RAO. The cadmium detection (50.3 mg/kg in a sample from 20.5 to 21.5 feet bgs vs. the WQSA threshold of 43.7 mg/kg for an assumed depth interval of 40 to 65 feet bgs) was not deemed site contamination

because it was an isolated occurrence. The LF-5 START evaluation encompassed the DP-9 site and concluded that VOC concentrations did not warrant SVE, but DP-9 data gap sampling results had already shown that VOCs in soil gas at DP-9 were not a continuing contaminant source and did not pose a threat to groundwater. Based on these results, DP-9 does not pose an adverse risk to groundwater quality.

#### *2.8.3.6 Site Constituents of Concern and Remedial Action Objectives*

Based on the HHRA and the WQSA, there are no COCs or RAOs for DP-9.

### 2.8.4 Site Summary for Earth Technology Corporation 8

#### *2.8.4.1 Site Description*

ETC-8 is located in grid N9 near the western boundary of Castle AFB (Appendix A, Plate 1). Based on a 1946 aerial photograph (EPA, 1991), ETC-8 was identified as a former skeet shooting range. Present surface cover is grass and an asphalt parking lot; all buildings at the site were removed in 2003. Potential sources of contamination were lead shot and clay pigeon shards from target shooting.

#### *2.8.4.2 Site Characterization*

ETC-8 was first investigated as part of the SCOU Data Gap investigation in 1997. Data gap soil samples were collected from unpaved locations within an arc extending from the northeast to the northwest of the former shooting pad, where deposits of lead shot and clay pigeon shards were expected to be found. Soil sampling locations (16 hand-auger borings) are shown on Figure 2-11. A total of 27 soil samples were collected, typically at ground surface, 1 foot bgs and 3 feet bgs. Samples were analyzed for PAHs (Method SW8310) and for metals (Method SW6010). A summary of the maximum detections in data gap study samples is presented in the table below.

| Data Gap Maximum Detections for ETC-8 | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration[1]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| SVOCs | Anthracene | 0.31 | 0-0.25 | mg/kg |
| | Benzo(a)anthracene | 1.96 | 0-0.25 | mg/kg |
| | Benzo(a)pyrene | 3.07 | 0-0.25 | mg/kg |
| | Benzo(k)fluoranthene | 1.07 | 0-0.25 | mg/kg |
| | Chrysene | 1.53 | 0-0.25 | mg/kg |
| | Dibenz(a,h)anthracene | 0.163 | 0-0.25 | mg/kg |
| | Indeno(1,2,3-c,d)pyrene | 1.29 | 0-0.25 | mg/kg |
| | Fluoranthene | 3.86 | 0-0.25 | mg/kg |
| | Phenanthrene | 1.45 | 0-0.25 | mg/kg |
| | Pyrene | 2.38 | 0-0.25 | mg/kg |
| Metals | Silver | 3.62 (0.45) | 2.5-3 | mg/kg |
| | Lead | 58.4 (7.4) | 0-0.25 | mg/kg |
| | Selenium | 12.2 (0.5) | 1-1.5 | mg/kg |

**Note**
[1] Corresponding TBVs are listed in parentheses.

PAHs were detected only in surface soil samples (<1 foot bgs). Metals (>TBVs) were detected in surface and subsurface soil samples to a maximum depth of approximately 3 feet bgs. Lead was reported above background value (7.4 mg/kg) in 16 of the 18 samples analyzed. The maximum reported concentration was 58.4 mg/kg. Other metals detected above background within the top 3 feet of soil at ETC-8 were selenium (12.2 mg/kg vs. 0.5 mg/kg) and silver (3.62 mg/kg vs. 1.0 mg/kg). Arsenic and antimony were not detected above background in any of the soil samples analyzed.

After the SCOU Data Gap Investigation, the BCT agreed that the ETC-8 site was sufficiently characterized to support selection of an appropriate remedy. However, the BCT decided that additional sampling and analysis would be required prior to or during the remedial action to refine estimates of the extent of PAH contamination at the ETC-8 site. A complete presentation of data gap sampling activities and results for ETC-8 is provided in Section 5.5 of the *Source Control Operable Unit Data Gap Investigation Report* (Jacobs, 1999a).

#### 2.8.4.3 Removal Action

An action memorandum for an excavation and disposal removal action at ETC-8 was issued in May 2000 (*Action Memorandum for CERCLA Excavation Sites ETC-2, ETC-8, DA-3 and Building 1344 at Castle Airport, Atwater, California*; Jacobs, 2000c). The removal action for the ETC-8 site is described in *Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation/Disposal Sites* (Jacobs, 2000a). Additional sampling was conducted prior to excavation to further delineate the extent of PAH contamination. Nineteen surface samples were obtained at locations shown on Figure 2-11. All samples were analyzed in the field for PAHs using Method SW8310. Field data accuracy was confirmed by sending six split samples to a fixed laboratory for analysis by Method 8310. Detectable PAH concentrations were reported in samples from 18 of the 19 locations. The maximum reported PAH concentrations in ETC-8 surface scrape samples were consistent with, or less than the PAH detections reported in the preceding table for the SCOU Data Gap Investigation.

The removal action at ETC-8 took place from 30 May through 30 August 2000. Excavation extent and confirmation sample locations are shown on Figure 2-12. Depth of excavation ranged from 1 to a maximum of about 4 feet. A total of approximately 2,210 $yd^3$ of contaminated soil was removed. Based on confirmation sample results (*Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation/Disposal Sites* [Jacobs, 2000a]), updated residential human health RAOs were achieved in the excavated areas. However, based on BCT consensus, the paved roadway bisecting the site, presumably underlain by soil with PAHs exceeding updated residential human health RAOs, was left in place.

#### 2.8.4.4 Human Health Risk Assessment

Although a removal action was completed at ETC-8, it is assumed that contamination remaining under the paved roadway is the same or similar to the contamination on both sides of the roadway. Since the buildings and other paved areas surrounding the site have been removed, the roadway no longer provides a practical barrier to exposure as originally contemplated by the BCT after the removal action. Therefore, the risk to human health at ETC-8 is assumed to be the updated baseline risk (Jacobs, 2001). Risk assessment results for ETC-8 are provided in Table 2-4. The updated baseline adult residential cancer risk for surface soil was 4E-05 and the non-cancer HI was 0.1. The adult residential non-cancer HI

for subsurface soil was also 0.1. Cancer risk from subsurface soil was not calculated because carcinogenic slope factors were not available for any of the contaminants. The primary risk driver was benzo(a)pyrene (81 percent) at 3 mg/kg. The blood-lead estimate for the child residential scenario was 3.9 µg/dL. Based on the updated adult residential cancer risk results for surface soil, ETC-8 poses an adverse risk to human health.

#### *2.8.4.5 Water Quality Site Assessment*

Assuming that similar contamination occurs under the road as occurred in the area excavated, none of the ETC-8 PAHs exceed WQSA RAOs. In previous sampling, manganese was reported at 247 mg/kg in one sample, which exceeds the WQSA threshold (228 mg/kg). However, this concentration is less than the maximum TBV (1,100 mg/kg) and is not considered site contamination. No other inorganic contaminants exceeding WQSA thresholds have been identified. Based on these results, ETC-8 does not pose an adverse risk to groundwater quality.

#### *2.8.4.6 Site Contaminants of Concern and Remedial Action Objectives*

Based on the HHRA and WQSA, COCs and RAOs for soil remaining on site after the ETC-8 removal action are listed below.

| COC (concentration) | RAO Source | RAO |
|---|---|---|
| Benzo(a)anthracene (1.96 mg/kg, soil) | HHRA | 0.89 mg/kg (residential) |
| Benzo(a)pyrene (3.07 mg/kg, soil) | HHRA | 0.089 mg/kg (residential) |
| Benzo(k)fluoranthene (1.07 mg/kg, soil) | HHRA | 0.89 mg/kg (residential) |
| Dibenz(a,h)anthracene (0.16 mg/kg, soil) | HHRA | 0.150 mg/kg (residential) |
| Indeno(1,2,3-cd)pyrene (1.29 mg/kg, soil) | HHRA | 0.89 mg/kg (residential) |

The PAHs benzo(a)anthracene; benzo(a)pyrene; benzo(k)fluoranthene; dibenz(a,h)anthracene; and indeno(1,2,3-cd)pyrene in soil represent an adverse risk to human health.

## 2.8.5 Site Summary for Earth Technology Corporation 10

### *2.8.5.1 Site Description*

ETC-10, a skeet-shooting range active until 1995, is located in grid L16 (Appendix A, Plate 1). The presence of clay pigeon shards and lead pellets was confirmed during a visual inspection of the site. Based on the target shooting configuration, particulate deposits were likely distributed in a fan-shaped arc extending 300-500 feet radially from the shooting stand (Figure 2-13). Potential sources of contamination were lead shot and clay pigeon shards from target shooting.

ETC-10 is located in the large grassland area in the northeast portion of Castle AFB, but the associated wetlands are the most significant ecological feature. There are several large wetlands within the site and wetlands extend both to the north and south of the site (Plate 1 and Figure 2-13). ETC-10 is now within a wetlands preserve controlled by the BoP.

### *2.8.5.2 Site Characterization*

During the SCOU RI, a geophysical survey was conducted to determine the areas having the highest accumulation of metal fragments. However, the survey results were inconclusive because high clay and moisture content in surface soils interfered with conductivity measurements. Consequently, it was necessary to select sampling locations based on the highest accumulation of lead pellets as determined from site walks and visual inspections. Soil sampling locations (hand-auger borings) are shown on Figure 2-13. RI activities related to assessment of ecological risk included the collection of 18 soil and sediment samples. Seventeen surface samples were taken from wetland and upland soils in the fan-shaped area representing the assumed flight path of clay pigeons and shotgun shell discharges. These samples were analyzed for antimony, arsenic and lead. Sieved splits from five sample locations were also analyzed for PAHs. One shallow sample (3.75 feet bgs) was collected and analyzed for soluble lead. A summary of the number and types of samples, analyses and maximum detections from the SCOU RI is presented below.

| ETC-10 SCOU RI Sampling Summary | | | | |
|---|---|---|---|---|
| **Soil Borings** | **Soil Sediment/Scrape Locations** | **Soil Gas Probes** | **Soil Samples** | **Soil Gas Samples** |
| 1 | 18 | 0 | 19 | 0 |

| ETC-10 SCOU RI Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Analyses** | |
| Metals | SW6010 |
| Metals (Leachable) | DIWET/SW6010 |
| Arsenic | SW7060 |
| Antimony | SW7041 |
| Lead | SW7421 |

| ETC-10 SCOU RI Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| Metals | Lead | 283,000 (7.4) | 0-0.25 | mg/kg |
| | Antimony | 6,780 (6.7) | 0-0.5 | mg/kg |
| | Arsenic | 1,350 (9.9) | 0-0.25 | mg/kg |
| | Selenium | 0.88 (0.5) | 0.25-0.75 | mg/kg |
| Metals (Leachable) | Lead | 0.48 (0.17) | 0.25-0.75 | mg/L |
| | Barium | 0.47 (0.022) | 0.25-0.75 | mg/L |
| | Zinc | 0.19 (0.20) | 0.25-0.75 | mg/L |

**Note**
[1] Corresponding TBVs are listed in parentheses.

Reported concentrations of lead in all samples analyzed via Method SW7421 were greater than the TBV (7.4 mg/kg). Arsenic exceeded its TBV (9.9 mg/kg) in four of 13 samples, and antimony exceeded its TBV (6.7 mg/kg) in five of 13 samples. The concentrations of lead, arsenic and antimony were reported in samples collected roughly 300 to 500 feet from the shooters pad in the center of the skeet and trap-shooting area.

After completion of the SCOU RI, the BCT identified a data gap due to the lack of characterization data for leachable metals contamination at ETC-10. In order to address this data gap and assess the potential for soluble lead transport, a subsurface soil sample (ETC10HA01) collected at ETC-10 was analyzed for soluble lead via WET analysis. ETC10HA01 contained an estimated WET leachate concentration of 0.024 mg/L, which slightly exceeds the WET TBV for sandy soil (0.023 mg/L). After the data gap investigation, the BCT agreed that the ETC-10 site was sufficiently characterized to support selection of

an appropriate remedy. However, PAH contamination, (which was associated with clay pigeon shards at other Castle AFB shooting ranges) was not characterized at ETC-10 during the SCOU RI. Therefore, the BCT decided that additional sampling and analysis would be required prior to or during the remedial action to (1) characterize PAH contamination and (2) refine estimates of the extent of metals contamination at the ETC-10 site.

A complete presentation of RI activities and results for the ETC-10 site, including the subsequent WET sample analysis, is provided in Section 7.8.4b of the SCOU RI/FS (Jacobs, 1997a). Results of sampling related to ecological risk assessment are presented in the *Comprehensive Basewide Scoping and Phase I Ecological Risk Assessment* (Jacobs, 1995).

#### *2.8.5.3 Removal Action*

An action memorandum for an excavation and disposal removal action at ETC-10 was issued in October 1996 (*Action Memorandum–Removal Action for ETC-10 at Castle Air Force Base, California*; USAF, 1996). The removal action for ETC-10, including sampling conducted to further characterize PAH and metals contamination, is described in the *ETC-10 Removal Action Completion Report* (Jacobs, 1999b).

A summary of the number and types of samples, analyses and maximum detections from the sampling conducted to further characterize the extent of metals and PAH contamination prior to excavation, follows. Metals results from this sampling were similar to those from the SCOU RI sampling, and maximum detections of metals in the samples did not exceed maximum detections in SCOU RI samples. Consequently, only PAH results are summarized below.

| ETC-10 Pre-Removal Action Sampling Summary | | | | |
|---|---|---|---|---|
| **Soil Borings** | **Soil Sediment/Scrape Locations** | **Soil Gas Probes** | **Soil Samples** | **Soil Gas Samples** |
| 8 | 11 | 0 | 30 | 0 |

| ETC-10 Pre-Removal Action Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil Analyses** | |
| PAHs | SW8310 |
| Arsenic | SW7060 |
| Antimony | SW7041 |
| Lead | SW7421 |

| ETC-10 Pre-Removal Action Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| PAHs | Benzo(a)anthracene | 1 | 0.5 | mg/kg |
| | Benzo(a)pyrene | 2.19 | 0.5 | mg/kg |
| | Benzo(b)fluoranthene | 0.095 | 0.5 | mg/kg |
| | Benzo(k)fluoranthene | 0.9 | 0.5 | mg/kg |
| | Chrysene | 1.42 | 0.5 | mg/kg |
| | Dibenz(a,h)anthracene | 0.43 | 0.5 | mg/kg |
| | Indeno(1,2,3-c,d)pyrene | 1.9 | 0.5 | mg/kg |
| | Fluoranthene | 1.35 | 0.5 | mg/kg |
| | Phenanthrene | 0.34 | 0.5 | mg/kg |
| | Pyrene | 1.34 | 0.5 | mg/kg |

The removal action at ETC-10 took place from 27 July 1997 through 10 August 1998. Excavation consisted of an area of "deep" excavation for PAHs (up to 30 inches of soil removed in two stages), an area of shallow scraping where clay pigeon shards were observed (2 inches to 26 inches of soil removed in two stages), and the metals scrape area (2 inches to 4 inches of soil removed in two stages). Confirmation samples were collected from a total of 21 locations in the deep excavation area and the shallow scrape area after excavation, and analyzed for PAHs via Method SW8310. PAH confirmation sample locations are shown on Figure 2-14. The analytical result for one confirmation sample (274 µg/kg; sample location ETC10SC27; sample number ETC10SC27R1) exceeded the removal action proposed cleanup level of 260 µg/kg (EPA's 1996 occupational preliminary remediation goal). This sample was collected from an area where the sampling grid was split in two. The *ETC-10 Removal Action Completion Report* (Jacobs, 1999b) reported that, because the area represented by the sample was small and the result only marginally

exceeded the removal action proposed cleanup level, the contamination was deemed insignificant and no further excavation was performed. In addition to the sample from ETC10SC27, benzo(a)pyrene in two other confirmation samples exceeded the updated occupational human health RAO of 120 µg/kg, and in three other samples exceeded the updated residential human health RAO of 89 µg/kg. None of the reported benzo(a)pyrene concentrations exceeded its WQSA RAO. The average benzo(a)pyrene result for all confirmation samples (deep excavation and shallow scrape) was 35 µg/kg, while the $UCL^{95}$ (data set failed normality test so assumed to be log normally distributed) was 99.7 µg/kg, the latter of which exceeds the residential but not the occupational updated RAO.

Confirmation samples from 176 locations were collected from the metals scrape area after excavation, and analyzed on site using a mobile x-ray fluorescence laboratory. To evaluate the accuracy of mobile laboratory results, splits from approximately 10 percent of the samples were sent to a fixed laboratory and analyzed for lead by SW7421 (correlation factor of 0.96). In addition, samples were collected at eight of the PAH confirmation sample locations and sent to a fixed laboratory for lead analysis by SW7421. Three x-ray fluorescence confirmation sample results for lead exceeded the occupational cleanup level of 750 mg/kg (843 mg/kg at grid location E4; 780 mg/kg at grid location H4; 812 mg/kg at grid location J7). These slight exceedances distributed throughout the excavation area were not deemed significant because the calculated $UCL^{95}$ for the entire confirmation sample data set was 330 mg/kg, which is less than all updated human health and WQSA RAOs. Confirmation sampling results are presented in the *ETC-10 Removal Action Completion* Report (Jacobs, 1999b).

When it was determined that no further excavation was required, site restoration was initiated. Restoration consisted of grading the side slopes of the deep PAH excavation, backfilling the PAH excavation next to existing structures and grading to reestablish natural drainage patterns throughout the excavated area.

Based on soil stockpile sampling results, it was determined that excavation/scraping spoils from ETC-10 met Castle AFB consolidation landfill acceptance criteria, and the spoils were transported to LF-3 for temporary storage and ultimately disposed in LF-5.

Based on the $UCL^{95}$ for confirmation sampling results, the removal action did not meet the updated residential human health RAO for benzo(a)pyrene.

#### 2.8.5.4 *Human Health Risk Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) calculated human health risk for ETC-10 based on post removal action detections (confirmation sample results). Methodology was the same as that used during the SCOU RI/FS as updated in 2001 and described in Section 2.6.1. Risk assessment results for ETC-10 are provided in Table 2-4. The adult residential cancer risk for surface soil was 4E-06 and the non-cancer HI was 0.1. The primary risk driver was arsenic (75 percent) at 3.4 mg/kg, well below the TBV and HHRA RAO of 9.9 mg/kg. Benzo(a)pyrene at the $UCL^{95}$ concentration of 99.7 µg/kg (or 0.1 mg/kg) contributed 25 percent of the risk (1.1E-06). The blood-lead estimate for the child residential scenario based on the $UCL^{95}$ concentration of 330 mg/kg was 8.8 µg/dL, less than the child protective level of 10 µg/dL. Based on these results, ETC-10 poses an adverse risk to human health.

#### 2.8.5.5 *Water Quality Site Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) updated the WQSA for ETC-10 based on post removal action detections (confirmation sample results). All confirmation sample results for benzo(a)pyrene, antimony, arsenic and lead, the indicator contaminant for cleanup, were less than their respective WQSA RAOs. Accordingly, ETC-10 does not pose an adverse risk to groundwater quality.

#### 2.8.5.6 *Ecological Risk Assessment*

The Scoping ERA identified ETC-10 as one of 25 Castle AFB SCOU sites with the potential to impact ecological habitat. The Phase I ERA determined that metals (primarily lead) contamination at ETC-10 represented a potential risk to almost all target receptors (i.e., ecological quotients exceeded 1) (Jacobs, 1995). ETC-10 was not included in the Phase II ERA because the potential for impact was clear. Following the Phase II ERA, the Air Force, EPA and DTSC determined that additional contaminant characterization (soluble lead in wetlands soil) and biological survey data were needed to support remedy selection. These data sets were collected during March and June 2001, respectively, and the results presented in the CB RI/FS – Part 2 (Jacobs, 2002a). Analytical results indicated that soluble lead is present at ETC-10 at levels that could have an impact on ecological receptors. However, biological survey results indicated that lead contamination has not affected the ecological health of the wetland communities. Although biological survey

results indicated that metals contamination has not affected the ecological health of the wetland communities, analytical data, including toxicity analysis and bioassays, indicated that contaminants within the wetlands associated with ETC-10 represent a potential adverse risk to ecological receptors.

#### *2.8.5.7 Site Contaminants of Concern and Remedial Action Objectives*

Based on post removal action conditions, COCs and RAOs for the ETC-10 site are listed below.

| COC (concentration) | RAO Source | RAO |
|---|---|---|
| Benzo(a)pyrene (0.274 mg/kg maximum; 0.1 mg/kg $UCL^{95}$) | HHRA | 0.089 mg/kg (Residential) |

The PAH benzo(a)pyrene in soil represents an adverse risk to human health. Although the maximum detections for lead exceed updated residential HHRA RAOs, the $UCL^{95}$ for confirmation samples within the excavated areas (330 mg/kg) is well below the residential HHRA RAO (400 mg/kg for lead).

Due to site contamination that exceeds the residential human health RAO, the following is a qualitative RAO specific to ETC-10:

- Prevent use of the ETC-10 site that would result in potential human exposure to contaminated soils at ETC-10 under residential use conditions.

In addition to the above RAO, a qualitative ecological RAO of no adverse impact to wetland habitat or species (as determined consistent with procedures established in the ERA) applies to ETC-10.

### 2.8.6 Site Summary for Fire Training Area 1

#### *2.8.6.1 Site Description*

FTA-1, used for fire training exercises from 1955 through 1975, is located adjacent to B1888 in grid L15 (Appendix A, Plate 1). Fuel, waste oil, solvents and other chemicals were accumulated weekly in a 2,000-gallon tank at the site. These materials were applied directly to soil pits and ignited. Other chemicals stored in 55-gallon drums were burned in an area adjacent to the pits. Multiple burn areas were identified from aerial photographs. The burn

areas were unlined and no surface fluid collection systems were present. The burn pits and other visibly discolored surfaces were potential contamination release areas.

The FTA-1 surface is unpaved, except for the area surrounding B1888. A hardpan layer is typically present between 5 and 10 feet bgs. The upper 20 feet of the subsurface is predominantly silt with interbedded silty sands. Three sand layers are present in the intervals at 20-25 feet, 35-40 feet and 40-60 feet bgs. The FTA-1 site is now owned by the BoP. The Federal Aviation Administration currently uses B1888 as a remote radar/communications facility.

FTA-1 is located in the northeastern grasslands area of Castle AFB. Although there are no wetlands within the general site boundary, several large wetlands occur a short distance to the east and northeast (Plate 1 and Figure 2-15). Runoff from the site has the potential to affect all of these wetlands. The wetlands associated with FTA-1 are now within a wetlands preserve controlled by the BoP.

#### *2.8.6.2 Site Characterization*

The FTA-1 site was previously investigated in 1988 and 1990. A soil gas survey found TCE (up to 470 µg/L); benzene (up to 4,300 µg/L); total hydrocarbons (up to 100,000 µg/L) and other VOCs in soil gas samples collected from the site. Six soil borings were installed and sampled at depths ranging from 5 to 40 feet bgs. Aromatic VOCs including benzene (up to 60.6 mg/kg) and xylenes (up to 245 mg/kg) and TPH (up to 22,600 mg/kg) were detected in soil samples.

During the Phase 1 SCOU RI, soil (including surface scrapes) and soil gas samples were collected from locations within a sampling grid to confirm historical data and characterize site contamination. During the Phase 2 RI, step-out borings were drilled and soil, soil gas and groundwater (HydroPunch) samples were collected to determine the lateral/vertical extent of VOC, petroleum hydrocarbon and metals contamination. Surface scrape samples were also taken for the ERA. Following the Phase 2 RI, additional soil samples were collected and analyzed for metals (SCOU update sampling). Soil sample depths typically ranged from the surface to 40 feet bgs; downhole soil gas sample depths ranged from 5 to 60 feet bgs.

RI activities related to assessment of ecological risk included the collection of 40 soil samples (29 surface and 11 near-surface) and 24 soil gas samples. Surface soil samples were taken from within the site and from the wetlands to the northwest and east. Samples were analyzed for VOCs, SVOCs, TPH and metals; a limited number of the samples were analyzed for dioxins/furans. Near-surface soil sample and soil gas sample depths were between 0.5 and 6 feet bgs. Soil samples were analyzed for VOCs, SVOCs, TPH and metals; soil gas samples were analyzed for VOCs.

SCOU RI soil, soil gas and groundwater sampling locations at FTA-1 are shown on Figure 2-15. A summary of the number and types of samples, analyses and maximum detections from the SCOU RI and the SCOU update sampling is presented below.

| FTA-1 SCOU RI Sampling Summary | | | | | |
|---|---|---|---|---|---|
| **Soil Borings** | **Soil Sediment/Scrape Locations** | **Soil Gas Probes** | **Soil Samples** | **Groundwater (HydroPunch) Samples** | **Soil Gas Samples** |
| 44 | 11 | 24 | 166 | 5 | 103 |

| FTA-1 SCOU RI Analysis Summary | |
|---|---|
| **Contaminant Category** | **Analytical Method** |
| **Soil/Groundwater Analyses** | |
| VOCs | SW8260 |
| SVOCs | SW8270 |
| Petroleum Hydrocarbons | CA8015/TVPH & TEPH |
| Dioxins/Furans | SW8280 |
| Metals | SW6010 |
| Arsenic | SW7060 |
| Lead | SW7421 |
| Mercury | SW7471 |
| Selenium | SW7740 |
| Chromium (Hexavalent) | SW7196 |
| Metals (Leachable) | DIWET/SW6010 |
| TOC (total organic carbon) | Walkley-Black |
| pH | SW9045 |
| **Soil Gas Analyses** | |
| VOCs | SGVOC, E18 |
| | TO-14 |

| FTA-1 SCOU RI Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1]** | **Sample Depth (feet bgs)** | **Units** |
| **Soil Results** | | | | |
| VOCs | TCE | 360 | 6-7 | mg/kg |
| | Xylenes | 173 | 10.5-11.5 | mg/kg |
| | 1,2,4-Trimethylbenzene | 89 | 10.5-11.5 | mg/kg |
| | 1,3,5-Trimethylbenzene | 30 | 10.5-11.5 | mg/kg |
| | Benzene | 9.7 | 10.5-11.5 | mg/kg |
| | *cis*-1,2-DCE | 6.6 | 2-3 | mg/kg |
| SVOCs | Benzo(a)pyrene | 1.4 | 0-0.25 | mg/kg |
| | 4-Methylphenol | 24 | 5.5-6.5 | mg/kg |
| | 2-Methylnaphthalene | 22 | 5.5-6.5 | mg/kg |
| | Naphthalene | 15 | 10.5-11.5 | mg/kg |
| | 2,4-Dimethylphenol | 7.8 | 5.5-6.5 | mg/kg |
| Dioxins/Furans | Octachlorodibenzo-p-dioxin (OCDD) | 0.068 | 2-3 | mg/kg |
| | 1,2,3,4,6,7,8-heptachlorodibenzofuran (HPCDD-1234678) | 0.0061 | 0-0.25 | mg/kg |
| | Hexachlorinated dibenzodioxins (HXCDD) | 0.00092 | 0-0.25 | mg/kg |
| | Hexachlorinated dibenzofurans (HXCDF) | 0.0003 | 0-0.25 | mg/kg |
| Petroleum Hydrocarbons | Gasoline | 5,400 | 10.5-11.5 | mg/kg |
| | Diesel | 19,000 | 15.5-16.5 | mg/kg |
| | Jet Fuel | 5,900 | 14.5-15.5 | mg/kg |
| Metals | Arsenic | 28.8 (12.2) | 15-16 | mg/kg |
| | Barium | 1,050 (319) | 2-3 | mg/kg |
| | Beryllium | 2.2 (0.89) | 40.5-41.5 | mg/kg |
| | Cadmium | 16.3 (0.91) | 2-3 | mg/kg |
| | Chromium | 364 (29.4) | 2-3 | mg/kg |
| | Cobalt | 57.1 (13.3) | 2-3 | mg/kg |
| | Copper | 127 (53.6) | 0-0.25 | mg/kg |
| | Lead | 3,990 (7.4) | 2-3 | mg/kg |
| | Manganese | 1,080 (765) | 25.5-26.5 | mg/kg |
| | Molybdenum | 8.8 (2.0) | 2-3 | mg/kg |
| | Nickel | 448 (29.6) | 0-0.25 | mg/kg |
| | Silver | 1.7 (0.61) | 40.5-41.5 | mg/kg |
| | Selenium | 1.1 (0.5) | 0-0.25 | mg/kg |
| | Vanadium | 77.4 (70.2) | 20.5-21.5 | mg/kg |
| | Zinc | 623 (101) | 2-3 | mg/kg |

| FTA-1 SCOU RI Maximum Detections | | | | |
|---|---|---|---|---|
| **Contaminant Category** | **Contaminant of Potential Concern** | **Maximum Concentration [1]** | **Sample Depth (feet bgs)** | **Units** |
| **Groundwater (HydroPunch) Results** | | | | |
| VOCs | TCE | 79 | ~70-75 | µg/L |
| | Benzene | 2.2 | ~70-75 | µg/L |
| | Toluene | 23 | ~70-75 | µg/L |
| | Ethylbenzene | 33 | ~70-75 | µg/L |
| | Naphthalene | 59 | ~70-75 | µg/L |
| | Xylenes | 174 | ~70-75 | µg/L |
| Petroleum Hydrocarbons | Gasoline | 1.8 | ~70-75 | mg/L |
| | Diesel | 0.5 | ~70-75 | mg/L |
| **Soil Gas Results** | | | | |
| VOCs | Benzene | 172 | 21.5-22.5 | µg/L |
| | Xylenes | 277 | 21.5-22.5 | µg/L |
| | Toluene | 56 | 21.5-22.5 | µg/L |
| | TCE | 970 | 40 | µg/L |
| | *cis*-1,2-DCE | 441 | 28-28.5 | µg/L |
| | Chloroform | 341 | 21.5-22.5 | µg/L |

**Note**
* Corresponding TBVs are listed in parentheses.

Chlorinated and aromatic VOCs (BTEX) were detected in soil and soil gas samples from FTA-1 to respective depths of approximately 50 and 55 feet bgs. The estimated extent of benzene and TCE contamination in soil gas (RI data) is shown on Figure 2-15. Petroleum hydrocarbons and SVOCs were detected in soil samples to approximately 25 and 30 feet bgs, respectively. Metals were detected above TBVs in surface and subsurface soil samples to approximately 50 feet bgs. Dioxins/furans were detected in surface and shallow subsurface soil samples to approximately 3 feet bgs. Chlorinated and aromatic VOCs and petroleum hydrocarbons were detected in groundwater (HydroPunch) samples collected at approximately 70-75 feet bgs (Shallow HSZ). All of the maximum reported groundwater (HydroPunch) concentrations listed above were from the same boring (FTA1SB31) located in the central portion of the site. Reported contaminant concentrations in the other four HydroPunch samples were non-detect or minimal. After the Phase 2 RI, the BCT agreed that FTA-1 was sufficiently characterized to support selection of an appropriate remedy, but decided that additional sampling and analysis would be required during the remedial action to refine estimates of the extent of VOC and dioxin/furan contamination.

A complete presentation of RI activities and results for FTA-1 is provided in Section 7.5.1 of the SCOU RI/FS (Jacobs, 1997a). Results of sampling related to ecological risk assessment are presented in the *Comprehensive Basewide Scoping and Phase I Ecological Risk Assessment* (Jacobs, 1995).

#### *2.8.6.3 Removal Action*

An action memorandum for an SVE removal action at FTA-1 was issued in September 1995 (*Final Removal Action Memoranda for Fire Training Area 1, Discharge Area 4, Detonation and Burn Facility, and Building 871 at Castle AFB, CA*; USAF, 1995). The SVE system, which includes 44 vapor extraction and monitoring wells (Figure 2-15), was started in November 1996 and remains in operation. Through the middle of 2003, the FTA-1 SVE system had removed almost 66,000 pounds of fuels (total volatile petroleum hydrocarbons [TVPH]) and VOCs. The CB RI/FS – Part 2 (Jacobs, 2002a) established that SVE, potentially followed by bioventing remains the appropriate preferred alternative for VOC contamination at FTA-1.

A cap was installed as part of the 1996 removal action. Although the primary purpose of the removal action was to address VOC contamination, the *FTA-1 Focused Feasibility Study* (Jacobs, 2002c) established that the cap served to limit potential human and environmental exposure to all contaminants present at FTA-1. The cap (Figure 2-15) was designed and constructed as an engineered alternative to a Class III cap, and consists of a geomembrane liner (low permeability layer), a 1-foot sand layer for drainage, a 1-foot soil layer and vegetative cover. During cap construction, soils from other SCOU sites were consolidated at FTA-1 to provide an adequate foundation layer. None of the soil consolidated at FTA-1 met or exceeded criteria defining hazardous or designated waste.

Maintenance and monitoring of the FTA-1 cap is performed in accordance with procedures outlined in the *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills 1, 3 and 5* (CPCMP; Jacobs, 1998b). Cap maintenance and monitoring activities consist of semiannual inspections of the cap and controlled area (area inside perimeter fence), reporting of inspection results and completion of any necessary repairs. Inspection activities include visual inspections of the final cover, security fence, access roads and drainage ditches. To date, the only maintenance required has been minor repairs/cleaning of drainage features and repair of minor erosional damage and filling of rodent burrows in the vegetative layer of the cap.

#### *2.8.6.4 Human Health Risk Assessment*

The CB RI/FS – Part 2 (Jacobs, 2002a) calculated human health risk for FTA-1 based on post removal action contaminant concentrations. For the purposes of estimating residual or post removal action risk, the engineered cap at FTA-1 was assumed to eliminate all human exposure pathways to capped soil. Therefore, there would be a potential for residual risk only from contaminants in soil outside of the existing cap. Methodology was the same as that used during the SCOU RI/FS as updated in 2001 and described in Section 2.6.1. Risk assessment results for FTA-1 are provided in Table 2-4. The adult residential cancer risk for surface soil without the ingestion of homegrown produce was 5E-07 and the HI was 0.1. For subsurface soil the adult residential cancer risk was 2E-06 and the HI was 0.1. The post removal action blood-lead estimates for the child residential scenario for surface soil (4.1 µg/dL) and subsurface soil (2.8 µg/dL) were both less than the established standard of 10 µg/dL. The primary risk driver for surface soil (81 percent) was cadmium. The primary risk drivers for subsurface soil were beryllium (54 percent) and cadmium (44 percent). However, the beryllium concentration of 0.82 mg/kg is less than the maximum TBV for beryllium of 0.89 mg/kg. If beryllium is not considered in the risk calculation, the post removal action adult residential cancer risk for subsurface soil would be 2E-07. Based on these results, the capped FTA-1 site does not pose an adverse risk to human health.

#### *2.8.6.5 Water Quality Site Assessment*

WQSA thresholds for benzene; chloroform; *cis*-1,2-DCE; 1,2-dichloroethane; methylene chloride; TCE; TEPH (as diesel); TVPH (as gasoline); Freon 11 and 1,2,4-trimethylbenzene in soil were exceeded. Also, WQSA thresholds for benzene; carbon tetrachloride; chloroform; *cis*-1,2-DCE; TCE and toluene in soil gas were exceeded. The metals arsenic, lead and zinc exceeded their WQSA RAOs in soil. However, as a result of the FTA-1 removal action, all areas with soil gas/soil exceeding WQSA thresholds or RAOs are under an engineered alternative to a Class III cap and the capped area is presently undergoing SVE/bioventing for VOCs (solvents and fuels).

The following FTA-1 contaminants exceeded WQSA thresholds/RAOs in soil:

- Benzene exceeded VLEACH2 criteria for 10-20 (68.4 µg/kg), 30-40 (5.9 µg/kg) and 50-60 (0.0 µg/kg) feet bgs.
- Chloroform exceeded VLEACH2 criteria for 10-20 (68.4 µg/kg), 30-40 (3.0 µg/kg), 40-50 (1.4 µg/kg) and 50-60 (0.0 µg/kg) feet bgs.

- 1,2-Dichloroethane exceeded the VLEACH2 criterion for 0-10 feet bgs (8.5 µg/kg).
- *cis*-1,2-DCE exceeded VLEACH2 criteria for 40-50 (2.3 µg/kg) and 50-60 feet bgs (1.0 µg/kg) and VLEACH1 criteria for 0-10 (1,213 µg/kg ), 10-20 (454.7 µg/kg) and 30-40 feet bgs (160.7 µg/kg).
- TCE in soil exceeded VLEACH1 criteria for 0-10 (2,743 µg/kg) and 10-20 feet bgs (1,002.1 µg/kg) and VLEACH2 criteria for 30-40 (6.6 µg/kg), 40-50 (4.6 µg/kg) and 50-60 feet bgs (1.7 µg/kg).
- Freon 11 in soil exceeded the VLEACH2 criterion for 0-10 feet bgs (8.5 µg/kg).
- 1,2,4-Trimethylbenzene in soil exceeded VLEACH1 criteria for 20-30 feet bgs (28,480 µg/kg).
- TEPH (as diesel) and TVPH (as gasoline) exceeded the designated level methodology thresholds for 0-20 feet bgs (1,500 mg/kg and 100 mg/kg, respectively).
- Arsenic exceeded its WQSA RAO of 20 mg/kg at depths of 10 feet bgs (22.9 mg/kg) and 15 feet bgs (28.8 mg/kg and 23.5 mg/kg).
- Lead exceeded its WQSA RAO of 855 mg/kg at 2 feet bgs (3,990 mg/kg).
- Zinc exceeded its WQSA RAO of 319 mg/kg at 2 feet bgs (623 mg/kg).

The following FTA-1 contaminants exceeded WQSA thresholds/RAOs in soil gas:

- Benzene exceeded VLEACH2 criteria for 10-20 (66.3 µg/L), 20-30 (20.1 µg/L), 30-40 (5.9 µg/L), 40-50 (1.4 µg/L), and 50-60 feet bgs (0.1 µg/L).
- Carbon tetrachloride exceeded VLEACH2 criteria for 40-50 (5 µg/L) and 50-60 feet bgs (2 µg/L).
- Chloroform exceeded VLEACH2 criteria for 10-20 (66.3 µg/L), 20-30 (20.1 µg/L), 30-40 (5.9 µg/L), 40-50 (1.4 µg/L), and 50-60 feet bgs (0.1 µg/L).
- *cis*-1,2-DCE exceeded VLEACH2 criteria for 20-30 (9.1 µg/L), 40-50 (4.4 µg/L), and 50-60 feet bgs (1.8 µg/L) and VLEACH1 criteria for 10-20 (860.1 µg/L) and 30-40 feet bgs (304 µg/L).
- TCE exceeded VLEACH2 criteria for 10-20 (19 µg/L), 40-50 (4.8 µg/L) and 50-60 feet bgs (1.8 µg/L), and VLEACH1 criteria for 20-30 (559.1 µg/L) and 30-40 feet bgs (352.7 µg/L).
- Toluene exceeded the VLEACH2 criterion for 50-60 feet bgs (24.58 µg/L).

Based on the above results alone, FTA-1 poses an adverse risk to groundwater quality. However, as stated previously, an SVE/bioventing removal action is ongoing and all soil gas/soil contaminants exceeding WQSA thresholds and RAOs are beneath the existing cap and thus, the potential for groundwater impact is significantly diminished.

### 2.8.6.6 *Ecological Risk Assessment*

The Scoping and Phase I ERAs identified FTA-1 as one of 25 Castle AFB SCOU sites with the potential to impact ecological habitat (Jacobs, 1995). Results of the Phase II ERA showed that sediments in both the wetlands northwest and east of FTA-1 represented a risk to several target receptors (i.e., ecological quotients exceeded 1). Following the Phase II ERA, the Air Force, EPA and DTSC determined that additional contaminant characterization (extent of contamination in wetlands) and biological survey data were needed to support remedy selection. These data were collected during March and June 2001, respectively, and the results presented in the CB RI/FS – Part 2 (Jacobs, 2002a). Similar to other sites, the biological survey results indicated that contamination had not affected the ecological health of the wetland communities. However, based on the additional contaminant characterization data, calculated total ecological quotients for the bullfrog, water flea, duckweed and green algae receptors ranged from approximately 70 to nearly 2,000, indicating significant potential adverse risk.

Given that the cap installed as part of the FTA-1 removal action (see Figure 2-15) covered the majority of the grassland area determined to present a risk to ecological receptors, the grassland portion of FTA-1 was recommended for no further action in the Phase II ERA (Jacobs, 1997c). However, the subsequent FTA-1 FFS identified approximately 150 $yd^3$ of soil with metals (cadmium and nickel) contamination that posed an adverse risk to ecological receptors remained outside of the existing cap (Figure 2-16).

### 2.8.6.7 *Site Contaminants of Concern and Remedial Action Objectives*

Based on the HHRA and the WQSA, COCs and RAOs for the FTA-1 site are listed below. Where the COC concentration exceeds the WQSA and HHRA RAOs, the lowest RAO is specified. All areas that exceed the HHRA or WQSA RAOs are presently under the engineered alternative to a Class III cap that was constructed as part of the FTA-1 removal action.

| COC (concentration) | RAO Source | RAO |
|---|---|---|
| Arsenic (28.8 mg/kg in soil) | HHRA | Occupational RAO – 9.9 mg/kg |
| Benzene (9,700 µg/kg in soil) | WQSA | VLEACH2 – 68.4 µg/kg, 10 to 20 feet bgs or lowest level technically and economically achievable |
| Benzene (1,189 µg/L in soil gas) | WQSA | VLEACH2 – 5.8 µg/L, 30 to 40 feet bgs or lowest level technically and economically achievable |
| Benzo(a)pyrene (1.4 mg/kg in soil) | HHRA | Occupational RAO – 0.12 mg/kg |
| Cadmium (16.3 mg/kg in soil) | HHRA | Occupational RAO – 15 mg/kg |
| Carbon Tetrachloride (17.64 µg/L in soil gas) | WQSA | VLEACH2 – 2 µg/L, 50 to 60 feet bgs or lowest level technically and economically achievable |
| Chloroform (2,700 µg/kg in soil) | WQSA | VLEACH2 – 68.4 µg/kg, 10 to 20 feet bgs or lowest level technically and economically achievable |
| Chloroform (341.7 µg/L in soil gas) | WQSA | VLEACH2 – 19.8 µg/L, 20 to 30 feet bgs or lowest level technically and economically achievable |
| Cis-1,2-dichloroethene (6,600 µg/kg in soil) | WQSA | VLEACH2 – 21.5 µg/kg, 0 to 10 feet bgs or lowest level technically and economically achievable |
| Cis-1,2-dichloroethene (1,500 µg/L in soil gas) | WQSA | VLEACH2 – 15.7 µg/L, 10 to 20 feet bgs or lowest level technically and economically achievable |
| 1,2-Dichloroethane (21 µg/kg in soil) | WQSA | VLEACH2 – 8.5 µg/kg, 0 to 10 feet bgs or lowest level technically and economically achievable |
| Lead (3,990 mg/kg in soil) | HHRA | Occupational RAO – 755 mg/kg |
| Octachlorodibenzo-p-dioxin (68 µg/kg in soil) | HHRA | Occupational RAO – 24 µg/kg |
| 1,2,3,4,6,7,8-heptachlorodibenzofuran (6.1 µg/kg in soil) | HHRA | Occupational RAO – 2.4 µg/kg |
| Hexachlorinated dibenzodioxins (0.92 µg/kg) | HHRA | Occupational RAO – 0.24 µg/kg |
| Hexachlorinated dibenzofurans (0.3 µg/kg in soil) | HHRA | Occupational RAO – 0.24 µg/kg |
| TCE (360,000 µg/kg in soil) | WQSA | VLEACH2 – 47.8 µg/kg, 0 to 10 feet bgs or lowest level technically and economically achievable |
| TCE (2,000 µg/L in soil gas) | WQSA | VLEACH2 – 6.8 µg/L, 30 to 40 feet bgs or lowest level technically and economically achievable |
| TEPH (19,000 mg/kg in soil) | WQSA | 1,500 mg/kg, 0 to 20 feet bgs. |
| TVPH (5,400 mg/kg in soil) | WQSA | 100 mg/kg, 0 to 20 feet bgs. |
| Toluene (24.58 µg/L in soil gas) | WQSA | VLEACH2 – 11.3 µg/L, 50 to 60 feet bgs or lowest level technically and economically achievable |
| Freon 11 (9.9 µg/kg in soil) | WQSA | VLEACH2 – 8.5 µg/kg, 0 to 10 feet bgs or lowest level technically and economically achievable |
| 1,2,4-Trimethylbenzene (89,000 µg/kg in soil) | WQSA | VLEACH1 – 28,480 µg/kg, 20 to 30 feet bgs |
| Zinc (623 mg/kg in soil) | WQSA | 319 mg/kg |

At FTA-1, arsenic and lead in shallow soil pose an adverse risk to both groundwater quality and human health. Zinc in shallow soil poses an adverse risk to groundwater quality. Benzo(a)pyrene and dioxins in shallow soil pose an adverse risk to human health. Benzene; chloroform; *cis*-1,2-DCE; 1,2-dichloroethane; TCE; TEPH; TVPH; Freon 11 and

1,2,4-trimethylbenzene in soil pose an adverse risk to groundwater. Benzene; carbon tetrachloride; chloroform; *cis*-1,2-DCE; TCE and toluene in soil gas pose an adverse risk to groundwater. As noted, areas with COCs exceeding RAOs based on the HHRA or WQSA are located beneath the engineered alternative to a Class III cap.

Two metals, cadmium and nickel, occur at concentrations of ecological concern in soil outside of the existing cap. The ecological RAOs are 1.5 mg/kg for cadmium and 34.2 mg/kg for nickel. These ecological RAOs were established based on the highest reported concentrations of metals detected in FTA-1 wetlands sediment.

Due to post removal action conditions, the qualitative RAOs are specific to FTA-1:

- Protect remedial system from damage and protect the integrity of the cap.
- Prohibit activities that would limit access to any equipment and systems associated with monitoring and maintenance.
- Prevent human exposure to contaminated soils below the FTA-1 cap (currently attained via the Air Force/BoP Memorandum of Understanding [AF/BoP MOU] as described in Section 2.12.5).

In addition to the above, a qualitative ecological RAO of no adverse impact to wetland habitat or species (as determined consistent with procedures established in the ERA) applies to FTA-1.

### 2.8.7 Site Summary for Earth Technology Corporation 12

#### *2.8.7.1 Site Description*

ETC-12 is a former dump site located in grid H15/16 in the northeastern grasslands portion of Castle AFB (Appendix A, Plate 1). The site was identified based on analysis of a 1958 aerial photograph (EPA, 1991). During site inspection, surface debris and disturbed ground observed in the southern portion of ETC-12 confirmed the area as a probable dump site (Jacobs, 1997a). The site is composed of two noncontiguous sections, both of which contain wetlands (Appendix A, Plate 1).

The selected remedy for human health and water quality risk at ETC-12 was established in the *SCOU ROD Part* 1 (WPI, 2002) as no further action. Only issues related to ecological risk are addressed herein.

### 2.8.7.2 *Site Characterization*

Ecologically relevant data collected at ETC-12 during the SCOU RI consisted of three soil samples and 21 soil gas samples. Two surface soil samples were taken from the wetlands most likely to receive runoff from the site and were analyzed for PAHs and metals. All of the soil gas samples and a single soil sample were collected from between 0.5 and 5 feet bgs within the site. The soil gas samples were analyzed for VOCs; the single soil sample was analyzed for SVOCs and metals. No SVOCs/PAHs were detected in the soil samples. VOCs were reported in several of the soil gas samples, but only at low concentrations. Metals were detected in all soil samples. A summary of the maximum metals detections in surface and shallow soil is presented in the following table.

**ETC-12 SCOU RI Maximum Detections**

| Contaminant Category | Contaminant of Potential Concern | Maximum Concentration [1] | Sample Depth (feet bgs) | Units |
|---|---|---|---|---|
| **Soil Results** | | | | |
| Metals | Aluminum | 22,900 (9,390) | 0-0.5 | mg/kg |
| | Barium | 165 (130) | 0-0.5 | mg/kg |
| | Beryllium | 0.78 (0.43) | 0-0.5 | mg/kg |
| | Chromium | 27.9 (16.6) | 0-0.5 | mg/kg |
| | Copper | 21.4 (13.7) | 0-0.5 | mg/kg |
| | Lead | 17.9 (7.3) | 0-0.5 | mg/kg |
| | Molybdenum | 1.1 (0.87) | 0-0.5 | mg/kg |
| | Nickel | 20.5 (11.9) | 0-0.5 | mg/kg |
| | Thallium | 0.29 (no TBV) | 0-0.5 | mg/kg |
| | Vanadium | 48.3 (32.8) | 0-0.5 | mg/kg |
| | Zinc | 83.3 (19.8) | 0-0.5 | mg/kg |

**Note**
[1] Corresponding TBVs are listed in parentheses.

### 2.8.7.3 *Ecological Risk Assessment*

The Scoping ERA identified ETC-12 as one of 25 Castle AFB SCOU sites with the potential to impact ecological habitat. The Phase I and Phase II ERAs determined that soil contamination at ETC-12 represented a potential adverse risk to several target receptors (i.e., ecological quotients exceeded 1). The primary risk drivers were the metals chromium, lead and vanadium. Following the Phase II ERA, the Air Force, EPA and DTSC determined that biological survey data from the associated wetlands were needed to support remedy

selection. These data were collected during June 2001 and the results presented in the CB RI/FS – Part 2 (Jacobs, 2002a). Although biological survey results indicated that metals contamination has not affected the ecological health of the wetland communities, analytical data, including toxicity analysis and bioassays, indicated that contaminants within the wetlands associated with ETC-12 represent a potential adverse risk to ecological receptors.

#### *2.8.7.4 Site Contaminants of Ecological Concern and Remedial Action Objectives*

Based on the ERA, contaminants of ecological concern in wetlands are the metals chromium, lead and vanadium.

A qualitative ecological RAO of no adverse impact to wetland habitat or species (as determined consistent with procedures established in the ERA) applies to ETC-12.

### 2.8.8 Site Summary for Landfill 3

#### *2.8.8.1 Site Description*

LF-3 is a former landfill located in grid K/L16 in the northeastern grasslands portion of Castle AFB (Appendix A, Plate 1). The approximately 2-acre landfill was operational from 1954 to 1956. During this time, general refuse and some chemical wastes were disposed of in shallow trenches. The landfill was closed after only two years of operation due to poor drainage resulting from an extensive hardpan layer in soil at approximately 8 feet bgs (Jacobs, 1997a). A large wetland runs north-south through the western portion of the site (Appendix A, Plate 1).

Based on the agency-approved clean closure of LF-3 that was completed by removal action, the selected remedy for human health and water quality risk at LF-3 was established in the *SCOU ROD Part* 1 (WPI, 2002) as no further action. Only issues related to ecological risk are addressed herein.

#### *2.8.8.2 Site Characterization*

Ecologically relevant data collected at LF-3 during the SCOU RI consisted of 18 soil samples and nine soil gas samples. Nine surface scrape samples from within the site were analyzed for VOCs, SVOCs, TPH and metals. Seven shallow soil samples (0.5 to 5 feet bgs) collected within the site were tested for the same analytes. Two wetlands

sediment samples, collected as part of the ETC-11 and FR site investigations were included in the assessment of LF-3 because of the greater likelihood that the contaminants seen in these samples came from LF-3. These samples were analyzed for PAHs and metals. Nine soil gas samples collected from 5 feet bgs within the site were analyzed for VOCs. VOCs and PAHs were reported at low concentrations in soil samples but no VOCs were detected in the soil gas samples. Several metals were detected at concentrations exceeding TBVs, including a maximum concentration of lead of over 28,000 mg/kg. A summary of the maximum metals detections in surface and shallow soil is presented in the following table.

**LF-3 SCOU RI Maximum Detections**

| Contaminant Category | Contaminant of Potential Concern | Maximum Concentration [1] | Sample Depth (feet bgs) | Units |
|---|---|---|---|---|
| **Soil Results** | | | | |
| Metals | Aluminum | 14,700 (9,390) | 0-0.5 | mg/kg |
| | Antimony | 4.3 (3.8) | 0-0.5 | mg/kg |
| | Arsenic | 234 (7.9) | 0-0.5 | mg/kg |
| | Barium | 210 (130) | 0-0.5 | mg/kg |
| | Beryllium | 0.94 (0.43) | 0-0.5 | mg/kg |
| | Cadmium | 0.54 (0.5) | 0-0.5 | mg/kg |
| | Chromium | 26.4 (16.6) | 0-0.5 | mg/kg |
| | Copper | 26.4 (13.7) | 0-0.5 | mg/kg |
| | Lead | 28,500 (7.3) | 0-0.5 | mg/kg |
| | Manganese | 237 (228) | 0-0.5 | mg/kg |
| | Molybdenum | 1.2 (0.87) | 0-0.5 | mg/kg |
| | Nickel | 26.2 (11.9) | 0-0.5 | mg/kg |
| | Selenium | 4.2 (0.5) | 0-0.5 | mg/kg |
| | Silver | 1.1 (0.46) | 0-0.5 | mg/kg |
| | Thallium | 4.5 (no TBV) | 0-0.5 | mg/kg |
| | Vanadium | 50.6 (32.8) | 0-0.5 | mg/kg |
| | Zinc | 83.3 (46.9) | 0-0.5 | mg/kg |

**Note**
[1] Corresponding TBVs are listed in parentheses.

### *2.8.8.3 Ecological Risk Assessment*

The Scoping ERA identified LF-3 as one of 25 Castle AFB SCOU sites with the potential to impact ecological habitat. The Phase I and Phase II ERAs determined that soil contamination at LF-3 represented a potential risk to several target receptors

(i.e., ecological quotients exceeded 1). The primary risk drivers were metals (principally lead) and PAHs. A removal action was completed for the LF-3 site in 1999. The removal action included the excavation of all waste areas, followed by backfilling with clean soil. The removal action eliminated all sample locations that the Phase I and Phase II ERAs had shown to represent ecological risk. Consequently, the Air Force, EPA and DTSC determined that further characterization of the contamination in the wetlands and biological survey data from the wetlands were needed to support remedy selection. These data sets were collected during March and June 2001, respectively, and the results presented in the CB RI/FS – Part 2 (Jacobs, 2002a). Revised ecological quotients based on results from five sediment samples collected in the wetlands showed a potential risk to four aquatic receptors, with ecological quotients ranging from 50 to 500. Although biological survey results indicated that metals and PAH contamination has not affected the ecological health of the wetland communities, analytical data, including toxicity analysis and bioassays, indicated that contaminants within the wetlands associated with LF-3 represent a potential adverse risk to ecological receptors.

#### *2.8.8.4 Site Contaminants of Ecological Concern and Remedial Action Objectives*

Based on the ERA, contaminants of ecological concern in wetlands are metals, primarily lead, and PAHs.

A qualitative ecological RAO of no adverse impact to wetland habitat or species (as determined consistent with procedures established in the ERA) applies to LF-3.

### 2.8.9 Ecological No Further Action Sites

As described in Section 2.6.3, 225 ecological no further action sites were identified based on the ERA evaluation (all SCOU sites except ETC10, ETC12, FTA-1, LF-3, LF-5, DP-8, DP-8A and Landfill 5 Trenches). Table 2-1 lists the ROD (SCOU ROD Part 1, SCOU ROD Part 2 or SCOU ROD Part 3) where detailed site characteristics and the selected remedy for human health and water quality risks for each of the ecological no further action sites can be found.

## 2.9 DESCRIPTION OF ALTERNATIVES

This section provides descriptions of the remedial alternatives considered and evaluated for the SCOU ROD Part 3 sites. A general discussion of the IC alternative is provided before discussion of the alternatives for the individual or grouped sites.

Because of the similarity of the sites and the alternatives considered, the alternatives for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) are presented together in Section 2.9.2. Alternatives for DP-9 (Section 2.9.3), ETC-8 (Section 2.9.4), ETC-10 (Section 2.9.5) and FTA-1 (Section 2.9.6) are presented separately. The alternatives for sites with the potential for adverse ecological effects (ETC-10, ETC-12, FTA-1, LF-3 and LF-5) are presented together in Section 2.9.6 because the same alternatives were considered for all five sites.

### 2.9.1 Institutional Controls

In order to meet the qualitative RAOs identified in previous sections for LF-4 (including DP-5 and DP-6; LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); ETC-10 and FTA-1, ICs were evaluated as an alternative at these sites. ICs for LF-4 and LF-5 and their associated sites are based on State landfill closure requirements. ICs for FTA-1 are intended to preserve the cap previously implemented through removal action and to prevent or limit exposure to contaminants. ICs for ETC-10 are intended to prevent or limit exposure to contaminants. The ICs are non-technical, non-engineering actions that support or complement the removal actions completed at each of the sites (capping or excavation and disposal). ICs are a component of the remedy at ETC-10; FTA-1; LF-4 including DP-5 and DP-6; and LF-5 including DP-8, DP-8A and Landfill 5 Trenches.

Specific language is included in this ROD regarding implementation, monitoring, and enforcement of the selected ICs; therefore, compliance with the terms of this ROD will be protective of human health and the environment. Because the restrictions are specifically described in Section 2.12 and the means for implementing the restrictions are detailed herein, it is not necessary for the Air Force to submit any new post-ROD, IC implementation documents, such as a Land Use Control Implementation Plan (LUCIP), new Operation and Maintenance (O&M) plans or Remedial Action work plans. The Air Force at its discretion, may develop one or more such documents for sites affected by ICs, and will provide the EPA and the State of California any implementation documents it develops. However, to

address LF-4, LF-5 and their associated sites, and to the extent applicable, FTA-1, the existing landfill CPCMPs (Jacobs, 1997f; Jacobs, 1998c; Jacobs, 2000b; Jacobs, 2004c) will be revised to include restrictions as well as the implementation, monitoring and enforcement measures described later in this section. The Air Force will submit the revised CPCMPs to EPA and the State of California within 180 days of the signing of this ROD for review and approval.

The IC alternatives include various enforceable use restrictions and land use controls on the use of the property. The Air Force is responsible for implementing, maintaining and monitoring the remedial actions (including ICs) before and after property transfer. The Air Force will exercise this responsibility in accordance with CERCLA and the NCP. Any grantee of property constrained by ICs imposed through their transfer document(s) may request modification or termination of the ICs. Modification or termination of these ICs requires Air Force, EPA and State of California approval.

The regulatory agencies may conduct inspections of CERCLA remedial response activities. The Air Force will continue to provide access to the property for those purposes, as required under the Federal Facilities Agreement, and the transfer documents for the property will reserve a right of access to the property for those purposes for itself, the EPA, and the State of California.

The parcel of property encompassing LF-4 is currently leased to Merced County (Lease in Furtherance of Conveyance of Parcel A on Castle Air Force Base, California for the Airport to Castle Joint Powers Authority). For LF-4, restrictions equivalent to those specified in this ROD are currently implemented by lease terms and the existing CPCMP. The lease restrictions are in place and operational and will remain in place until the property is transferred by deed. At the moment of deed transfer, the lease restrictions will be superseded by equivalent restrictions to be included in the federal deed and the State Land Use Covenant described in this ROD. The CPCMP will remain in place for the LF-4 site.

The property encompassing ETC-10; FTA-1 and LF-5 including DP-8, DP-8A and Landfill 5 Trenches has been transferred to another federal agency, the BoP. The existing CPCMP for LF-5, including DP-8, DP-8A and Landfill 5 Trenches, prohibits access and use except for activities directly related to the operation and maintenance of the closed landfill. The AF/BoP MOU provides the Air Force continued access to conduct environmental activities

and restricts the BoP from any alterations at the sites without notification and approval of the Air Force. The Air Force will obtain EPA and State of California approval of any requested alterations prior to approving BoP changes. In addition, The AF/BoP MOU assigns wetland responsibility to the BoP, which has, in turn, established a *Preservation Area Mitigation and Management Plan* (Louis Berger and Associates [Berger], 1998) for wetland areas within BoP property. The BoP's plan restricts activities with the potential to affect wetlands in the preservation area of the transferred parcels. This includes the wetlands associated with ETC-10, ETC-12, FTA-1 and LF-3.

Meeting RAOs shall be the primary and fundamental indicator of IC performance, the ultimate aim of which is to protect human health and the environment. Performance measures for ICs are the RAOs plus the actions necessary to achieve those objectives. It is anticipated that successful implementation, operation, maintenance, and completion of these measures will achieve protection of human health and the environment and compliance with all legal requirements.

Descriptions of the ICs for ETC-10; FTA-1; LF-4 including DP-5 and DP-6; and LF-5 including DP-8, DP-8A and Landfill 5 Trenches are provided in site-specific discussions below and in Section 2.12 of this ROD. The current maintenance and monitoring requirements and procedures for LF-4, including DP-5 and DP-6, are described in the *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills* (Jacobs, 1997f). The current maintenance and monitoring requirements and procedures for LF-5, including DP-8, DP-8A and Landfill 5 Trenches, are described in the *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills 1, 3 and 5* (Jacobs, 1998c). Updates for the post-closure groundwater monitoring program for both landfill sites are described in the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update* (Jacobs, 2000b) and the *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update – Revision 1*(Jacobs, 2004c). Monitoring and maintenance of the existing cap at FTA-1 is conducted in accordance with procedures described in the existing CPCMPs (Jacobs, 1997f; Jacobs, 1998c) exclusive of landfill gas monitoring requirements. The AF/BoP MOU controls activities and restricts use at ETC-10; ETC-12; FTA-1; LF-3 and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches).

The Air Force may contractually arrange for third parties to perform any and all of the actions associated with ICs, although the Air Force is ultimately responsible under CERCLA

for the successful implementation, monitoring and maintenance of protective remedies, including ICs. ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations. ICs will be maintained at ETC-10 and FTA-1 until soils are at levels that allow for unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval.

#### *2.9.1.1 Deed Restrictions and Reservation of Access*

Each federal deed or letter of transfer to another federal agency will include a description of the residual contamination on the property, consistent with the Air Force's obligations under CERCLA Section 120(h) and the specific restrictions subsequently set forth in Section 2.12 Selected Remedy. The ICs, in the form of deed restrictions are "environmental restrictions" under California Civil Code section 1471. Letters of transfer to other federal agencies will also include a requirement that further transfers of the property, whether by deed or letter of transfer, will contain appropriate provisions to ensure that the restrictions continue to run with the land, as provided in California Civil Code section 1471. Deeds and letters of transfer will include legal descriptions of the sites covered by restrictions. Such information was provided to the BoP prior to transfer of the parcels containing LF-5, including DP-8, DP-8A and Landfill 5 Trenches; ETC-10 and FTA-1.

Each deed (or the existing transfer documents for BoP parcels) will also contain a reservation of access to the property for the Air Force, EPA and the State of California, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the Air Force IRP or the FFA.

The environmental restrictions are the basis for part of the CERCLA 120(h)(3) covenant that the United States is required to include in the deed for any property that has had hazardous substances stored for one year or more, known to have been released or disposed of on the property. During the time between adoption of this ROD and deeding of the property, the lease between the Air Force and the County of Merced implements appropriate restrictions for LF-4.

#### *2.9.1.2 Notice of Institutional Controls*

The Air Force will include the specific deed restriction language set forth in Section 2.12 in any deed or letter of transfer document for a parcel that includes one of the sites for which

ICs are selected pursuant to this ROD, and will provide a copy of the deeds to the regulatory agencies as soon as practicable after the transfer of fee title. The deed restriction language and State Land Use Covenant language incorporating those restrictions will be consistent. The Air Force will provide information to the property owners regarding necessary ICs in the draft deed. The signed deed will also include the specific land use restrictions. The information will also be communicated to appropriate state and local agencies with authority regarding any of the activities or entities addressed in the controls to ensure that such agencies can factor the information into their oversight, approval, and decision-making activities.

#### *2.9.1.3 Annual Evaluations/Monitoring*

The Air Force will conduct annual monitoring and undertake prompt action to address activity that is inconsistent with the IC objective or use restrictions, or any action that may interfere with the effectiveness of the ICs. The Air Force will submit to the regulatory agencies annual monitoring reports on the status of ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the ICs in the ROD were communicated in the deed(s), if property was deeded during the period covered, whether the owners and State and local agencies were notified of the ICs affecting the property and whether use of the property has conformed to such ICs. Five-year review reports will make recommendations on the continuation, modification or elimination of annual reports and IC monitoring frequencies. Five-year review reports are submitted to the regulatory agencies for review and comment.

#### *2.9.1.4 Response to Violations*

The Air Force will notify EPA and the State via e-mail or telephone as soon as practicable, but no later than 14 days after discovery of any activity that is inconsistent with the IC objective or use restrictions or any action that may interfere with the effectiveness of the ICs. Not later than 10 days following such notice, the Air Force will provide EPA and the State with a description of the corrective actions taken or planned (including proposed enforcement actions, if any) to address the conditions described in the notice. This description of corrective action is not subject to regulatory agency approval. Any violations that breach federal, State or local criminal or civil law will be reported to the appropriate civilian authorities, as required by law. For IC violations pertaining to LF-4 and LF-5, the County of Merced will also receive the notification and follow-up documentation.

#### 2.9.1.5 *Enforcement*

The regulatory agencies may conduct inspections of the ICs at ETC-10; FTA-1; LF-4 including DP-5 and DP-6; and LF-5 including DP-8, DP-8A and Landfill 5 Trenches. Prior to property transfer, the Air Force will provide access to the regulatory agencies for the purpose of inspections. The deed transferring property or letter of transfer to another federal agency will provide for such access to the regulatory agencies and the Air Force.

Any activity that is inconsistent with the IC objective or use restriction or any action that may interfere with the effectiveness of the ICs will be addressed by the Air Force as soon as practicable after the Air Force becomes aware of the violation, but in no event will the process be initiated later than 14 days after the Air Force discovers the violation. The Air Force will exercise such rights as it retained under the transfer documents to direct that activities in violation of the controls be immediately halted. To the extent necessary, the Air Force will engage the services of the U.S. Department of Justice to enforce such rights. State law gives the State separate enforcement authority against future landowners. See "State Land Use Covenants," below.

#### 2.9.1.6 *Approval of Land Use Modification*

Any grantee of property constrained by ICs imposed through their transfer document(s) may request modification or termination of the ICs. Modification or termination of these ICs requires Air Force, EPA and State of California approval.

#### 2.9.1.7 *State Land Use Covenants*

Immediately before transfer of title to the parcel including LF-4, the Air Force will execute a State Land Use Covenant with the State that includes the restrictions described in Section 2.12, legal descriptions of the property and affected areas, and provisions for regulatory agency access for purposes of inspections, monitoring and other activities. The State Land Use Covenant will be recorded before the recording of the federal deed. The State will enter into the State Land Use Covenant pursuant to State law, including 22 CCR, Section 67391.1. Modification or termination of the State Land Use Covenant must be undertaken in accordance with State law.

In addition, 22 CCR Section 67391.1 imposes certain obligations and restrictions on DTSC, including prohibitions on DTSC's certifying satisfactory completion of response actions, or

approving or concurring in certain response action decision documents, or considering property suitable for transfer to non-federal entities, unless appropriate land use covenants will be executed and recorded when hazardous substances will remain at the property at levels that are not suitable for unrestricted use. This regulation also provides for modification and termination of State Land Use Covenants.

### 2.9.2 Description of Alternatives for Landfill 4 (including DP-5 and DP-6) and Landfill 5 (including DP-8, DP-8A and Landfill 5 Trenches)

Several remedial alternatives were considered for LF-4 and LF-5 and their associated sites, during the FS process. The selection of remedial alternatives was based on the nature of wastes and the types, concentrations, and distribution of contaminants at the landfill sites. Remedial alternatives included only removal and containment methods. The CERCLA preference for treatment that reduces contaminant toxicity, mobility or volume could not be achieved because of the nature of wastes involved, i.e., large volumes of waste, the great majority of which did not contain contaminants exceeding HHRA or WQSA thresholds. Waste segregation was unlikely to be successful and would have been prohibitively expensive in both cost and time. The no action alternative was considered as required under CERCLA.

The remedial alternatives considered for LF-4 including DP-5 and DP-6 and for LF-5 including DP-8, DP-8A and Landfill 5 Trenches are listed below. It is noted that long-term maintenance and monitoring was considered an integral part of all capping alternatives.

- No Action
- Excavation and Off-site Disposal
- Excavation and On-site Disposal
- Class III Cap and ICs
- Evapotranspiration Cap and ICs
- Consolidation and Capping (Zoning) and ICs

Specific details regarding each of these alternatives are provided below. The following alternative descriptions include information on how each alternative satisfies (or does not satisfy) EPA threshold criteria (protection of human health and the environment and compliance with Applicable or Relevant and Appropriate Requirements [ARARs]). A separate discussion is provided for ICs because it applies to several of the alternatives.

#### 2.9.2.1 No Action

Under the no action alternative, no remedial activity would be employed to prevent direct soil contact, surface water percolation into groundwater, or wind dispersion of contaminated soils. The no action alternative would not comply with State landfill closure ARARs.

#### 2.9.2.2 Excavation and Off-Site Disposal

Under the excavation and off-site disposal alternative, the trenches containing waste, contaminant hot spots, or suspected hot spots would be excavated, sorted and transported to off-site commercial landfills certified to receive the stockpiled waste materials. Long-term protection of human health and the environment would be provided by this alternative. There would be short-term risks to excavation and transport personnel because of the excavation activity (excavating and handling waste material). Excavation and transport activities could be designed to comply with all ARARs.

#### 2.9.2.3 Excavation and On-Site Disposal

Under the excavation and on-site disposal alternative, the trenches containing waste, hot spots or suspected hot spots would be excavated, sorted and relocated to one of the other existing on-site landfills. Long-term protection of human health and the environment would be provided by this alternative through encapsulation and isolation of the waste material. There would be short-term risks to excavation and transport personnel because of the excavation activity (excavating and handling waste material). Excavation and transport activities could be designed to comply with all ARARs.

#### 2.9.2.4 Class III Cap and ICs

Under the Class III cap and ICs alternative a Class III cap would be placed over the majority of the identified trenches. ICs would serve to ensure long-term cap integrity. This alternative would provide both long-term and short-term protection of human health and the environment by isolating landfill contents and eliminating exposure pathways. There would be some short-term risks during the consolidation and capping activities. The alternative would be designed to comply with State landfill regulations and thus, would comply with ARARs.

#### 2.9.2.5 *Evapotranspiration Cap and ICs*

Under the evapotranspiration cap and ICs alternative, an evapotranspiration cap would be placed over a portion of the landfills. An evapotranspiration cap was an emerging technology providing protection of waste by storing infiltrated precipitation in the cap. The precipitation is later transpired (removed from the cap) via specially selected plants. ICs would serve to ensure long-term cap integrity. This alternative would provide both long-term and short-term protection of human health and the environment by isolating landfill contents and eliminating exposure pathways. There would be some short-term risks during the consolidation and capping activities. In addition to its special construction characteristics, the cap would need to be designed to comply with State landfill regulations and thus could comply with ARARs.

#### 2.9.2.6 *Consolidation and Capping (Zoning) and ICs*

Under the consolidation and capping (zoning) and ICs alternative a Class III cap would be placed over the majority of the identified trenches. Waste material in outlying trenches would be excavated and placed in the area to be capped prior to cap construction. ICs would serve to ensure long-term cap integrity. This alternative would provide both long-term and short-term protection of human health and the environment by isolating landfill contents and eliminating exposure pathways. There would be some short-term risks during the consolidation and capping activities. The alternative would be designed to comply with State landfill regulations and thus, would comply with ARARs.

#### 2.9.2.7 *Institutional Controls*

The ICs imposed at LF-4, including DP-5 and DP-6, and at LF-5, including DP-8, DP-8A and Landfill 5 Trenches, will include controls to prevent contact with landfill wastes and gases, prevent or minimize migration of landfill contaminants, and protect the integrity of the existing caps and associated structures installed during the removal actions. ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations. Modification or termination of ICs requires Air Force, EPA and State of California approval.

The ICs imposed on LF-4 and LF-5 and their associated sites would accomplish the following:

- Limit use of the property to nonirrigated open space unless otherwise approved in accordance with State landfill regulations
- Prevent contact with landfill waste and gases and ensure the integrity of the caps by:
  - Prohibiting construction, excavation, drilling, grading, removal, trenching, filling earth movement, mining, or planting that would disturb the soil or the landfill cover, including the vegetative cap, except for the purpose of monitoring groundwater or landfill gas
  - Prohibiting extraction of groundwater for any purpose other than monitoring
  - Prohibiting disturbance or removal of fencing or signs or other barriers intended to exclude the public from the landfill
- Prevent or minimize migration of landfill contents to the vadose zone and to groundwater and protect water quality by:
  - Prohibiting the surface application of water (e.g. irrigation) that might result in ponding on the cap or erosion sufficient to degrade the cap
  - Prohibiting activities that could affect the drainage, sub-drainage, or erosion controls for the landfill cover
- Protect remedial system from damage and preserve access to remedial equipment and systems associated with maintenance and monitoring by:
  - Prohibiting disturbance of any equipment and systems associated with the caps and the closed landfills
  - Prohibiting activities that would limit access to any equipment and systems associated with monitoring and maintenance

This alternative provides overall protection of human health and the environment by ensuring that the integrity of the cap and associated systems will be maintained. Restrictions will be formulated to be in compliance with ARARs for closed landfills.

### 2.9.3 Description of Alternatives for Disposal Pit 9

During the SCOU FS process, DP-9 was considered with LF-5, DP-8, DP-8A and Landfill 5 Trenches and was included in the consolidation and capping and ICs preferred alternative. However, the consolidation and capping removal action undertaken and completed for LF-5, DP-8, DP-8A and Landfill 5 Trenches did not affect DP-9; no waste material to be excavated was identified at DP-9 and the cap installed did not cover DP-9. As the result, because there were no contaminants exceeding RAOs identified at DP-9, the BCT reached a no further action determination. No other alternatives were considered for DP-9.

### 2.9.4 Description of Alternatives for Earth Technology Corporation 8

Following completion of the excavation and disposal removal action at ETC-8, the BCT determined that evaluation of additional remedial action was required to address PAH-impacted soil remaining beneath the asphalt-paved road within the site. A limited set of remedial alternatives was evaluated in an FFS conducted as part of the CB RI/FS – Part 2 (Jacobs, 2002a). Excavation and disposal was included because excavation and disposal was the SCOU FS preferred alternative for shooting range sites (i.e., ETC-8 and ETC-10). The no action alternative was also evaluated, as required under CERCLA. The following remedial alternatives were considered for ETC-8:

- No Action
- Excavation and Disposal
- Institutional Controls

Specific details regarding each of these alternatives are provided below. The following alternative descriptions include information on how each alternative satisfies (or does not satisfy) EPA threshold criteria (protection of human health and the environment and compliance with ARARs).

#### *2.9.4.1 No Action*

Under this alternative, no remedial activity or controls, other than the existing pavement, would be employed to prevent direct human contact with the potentially PAH-impacted soil beneath the road. Any PAH-impacted soil beneath the road traversing ETC-8 and in adjacent areas would remain in place.

This alternative does provide some protection of human health and the environment at ETC-8 as there is an existing physical barrier to human contact with the potentially impacted soil. However, there is no assurance that the present physical barrier will remain in place or that intrusive activities will be prevented. Consequently, the no action alternative does not completely satisfy the threshold criterion of overall protection of human health and the environment. A no action alternative does not require a ARARs analysis because ARARs are only triggered if a response action is taken.

#### 2.9.4.2 *Excavation and Disposal*

Under this alternative, areas where soil exceeds unrestricted use levels (residential RAOs) will be excavated and the soil transported off site for disposal. This alternative requires removal of the asphalt road, collection and analysis of samples to identify soil exceeding RAOs for site COCs (PAHs), excavation and off-site disposal of contaminated soil, collection and analysis of confirmation samples, backfilling of the excavation and preparation of a supplemental remedial action completion report. Based on the original removal action and the results of recent excavation delineation sampling, the volume of soil to be removed and disposed would be on the order of 5,200 $yd^3$.

This alternative provides maximum protection of human health and the environment at the ETC-8 site; all soil with PAH concentrations exceeding risk-based residential RAOs would be removed from the site. Similar to other excavation and disposal removal actions at Castle AFB, this alternative can be designed to be in compliance with ARARs such as local air quality and dust control regulations associated with excavation/construction activities. In addition, this alternative would meet all State and Federal ARARs for soil cleanup.

#### 2.9.4.3 *Institutional Controls*

The ICs alternative would require development of an enforceable legal control that would prevent human contact with the potentially PAH-impacted soil beneath the road. Basically, the road or an alternative physical barrier to human contact with this soil must remain in place. No development could occur without regulatory approval and appropriate sampling and soil removal.

This alternative would provide protection of human health and the environment by eliminating the potential (administratively, not physically) for human contact with the remaining PAH-impacted soil. In addition, this alternative would be in compliance with ARARs because there is no physical response action, and no evaluation against ARARs is required.

### 2.9.5 Description of Alternatives for Earth Technology Corporation 10

Following completion of the excavation and removal action at ETC-10, the BCT determined that additional remedial action was required to address residual metals (lead) and benzo(a)pyrene contamination, both of which exceeded occupational RAOs at individual

sampling locations. A limited set of remedial alternatives was evaluated in a FFS conducted as part of the CB RI/FS – Part 2 (Jacobs, 2002a). Excavation and disposal was included because it was the SCOU FS preferred alternative for shooting range sites (i.e., ETC-8 and ETC-10). The no action alternative was also evaluated, as required under CERCLA. The following remedial alternatives were considered for ETC-10:

- No Action
- Excavation and Disposal
- Institutional Controls

Specific details regarding each of these alternatives are provided below. The following alternative descriptions include information on how each alternative satisfies (or does not satisfy) EPA threshold criteria (protection of human health and the environment and compliance with ARARs).

#### *2.9.5.1 No Action*

Under this alternative, no additional remedial activity would occur and the lead concentration in soil at ETC-10, as defined at the completion of the 1998 removal action, would remain.

This alternative would not provide protection of human health at the ETC-10 site. A no action alternative does not require a ARARs analysis because ARARs are only triggered if a response action is taken.

#### *2.9.5.2 Excavation and Disposal*

The excavation and disposal alternative would require additional excavation in those portions of the original excavation area where confirmation sample results exceed current health protective levels (residential RAO for lead of 400 mg/kg). Because on-site disposal options for contaminated soil are closed (LF-4 and LF-5), all lead-impacted soil excavated from ETC-10 would require off-site disposal. Although not a certainty, it is assumed that excavation would involve removal of only 1 to 2 feet of additional soil in the areas of ETC-10 that exceed the residential RAO. These areas would then require backfill with clean soil. This process would essentially destroy any wetland habitat in the excavated area and thereby, require complete restoration of some amount of wetlands. As noted in the

ecological FFS, the restoration process has a relatively low success rate and typically results in a wetland of lesser quality than that originally present. In addition, the BoP's *Preservation Area Mitigation and Management Plan* (Berger, 1998), which was established after the ETC-10 removal action, precludes excavation in the wetland areas and requires a 3:1 ratio for habitat replacement should any of the preserved wetland areas be impacted.

This alternative would provide protection of human health at the ETC-10 site. Soil with lead at concentrations exceeding the unrestricted use level (residential RAO) would be excavated and removed from the site. The removed soil would be replaced with clean backfill from an approved source. Overall protection of the environment would not be attained since the wetland would be destroyed without assurance of recovery to an acceptable level.

Similar to other excavation and disposal removal actions at Castle AFB, this alternative can be designed to be in compliance with ARARs, such as local air quality and dust control regulations, associated with excavation/construction activities. However, implementation of this alternative would result in destruction of wetlands potentially inhabited by endangered species.

#### *2.9.5.3 Institutional Controls*

The ICs imposed on ETC-10 would prevent human exposure to contaminated soil at ETC-10 under residential use conditions. ICs for ETC-10 will remain in place until soil contaminants are at levels that allow for unrestricted use and exposure. Modification or termination of ICs requires Air Force, EPA and State of California approval.

This alternative would provide protection of human health by prohibiting residential use of the site and eliminating the potential (administratively, not physically) for human contact with the remaining benzo(a)pyrene-impacted soil. In addition, this alternative would be in compliance with ARARs because there is no physical response action, and no evaluation against ARARs is required.

### 2.9.6 Description of Alternatives for Fire Training Area 1

Several remedial alternatives were considered for FTA-1 in the SCOU FS. The remedial alternatives were based on the type, concentration and distribution of contaminants and

soil/subsurface conditions at FTA-1. All FTA-1 contaminants were addressed by the FS alternatives.

The following remedial alternatives were considered for FTA-1 in the SCOU FS:

- No Action
- SVE with Bioventing, *Ex Situ* Solidification/Stabilization and Excavation with On-site Disposal
- SVE with Bioventing, *Ex Situ* Soil Washing and Excavation with On-site Disposal
- Thermally Enhanced SVE, *Ex Situ* Solidification/Stabilization and Excavation with On-site Disposal
- Thermally Enhanced SVE, *Ex Situ* Soil Washing and Excavation with On-site Disposal

Alternatives evaluated in the SCOU FS are presented in Sections 2.9.6.1 through 2.9.6.5. Due to reasons described in Section 2.9.6.6, an FTA-1 FFS provided further evaluation for non-VOC remedial alternatives. Alternatives evaluated in the FTA-1 FFS pursuant to issues identified by the regulatory agencies regarding the preferred alternative for non-VOCs are presented in Section 2.9.6.6. All of the descriptions include information on how each alternative satisfies or does not satisfy EPA threshold criteria (protection of human health and the environment and compliance with ARARs; see Section 2.10).

#### *2.9.6.1 No Action*

Under this alternative, no remedial activity would be employed to prevent direct soil contact, percolation of leachate to groundwater or wind dispersion of contaminated soils. Groundwater monitoring would continue for a period of up to 30 years.

The no action alternative would not actively protect public health and the environment and would not comply with many of the chemical-specific ARARs relating to water quality. Consequently, the no action alternative did not satisfy threshold criteria for FTA-1.

#### *2.9.6.2 SVE with Bioventing, Ex Situ Solidification/Stabilization and Excavation and Disposal*

Under this alternative, the remediation would be accomplished in three main steps: first, the SVE system would be installed and operated to remove the VOCs from the soil. Second, the SVE system would be modified into the bioventing system, which would be operated to

remove the SVOCs from the soil. Third, the non-volatile contaminants would be excavated and treated at FTA-1 or removed to a consolidation landfill on base.

This composite alternative provides both short-term and long-term protection of human health and the environment by reducing the concentration and risk of exposure to VOCs, SVOCs, dioxins, and metals from soil to below HHRA and WQSA RAOs. This alternative would reduce the risk of direct contact with contaminated soils via dermal or ingestion routes to acceptable risk levels. Further contamination of groundwater by VOCs, SVOCs, and metals is prevented. This alternative requires measures to protect workers and the community during excavation, handling, transportation, and treatment of contaminated soil.

This alternative would reduce concentrations of contaminants in soil to below the risk-based levels. Due to this reduction in soil contaminants and the corresponding threat to groundwater quality, the alternative would likely comply with many of the chemical-specific ARARs relating to water quality. The design of the SVE system, including emission controls on the treatment system, would comply with air quality ARARs. Air monitoring would be conducted to provide compliance during treatment. If on-site soil treatment were used, the treatment system would need to comply with applicable local, State and Federal air quality ARARs and Federal ARARs for new sources and specific pollutants. The alternative would comply with location-specific ARARs because impacts to local wetlands could be minimized during construction activities.

#### *2.9.6.3 SVE with Bioventing, Ex Situ Soil Washing and Excavation and Disposal*

Under this alternative, the remediation would be accomplished in three main steps: first, the SVE system would be installed and operated to remove the VOCs from the soil. Second, the SVE system would be modified into the bioventing system, which would be operated to remove the SVOCs from the soil. Third, the metals-contaminated soils would be excavated and treated with a soil washing process. The dioxin-contaminated soils would be excavated and disposed of in an off-site Class I hazardous waste landfill.

This alternative provides both short-term and long-term protection of human health and the environment by reducing the concentration and risk of exposure to VOCs, SVOCs, and metals from soil to below RAOs. This alternative would reduce the risk of direct contract with contaminated soils via dermal or ingestion routes to acceptable risk levels. Further contamination of groundwater by VOCs, SVOCs, and metals is prevented. This alternative

requires measures to protect workers and the community during excavation, handling, transportation, and treatment of contaminated soil.

This alternative would reduce concentrations of contaminants in soil to below the risk-based levels. Due to this reduction in soil contaminants and the corresponding threat to groundwater quality, the alternative would likely comply with many of the chemical-specific ARARs relating to water quality. Design of the SVE system, including emission controls on the treatment system, would be done to comply with air quality ARARs. Air monitoring would be conducted to provide compliance during treatment. If on-site soil treatment is used, the treatment system would need to comply with applicable air quality ARARs and Federal ARARs for new sources. The alternative would comply with location-specific ARARs, because impacts to local wetlands could be minimized during construction activities.

#### *2.9.6.4 Thermally Enhanced SVE, Ex Situ Solidification/Stabilization and Excavation and Disposal*

Under this alternative, the remediation would be accomplished in two main steps: first, the thermally-enhanced SVE system would be installed and operated to remove the VOCs and SVOCs from the soil. Second, the metals-contaminated soils would be excavated and treated with a solidification process. The dioxin-contaminated soils would be excavated and disposed of at an on-site consolidation landfill (or treated at a permitted off-site facility, if necessary).

This alternative provides both short-term and long-term protection of human health and the environment by reducing the concentration and risk of exposure to VOCs, SVOCs, and metals from soil. This alternative would reduce the risk of direct contact with contaminated soils via dermal or ingestion routes to acceptable risk levels. Further contamination of groundwater by VOCs, SVOCs, and metals is prevented. Thermally-enhanced SVE would probably reduce the TEPH as diesel to the WQSA threshold. This alternative requires measures to protect workers and the community during excavation, handling, and treatment of contaminated media.

This alternative would reduce concentrations of contaminants in soil. Due to this reduction in soil contaminants and the corresponding threat to groundwater quality, the alternative would most likely comply with many of the chemical-specific ARARs relating to water

quality. The design of the SVE system, including emission controls on the treatment system, would comply with air quality ARARs. Air monitoring would be conducted to provide compliance during treatment. If on-site soil treatment is used, the treatment system would need to comply with applicable local, State and Federal air quality ARARs and federal ARARs for new sources, and those for specific pollutants. The alternative would comply with location-specific ARARs because impacts to local wetlands could be minimized during construction activities.

#### *2.9.6.5 Thermally Enhanced SVE, Ex Situ Soil Washing and Excavation with On-site Disposal*

Under this alternative, the remediation would be accomplished in two main steps: first, the thermally-enhanced SVE system would be installed and operated to remove the VOCs and SVOCs from the soil. Second, the metals-contaminated soils would be excavated and treated with a soil washing process. The dioxin-contaminated soils would be excavated and disposed of in an off-site Class I hazardous waste landfill.

This alternative provides both short-term and long-term protection of human health and the environment by reducing the concentration and risk of exposure to VOCs, SVOCs, and metals from soil. This alternative would reduce the risk of direct contact with contaminated soils via dermal and ingestion routes to acceptable risk levels. Further contamination of groundwater by VOCs, SVOCs, and metals is prevented. Thermally-enhanced SVE is not able to reduce the TEPH as diesel to the RAO (100 mg/kg), but would probably be able to reduce the concentration level to 1,000 mg/kg. This alternative requires measures to protect workers and the community during excavation, handling, and treatment of contaminated media.

This alternative would reduce concentrations of contaminants in soil to below the RAOs in less than one year. Due to this reduction in soil contaminants and the corresponding threat to groundwater quality, the alternative would likely comply with many of the chemical-specific ARARs relating to water quality. The design of the SVE system, including emission controls on the treatment system, would comply with air quality ARARs.
Air monitoring would be conducted to ensure compliance during treatment. If on-site soil treatment is used, the treatment system would need to comply with applicable local, State and Federal ARARs. The alternative would comply with location-specific ARARs, because impacts to local wetlands could be minimized during construction activities.

#### 2.9.6.6 *Focused Feasibility Study for FTA-1 Non-VOC Contamination*

The SCOU FS recommended *ex situ* solidification/stabilization for non-VOC contamination at FTA-1 (Jacobs, 1997a). In 2001, the BCT determined that a FFS to review the FTA-1 CERCLA remedial response process to date and to provide an updated CERCLA evaluation of alternatives for non-VOC contamination was required. There were three primary reasons for the FFS (Jacobs, 2002c):

- The Class III-equivalent cap that was placed over the site during the removal action was not evaluated in the SCOU FS.
- Excavation and off-site disposal of all soil impacted by non-VOC contamination above RAO levels at the FTA-1 site was not evaluated in the SCOU FS.
- New site data, the updated baseline HHRA, the completed ERA and updated RAOs needed to be considered in determining a preferred alternative for non-VOC contamination at FTA-1.

Three alternatives were evaluated in the FTA-1 FFS (Jacobs, 2002c) to address non-VOC contamination:

- Capping (with ICs)
- Excavation and Off-Site Disposal
- Solidification and Stabilization (with ICs)

Capping is the containment alternative. It prevents exposure, reduces mobility of contaminants and represents the presumptive remedy specified for low-level threat wastes as defined in *Presumptive Remedy for Metals-in-Soils Sites* (EPA, 1999b). Excavation/off-site disposal removes contaminated soil and minimizes the need for long-term management activities. Solidification/stabilization is a treatment alternative but would require more long-term management activities. Solidification/stabilization was the SCOU FS preferred alternative.

The no-action alternative was rejected because it was previously evaluated in the SCOU FS. An alternative limited to ICs was also rejected because it would allow contaminants in the surface and subsurface to migrate to surface water, groundwater or air, thereby resulting in potential human exposure or adverse impacts to the environment, including groundwater quality. However, ICs are an element of both the capping and the solidification and stabilization alternatives.

Specific details regarding each of these alternatives are provided below. The following alternative descriptions include information on how each alternative satisfies (or does not satisfy) EPA threshold criteria (protection of human health and the environment and compliance with ARARs).

#### 2.9.6.6.1 Capping (with ICs)

The capping with ICs alternative would require excavation of all soil contaminated with COCs in excess of the RAOs and consolidation of this soil under a cap located at FTA-1. Although FTA-1 is not a landfill, the Class II/III cap identified as the preferred alternative for Castle AFB landfill sites in the SCOU FS would be used for FTA-1 in order to maximize protection of groundwater and eliminate exposure and migration routes. The areas requiring excavation were established as 30-foot by 30-foot squares centered on borings where the RAOs are exceeded. Final excavation areas would be based on confirmation sample results. Isolated 30-foot by 30-foot excavation areas were selected rather than linking adjacent borings into larger excavation areas, because site characterization data indicate a hot-spot contaminant distribution rather than a widespread homogenous distribution. The depth of excavation would be 2 feet beneath the lowest depth exceeding the RAO.

Capping in combination with ICs would provide adequate protection of human health and the environment. Excavation and consolidation of contaminated soil beneath a Class II/III cap would eliminate or minimize human health exposure and potential migration routes to groundwater. The cap can be installed at any time in coordination with the selected remedy for VOCs at FTA-1. After completion, the cap would require long-term maintenance to maintain cap integrity and site drainage.

Similar to other containment removal actions at Castle AFB, this alternative can be designed to be in compliance with ARARs, such as local air quality and dust control regulations, associated with excavation/construction activities. This alternative would also address ARARs for contamination in soil and groundwater as all material with contaminant concentrations greater than Castle AFB RAOs would be capped, and the cap would prevent surface water infiltration and generation of leachate. Land disposal restrictions would be met because contaminated soil at FTA-1 is considered a residual waste and the waste would be capped in place. Cap design, construction, maintenance and monitoring (exclusive of groundwater and landfill gas monitoring, since FTA-1 is not a landfill) will follow State regulations specified for a Class III landfill cap, as appropriate and to the extent

necessary given the nature and levels of soil contamination at FTA-1. Capping of contaminated soil and standard erosion control measures that are part of cap design and construction would mitigate potential impact to nearby wetlands. Other location-specific ARARs are not an issue because there are no known endangered species or historical structures and the site has already been heavily disturbed by past activities such that no unknown archeological resources would be present.

#### 2.9.6.6.2 Excavation and Off-site Disposal

The excavation and off-site disposal alternative would require excavation of all site soil having COCs in excess of RAOs and transport and off-site disposal of soil at an EPA-approved landfill facility. This action would destroy the existing cap installed as part of the SVE removal action. Excavated soils would be segregated and disposed at approved Class I (hazardous), II (regulated) and III (municipal) facilities, in accordance with waste profiles performed during the remedial action. Of the approximately 3,470 $yd^3$ to be excavated, it is assumed Class I and II facilities will receive 290 and 3,180 $yd^3$, respectively. The Class I waste includes dioxin-contaminated soils and lead-contaminated soils. Although the dioxin-contaminated soil may not be hazardous by definition, disposal options for dioxin-contaminated soil are highly limited and would necessitate treatment at a Class I hazardous waste facility. All other FTA-1 soil exceeding RAOs would be handled as designated Class II waste.

Excavation and off-site disposal provides a high level of overall protection of human health and the environment, because all soils with contamination that exceeds RAOs will be removed from the FTA-1 site. Placement of the contaminated soil in a permitted facility will minimize the potential for future human or environmental exposure. In addition, no engineering or institutional controls are required after implementation of this alternative.

Similar to other excavation and disposal removal actions at Castle AFB, this alternative can be designed to be in compliance with ARARs, such as local air quality and dust control regulations, associated with excavation/construction activities. This alternative would also address ARARs for contamination in soil and groundwater as all material with contaminant concentrations greater than Castle AFB RAOs would be removed and disposed off-site in an appropriately licensed landfill. Excavation and disposal would be performed in accordance with requirements for transport and disposal of wastes at commercial facilities. Excavated waste would be disposed at Class I or Class II landfills depending on waste

characterization data collected during remediation. Handling of RCRA hazardous waste (one area of lead-contaminated soil may meet hazardous waste criteria) would be done in a manner to comply with RCRA and all State land disposal restriction ARARs. This alternative would be in compliance with the primary location-specific ARARs regarding wetlands because the excavation and off-site disposal of all residual wastes exceeding ecological RAOs would eliminate potentially deleterious chemical impacts to the wetlands. Other potential impacts to the adjacent wetlands (sediment runoff, etc.) would be mitigated by standard erosion control measures. Other location-specific ARARs are not an issue because there are no known endangered species or historical structures and the site has already been heavily disturbed by past activities such that no unknown archeological resources would be present.

#### 2.9.6.6.3 Solidification and Stabilization (with ICs)

The solidification and stabilization with ICs alternative would require that areas of the FTA-1 site exceeding the RAOs for non-VOCs are excavated, stabilized by the addition of Portland cement as a fixing agent, returned to the FTA-1 site and covered with a layer of clean native fill. This action would destroy the existing cap installed as part of the SVE removal action. Soil stabilization would include testing to confirm that site contaminants do not leach from the stabilized material. This alternative would be conducted after the completion of the ongoing SVE/bioventing remedial action.

Solidification/stabilization in combination with ICs would provide adequate protection of human health and the environment by chemically and physically stabilizing the soil contaminants so that they are not a source of exposure and are not available for transport in the environment. Soils with metals and dioxins at levels exceeding RAOs will remain on site, but the risk of exposure to humans is significantly reduced due to the soil stabilization process and the native soil cover. Minimizing migration of contaminants via the vadose zone or surface water drainage routes and eliminating the source of direct exposure protects the environment. ICs do not reduce contaminant migration but enhance the overall protection of receptors by restricting access and future land use.

Similar to other containment removal actions at Castle AFB, this alternative can be designed to be in compliance with ARARs, such as local air quality and dust control regulations, associated with excavation/construction activities. This alternative would also address ARARs for contamination in soil and groundwater as all material with contaminant

concentrations greater than Castle AFB RAOs would be stabilized such that it would not be an exposure source or be available for solution or transport in the environment. Land disposal restrictions would be met because contaminated soil at FTA-1 is considered a residual waste and the waste would be solidified and disposed on site.

Solidification/stabilization would be in compliance with the primary location-specific ARARs regarding wetlands because stabilization of all waste exceeding ecological RAOs would eliminate potentially deleterious chemical impacts to the wetlands. Other potential impacts to the adjacent wetlands (sediment runoff, etc.) would be mitigated by standard erosion control measures. Other location-specific ARARs are not an issue because there are no known endangered species or historical structures and the site has already been heavily disturbed by past activities such that no unknown archeological resources would be present.

### 2.9.7 Description of Alternatives for Ecological Risk to Wetlands at ETC-10, ETC-12, FTA-1, LF-3 and LF-5

Following the Phase II ERA, a technical working group session held with representatives of the Air Force, DTSC and EPA identified the need for additional data to determine the appropriate remedial action(s) for addressing ecological risk at ETC-10, ETC-12, FTA-1, LF-3 and LF-5. These data were collected and a limited set of remedial alternatives was evaluated in an FFS conducted as part of the CB RI/FS – Part 2. The following remedial alternatives were considered for addressing ecological risk at the five sites with potential to impact wetland habitat:

- No Action
- Excavation and Restoration
- Long-Term Ecological Monitoring.

Specific details regarding each of these alternatives are provided below. The following alternative descriptions include information on how each alternative satisfies (or does not satisfy) EPA threshold criteria (protection of human health and the environment and compliance with ARARs).

#### 2.9.7.1 *Alternative 1—No Action*

Under this alternative, no remedial activity would be employed to prevent direct soil contact by ecological receptors in a wetland habitat. The no action alternative would provide no protection to the wetlands at these sites and thus, does not satisfy threshold criteria for any of the sites. A no action alternative does not require a ARARs analysis because ARARs are only triggered if a response action is taken.

#### 2.9.7.2 *Alternative 2—Excavation and Restoration*

Under this alternative, wetland soils containing waste, hot spots, or suspected hot spots not included as part of the remediation for nonecological concerns would be excavated, sorted and transported off site. Wetland restoration would be performed following the excavation. Because the primary contaminants of ecological concern at ETC-10; ETC-12; FTA-1; LF-3 and LF-5 including DP-8, DP-8A and Landfill 5 Trenches are surface metals, this remedial option would involve the removal and backfill of contaminated soils to a maximum depth of only 1 to 2 feet. However, this would essentially destroy the wetland habitat, requiring complete restoration of the wetland in the excavated area. In general, this process has a relatively low success rate and is likely to result in a wetland of lesser quality than that present before the excavation. Furthermore, successful restoration relies on the availability of a seed bank, which is usually provided by the topsoil from the original wetland. In the case of ETC-10, ETC-12, FTA-1, LF-3 and LF-5 and its associated sites, none would be available because the seed bank is located within the contaminated soil being excavated.

Although this alternative would protect wetland ecological receptors from coming into contact with contaminated soils, the resulting destruction of the habitat and low probability of success in restoring the wetland to its original condition may result in significant impacts to the ecological health of the wetland. Thus, it would not be protective of the environment.

Similar to other excavation and disposal removal actions at Castle AFB, this alternative can be designed to be in compliance with ARARs, such as local air quality and dust control regulations, associated with excavation/construction activities. However, implementation of this alternative would result in destruction of wetlands potentially inhabited by endangered species.

#### *2.9.7.3 Alternative 3—Long-Term Ecological Monitoring*

Under this alternative, five-yearly monitoring would be conducted to ensure that the ecological health of the contaminated wetlands is maintained. Monitoring would continue at five-year intervals for 30 years unless the Air Force, EPA, and DTSC are in mutual agreement that monitoring can be discontinued. To ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued, in mutual agreement with the Air Force, EPA and DTSC. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives.

This alternative would still allow receptors to be in contact with contaminated soils. However, results of the biological surveys to date indicate that contaminants at these sites have had no adverse impacts on wetland receptors, and long-term monitoring would confirm that there are no future impacts. Thus, this alternative would ensure that the ecological health of these wetlands is maintained.

## 2.10 COMPARATIVE ANALYSIS OF ALTERNATIVES

EPA guidance defines nine criteria for evaluating remedial alternatives under CERCLA (EPA, 1988). These criteria are subdivided into three groups: threshold criteria, balancing criteria and modifying criteria. Threshold and balancing criteria are evaluated during the FS process. Modifying criteria are considered after comments on the Proposed Plan are received and given an appropriate response.

Threshold criteria addressed in the preceding subsection:

- Overall Protection of Human Health and the Environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Balancing criteria:

- Long-term Effectiveness or Permanence

- Reduction of Toxicity, Mobility, and Volume through Treatment
- Short-Term Effectiveness
- Implementability
- Cost

Ranking based on the balancing criteria will generally indicate a technically and economically preferable alternative. However, in many cases the apparent preference for one alternative over another may not be significant. Also, the most technically and economically preferred alternative might have other drawbacks. In these instances, modifying criteria are used to distinguish among alternatives that are otherwise closely ranked.

Modifying criteria:

- State Acceptance
- Community Acceptance

The nine criteria are described in Table 2-11.

The remedial alternatives for LF-4 (including DP-5 and DP-6); LF-5 (including DP-8, DP-8A and Landfill 5 Trenches); ETC-8; ETC-10 and FTA-1 were compared using the EPA evaluation criteria. These comparisons served as the basis for the selection of remedial alternatives for each site.

The comparative analysis of alternatives for LF-4 (including DP-5 and DP-6) and for LF-5 (including DP-8, DP-98A and Landfill 5 Trenches) is summarized in Table 2-12. The no action alternative scored high on short-term effectiveness, implementability and cost and low on reduction of toxicity, mobility or volume, receiving a total score of 23. The excavation and off-site disposal option scored high on overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence and reduction of toxicity, mobility or volume and low on cost, receiving a total score of 27. The excavation and on-site disposal alternative received intermediate scores on all criteria, receiving a total score of 26. The Class III cap and ICs alternative scored high on compliance with ARARs, short-term effectiveness and implementability and had intermediate scores for all other criteria, receiving a total score of 27. The evapotranspiration cap and ICs alternative scored high for compliance with ARARs, short-

term effectiveness and implementability and scored low for cost, receiving a total score of 25. The consolidation and capping and ICs alternative received high scores on all criteria except short-term effectiveness, receiving a total score of 28.

The consolidation and capping and ICs alternative ranked number 1 and was identified as the preferred alternative in the SCOU FS. The *SCOU Proposed Plan* (WPI, 1997) added SVE to the preferred alternative for the Landfill 5 Trenches as the presumptive remedy for the VOCs that were detected above the lowest WQSA thresholds (VLEACH2, see Section 2.6.2.3). Subsequently, a consolidation and capping removal action was conducted at LF-4 (including DP-5 and DP-6) in accordance with the September 1997 *Action Memorandum–Removal Action for Castle Vista Landfills A and B and Castle Airport Landfills 2 and 4* (Jacobs, 1997e) and at LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) in accordance with the October 1998 *Action Memorandum for Landfills 1, 3 and 5* (Jacobs, 1998b). Long-term cap maintenance and monitoring and post-closure groundwater monitoring were initiated at both landfills as part of the removal actions. The removal actions are documented in the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b) and were summarized in Sections 2.8.1.3 (LF-4) and 2.8.2.3 (LF-5). Pursuant to the Castle AFB VOC RAO (Section 2.7), a START evaluation, completed and presented for LF-5 in the landfill closure report, established that SVE was not required because the site did not pose an adverse risk to groundwater quality.

This ROD recognizes the completion of these removal actions and considers only no action and ICs as alternatives for LF-4 and LF-5 and their associated sites. A comparative analysis summary is not provided for LF-4 (including DP-5 and DP-6) or LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) because only one alternative (ICs) satisfied both threshold criteria and thus evaluation against balancing or modifying criteria was unnecessary.

Table 2-13 summarizes the evaluation of alternatives conducted for the SCOU FS for FTA-1. Table 2-14 presents summary evaluations of alternatives from the FFSs for ETC-8 and FTA-1. Table 2-15 presents a summary of the comparative analysis of alternatives conducted for FTA-1 in the SCOU FS. Table 2-16 and Table 2-17 present summaries of the comparative analysis of alternatives from the FFSs for ETC-8 and FTA-1, respectively. As described in Section 2.9.3.1 for ETC-8 and Section 2.9.5.1 for FTA-1, the no action alternative for these sites failed to meet "Threshold" requirements (overall protection of

human health and the environment and compliance with ARARs) and, therefore, is not included in the summary tables. A brief summary of how the remaining alternatives would meet the "Threshold" requirements is included with the alternative descriptions in Section 2.9. The preferred alternative for FTA-1 is based on the SCOU FS for VOCs (SVE and bioventing) and the FTA-1 FFS for non-VOCs (capping, ICs and excavation and disposal). A comparative analysis summary is not provided for ETC-10 because only one alternative (ICs) satisfied both threshold criteria and thus, evaluation against balancing or modifying criteria was unnecessary.

The comparative analysis of alternatives for ecological risk at ETC-10, ETC-12, FTA-1, LF-3 and LF-5 was also straightforward because only the long-term ecological monitoring alternative satisfied both threshold criteria. As described in Sections 2.9.6.1 and 2.9.6.2, the no-action alternative would not establish that there would be no adverse impact from metals present in the wetlands, and the excavation and disposal alternative would result in the destruction of wetlands potentially inhabited by endangered species with uncertain success of wetland mitigation, restoration or replacement efforts.

## 2.11 PRINCIPAL THREAT WASTE

### 2.11.1 Landfill 4 Including DP-5 and DP-6

Based on post-removal action conditions (see Section 2.8.1.6), there are no principal threat wastes that constitute an adverse threat to human health or to groundwater outside of the LF-4 caps. Zinc in a single soil sample exceeded the WQSA threshold; however, the threshold assumes a depth interval of 40 to 65 feet bgs and the zinc sample was from 10 feet bgs. The Air Force and the regulatory agencies agreed that the single detection of zinc did not pose an adverse risk because of the environmental attenuation afforded by the 30 feet of additional soil column.

It is noted that there may be COCs present within the waste material now capped at LF-4 that exceed human health or WQSA RAOs; however, the installed cap at LF-4 eliminates potential routes of exposure.

### 2.11.2 Landfill 5 Including DP-8, DP-8A and Landfill 5 Trenches

Based on post removal action conditions (see Section 2.8.2.7), there are no principal threat wastes that constitute an adverse threat to human health or to groundwater outside of the LF-5 cap. All confirmation soil sample results were less than human health and WQSA RAOs except for distributed hits of manganese (WQSA) and single hits of mercury (WQSA) and cadmium (HHRA). These results were not considered COCs because the manganese and cadmium results marginally exceeded TBVs and/or did not show a pattern suggestive of contamination and the small area of mercury contamination that measurably exceeded the WQSA RAO was excavated and disposed off site (see Section 2.8.2.7.1). All shallow soil gas results were less than WQSA thresholds.

It is noted that there may be COCs present within the waste material now capped at LF-5 that exceed human health or WQSA RAOs. However, the installed cap at LF-5 eliminates potential routes of exposure.

Metals in the associated wetlands constitute the principal threat to ecological receptors.

### 2.11.3 Disposal Pit 9

There are no contaminants in soil or soil gas that constitute a principal threat to human health or to groundwater.

### 2.11.4 Earth Technology Corporation 8

PAHs, including benzo(a)anthracene; benzo(a)pyrene; benzo(k)fluoranthene; dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene in soil constitute the principal threat to human health. No contaminants are present that constitute a principal threat to groundwater.

### 2.11.5 Earth Technology Corporation 10

Benzo(a)pyrene in shallow soil is the principal threat to human health. No contaminants are present that constitute a principal threat to groundwater. Lead in soil and in the associated wetlands constitutes the principal threat to ecological receptors due to potential adverse risk.

### 2.11.6 Fire Training Area 1

Benzo(a)pyrene, metals (arsenic and lead) and dioxins/furans constitute a principal threat to human health. VOCs in soil or soil gas, including benzene; carbon tetrachloride; chloroform; *cis*-1,2-DCE; 1,2-dichloroethane; TCE, toluene; Freon 11 and 1,2,4-trimethylbenzene; petroleum hydrocarbons in the gasoline and diesel ranges; and the metals arsenic, lead, manganese and zinc constitute a principal threat to groundwater. All COCs that constitute an adverse risk to human health or groundwater quality are located beneath the engineered cap installed by the removal action. SVOCs and metals in the associated wetlands constitute the principal threat to ecological receptors. Cadmium and nickel in shallow soil outside of the existing cap constitute the principal threat to ecological receptors from the FTA-1 grassland area.

### 2.11.7 ETC-12 and LF-3

Based on site characterization (ETC-12) and post-removal action conditions (see Sections 2.8.7 and 2.8.8, respectively), there are no principal threat wastes that constitute an adverse risk to human health or to groundwater at ETC-12 and LF-3. At ETC-12, the metals cadmium, lead and vanadium in the associated wetlands constitute a potential adverse risk to ecological receptors. At LF-3, PAHs and metals, primarily lead, in the associated wetlands constitute a potential adverse risk to ecological receptors.

## 2.12 SELECTED REMEDY

Descriptions of the selected remedies for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) and for DP-9, ETC-8, ETC-10, FTA-1 and ETC-12/LF-3 are provided in the following site-specific discussions. Estimated costs for each remedy are also provided. The remedies (required actions and restrictions) are intended to apply to affected areas, not necessarily to the entire sites as originally defined in the feasibility study (e.g., LF-4 and LF-5). Affected areas are areas where hazardous substances remain at levels that make the property unsuitable for unrestricted use. Legal descriptions of the affected areas and monitoring well locations associated with LF-4 and LF-5 will be included in deeds or letters of transfer for each parcel. The affected areas for LF-4 and LF-5 and their associated sites (fenced areas) are shown on Figure 2-6 and Figure 2-9, respectively. In addition, survey of monitoring well locations and settlement

monuments for purposes of identifying their locations in the deed and State Land Use Covenant will occur prior to property transfer of LF-4.

### 2.12.1 Landfill 4 and Landfill 5

This ROD recognizes the completion of the consolidation and capping removal actions at LF-4 (including DP-5 and DP-6) (Section 2.8.1.3) and at LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) (Section 2.8.2.3) and considered only no action and ICs as alternatives for LF-4 and LF-5 and their associated sites. Post-closure cap maintenance and monitoring, including groundwater detection monitoring, has been started and is ongoing at LF-4 and LF-5 in accordance with the approved CPCMPs (Jacobs, 1997f; Jacobs, 1998c; Jacobs, 2000b; Jacobs, 2004c). The Air Force will continue to implement the CPCMPs to protect cap integrity and maintain groundwater detection monitoring.

The selected remedies for LF-4 and LF-5 and their associated sites, exclusive of DP-9 are as follows:

- LF-4 — Cap maintenance and monitoring and ICs
- DP-5 — Cap maintenance and monitoring and ICs
- DP-6 — Cap maintenance and monitoring and ICs
- LF-5 — Cap maintenance and monitoring, ICs and long-term ecological monitoring
- DP-8 — Cap maintenance and monitoring, ICs and long-term ecological monitoring
- DP-8A — Cap maintenance and monitoring, ICs and long-term ecological monitoring
- Landfill 5 Trenches — Cap maintenance and monitoring, ICs and long-term ecological monitoring

The estimated costs for ICs are $15,000 per year for LF-4, including DP-5 and DP-6 and $15,000 per year for LF-5, including DP-8, DP-8A and Landfill 5 Trenches. The estimated cost for long-term ecological monitoring at LF-5, including DP-8, DP-8A and Landfill 5 Trenches is $3,000 every five years.

ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations. Land use restrictions will be incorporated in any deed transferring all or part of the LF-4 site as grantee covenants. Following are the anticipated grantee deed covenants:

- Grantee covenants for itself and its successors and assigns that it will not conduct or allow others to conduct any construction, grading, removal, trenching, filling, earth movement, mining or planting that would disturb the soil or the landfill cover, including the vegetative cap, or the injection or release of water or other fluids except for the purpose of monitoring groundwater or landfill gas.
- Grantee covenants for itself and its successors and assigns that it will not extract groundwater from the property for any purpose other than monitoring.
- Grantee covenants for itself and its successors and assigns that it will not conduct or allow others to conduct activities that would cause disturbance or removal of fencing or signs intended to exclude the public from the landfill.
- Grantee covenants for itself and its successors and assigns that it will not conduct or allow others to conduct activities that would cause the surface application of water (i.e., irrigation) that might result in ponding on the cap or erosion sufficient to degrade the cap.
- Grantee covenants for itself and its successors and assigns that it will not conduct or allow others to conduct activities that would cause disturbance of any equipment and systems associated with monitoring and maintenance or settlement monuments or that could affect drainage, sub-drainage, or erosion controls for the landfill cover.
- Grantee covenants for itself and its successors and assigns that it will not conduct or allow others to conduct activities that limit access to any equipment and systems associated with monitoring and maintenance or settlement monuments or the drainage, sub-drainage, or erosion controls for the landfill cover.
- Grantee covenants for itself and its successors and assigns that the land use established for the LF-4 site is non-irrigated open space and that changes to this land use, which would include any construction within 1,000 feet of the capped area, must comply with 27 CCR Section 21190.

Immediately before transfer of the property including LF-4, the Air Force will execute a Land Use Covenant with the State that includes restrictions consistent with the grantee covenants listed above. The State Land Use Covenant will be recorded immediately before the recording of the federal deed. Modification or termination of the State Land Use Covenant must be undertaken in accordance with State law.

ICs similar to those listed above for LF-4 are already in place and fully implemented for LF-5, including DP-8, DP-8A and Landfill 5 Trenches as part of the AF/BoP MOU. LF-5 and its associated wetlands are located within the BoP United States Penitentiary, Atwater complex and public access, including residential use, is prohibited. ICs are currently in place and fully implemented as follows: (1) the AF/BoP MOU precludes site alterations that would interfere with Interagency Agreement (IAG) or IRP activities without notification and approval of the Air Force (the Air Force will obtain EPA and State of California approval of any requested alterations prior to issuing an approval notification to the BoP); (2) the

AF/BoP MOU establishes that BoP may use groundwater underlying the BoP parcel if and to the extent that such use conforms to and complies with all applicable laws and regulations; (3) the AF/BoP MOU establishes access for the Air Force and the BCT and (4) elements of prison security (e.g., patrolled security fencing) restrict the potential for human exposure to site contamination. In addition, implementation of the selected remedy will not threaten sensitive ecological habitats.

This remedy adds ICs to the ongoing post-closure maintenance and monitoring for LF-4 and LF-5, as specified in the following existing primary documents:

- *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills* (LF-4; Jacobs, 1997f)
- *Closure and Post-Closure Maintenance Plan for Castle Airport Landfills 1, 3 and 5* (Jacobs, 1998c)
- *Landfill 4 and Landfill 5 Closure and Post-Closure Maintenance Plan Update* (Jacobs, 2000b)

Within 180 days of the signing of this ROD, the Air Force will submit updated versions of these documents to include the ICs as outlined in Section 2.9.1 of this ROD.

Post-closure landfill gas monitoring at both landfills will continue to confirm lack of landfill gas migration. Post-closure groundwater monitoring will also continue for LF-4 and LF-5. Post-closure groundwater monitoring consists of two components: corrective action monitoring and detection monitoring. Corrective action monitoring addresses contaminants already in groundwater, i.e., releases prior to capping of the landfills; detection monitoring addresses any new releases from the landfills, i.e., releases subsequent to capping. The post-closure monitoring programs for landfill gas and groundwater are described in Sections 2.8.1.3 (LF-4) and 2.8.2.3 (LF-5).

Long-term ecological monitoring at LF-5 will consist of wetlands invertebrate and plant surveys every five years for up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no

impact and monitoring can thus be discontinued. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives.

### 2.12.2 Disposal Pit 9

The selected remedy for DP-9 is no further action. There is no cost associated with this remedy. Justification for a no further action determination is as follows:

- The 20-plus soil borings installed during the SCOU RI provided no evidence of waste disposal (physical or chemical) at the site.
- No VOCs, SVOCs or petroleum hydrocarbons (TVPH/TEPH) were detected in soil or soil gas samples from DP-9 at concentrations exceeding HHRA RAOs; one sample result for cadmium from 20.5 feet bgs (50.3 mg/kg) exceeded the WQSA threshold (43.7 mg/kg) but, as a single, isolated detection, is not considered site contamination.
- Two soil samples contained arsenic at concentrations exceeding the Castle AFB TBV of 9.9 mg/kg. The arsenic concentration in these two samples only marginally exceeded the TBV (10.0 mg/kg and 10.8 mg/kg) and the sample containing 10.8 mg/kg arsenic was collected from a depth greater than 15 feet bgs (15.5 to 16.5 feet bgs). These arsenic detections, and other metals marginally exceeding TBVs but not HHRA RAOs or WQSA thresholds, were not considered site contaminants.
- Sampling results from the LF-5 data gap investigation documented that there is no shallow or deep soil gas contamination exceeding WQSA thresholds in the vicinity of DP-9. The START evaluation performed for the LF-5 site determined that SVE was not warranted outside of the capped area.

### 2.12.3 Earth Technology Corporation 8

The selected remedy for ETC-8 is excavation and off-site disposal to remove all contaminated soil that exceeds risk-based RAOs. The estimated cost for excavation and disposal at ETC-8 is $700,000. The approximate area affected by the selected remedy is shown on Figure 2-11.

As described in Section 2.8.5.6, a removal action intended to clean up PAH-contaminated soil to risk-based RAOs was completed in 2000. The removal action achieved cleanup of PAH-contaminated surface soil in unpaved areas north of Buildings 1212 and 1213, but did not address soil beneath the roadway that transects ETC-8. Based on the area of the roadway and the results of recent excavation delineation sampling, approximately 5,200 $yd^3$ of soil exceeds risk-based RAOs. Removal of this soil will allow for unrestricted reuse of the ETC-8 site.

### 2.12.4 Earth Technology Corporation 10

The selected remedy for ETC-10 is ICs to prevent unacceptable human health risk by prohibiting use of the site without Air Force approval and long-term ecological monitoring. ICs are the only alternative identified during the FFS that satisfies both threshold criteria: (1) protection of human health and the environment and (2) compliance with ARARs. Although community opposition to ICs is acknowledged, excavation and disposal was rejected because it would result in destruction of wetlands inhabited by endangered species and thus, would not be protective of the environment. The estimated cost for ICs for ETC-10 is $15,000 per year. The estimated cost for long-term ecological monitoring at ETC-10 is $3,000 every five years. The approximate area affected by ICs is shown on Figure 2-14; long-term ecological monitoring will be conducted in the included and adjacent wetlands shown on Figure 2-13 and on Plate 1 (Appendix A).

Long-term ecological monitoring at ETC-10 will consist of wetlands invertebrate and plant surveys every five years for up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives.

ETC-10 and its associated wetlands are located within the BoP United States Penitentiary, Atwater complex, and public access, including residential use, is prohibited. ICs are currently in place and fully implemented as follows: (1) the AF/BoP MOU precludes site alterations that would interfere with IAG or IRP activities without notification of EPA, DTSC and the Air Force and approval of the Air Force; (2) the AF/BoP MOU establishes access for the Air Force and the BCT; (3) other than access required pursuant to the IAG/IRP, the BoP's *Preservation Area Mitigation and Management Plan* (Berger, 1998) restricts access to activities that are necessary for implementation of the plan and (4) elements of prison security (e.g., patrolled security fencing) restrict the potential for human exposure to site contamination. In addition, implementation of the selected remedy will not threaten sensitive ecological habitats. ICs will be maintained at ETC-10 until soils are at levels that allow for

unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval.

### 2.12.5 Fire Training Area 1

The selected remedy for FTA-1 is SVE and bioventing, cap maintenance and monitoring, excavation and disposal, long-term ecological monitoring and ICs. An SVE removal action was implemented at FTA-1 in 1996 and continues. Locations where the TVPH/TEPH RAO was exceeded prior to SVE will be resampled after SVE has attained VOC RAOs and the rate of TVPH removal has dropped to low and stable levels. Bioventing will be implemented, in consultation with the BCT, only if TPH RAOs are still exceeded upon completion of SVE and only to the extent necessary to attain the TPH RAOs. Completion of bioventing will be based on soil sampling to confirm TPH RAOs have been achieved. Capping, the preferred alternative for non-VOC contamination, was undertaken as part of the SVE removal action. Long-term cap maintenance and monitoring was implemented following construction and has been conducted in accordance with cap maintenance and monitoring procedures in the CPCMP for LF-5 (Jacobs, 1998c). Within 180 days of the signing of this ROD, the Air Force will submit a revised CPCMP to include cap maintenance and monitoring at FTA-1. This revised plan will establish the same cap maintenance and monitoring procedures now used for LF-4 and LF-5 for the FTA-1 cap. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to cessation of groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to support the demonstration that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone pose a threat to water quality as specified in 27 CCR, Subchapters 3 and 5 (Appendix D). If the results demonstrate that water quality limits will not be exceeded, groundwater monitoring will be discontinued.

The estimated cost for the SVE/bioventing action (in operation since 1996) was $2,600,000. The estimated cost for cap maintenance and monitoring and groundwater monitoring at FTA-1 is assumed to be less than $10,000 per year. The estimated cost for excavation and disposal at FTA-1 is $50,000. The estimated cost for long-term ecological monitoring at FTA-1 is $3,000 every five years. The estimated cost for ICs for FTA-1 is $15,000 per year. Approximate areas affected by the various remedy components are shown on Figure 2-15 and Figure 2-16 (excavation areas only).

The FTA-1 FFS established that the existing cap meets criteria (design, location and dimensions) for the capping alternative, with the exception of approximately 150 $yd^3$ of soil that exceeds ecological risk assessment RAOs. The cap in place at FTA-1 is equivalent to the Class II/III cap installed at Castle AFB consolidation landfills (LF-4 and LF-5) and, in conjunction with the other elements of the selected remedy, will provide effective protection of groundwater and eliminate exposure and migration routes. As noted above, within 180 days of the signing of this ROD, the Air Force will submit a revision to the LF-5 CPCMP to include similar cap maintenance and monitoring at FTA-1. This plan will establish the cap maintenance and monitoring procedures now used for LF-5 for the FTA-1 cap.

Excavation and disposal will address three areas identified in the FTA-1 FFS where contaminated soil exceeding ERA RAOs for cadmium and nickel lie outside the existing cap. These areas are shown on Figure 2-16. As shown, two of these areas overlap the southern boundary of the existing cap and the third overlaps the cap's boundary with the Building 1888 compound. To address potential ecological threats, the selected remedy includes excavation of these areas and off-site disposal of the contaminated soil (approximately 150 $yd^3$).

Long-term ecological monitoring at FTA-1 will consist of wetlands invertebrate and plant surveys every five years for up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives.

FTA-1 and its associated wetlands are located within the BoP United States Penitentiary, Atwater complex, and public access, including residential use, is prohibited. ICs are currently in place and fully implemented as follows: (1) the AF/BoP MOU precludes site alterations that would interfere with IAG or IRP activities without notification and approval of the Air Force (the Air Force will obtain EPA and State of California approval of any requested alterations prior to issuing an approval notification to the BoP); (2) the AF/BoP MOU establishes that BoP may use groundwater underlying the BoP parcel if and to the

extent that such use conforms to and complies with all applicable laws and regulations; (3) the AF/BoP MOU establishes access for the Air Force and the BCT and (4) elements of prison security (e.g., patrolled security fencing) restrict the potential for human exposure to site contamination. In addition, implementation of the selected remedy will not threaten sensitive ecological habitats. ICs will be maintained at FTA-1 until soils are at levels that allow for unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval.

### 2.12.6 Earth Technology Corporation 12

Long-term ecological monitoring is the selected remedy for ecological risk to wetlands at ETC-12. The estimated cost for long-term ecological monitoring at ETC-12 is $3,000 every five years. The wetlands affected by the remedy are those within and immediately adjacent to ETC-12 as shown on Plate 1 (Appendix A).

Long-term ecological monitoring at ETC-12 will consist of wetlands invertebrate and plant surveys every five years for up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives.

### 2.12.7 Landfill 3

Long-term ecological monitoring is the selected remedy for ecological risk to wetlands at LF-3. The estimated cost for long-term ecological monitoring at LF-3 is $3,000 every five years. The wetlands affected by the remedy are those within and immediately adjacent to LF-3 as shown on Plate 1 (Appendix A).

Long-term ecological monitoring at LF-3 will consist of wetlands invertebrate and plant surveys every five years up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will depend upon

three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact and monitoring can thus be discontinued. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives.

### 2.12.8 Ecological No Further Action Sites

The selected remedy for ecological risk at all SCOU sites other than DP-8, DP-8A, ETC-10, ETC-12, FTA-1, LF-3, LF-5 and Landfill 5 Trenches (total of 225 SCOU sites) is no further action. There is no cost associated with this remedy. These sites are no further action because they completely lacked ecological habitat or contained only habitat that was too marginal to be of concern (i.e., sites covered with buildings, roads, parking lots and urban lawn); because removal actions based on human health and WQSA concerns had substantially reduced the potential risks to ecological receptors or because additional data and/or ERA evaluation determined that the site risk to ecological receptors was not significant.

## 2.13 STATUTORY DETERMINATIONS

Statutory aspects of the selected remedies for each of the SCOU sites or group of SCOU sites addressed in this ROD are presented separately in the following subsections.

### 2.13.1 Landfill 4 (including DP-5 and DP-6) and Landfill 5 (including DP-8, DP-8A and Landfill 5 Trenches)

The selected remedy for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) is cap maintenance and monitoring and ICs, and (for LF-5, DP-8, DP-8A and Landfill 5 Trenches only) long-term ecological monitoring. Per the statutory requirements of CERCLA Section 121, this remedy will adequately protect human health, will comply with ARARs and is cost-effective, although treatment is not a component of this remedy. LF-4, LF-5 and their associated sites, with the exception of DP-9, have undergone waste consolidation and capping through removal actions. Post-closure maintenance and monitoring, including groundwater detection monitoring, was initiated under the removal action and is ongoing in accordance with the approved CPCMPs for LF-4 and LF-5. The

CPCMPs will be updated as appropriate to incorporate IC elements as described in Sections 2.9.1 and 2.12.1.

The selected remedy for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) will result in the following:

- Existing or potential risks posed by the sites through each pathway will be reduced or controlled by the response action.
- Implementation of the selected remedies will not pose unacceptable short-term risk or cross-media impacts.
- The remedies provide adequate protection of the environment.

ARARs for the selected remedy (cap maintenance and monitoring; ICs and [for LF-5, DP-8, DP-8A and Landfill 5 Trenches only] long-term ecological monitoring) are listed in Table 2-18.

The selected remedies for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) will be subject to five-year reviews. The next five-year review is scheduled for 2008.

### 2.13.2 Disposal Pit 9

The selected remedy for DP-9 is no further action, based on the determination that no remedial action, treatment or otherwise, is warranted given the limited contamination at the site. No further action determinations conform to ARARs by definition, as there is no action.

### 2.13.3 Earth Technology Corporation 8

The selected remedy for ETC-8 is excavation and off-site disposal. Per the statutory requirements of CERCLA Section 121, this remedy will adequately protect human health, will comply with ARARs and is cost-effective, although treatment is not a component of the remedy. ETC-8 has previously undergone excavation and on-site disposal under removal action authority. The current remedy addresses potentially PAH-impacted soil at the site not removed during the removal action.

The selected remedy for ETC-8 will result in the following:

- Existing or potential risks posed by the site through each pathway will be eliminated by the remedial action.
- Implementation of the selected remedy will not pose unacceptable short-term risk or cross-media impacts.
- The remedy provides adequate protection of the environment.

ARARs for excavation and off-site disposal of the remaining PAH-impacted soil at ETC-8 are listed in Table 2-19.

### 2.13.4 Earth Technology Corporation 10

The selected remedy for ETC-10 is ICs and long-term ecological monitoring. Per the statutory requirements of CERCLA Section 121, this remedy will adequately protect human health, will comply with ARARs and is cost-effective, although treatment is not a component of the remedy. ETC-10 has previously undergone excavation and on-site disposal under removal action authority. The current remedy addresses lead-impacted soil remaining at the site that does not meet residential RAOs.

The selected remedy for ETC-10 will result in the following:

- Existing or potential risks posed by the site will be controlled by the remedial action.
- Implementation of the selected remedy will not pose unacceptable short-term risk or cross-media impacts.
- The remedy provides adequate protection of the environment.

ARARs for ICs and long-term ecological monitoring at ETC-10 are listed in Table 2-20.

The selected remedy for ETC-10 will be subject to five-year reviews. The next five-year review is scheduled for 2008.

### 2.13.5 Fire Training Area 1

The selected remedy for FTA-1 is SVE and bioventing, cap maintenance and monitoring, ICs, excavation and disposal and long-term ecological monitoring. Per the statutory requirements of CERCLA Section 121, this remedy will adequately protect human health, will comply with ARARs and is cost-effective. An SVE removal action addressing VOC

contamination at the site is ongoing. A cap, equivalent to that identified as the preferred alternative for non-VOC contamination remaining at the site (metals and dioxins), was installed as part of the SVE removal action. Long-term maintenance and monitoring of this cap was initiated under the removal action and is ongoing in accordance with the approved CPCMP for LF-5 (Jacobs, 1998c). Within 180 days of the signing of this ROD, the Air Force will submit a revised CPCMP to include cap maintenance and monitoring at FTA-1. This revised plan will establish the cap maintenance and monitoring procedures now used for LF-4 and LF-5 for the FTA-1 cap. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to ceasing groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to support the demonstration that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone pose a threat to water quality as specified in 27 CCR, Subchapters 3 and 5 (Appendix D). If the results demonstrate that water quality limits will not be exceeded, groundwater monitoring will be discontinued.

The selected remedy for FTA-1 will result in the following:

- Existing or potential risks posed by the site will be controlled by the remedial action.
- Implementation of the selected remedy will not pose unacceptable short-term risk or cross-media impacts.
- The remedy provides adequate protection of the environment.

ARARs for SVE and bioventing, cap maintenance and monitoring, ICs, excavation and disposal and long-term ecological monitoring at FTA-1 are outlined in Table 2-21.

The selected remedy for FTA-1 will be subject to five-year reviews. The next five-year review is scheduled for 2008.

### 2.13.6 Ecological Risk to Wetlands at ETC-12 and LF-3

The selected remedy for ecological risk to wetlands at ETC-12 and LF-3 is long-term ecological monitoring. Per the statutory requirements of CERCLA Section 121, this remedy will adequately protect the environment, will comply with ARARs and is cost-effective, although treatment is not a component of the remedy.

The selected remedy for ETC-12 and LF-3 will result in the following:

- Existing or potential risks posed by the site will be controlled by the remedial action.
- Implementation of the selected remedy will not pose unacceptable short-term risk or cross-media impacts.
- The remedy provides adequate protection of the environment.

ARARs for long-term ecological monitoring at ETC-12 and LF-3 are listed in Table 2-22.

### 2.13.7 Five-Year Review

In compliance with CERCLA requirements, a five-year review process has been developed to assess the effectiveness of remedial actions undertaken at Castle AFB. Five-year reviews are comprehensive reviews of all remedial actions that are long-term (take longer than five years to complete, e.g., pump-and-treat remediation of contaminated groundwater) or will leave contamination in place that does not allow for unrestricted use (e.g., capped landfills). The goal of the reviews is to confirm that the selected remedial actions remain in compliance with performance standards established in the appropriate ROD, that cleanup goals are being or will be achieved, and that the selected remedial actions continue to be protective of human health and the environment.

CERCLA regulations state that a five-year review will be conducted every five years until contaminant concentrations are reduced to levels that no longer pose an adverse risk to human health or the environment. The initial five-year review for Castle AFB was completed in 1998 (Jacobs, 1998a) and focused on the ongoing, long-term groundwater remedial actions. The second five-year review was completed in January 2004 (Jacobs, 2004a) and included an evaluation of all ongoing long-term remedies (five or more years to complete) as well as any remedial actions that will not allow for unrestricted use. ETC-10; FTA-1; LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) were addressed in the second five-year review and will be addressed in subsequent five-year reviews because the selected remedies will take longer than five years to complete and because hazardous substances remain in place at concentrations above unlimited use/unrestricted exposure levels.

## 2.14 DOCUMENTATION OF SIGNIFICANT CHANGES

The SCOU Proposed Plan was submitted to the RAB and the public for review on 15 August 1997 and a public hearing was held at the Atwater City Council Chambers on 15 September 1997. Public comments were received and are provided in the Responsiveness Summary in Section 3.

The preferred alternative for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A) in the *SCOU Proposed Plan* (WPI, 1997) was waste consolidation and capping, long-term maintenance and monitoring and ICs. The same alternative with SVE for soil gas contamination was presented as the preferred alternative for the Landfill 5 Trenches. Several changes have occurred since the Proposed Plan was issued.

- Removal actions were implemented and completed at both LF-4 and LF-5. These removal actions involved consolidation of wastes and construction of an engineered alternative to a Class III cap at both LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and most of the Landfill 5 Trenches). These removal actions are documented in the *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b). Post-closure maintenance and monitoring of the closed landfills, including groundwater detection monitoring, was initiated during the removal actions and continues in accordance with approved CPCMPs. The selected remedy for LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8 and DP-8A) is cap maintenance and monitoring and ICs.
- The preferred alternative for the Landfill 5 Trenches (that portion not covered by the cap) in the SCOU Proposed Plan included the additional element of SVE. As described in Section 2.8.2.5, a START evaluation was conducted for the LF-5 site and it was determined that SVE to address soil gas contamination outside of the capped area was not warranted. The selected remedy for the Landfill 5 Trenches is cap maintenance and monitoring, ICs and long-term ecological monitoring.
- The preferred alternative for DP-9 in the SCOU Proposed Plan was also waste consolidation and capping, long-term maintenance and monitoring and ICs. As noted, a waste consolidation and capping removal action has been completed at the LF-5 site. This action did not address DP-9 because of the limited contamination detected. Based on the information presented in Section 2.8.3 and summarized in Section 2.12, the selected remedy for DP-9 is no further action.

The selected remedies for ETC-8, ETC-10 and FTA-1 and for ecological risk at all 233 SCOU sites are consistent with the preferred alternatives established in the *CB Proposed Plan – Part 2* (Jacobs, 2003).

# Tables

## Table 2-1
## SCOU Site List

| SCOU ROD Part 1 (169 Sites) | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***No Further Action Sites*** (137 Sites) | | | | | | | |
| 1. | B23 | 28. | DP-3 | 55. | N2 | 113. | ST-T85 |
| 2. | B47 | 29. | DP-4A/4B | 56. | N3 | 114. | SWMU 4.1 |
| 3. | B84 | 30. | DP-7 | 57. | N4 | 115. | SWMU 4.2 |
| 4. | B541 | 31. | DP-10 | 58. | N5 | 116. | SWMU 4.9 |
| 5. | B545 | 32. | ETC-2 | 59. | N6 | 117. | SWMU 4.10 |
| 6. | B547 | 33. | ETC-3 | 60. | N7 | 118. | SWMU 4.11 |
| 7. | B871 | 34. | ETC-6 | 61. | N8 | 119. | SWMU 4.12 |
| 8. | B1182 | 35. | ETC-7 | 62. | N9 | 120. | SWMU 4.13 |
| 9. | B1204 | 36. | ETC-11 | 63. | N10 | 121. | SWMU 4.19 |
| 10. | B1205 | 37. | ETC-12 | 64. | PCB-1, 2, 3 | 122. | SWMU 4.20 |
| 11. | B1207 | 38. | ETC-13 | 65. | PCB-7 | 123. | SWMU 4.24 |
| 12. | B1319 | 39. | FR | 66. | PCB-8 | 124. | SWMU 4.25 |
| 13. | B1335 | 40. | FTA-2 | 67. | PCB-9 | 125. | SWMU 4.26 |
| 14. | B1344 | 41. | H1 | 68. | SS-1 | 126. | SWMU 4.27 |
| 15. | B1404 | 42. | H2 | 69. | SS-3 | 127. | SWMU 4.28 |
| 16. | B1405 | 43. | H3 | 70. | SS-5 | 128. | SWMU 4.30 |
| 17. | B1529 | 44. | F-1 | 71. | SS-6[3] | 129. | SWMU 4.31 |
| 18. | B1550[3] | 45. | F-2 | 72. | SS-7[3] | 130. | SWMU 4.32 |
| 19. | B1562 | 46. | F-3 | 73. | SS-9 | 131. | SWMU 4.33 |
| 20. | CVLF-A | 47. | F-5 | 74-105 | Stains 1 to 32 | 132. | SWMU 4.34 |
| 21. | CVLF-B | 48. | F-6 | 106. | SA-B1 | 133. | SWMU 4.35 |
| 22. | DBF | 49. | HWS-4 | 107. | SA-B2 | 134. | SWMU 4.36 |
| 23. | DA-2 | 50. | IWL | 108. | SA-B4 | 135. | SWMU 4.37 |
| 24. | DA-3 | 51. | LG-1 | 109. | SDS | 136. | SWMU 4.38 |
| 25. | DA-8 | 52. | LF-1 | 110. | ST-1201 | 137. | UFL-4 |
| 26. | DP-1 | 53. | LF-2 | 111. | ST-1206 | | |
| 27. | DP-2 | 54. | LF-3 | 112. | ST-1571 | | |
| ***Petroleum Hydrocarbon Only Sites*** NFA Under CERCLA, must meet State requirements (32 Sites) | | | | | | | |
| 1. | B59[4] | 9. | B950 | 17. | DA-7[4] | 25. | JP4 Fuel Line |
| 2. | B79[4] | 10. | B951 | 18. | ETC-4[7] | 26. | JP7 |
| 3. | B175 | 11. | B1324 | 19. | FTA-3* | 27. | PFFA[4] |
| 4. | B325 | 12. | B1325/HWS-3 | 20. | FS-1 | 28. | SS-8[4] |
| 5. | B508[4] | 13. | B1560 | 21. | FS-2 | 29. | ST-T61/HWS-1[7] |
| 6. | B551* | 14. | B1865/1868 | 22. | FS-3 | 30. | UFL-1[6] |
| 7. | B909[4] | 15. | DA-1/TCC-1 | 23. | FS-4 | 31. | UFL-2 |
| 8. | B917[4] | 16. | DA-6[4] | 24. | H-4[6] | 32. | UFL-3 |
| *Insignificant VOC contamination. An evaluation was completed to demonstrate that there is no potential impact to groundwater. | | | | | | | |

## Table 2-1
## SCOU Site List

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SCOU ROD Part 2 (53 Sites)** | | | | | | | |
| ***Volatile Organic Compound Sites*** Soil Vapor Extraction (19 Sites) | | | | | | | |
| 1. | B51[1] | 6. | B1260[2] | 11. | B1762 | 16. | SS-4 |
| 2. | B52[1] | 7. | B1266[2] | 12. | ETC-5[2] | 17. | ST-55[2] |
| 3. | B53[1] | 8. | B1314[5] | 13. | F-4 | 18. | ST-T66[2] |
| 4. | B54[2] | 9. | B1350 | 14. | SA-B3[2] | 19. | ST-T67[2] |
| 5. | B1253[1] | 10. | B1709 | 15. | SS-2 | | |
| Soil Vapor Extraction and Excavation and Disposal (1 Site) | | | | | | | |
| 1. | DA-4[5] | | | | | | |
| Soil Vapor Extraction, Excavation and Disposal and Bioventing (1 Site) | | | | | | | |
| 1. | DA-5 | | | | | | |
| ***Shallow Contamination Sites*** Excavation and Off-site Disposal (4 Sites) | | | | | | | |
| 1. | SWMU 4.4 | 2. | SWMU 4.6 | 3. | SWMU 4.16 | 4. | SWMU 4.22 |
| Excavation and Disposal and Bioventing (2 Sites) | | | | | | | |
| 1. | SWMU 4.3 | 2. | SWMU 4.21 | | | | |
| ***No Further Action Sites*** (14 Sites) | | | | | | | |
| 1. | B1532 | 5. | SWMU 4.8 | 9. | SWMU 4.18 | 12. | PCB-4 |
| 2. | B1541[8] | 6. | SWMU 4.14 | 10 | SWMU 4.23[8] | 13. | PCB-5 |
| 3. | SWMU 4.5 | 7. | SWMU 4.15 | 11. | SWMU 4.29 | 14. | PCB-6 |
| 4. | SWMU 4.7 | 8. | SWMU 4.17 | | | | |
| ***Stains*** *CERCLA Exempt, must meet State requirements (12 Sites)* | | | | | | | |
| 1. | Stain 33 | 4. | Stain 36 | 7. | Stain 39 | 10. | Stain 42 |
| 2. | Stain 34 | 5. | Stain 37 | 8. | Stain 40 | 11. | Stain 43 |
| 3. | Stain 35 | 6. | Stain 38 | 9. | Stain 41 | 12. | Stain 44 |
| **SCOU ROD Part 3 (11 Sites; 233 Sites for Ecological Risk)** | | | | | | | |
| ***Soil Contamination Sites*** Cap Maintenance and Monitoring and Institutional Controls (3 Sites) | | | | | | | |
| 1. | DP-5 | 2. | DP-6 | 3. | LF-4 | | |
| Cap Maintenance and Monitoring, Institutional Controls and Long-Term Ecological Monitoring (4 Sites) | | | | | | | |
| 1. | DP-8 | 2. | DP-8A | 3. | LF-5 | 4. | LF-5 Trenches |
| Excavation and Disposal (1 Site) | | | | | | | |
| 1. | ETC-8 | | | | | | |
| Institutional Controls and Long-Term Ecological Monitoring (1 Site) | | | | | | | |
| 1. | ETC-10 | | | | | | |
| Soil Vapor Extraction, Bioventing, Cap Maintenance and Monitoring, Institutional Controls, Long-Term Ecological Monitoring and Excavation and Disposal (1 Site) | | | | | | | |
| 1. | FTA-1 | | | | | | |

## Table 2-1
## SCOU Site List

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ***No Further Action Sites*** (1 Site) | | | | | | | |
| 1. | DP-9 | | | | | | |
| ***Ecological Risk Sites*** Long-Term Ecological Monitoring (2 Sites) | | | | | | | |
| 1. | ETC-12 | 2. | LF-3 | | | | |
| No Further Ecological Action (225 Sites) | | | | | | | |
| All remaining SCOU sites not listed above. | | | | | | | |

**Notes**

[1] Indicates facilities in the B51 Group
[2] Indicates facilities in the B54 Group
[3] Indicates facilities in the DA-8 Group
[4] Indicates facilities in the PFFA Group
[5] Indicates that DA-4 and B1314 are linked
[6] Indicates that H-4 and UFL-1 are linked
[7] Indicates that ETC-4 and ST-T61/HWS-1 are linked
[8] Indicates that B1541 and SWMU 4.23 are linked

*Acronyms*

| | |
|---|---|
| CB | comprehensive basewide |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| NFA | no further action |
| PHO | petroleum hydrocarbon only |
| ROD | record of decision |
| SCOU | source control operable unit |
| START | Soil Vapor Extraction Turn-on and Remediation Test |
| VOC | volatile organic compound |

*Sites*

| | | | |
|---|---|---|---|
| B | Building | JP | Jet Propulsion |
| CVLF-A | Castle Vista Landfill A | LG | Lagoon |
| CVLF-B | Castle Vista Landfill B | LF | Landfill |
| DA | Discharge Area | N | Ground Disturbance |
| DBF | Detonation and Burn Facility | PCB | Polychlorinated Biphenyl |
| DP | Disposal Pit | PFFA | Petroleum Fuel Farm Area |
| ETC | Earth Technology Corporation Site | SA | Storage Area |
| F | Aircraft Maintenance Hangar | SDS | Storm Drain System |
| FR | Firing Range | SS | Sanitary Sewer |
| FS | Fuel Spill | ST | Structure |
| FTA | Fire Training Area | STA | Stain |
| H | Gasoline Station | SWMU | Solid Waste Management Unit |
| HWS | Hazardous Waste Storage Area | UFL | Underground Fuel Leak |
| IWL | Industrial Waste Line | | |

## Table 2-2
## Contaminants of Potential Concern in Soil at Castle AFB

| COPCs from HHRA | COPC for Vadose Zone Screening | COPCs from HHRA | COPC for Vadose Zone Screening |
|---|---|---|---|
| ***Inorganic Compounds*** | | | |
| Arsenic | x | Mercury | |
| Barium | | Molybdenum | x |
| Beryllium | x | Nickel | x |
| Cadmium | x | Selenium | x |
| Chromium | x | Silver | x |
| Cobalt | x | Thallium | |
| Lead | x | | |
| ***Organic Compounds*** | | | |
| Acenaphthene | | 1,3-Dichlorobenzene | |
| Acenaphthylene | | 1,4-Dichlorobenzene | x |
| Anthracene | x | 1,2-Dichloroethane | |
| Benzene | x | *cis*-1,2-Dichloroethene | x |
| Benzo(a)anthracene | x | Dieldrin | |
| Benzo(a)pyrene | x | Diethyl phthalate | |
| Benzo(b)fluoranthene | x | 2,4-Dimethylphenol | |
| Benzo(ghi)perylene | | 2,4-Dinitrotoluene | |
| Benzo(k)fluoranthene | | Endrin | |
| Bis(2-Ethylhexyl)phthalate | | Ethylbenzene | x |
| 2-Butanone | | Fluoranthene | x |
| Butyl benzyl phthalate | | Fluorene | |
| *n*-Butylbenzene | | Heptachlor epoxide | |
| *sec*-Butylbenzene | | Hexachlorobutadiene | |
| *t*-Butylbenzene | | Indeno(1,2,3-cd)pyrene | |
| Carbon tetrachloride | x | Methylene chloride | |
| a-Chlordane | | 2-Methylnaphthalene | |
| g-Chlordane | | 2-Methylphenol | |
| 4-Chloroaniline | | 4-Methylphenol | |
| Chlorobenzene | | Naphthalene | x |
| Chloroform | x | Polychlorinated biphenyls (PCBs) | |
| 4-Chlorotoluene | | Pentachlorophenol | |
| Chrysene | x | Phenanthrene | x |
| Isopropylbenzene (Cumene) | | Phenol | |
| Isopropyltoluene (*p*-Cymene) | | *n*-Propylbenzene | |
| DDD | | Pyrene | |
| DDE | | Styrene | |
| DDT | | Tetrachloroethene | x |
| Heptachlorodibenzo-*p*-dioxins | | Toluene | x |
| Heptachlorodibenzofurans | | 1,2,3-Trichlorobenzene | |
| Hexachlorodibenzo-*p*-dioxins | | 1,2,4-Trichlorobenzene | |
| Octachlorodibenzo-*p*-dioxin | | 1,1,1-Trichloroethane | |
| Pentachlorodibenzofurans | | Trichloroethene | x |
| Tetrachlorodibenzo-*p*-dioxins | | Dichlorodifluoromethane (FC12) | x |
| Tetrachlorodibenzofurans | | Trichlorofluoromethane (FC11) | x |
| Di-*n*-butyl phthalate | | 2,4,5-Trichlorophenol | |
| Di-*n*-octylphthalate | | 1,2,3-Trichloropropane | |
| Dibenz(a,h)anthracene | | 1,2,4-Trimethylbenzene | x |
| Dibenzofuran | | 1,3,5-Trimethylbenzene | |
| 1,2-Dibromo-3-chloropropane | | Xylenes | x |
| 1,2-Dichlorobenzene | x | Vinyl Chloride | x |

**Notes**

COPC contaminants of potential concern

HHRA human health risk assessment

## Table 2-3
## Test Species and Critical Effects for Contaminants of Potential Concern

| COPC | Test Species and Critical Effect |
|---|---|
| ***Inorganics*** | |
| Arsenic | human: hyperpigmentation, vascular complications |
| Antimony | rat: blood glucose, longevity |
| Barium | human, rat: increased kidney weight |
| Beryllium | dog: lesions in small intestine |
| Cadmium | human: proteinuria |
| Chromium | rat: none observed |
| Cobalt | NA |
| Lead | human: child neurobehavioral development |
| Mercury | rat: kidney |
| Molybdenum | human: increased uric acid levels |
| Nickel | rat: decreased organ weights |
| Selenium | human: selenosis |
| Silver | human: skin |
| Thallium | rat: increased SGOT and LDH |
| ***Organics*** | |
| Acenaphthene | mouse: liver |
| Acenaphthylene | |
| Anthracene | mouse: no effect |
| Benzene | human: decreased lymphocytes |
| Benzo(a)anthracene | |
| Benzo(a)pyrene | |
| Benzo(b)fluoranthene | |
| Benzo(g,h,i)perylene | |
| Benzo(k)fluoranthene | |
| Bis(2-ethylhexyl)phthalate | guinea pig: liver |
| 2-Butanone | mouse, rat: fetal birth weight |
| Butylbenzylphthalate | rat: increased liver weight |
| *n*-Butylbenzene | |
| *sec*-Butylbenzene | |
| *t*-Butylbenzene | |
| Carbon tetrachloride | rat: liver |
| α-Chlordane | rat: liver |
| γ-Chlordane | rat: liver |
| 4-Chloroaniline | rat: spleen |
| Chlorobenzene | dog: liver, kidney |
| Chloroform | dog: liver |
| 4-Chlorotoluene | |
| Chrysene | |
| Isopropylbenzene | rat: kidney |
| Isopropyltoluene | |
| DDD | |
| DDE | |
| DDT | rat: liver |
| 1,2,3,4,6,7,8-Heptachlorodibenzofuran | rat, mouse: reproductive effects |
| 1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin | rat, mouse: reproductive effects |
| Octachlorodibenzo-*p*-dioxin | rat, mouse: reproductive effects |
| Di-*n*-butylphthalate | rat: increased mortality |
| Di-*n*-octylphthalate | rat: kidney, liver, SGOT activity |
| Dibenz(a,h)anthracene | |

## Table 2-3
## Test Species and Critical Effects for Contaminants of Potential Concern

| COPC | Test Species and Critical Effect |
|---|---|
| Dibenzofuran | |
| 1,2-Dibromo-3-chloropropane | rabbit: testes |
| Dibromochloromethane | rat: liver |
| 1,2-Dichlorobenzene | rat: no effect |
| 1,3-Dichlorobenzene | |
| 1,4-Dichlorobenzene | rat: liver |
| 1,1-Dichloroethane | cat: kidney |
| 1,2-Dichloroethane | |
| *cis*-1,2-Dichloroethene | rat: blood |
| Dieldrin | rat: liver |
| Diethyl phthalate | rat: growth and organ weights |
| 2,4-Dimethylphenol | mouse: lethargy, prostration, ataxia |
| 2,4-Dinitrotoluene | dog: nervous system |
| Endrin | dog: liver, convulsions |
| Ethylbenzene | rat: liver and kidney; fetotoxicity |
| Fluoranthene | mouse: kidney, liver |
| Fluorene | mouse: RBC |
| Heptachlor epoxide | dog: increased liver/body weight ratio |
| Hexachlorobutadiene | |
| Indeno(1,2,3-cd)pyrene | |
| Methylene chloride | rat: liver |
| 2-Methylnaphthalene | |
| 2-Methylphenol | rat: nervous system |
| 4-Methylphenol | |
| Naphthalene | rat: decreased weight |
| PCB | monkey: eyes, meibomian glands, nails, immune system |
| Pentachlorophenol | rat: liver, kidney |
| Phenanthrene | |
| Phenol | rat: fetal body weight |
| *n*-Propylbenzene | |
| Pyrene | mouse: kidney |
| Styrene | human: CNS effects / dog: red blood cells, liver |
| Tetrachloroethene | mouse: liver / rat: weight gain |
| Toluene | rat: liver, kidney |
| 1,2,3-Trichlorobenzene | |
| 1,2,4-Trichlorobenzene | rat: adrenal gland |
| 1,1,1-Trichloroethane | |
| 1,1,2-Trichloroethane | mouse: serum |
| Trichloroethene | rat: liver |
| Trichlorofluoromethane | rat, mouse: increased mortality |
| 2,4,5-Trichlorophenol | rat: liver and kidney pathology |
| 1,2,3-Trichloropropane | rat: liver, kidney, blood |
| 1,2,4-Trimethylbenzene | |
| 1,3,5-Trimethylbenzene | |
| Xylenes | rat: CNS, mortality |

**Notes**

| | | | |
|---|---|---|---|
| CNS | central nervous system | NA | not available |
| COPC | contaminant of potential concern | RBC | red blood cell |
| LDH | lactate dehydrogenase | SGOT | serum glutamic-oxaloacetic transaminase |

## Table 2-4
## HHRA Results for SCOU ROD Part 3 Sites

| Site | Cancer Risk and Non-Cancer Hazard Index | | | | Estimated Blood-Lead Concentration (µg/dL) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Adult Residential (Without Plant Uptake Unless Noted) | | | | Exposure Point Concentration (mg/kg) | | Child Residential Blood-Lead Concentration (µg/dL) | | | |
| | Surface Soil | | Subsurface Soil | | Surface | Subsurface | Surface with Plant Uptake | Surface w/o Plant Uptake | Subsurface with Plant Uptake | Subsurface w/o Plant Uptake |
| | Cancer Risk | Non-Cancer Hazard | Cancer Risk | Non-Cancer Hazard | | | | | | |
| Landfill 4[1] | ***4E-06*** | 0.1 | -- | -- | ND | ND | -- | -- | -- | -- |
| Landfill 5[1] | ***4E-06*** | 0.1 | -- | -- | 21.1 | -- | 2.5 | -- | 2.2 | -- |
| Landfill 5—DP-9[2] | 1E-07 | 0.1 | 2E-07 | 0.1 | 35.3 | 6.3 | 3.0 | 2.5 | 1.9 | 1.9 |
| ETC-8[2] | ***4E-05*** | 0.1 | -- | 0.1 | 58 | 13 | 3.9[3] | 3.0[3] | NC | NC |
| ETC-10[1] | ***4E-06*** | 0.1 | -- | -- | 846 | ND | ***33.5*** | ***19.7*** | -- | -- |
| | | | | | 330[4] | ND | ***14.1*** | 8.8 | -- | -- |
| FTA-1[1] | 5E-07 | 0.1 | ***2E-06*** | 0.1 | 65.2[4] | 30.8[4] | 4.1 | 3.2 | 2.8 | 2.4 |

**Notes**

[1] Post removal action human health risk and estimated blood-lead concentration—no differentiation between surface and subsurface soil except for FTA-1; source is CB RI/FS – Part 2, Appendix I (Jacobs, 2002a).

[2] Updated SCOU baseline HHRA and estimated blood-lead concentration; source is SCOU baseline HHRA update (Jacobs, 2001).

[3] Source is SCOU baseline HHRA.

[4] $UCL^{95}$

Results presented in ***bold italics*** exceed or equal the decision criteria for cancer risk (1E-06), non-cancer hazard (1) or blood-lead (10 µg/dL).

| | | | |
|---|---|---|---|
| µg/dL | micrograms per deciliter | NC | not calculated |
| ETC-# | Earth Technology Corporation | ND | not detected above background |
| FTA-# | Fire Training Area | ROD | remedial action objectives |
| HHRA | human health risk assessment | SCOU | Source Control Operable Unit |
| mg/kg | milligrams per kilogram | $UCL^{95}$ | 95 percent upper confidence limit |

## Table 2-5
## Castle AFB Threshold Background Values

| Analyte | Shallow (less than 30 ft bgs) | | Deep (greater than 30 ft bgs) | | Threshold Background Value Range | |
|---|---|---|---|---|---|---|
| | Silts (mg/kg) | Sands (mg/kg) | Silts (mg/kg) | Sands (mg/kg) | Minimum (mg/kg) | Maximum (mg/kg) |
| aluminum | 16,200 | 9,520 | 18,000 | 7,750 | 7,750 | 18,000 |
| antimony | 6.7 | 4.8 | 11.5 | 3.5 | 3.5 | 11.5 |
| arsenic | 9.9 | 9.74 | 12.2 | 4.4 | 4.4 | 12.2 |
| barium | 319 | 109 | 240 | 107.65 | 107.65 | 319 |
| beryllium | 0.89 | 0.39 | 0.85 | 0.26 | 0.26 | 0.89 |
| boron * | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |
| cadmium * | 0.5 | 0.5 | 0.91 | 0.5 | 0.5 | 0.91 |
| calcium | 6,590 | 2,520 | 8,740 | 2,069.84 | 2,069.84 | 8,740 |
| chromium, total | 29.4 | 19.1 | 27.7 | 7.3 | 7.3 | 29.4 |
| chromium VI and compounds * | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |
| cobalt | 12.8 | 7.0 | 13.3 | 5.4 | 5.4 | 13.3 |
| copper | 53.62 | 17.1 | 27.8 | 8.3 | 8.3 | 53.62 |
| iron | 25,900 | 20,400 | 46,100 | 14,300 | 14,300 | 46,100 |
| lead | 7.4 | 6.7 | 6.4 | 3.2 | 3.2 | 7.4 |
| magnesium | 8,160 | 5,040 | 10,400 | 4,615.38 | 4,615.38 | 10,400 |
| manganese | 1,100 | 228 | 765 | 266 | 228 | 1,100 |
| mercury * | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| molybdenum | 0.59 | 2.0 | 0.71 | 2.0 | 0.59 | 2.0 |
| nickel | 29.6 | 22.5 | 24.8 | 4.5 | 4.5 | 29.6 |
| potassium | 3,430 | 2,890 | 3,460 | 3,080 | 2,890 | 3,460 |
| selenium * | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| silica | 2,630 | 1,620 | 948 | 2,327.18 | 948 | 2,630 |
| silver | 0.30 | 0.45 | 0.61 | 0.30 | 0.30 | 0.61 |
| sodium | 315 | 116 | 208 | 89.3 | 89.3 | 315 |
| thallium * | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 |
| vanadium | 70.2 | 58.06 | 109 | 28.8 | 28.8 | 109 |
| zinc | 70.2 | 46.9 | 101 | 32.8 | 32.8 | 101 |
| gross alpha | 34 pCi/g | 48 pCi/g | 72 pCi/g | 44 pCi/g | 34 pCi/g | 72 pCi/g |
| gross beta | 43 pCi/g | 52 pCi/g | 74 pCi/g | 53.2 pCi/g | 43 pCi/g | 74 pCi/g |

**Notes**

| | | | |
|---|---|---|---|
| * | ND (not detected at method detection limit) | mg/kg | milligrams per kilogram |
| bgs | below ground surface | pCi/g | pico Curie per gram |

Alpha & beta units are pCi/g; all other units are milligrams per kilogram (mg/kg) or ppm.

If less than 50%ND, replaced ND with one-half method detection limit (MDL) before calculating mean and standard deviation.

For each group:

If greater than 50%ND, used maximum

If nonparametric, used maximum

If mean plus two standard deviations greater than maximum, used maximum

The last column in each group contains the threshold background values for that group

The threshold background value (TBV) range takes the minimum and maximum of the group TBVs

## Table 2-6
## Castle AFB Soluble Threshold Background Values

| Analyte | Shallow Background (mg/L) | | Deep Background (mg/L) | | Threshold Background Value Range (mg/L) | | Threshold Background Value Range (µg/L) | |
|---|---|---|---|---|---|---|---|---|
| | Silts | Sands | Silts | Sands | Minimum | Maximum | Minimum | Maximum |
| aluminum | 2.2 | 0.99 | 0.68 | 1.7 | 0.68 | 2.2 | 680 | 2,200 |
| antimony | NA | NA | NA | NA | NA | NA | NA | NA |
| arsenic | ND | ND | ND | ND | ND | ND | ND | ND |
| barium | 0.022 | 0.0073 | 0.0054 | 0.013 | 0.0054 | 0.022 | 5.400 | 22.0 |
| beryllium | 0.00050 | 0.00050 | ND | 0.00060 | 0.0005 | 0.0006 | 0.5000 | 0.6000 |
| boron | NA | NA | NA | NA | NA | NA | NA | NA |
| cadmium | ND | ND | ND | ND | ND | ND | ND | ND |
| calcium | 6.3 | 1.1 | 1.2 | 1.7 | 1.1 | 6.3 | 1100 | 6300 |
| chromium, total | ND | 0.0067 | ND | 0.0069 | 0.0067 | 0.0069 | 6.700 | 6.900 |
| hexavalent chromium | ND | ND | ND | ND | ND | ND | ND | ND |
| cobalt | ND | ND | ND | ND | ND | ND | ND | ND |
| copper | ND | ND | ND | ND | ND | ND | ND | ND |
| iron | 1.6 | 0.80 | 0.63 | 1.7 | 0.63 | 1.7 | 630 | 1700 |
| lead | 0.017 | 0.023 | 0.015 | 0.015 | 0.015 | 0.023 | 15 | 23 |
| magnesium | 2.1 | 0.20 | 0.28 | 0.38 | 0.20 | 2.1 | 200 | 2100 |
| manganese | 0.030 | 0.010 | 0.0082 | 0.092 | 0.0082 | 0.092 | 8.20 | 92.0 |
| mercury | ND | ND | 0.00063 | 0.00057 | 0.00057 | 0.00063 | 0.57000 | 0.63000 |
| molybdenum | 0.0047 | ND | 0.0049 | 0.0040 | 0.004 | 0.0049 | 4.00 | 4.900 |
| nickel | 0.0110 | 0.019 | 0.02 | 0.0200 | 0.011 | 0.02 | 11.00 | 20.0 |
| potassium | 0.65 | 0.96 | 0.42 | 0.56 | 0.42 | 0.96 | 420 | 960 |
| selenium | ND | ND | ND | ND | ND | ND | ND | ND |
| silica | NA | NA | NA | NA | NA | NA | NA | NA |
| silver | ND | ND | ND | ND | ND | ND | ND | ND |
| sodium | 13 | 6.2 | 8.0 | 5.0 | 5.0 | 13 | 5,000 | 13,000 |
| thallium | ND | ND | ND | ND | ND | ND | ND | ND |
| vanadium | 0.043 | 0.028 | 0.024 | 0.022 | 0.022 | 0.043 | 22.0 | 43.0 |
| zinc | 0.027 | 0.020 | 0.015 | 0.026 | 0.015 | 0.027 | 15.0 | 27.0 |

**Notes**

µg/L micrograms per liter

mg/L milligrams per liter

NA not available—waste extraction test (WET) results are not available for antimony, boron or silica

ND not detected at method detection limit

## Table 2-7
## HHRA RAOs and WQSA Thresholds for VOCs in Soil and Soil Gas

| Contaminant | Model | Water Quality Site Assessment Threshold for Given Maximum Depths of Contamination (µg/kg [soil], µg/L [soil gas]) | | | | | | HHRA RAOs[3] (Residential Scenario) |
|---|---|---|---|---|---|---|---|---|
| | | Shallow | | Deep | | | | |
| | | 0-10' | 10-20' | 20-30' | 30-40' | 40-50' | 50-60' | < 15 feet (µg/kg) |
| **Volatile Organics[1]** | | | | | | | | |
| benzene (soil) | VLEACH1 | 88,567.0 | 19,594.0 | 5,658.0 | 1,698.9 | 501.1 | 86.2 | 360 |
| | VLEACH2 | 291.5 | 68.4 | 20.8 | 3.0 | 1.4 | 0.0 | |
| benzene (soil gas) | VLEACH1 | 85,763.0 | 18,974.0 | 5,479.0 | 1,645.2 | 485.2 | 83.5 | |
| | VLEACH2 | 282.2 | 66.3 | 20.1 | 5.9 | 1.4 | 0.1 | |
| carbon tetrachloride (soil) | VLEACH1 | 2,700.0 | 1,000.0 | 500.0 | 300.0 | 200.0 | 100.0 | 240 |
| | VLEACH2 | 47.8 | 18.3 | 10.2 | 6.6 | 4.6 | 1.7 | |
| carbon tetrachloride (soil gas) | VLEACH1 | 2,846.8 | 1,040.1 | 559.1 | 352.7 | 235.0 | 102.4 | |
| | VLEACH2 | 49.6 | 19.0 | 10.6 | 6.9 | 4.8 | 1.8 | |
| chloroform (soil) | VLEACH1 | 8,900.0 | 2,000.0 | 5,700.0 | 1,700.0 | 500.0 | 100.0 | 450 |
| | VLEACH2 | 291.5 | 68.4 | 20.8 | 3.0 | 1.4 | 0.0 | |
| chloroform (soil gas) | VLEACH1 | 85,763.0 | 18,974.0 | 5,479.0 | 1,645.2 | 485.2 | 83.5 | |
| | VLEACH2 | 282.2 | 66.3 | 20.1 | 5.9 | 1.4 | 0.1 | |
| dichlorobenzene, 1,2-(soil) | VLEACH1 | 293,400.0 | 102,200.0 | 28,500.0 | 8,600.0 | 2,500.0 | 500.0 | 370,000 |
| | VLEACH2 | 293,350.0 | 195,050.0 | 54,641.0 | 15,397.0 | 2,847.5 | 25.2 | |
| dichlorobenzene, 1,2-(soil gas) | VLEACH1 | 56,439.0 | 19,962.0 | 5,479.3 | 1,646.1 | 490.2 | 93.5 | |
| | VLEACH2 | 56,439.0 | 37,525.0 | 10,512.0 | 2,962.3 | 547.8 | 4.8 | |
| dichlorobenzene,1,4-(soil) | VLEACH1 | 293,400.0 | 102,200.0 | 28,500.0 | 8,600.0 | 2,500.0 | 500.0 | 3,600 |
| | VLEACH2 | 293,350.0 | 195,050.0 | 54,641.0 | 15,397.0 | 2,847.5 | 25.2 | |
| dichlorobenzene,1,4-(soil gas) | VLEACH1 | 56,439.0 | 19,962.0 | 5,479.3 | 1,646.1 | 490.2 | 93.5 | |
| | VLEACH2 | 56,439.0 | 37,525.0 | 10,512.0 | 2,962.3 | 547.8 | 4.8 | |
| dichlorodiflouoromethane (FC12)- (soil) | VLEACH1 | 85.0 | 25.0 | 12.0 | 6.0 | 3.0 | 1.0 | 280,000 |
| | VLEACH2 | 8.5 | 2.5 | 1.2 | 0.6 | 0.3 | 0.1 | |
| dichlorodiflouoromethane (FC12)- (soil gas) | VLEACH1 | 21,035.0 | 6,187.5 | 2,850.5 | 1,548.9 | 845.8 | 312.7 | |
| | VLEACH2 | 2,001.3 | 620.6 | 286.5 | 156.8 | 85.4 | 14.2 | |

## Table 2-7
## HHRA RAOs and WQSA Thresholds for VOCs in Soil and Soil Gas

| Contaminant | Model | Water Quality Site Assessment Threshold for Given Maximum Depths of Contamination (µg/kg [soil], µg/L [soil gas]) | | | | | | HHRA RAOs[3] (Residential Scenario) |
|---|---|---|---|---|---|---|---|---|
| | | Shallow | | Deep | | | | |
| | | 0-10' | 10-20' | 20-30' | 30-40' | 40-50' | 50-60' | < 15 feet (µg/kg) |
| dichloroethane,1,2- (soil) | VLEACH1 | 84.9 | 25.0 | 11.5 | 6.3 | 3.4 | 1.3 | 430 |
| | VLEACH2 | 8.5 | 2.5 | 1.2 | 0.6 | 0.3 | 0.1 | |
| dichloroethane,1,2- (soil gas) | VLEACH1 | 21,035.0 | 6,187.5 | 2,850.5 | 1,548.9 | 845.8 | 312.7 | |
| | VLEACH2 | 2,001.3 | 620.6 | 286.5 | 156.8 | 85.4 | 14.2 | |
| dichloroethene, cis-,1,2- (soil) | VLEACH1 | 1,212.7 | 454.7 | 249.5 | 160.7 | 110.0 | 50.8 | 140,000 |
| | VLEACH2 | 21.5 | 8.4 | 4.8 | 3.2 | 2.3 | 1.0 | |
| dichloroethene, cis-,1,2- (soil gas) | VLEACH1 | 2,294.0 | 860.1 | 472.0 | 304.0 | 208.1 | 96.0 | |
| | VLEACH2 | 40.7 | 16.0 | 9.1 | 6.1 | 4.4 | 1.8 | |
| dichloropropane,1,2- (soil) | VLEACH1 | ------- | ------- | ------- | ------- | ------- | ------- | 670 |
| | VLEACH2 | ------- | ------- | ------- | ------- | ------- | ------- | |
| dichloropropane,1,2- (soil gas) | VLEACH1 | ------- | ------- | ------- | ------- | ------- | ------- | |
| | VLEACH2 | ------- | ------- | ------- | ------- | ------- | ------- | |
| ethylbenzene (soil) | VLEACH1 | 220,400.0 | 88,804.0 | 24,747.0 | 7,435.9 | 2,226.0 | 442.4 | 230,000 |
| | VLEACH2 | 220,340.0 | 220,340.0 | 78,540.0 | 22,619.0 | 4,383.4 | 42.1 | |
| ethylbenzene (soil gas) | VLEACH1 | 48,799.0 | 19,662.0 | 5,479.3 | 1,646.3 | 492.1 | 97.9 | |
| | VLEACH2 | 48,785.0 | 48,785.0 | 17,391.0 | 5,008.2 | 970.6 | 9.3 | |
| methylene chloride (soil) | VLEACH1 | 84.9 | 25.0 | 11.5 | 6.3 | 3.4 | 1.3 | 2,300 |
| | VLEACH2 | 8.5 | 2.5 | 1.2 | 0.6 | 0.3 | 0.1 | |
| methylene chloride (soil gas) | VLEACH1 | 21,035.0 | 6,187.5 | 2,850.5 | 1,548.9 | 845.8 | 312.7 | |
| | VLEACH2 | 2,001.3 | 620.6 | 286.5 | 156.8 | 85.4 | 14.2 | |
| naphthalene (soil) | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 190,000 |
| | VLEACH2 | 82,896.0 | 82,896.0 | 82,896.0 | 82,896.0 | 68,348.0 | 74.9 | |
| naphthalene (soil gas) | VLEACH1 | 1,599.9 | 1,599.9 | 1,599.9 | 1,599.9 | 424.0 | 33.0 | |
| | VLEACH2 | 1,599.9 | 1,599.9 | 1,599.9 | 1,599.9 | 1,318.9 | 1.4 | |
| tetrachloroethene (soil) | VLEACH1 | 2,700.0 | 1,000.0 | 500.0 | 300.0 | 200.0 | 100.0 | 3,800 |
| | VLEACH2 | 47.8 | 18.3 | 10.2 | 6.6 | 4.6 | 1.7 | |

## Table 2-7
## HHRA RAOs and WQSA Thresholds for VOCs in Soil and Soil Gas

| Contaminant | Model | Water Quality Site Assessment Threshold for Given Maximum Depths of Contamination (µg/kg [soil], µg/L [soil gas]) | | | | | | HHRA RAOs[3] (Residential Scenario) |
|---|---|---|---|---|---|---|---|---|
| | | Shallow | | Deep | | | | |
| | | 0-10' | 10-20' | 20-30' | 30-40' | 40-50' | 50-60' | < 15 feet (µg/kg) |
| tetrachloroethene (soil gas) | VLEACH1 | 2,846.8 | 1,040.1 | 559.1 | 352.7 | 235.0 | 102.4 | |
| | VLEACH2 | 49.6 | 19.0 | 10.6 | 6.9 | 4.8 | 1.8 | |
| toluene (soil) | VLEACH1 | 215,810.0 | 44,728.0 | 12,463.0 | 3,744.0 | 1,128.0 | 207.6 | 520,000 |
| | VLEACH2 | 315,150.0 | 75,409.0 | 21,600.0 | 6,148.9 | 1,201.8 | 25.7 | |
| toluene (soil gas) | VLEACH1 | 94,872.0 | 19,662.0 | 5,479.0 | 1,645.9 | 489.2 | 91.3 | |
| | VLEACH2 | 138,540.0 | 33,150.0 | 9,495.3 | 2,703.0 | 528.3 | 11.3 | |
| TVPH-volatile (as gasoline in soil) | DLM | 100,000.0 | 100,000.0 | TBD[2] | TBD[2] | TBD[2] | TBD[2] | N/A |
| | DLM | ------- | ------- | ------- | ------- | ------- | ------- | |
| TEPH-extractable (as diesel; JP-4 in soil) | DLM | 1,500,000.0 | 1,500,000.0 | TBD[2] | TBD[2] | TBD[2] | TBD[2] | N/A |
| | DLM | ------- | ------- | ------- | ------- | ------- | ------- | |
| trichloroethene (soil) | VLEACH1 | 2,742.8 | 1,002.1 | 538.7 | 339.8 | 226.5 | 98.7 | 3,700 |
| | VLEACH2 | 47.8 | 18.3 | 10.2 | 6.6 | 4.6 | 1.7 | |
| trichloroethene (soil gas) | VLEACH1 | 2,846.8 | 1,040.1 | 559.1 | 352.7 | 235.0 | 102.4 | |
| | VLEACH2 | 49.6 | 19.0 | 10.6 | 6.9 | 4.8 | 1.8 | |
| trichlorofluoromethane (FC11)- (soil) | VLEACH1 | 85.0 | 25.0 | 12.0 | 6.0 | 3.0 | 1.0 | 1,200,000 |
| | VLEACH2 | 8.5 | 2.5 | 1.2 | 0.6 | 0.3 | 0.1 | |
| trichlorofluoromethane (FC11)- (soil gas) | VLEACH1 | 21,035.0 | 6,187.5 | 2,850.5 | 1,548.9 | 845.8 | 312.7 | |
| | VLEACH2 | 2,001.3 | 620.6 | 286.5 | 156.8 | 85.4 | 14.2 | |
| trimethylbenzene,1,2,4- (soil) | VLEACH1 | 293,350.0 | 102,200.0 | 28,480.0 | 8,555.9 | 2,547.9 | 485.9 | 120,000 |
| | VLEACH2 | 293,350.0 | 195,050.0 | 54,641.0 | 15,397.0 | 2,847.5 | 25.2 | |
| trimethylbenzene,1,2,4- (soil gas) | VLEACH1 | 56,439.0 | 19,962.0 | 5,479.3 | 1,646.1 | 490.2 | 93.5 | |
| | VLEACH2 | 56,439.0 | 37,525.0 | 10,512.0 | 2,962.3 | 547.8 | 4.8 | |
| vinyl chloride (soil) | VLEACH1 | 84.9 | 25.0 | 11.5 | 6.3 | 3.4 | 1.3 | 30 |
| | VLEACH2 | 8.5 | 2.5 | 1.2 | 0.6 | 0.3 | 0.1 | |
| vinyl chloride (soil gas) | VLEACH1 | 21,035.0 | 6,187.5 | 2,850.5 | 1,548.9 | 845.8 | 312.7 | |
| | VLEACH2 | 2,001.3 | 620.6 | 286.5 | 156.8 | 85.4 | 14.2 | |

## Table 2-7
## HHRA RAOs and WQSA Thresholds for VOCs in Soil and Soil Gas

| Contaminant | Model | Water Quality Site Assessment Threshold for Given Maximum Depths of Contamination (µg/kg [soil], µg/L [soil gas]) | | | | | | HHRA RAOs[3] (Residential Scenario) |
|---|---|---|---|---|---|---|---|---|
| | | Shallow | | Deep | | | | |
| | | 0-10' | 10-20' | 20-30' | 30-40' | 40-50' | 50-60' | < 15 feet (µg/kg) |
| xylene (soil) | VLEACH1 | 293,350.0 | 102,200.0 | 28,480.0 | 8,555.9 | 2,547.9 | 485.9 | 210,000 |
| | VLEACH2 | 293,350.0 | 195,050.0 | 54,641.0 | 15,397.0 | 2,847.5 | 25.2 | |
| xylene (soil gas) | VLEACH1 | 56,439.0 | 19,962.0 | 5,479.3 | 1,646.1 | 490.2 | 93.5 | |
| | VLEACH2 | 56,439.0 | 37,525.0 | 10,512.0 | 2,962.3 | 547.8 | 4.8 | |

**Notes**

Shading indicates soil gas RAOs.

1 WQSA thresholds represent levels considered protective of groundwater. HHRA RAOs represent levels considered protective of human health. VOC sites will be closed in accordance with the Castle Airport SVE Termination or Optimization Process (STOP).

2 TEPH/TVPH RAOs are based on –0 to 20 ft, DLM

3 All human health risk assessment RAOs were calculated during the RI/FS using the methodology outlined in *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual Part A*, Interim Final (EPA, 1989) and updated in 2001 (Jacobs, 2001). The RAOs were generally established at the lowest level of either the concentration that represents a cancer risk of 1E-06, or the concentration that represents a chemical-specific non-cancer hazard quotient of 1.

| | |
|---|---|
| µg/kg | micrograms per kilogram |
| µg/L | micrograms per liter |
| DLM | California Water Board, Designated Level Methodolgy |
| HHRA | human health risk assessment |
| RAO | remedial action objective |
| ROD | Record of Decision |
| SCOU | Source Control Operable Unit |
| TBD | to be determined; greater than 20 feet must meet State Acceptance Criteria |
| VLEACH1 | vadose zone model with 1 foot mixing zone |
| VLEACH2 | vadose model with no mixing zone |
| VOC | volatile organic compound |
| WQSA | water quality site assessment |

## Table 2-8
## HHRA and WQSA RAOs for SVOCs

| Contaminant[1] | Model | Water Quality Site Assessment Threshold for Given Maximum Depths of Contamination (µg/kg [soil]) | | | | | | HHRA RAOs[3] (Residential Scenario) |
|---|---|---|---|---|---|---|---|---|
| | | Shallow | | Deep | | | | < 15 feet (µg/kg) |
| | | 0-10' | 10-20' | 20-30' | 30-40' | 40-50' | 50-60' | |
| **Semi-Volatile Organics[2]** | | | | | | | | |
| anthracene | | | | | | | | 100,000,000 |
| benzo(a)anthracene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 890 |
| benzo(a)pyrene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 89 |
| benzo(b)fluoranthene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 890 |
| benzo(k)fluoranthene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 890 |
| bis(2-ethylhexyl) phthalate | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 87,000 |
| chrysene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 8,900 |
| di-*n*-butyl phthalate | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 52,000,000 |
| DDD | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 5,900 |
| DDE | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 4,200 |
| DDT | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 4,200 |
| dibenz(a,h)anthracene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 150 |
| dinitrotoluene,2,4- | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 3,900 |
| fluoranthene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 18,000,000 |
| g-chlordane | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 1,100 |
| HPCDD, 1,2,3,4,6,7,8- | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | N/A |
| heptachlor epoxide | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 160 |
| heptachlorodibenzo-*p*-dioxins | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | N/A |
| heptachlorodibenzofurans | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | N/A |
| hexachlorodibenzo-*p*-dioxins | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | N/A |
| indeno(1,2,3-cd)pyrene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 890 |
| 4-methylphenol | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 2,600,000 |
| naphthalene[1] | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 190,000 |
| octachlorodibenzo-*p*-dioxin | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 10 |
| PCB | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 210 |
| pentachlorodibenzofurans | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 1,200 |
| phenanthrene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 14,000,000 |

## Table 2-8
## HHRA and WQSA RAOs for SVOCs

| Contaminant[1] | Model | Water Quality Site Assessment Threshold for Given Maximum Depths of Contamination (µg/kg [soil]) | | | | | | HHRA RAOs[3] (Residential Scenario) |
|---|---|---|---|---|---|---|---|---|
| | | Shallow | | Deep | | | | < 15 feet |
| | | 0-10' | 10-20' | 20-30' | 30-40' | 40-50' | 50-60' | (µg/kg) |
| pyrene | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 14,000,000 |
| tetrachlorodibenzo-*p*-dioxins | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | 0 |
| tetrachlorodibenzofurans | VLEACH1 | 82,907.0 | 82,907.0 | 82,907.0 | 82,907.0 | 21,969.0 | 1,707.6 | N/A |

**Notes**

1 Naphthalene is also included in the Volatile Organic Compound RAO summary.

2 WQSA thresholds for SVOCs are based upon modeling results for naphthalene, not the individual compounds listed. Naphthalene was selected to conservatively represent the SVOCs.

3 All human health risk assessment RAOs were calculated during the RI/FS using the methodology outlined in *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual Part A,* Interim Final (EPA, 1989) and updated in 2001 (Jacobs, 2001). The RAOs were generally established at the lowest level of either the concentration that represents a cancer risk of 1E-06, or the concentration that represents a chemical-specific non-cancer hazard quotient of 1.

| | |
|---|---|
| µg/kg | micrograms per kilogram |
| HHRA | human health risk assessment |
| N/A | not applicable |
| RAO | remedial action objective |
| VLEACH1 | vadose zone model with 1 foot mixing zone |
| SVOC | semivolatile organic compound |
| WQSA | water quality site assessment |

## Table 2-9
## HHRA and WQSA RAOs for Metals and Other Inorganics

| Contaminant | Water Quality Site Assesment Threshold for Metals[3] (µg/kg) | HHRA RAOs[6] (Residential Scenario) (µg/kg) | SCOU Shallow Silts Threshold Background Value (µg/kg) |
|---|---|---|---|
| **Metals/Other Inorganics** | | | |
| aluminum | 71,103,000 | 100,000,000 | 16,200,000 |
| antimony | 11,500 | 280,000 | 6,700 |
| arsenic[4] | 20,000 | 1,000 | 9,900 |
| barium | 2,775,000 | 44,000,000 | 319,000 |
| beryllium | 7,600 | 910,000 | 890 |
| cadmium | 43,700 | 4,400 | 500 |
| chromium | 2,500,000 | 100,000,000 | 29,400 |
| cobalt | 349,000 | 42,000,000 | 12,800 |
| copper | 244,000 | 26,000,000 | 53,600 |
| lead | 855,000 | 400,000 | 7,400 |
| manganese[5] | 228,000 | 12,000,000 | 1,100,000 |
| molybdenum | 95,000 | 3,500,000 | 590 |
| mercury | 100 | 210,000 | 100 |
| nickel[1] | 1,167,000 | 8,400,000 | 29,600 |
| selenium | 32,000 | 3,500,000 | 500 |
| silver | N/A | 3,500,000 | 300 |
| thallium[2,5] | 20,000 | 47,000 | 40,000 |
| vanadium | 629,000 | 4,900,000 | 70,200 |
| zinc | 319,000 | 100,000,000 | 70,200 |

# Table 2-9
## HHRA and WQSA RAOs for Metals and Other Inorganics

**Notes**

1 Nickel (soluble salts)

2 Thallic Oxide

3 WQSA values derived using DLM; depth interval assumed–40 to 65 ft bgs.

4 The arsenic RAO is less than the threshold background value (TBV) so the TBV would take precedence as the RAO.

5 The manganese and thallium WQSA thresholds are less than their respective TBVs, so the TBVs take precedence as the WQSA thresholds.

6 All human health risk assessment RAOs were calculated during the RI/FS using the methodology outlined in *Risk Assessment Guidance for Superfund: Volume 1, Human Health Evaluation Manual Part A,* Interim Final (EPA, 1989) and updated in 2001 (Jacobs, 2001). The RAOs were generally established at the lowest level of either the concentration that represents a cancer risk of 1E-06, or the concentration that represents a chemical-specific non-cancer hazard quotient of 1. The RAO for lead was established as the level that would not result in an estimated blood-lead level greater than 10 µg/dL.

| | |
|---|---|
| µg/kg | micrograms per kilogram |
| DLM | California Water Board, Designated Level Methodolgy |
| HHRA | human health risk assessment |
| RAO | remedial action objective |
| SCOU | Source Control Operable Unit |
| WQSA | Water Quality Site Assessment |

## Table 2-10
## Waste Consolidated in Landfill 4 and Landfill 5

| Landfill (LF) | Volume (cubic yards) | Disposal Period | Waste Types |
|---|---|---|---|
| **LF-4 (1)** | 93,200 | 1957 - 1970 | household/commercial |
| **Additional Waste Consolidated at LF-4 from:** | | | |
| LF-2 | 53,600 | 17-Dec-97 to 26-Feb-98; 10-Aug-98 to 11-Sep-98 | household/commercial/construction debris |
| CVLF-A | 8,700 | 20-Oct-97 to 27-Oct-97 | household |
| CVLF-B | 63,000 | 28-Oct-97 to 15-Dec-97 | household/construction debris/burned waste |
| LF-1 | 117,000 | 18-Jan-99 to 29-Apr-99 | household/construction debris/soil |
| CERCLA/Petro. Hydrocarbon Sites | 6,200 | 31-May-99 to 18-Aug-99 | soil with TEPH and TVPH levels less than LF acceptance criteria |
| **Non-Landfill Wastes Received at LF-4:** | | | |
| Excavated soil from soil treatment cell | 9,400 | 17-Nov to 21-Nov-97 | treated soils with VOC levels less than LF acceptance criteria |
| Soil from Haz Waste Drum Storage Fac | 40 | 8-Jan-98 | soil with VOC levels less than LF acceptance criteria |
| Soil from PCB-9 | 30 | 26-Jan-98 | soil with PCB levels less than LF acceptance criteria |
| Two drums TEPH contaminated soil | 0.18 | 24-Feb-98 | 5 cu. ft - soil TEPH levels less than LF acceptance criteria |
| **Total Estimated Waste Volume at LF-4:** | **351,170** | | |
| | | | |
| **LF-5 (1)** | 100,000 | 1971 - 1977 | household/commercial/construction/demolition debris |
| **Additional Waste Consolidated at LF-5 from:** | | | |
| LF-1 | 11,000 | 14-Jan-99 to 6-Mar-99 | household/construction debris/soil |
| LF-3 | 57,000 | 16-Nov-98 to 4-Mar-99 | household/construction debris/soil with lead levels less than LF acceptance criteria |
| Firing Range | 11,400 | 01-Aug-99 to 14-Sep-99 | soil berms with lead levels less than LF acceptance criteria |
| **Non-Landfill Wastes Received at LF-5:** | | | |
| Concrete construction rubble from BOP | 17,700 | 4-Nov to 11-Nov-98 | concrete rubble defined as non-hazardous |
| Treated petroleum only soil from LTU | 300 | 8-Sep-99 | soil with VOC levels less than LF acceptance criteria |
| Soil from SVE Decision Study | 70 | 26-Jul-00 | soil with VOC levels less than LF acceptance criteria |
| **Total Estimated Waste Volume at LF-5:** | **197,470** | | |

Note: (1) Includes waste consolidated within the landfill footprint area from the following outlying landfill trench areas (in cubic yards):

**LF-4 Trenches**: Cell 1, Trench (Tr.) 'D' - **320**; Cell1, Tr. I/J - **2,415**; Cell 1, Tr. G - **300**; Cell 2, Tr. K - **3,589** = **6,624**

**LF-5 Trenches**: Tr. 'A' - **5,938**; Tr. 'B' - **6,501**; Tr. 'C' - **635**; Tr. 'D' - **933**; Tr. 'H' - **463**; Tr. 'J' - **3,609**; Tr. 'L' - **1,397** = **19,476**

## Table 2-11
## U.S. Environmental Protection Agency Evaluation Criteria

| THRESHOLD CRITERIA |
|---|
| **Overall Protection of Human Health and the Environment** – Addresses whether or not a cleanup option provides adequate protection and describes how risks, posed through each pathway, are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.<br><br>**Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** – Addresses whether a cleanup option will meet all ARARs and/or provide grounds for invoking a waiver. |
| **BALANCING CRITERIA** |
| **Long-Term Effectiveness or Permanence** – Refers to the ability of a cleanup option to maintain reliable protection of human health and the environment, over time, once cleanup goals (i.e. remedial action objectives) have been met.<br><br>**Reduction of Toxicity, Mobility, and Volume through Treatment** – Refers to the anticipated ability of a cleanup option to reduce the toxicity, mobility, and volume of the hazardous components present at the site.<br><br>**Short-Term Effectiveness** – Addresses the period of time needed to complete the cleanup option, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the cleanup goals (i.e. remedial action objectives) are achieved.<br><br>**Implementability** – Refers to the technical and administrative feasibility of a cleanup option, including the availability of materials and services needed to carry out a particular option.<br><br>**Cost** – Refers to the estimated capital and operation and maintenance costs of each option. |
| **MODIFYING CRITERIA** |
| **State Acceptance** – indicates whether, based on its review of the information, the state concurs with, opposes to, or has no comment on the preferred cleanup options.<br><br>**Community Acceptance** – Indicates whether community concerns are addressed by the cleanup option and whether or not the community has a preference for a cleanup option. |

## Table 2-12
## FS Evaluation of Alternatives for LF-4 and LF-5

| Remedial Alternative | Overall Protection of Human Health and the Environment | Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) | Long-Term Effectiveness and Permanence | Reduction of Toxicity, Mobility or Volume | Short-Term Effectiveness | Implementability | Cost | Agency Acceptance | Community Acceptance | Total Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Action | 2 | 3 | 2 | 1 | 5 | 5 | 5 | N/A | N/A | 23 | 6 |
| Excavation and Transport to Offsite Landfill | 5 | 5 | 5 | 5 | 3 | 3 | 1 | N/A | N/A | 27 | 2 |
| Disposal at Onsite Consolidation Landfill | 4 | 5 | 4 | 4 | 3 | 3 | 3 | N/A | N/A | 26 | 4 |
| Class III Cap | 3 | 5 | 3 | 3 | 5 | 5 | 3 | N/A | N/A | 27 | 2 |
| Evapotranspiration Cap | 3 | 5 | 3 | 3 | 5 | 5 | 1 | N/A | N/A | 25 | 5 |
| Zoning | 4 | 5 | 4 | 4 | 3 | 4 | 4 | N/A | N/A | 28 | 1 |

**Notes**

FS feasibility study

LF landfill

NA not apllicable to the FS evaluation

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| **OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT** | **1** | **4** | **4** | **4** | **4** |
| Does alternative achieve adequate protection? | No | Yes | Yes | Probably will not meet PRAO for diesel | Probably will not meet PRAO for diesel |
| Are risks posed through each pathway addressed by the alternative? | N/A | Yes | Yes | Yes | Yes |
| | | | | | |
| **COMPLIANCE WITH ARARs** | **1** | **5** | **5** | **5** | **5** |
| Does alternative comply with chemical-specific ARARs? | Yes | Yes | Yes | Yes | Yes |
| Does alternative comply with action-specific ARARs? | Yes | Yes | Yes | Yes | Yes |
| Does alternative comply with location-specific ARARs? | Yes | Yes | Yes | Yes | Yes |
| Does alternative comply with other criteria, advisories, guidances? | No (PWQSA) | Yes | Yes | Waiver of PRAO for diesel probable | Waiver of PRAO for diesel probable |
| | | | | | |
| **LONG-TERM EFFECTIVENESS AND PERMANENCE** | **1** | **2** | **3** | **2** | **3** |
| MAGNITUDE OF RESIDUAL RISK | | | | | |
| What is the magnitude of remaining risk? | 1-10-3 | <10-6 | <10-6 | <10-6 | <10-6 |
| What remaining sources of risk can be identified? | Metals, VOCs, SVOCs, dioxins, PAHs, diesel and gasoline components | None | None | None | None |
| How much is due to treatment residuals, and how much is due to untreated residual contamination? | N/A | 10% treatment residuals/ 90% untreated residuals | 50% treatment residuals/ 50% untreated residuals | 10% treatment residuals/ 90% untreated residuals | 50% treatment residuals/ 50% untreated residuals |
| Will a 5-year review be required? | Yes | | | | |

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| ADEQUACY AND RELIABILITY OF CONTROLS | | | | | |
| What is likelihood that technologies will meet required process efficiencies or performance specifications? | N/A | High | High | Moderate | Moderate |
| What type and degree of long-term management is required? | LTGSP (16 to 30 years) | None | None | None | None |
| What are the requirements for long-term monitoring? | Quarterly | Quarterly | Quarterly | Quarterly | Quarterly |
| What operation and maintenance functions must be performed? | N/A | See Section 5.7.2 in FS | See Section 5.7.3 in FS | See Section 5.7.4 in FS | See Section 5.7.5 in FS |
| What difficulties and uncertainties may be associated with long-term operation and maintenance? | N/A | None, short term | None, short term | None, short term | None, short term |
| What is the potential need for replacement of technical components? | N/A | Low | Low | Low | Low |
| What is the magnitude of threats or risks should the remedial action need replacement? | N/A | Minimal: increase time to cleanup | Minimal: increase time to cleanup | Minimal: increase time to cleanup | Minimal: increase time to cleanup |
| What is the degree of confidence that controls can adequately handle potential problems? | N/A | High | High | High | High |
| What are the uncertainties associated with land disposal of residuals and untreated wastes? | N/A | Minimal subject to successful treatability testing for solidification/ stabilization | Minimal subject to successful treatability testing for soil washing | Minimal subject to successful treatability testing for solidification/ stabilization | Minimal subject to successful treatability testing for soil washing |
| | | | | | |
| **REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT** | **1** | **4** | **4** | **4** | **4** |
| TREATMENT PROCESS AND REMEDY | | | | | |
| Does the treatment process employed address the principal threat? | N/A | Yes | Yes | Yes | Yes |
| Are there any special requirements for the treatment process? | N/A | Treatability test required | Treatability test required | Treatability test required | Treatability test required |

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| AMOUNT OF HAZARDOUS MATERIAL DESTROYED OR TREATED | | | | | |
| What portion (mass, volume) of the contaminated material is destroyed? | None | None | None | None | None |
| What portion (mass, volume) of the contaminated material is treated? | None | All soil above PRAOs | All soil above PRAOs | All soil above PRAOs | All soil above PRAOs |
| REDUCTION IN TOXICITY, MOBILITY, OR VOLUME | | | | | |
| To what extent is the total mass of toxic contaminants reduced? | None | >90% | >90% | >90% | >90% |
| To what extent is the mobility of toxic contaminants reduced? | None | High | High | High | High |
| To what extent is the volume of toxic contaminants reduced? | None | >90% | >90% | >90% | >90% |
| IRREVERSIBILITY OF THE TREATMENT | | | | | |
| To what extent are the effects of treatment irreversible? | N/A | Unknown for solidification/ stabilization | 100% | Unknown for solidification/ stabilization | 100% |
| TYPE AND QUANTITY OF TREATMENT RESIDUAL | | | | | |
| What residuals remain? | N/A | Solidified soil | Filter cake; contaminated water | Solidified soil | Filter cake; contaminated water |
| What are their quantities and characteristics? | N/A | >5000 cubic yards; cement like | Thickened solids; >3000 cubic yards. | >5000 cubic yards; cement like | Thickened solids; >3000 cubic yards. |
| What risks do treatment residuals pose? | N/A | Unknown in long-term | Unknown; will be disposed offsite | Unknown in long-term | Unknown; will be disposed offsite |
| STATUTORY PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT | | | | | |
| Are principal threats within the scope of the action? | N/A | Yes | Yes | Yes | Yes |
| Is treatment used to reduce inherent hazards posed by principal threats at the site? | No | Yes, subject to successful treatability testing for solidification/ stabilization | Yes, subject to successful treatability testing for soil washing | Yes, subject to successful treatability testing for solidification/ stabilization | Yes, subject to successful treatability testing for soil washing |

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| **SHORT-TERM EFFECTIVENESS** | **5** | **3** | **3** | **3** | **3** |
| PROTECTION OF COMMUNITY DURING REMEDIAL ACTIONS | | | | | |
| What are the risks to the community during remedial actions that must be addressed? | N/A | Off-gas, dust | Off-gas, dust, and filter cake/water | Off-gas, dust and spent carbon | Off-gas, dust, spent carbon and filter cake/water |
| How will the risks to the community be addressed and mitigated? | N/A | Catalytic oxidation, Health/Safety Plan | Catalytic oxidation, Health/Safety Plan | Catalytic oxidation, Health/Safety Plan, regen. carbon offsite | Catalytic oxidation, Health/Safety Plan, regen. carbon offsite |
| What risks remain to the community that cannot be readily controlled? | N/A | None | None | None | None |
| PROTECTION OF WORKERS DURING REMEDIAL ACTIONS | | | | | |
| What are the risks to the workers that must be addressed? | N/A | Same to community | Same to community | Same to community | Same to community |
| What risks remain to the workers that cannot be readily controlled? | N/A | None | None | None | None |
| How will the risks to the workers be addressed and mitigated? | N/A | Same | Same | Same | Same |
| ENVIRONMENTAL IMPACTS | | | | | |
| What environmental impacts are expected with the construction and implementation of the alternative? | N/A | Dust | Dust | Dust | Dust |
| What are the available mitigation measures to be used and what is their reliability to minimize potential impacts? | N/A | Good construction practices | Good construction practices | Good construction practices | Good construction practices |
| What are the impacts that cannot be avoided should the alternative be implemented? | N/A | None | None | None | None |
| TIME UNTIL REMEDIAL RESPONSE OBJECTIVES ARE ACHIEVED | | | | | |
| How long until protection against threats being addressed by the specific action is achieved? | N/A | 44 months | 44 months | 11 months | 11 months |
| How long until any remaining site threats will be addressed? | N/A | Same as above | Same as above | Same as above | Same as above |
| How long until remedial response objectives are achieved? | N/A | Same as above | Same as above | Same as above | Same as above |

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| **IMPLEMENTABILITY** | **5** | **4** | **2** | **2** | **1** |
| ***TECHNICAL FEASIBILITY*** | | | | | |
| ABILITY TO CONSTRUCT AND OPERATE TECHNOLOGY | | | | | |
| What difficulties may be associated with construction? | N/A | Drilling/ excavation around buildings | Drilling/ excavation around buildings | Drilling/ excavation around buildings | Drilling/ excavation around buildings |
| What uncertainties are related to construction? | N/A | Number of wells | Number of wells | Number of wells | Number of wells |
| RELIABILITY OF TECHNOLOGY | | | | | |
| What is the likelihood that technical problems will lead to schedule delays? | N/A | Low SVE, Bioventing; moderate solidification/ stabilization | Low SVE, Bioventing; high soil washing | Low Thermally-enhanced SVE; moderate solidification/ stabilization | Low Thermally-enhanced SVE; high soil washing |
| EASE OF UNDERTAKING ADDITIONAL REMEDIAL ACTION, IF NECESSARY | | | | | |
| What likely future remedial actions may be anticipated? | N/A | None | None | None | None |
| How difficult would it be to implement the additional remedial actions, if required? | N/A | N/A | N/A | N/A | N/A |
| MONITORING CONSIDERATIONS | | | | | |
| Do migration or exposure pathways exist that cannot be monitored adequately? | N/A | No | No | No | No |
| What risks of exposure exist should monitoring be insufficient to detect failure? | N/A | Inhalation of off-gas | Inhalation of off-gas | Inhalation of off-gas and hydrocarbon in sewer | Inhalation of off-gas and hydrocarbon in sewer |

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| ***ADMINISTRATIVE FEASIBILITY*** | | | | | |
| COORDINATION WITH OTHER AGENCIES | | | | | |
| What steps are required to coordinate with other agencies? | N/A | EPA/state approval of ROD | EPA/state approval of ROD | EPA/state approval of ROD | EPA/state approval of ROD |
| What steps are required to set up long-term or future coordination among agencies? | N/A | 5 yr. review | 5 yr. review | 5 yr. review | 5 yr. review |
| Can permits for offsite activities be obtained if required? | N/A | Yes | Yes | Yes | Yes |
| | | | | | |
| ***AVAILABILITY OF SERVICES AND MATERIALS*** | | | | | |
| AVAILABILITY OF TREATMENT, STORAGE CAPACITY, AND DISPOSAL SERVICES | | | | | |
| Are adequate treatment, storage capacity, and disposal services available? | N/A | Yes | Yes | Yes | Yes |
| How much additional capacity is necessary? | N/A | None | None | None | None |
| Does the lack of capacity prevent implementation? | N/A | N/A | N/A | N/A | N/A |
| What additional provisions are required to provide the needed additional capacity? | N/A | N/A | N/A | N/A | N/A |
| AVAILABILITY OF NECESSARY EQUIPMENT AND SPECIALISTS | | | | | |
| Are the necessary equipment and specialists available? | N/A | Yes | Yes | Yes | Yes |
| What additional equipment and specialists required? | N/A | None | None | None | None |
| Does the lack of equipment and specialists prevent implementation? | N/A | N/A | Delays possible | Delays possible | Delays possible |
| What special provisions are required to provide the needed equipment and specialists? | N/A | None | Longer lead times | Longer lead times | Longer lead times |

## Table 2-13
## FS Evaluation of Alternatives for FTA-1

| CRITERIA | No Action Alternative | SVE/Bioventing/ Solidification/ Stabilization | SVE/Bioventing/ Soil Washing | Thermally-Enhanced SVE/ Solidification/ Stabilization | Thermally-Enhanced SVE/Soil Washing |
|---|---|---|---|---|---|
| AVAILABILITY OF PROSPECTIVE TECHNOLOGIES | | | | | |
| Are technologies under consideration generally available and sufficiently demonstrated for the specific application? | N/A | Yes | Probably; Soil washing processes have been recently commercialized | Probably; Limited commercial experience with thermally-enhanced SVE | Probably; Soil washing processes have been recently commercialized, limited commercial experience with thermally-enhanced SVE |
| Will technologies require further development before they can be applied full-scale to the type of waste at the site? | N/A | No | No | No | No |
| When should the technology be available for full-scale use? | N/A | N/A | N/A | N/A | N/A |
| Will more than one vendor be available to provide a competitive bid? | N/A | Yes | Yes; Limited number of vendors experienced with soil washing | Yes; Limited number of vendors experienced with thermally-enhanced SVE | Yes; Limited number of vendors experienced with thermally-enhanced SVE |
| | | | | | |
| **COST** | **5** | **3** | **1** | **3** | **1** |
| Cost Comparison | $782,000 | $10,375,000 | $14,080,000 | $10,100,000 | $13,700,000 |

**Notes**

Source: Source Control Operable Unit Remedial Investigation/Feasibility Study (Jacobs, 1997a)

| | | | | | |
|---|---|---|---|---|---|
| EPA | Environmental Protection Agency | PRAO | preliminary remediation action objective | SVE | soil vapor extraction |
| LTGSP | Long-Term Groundwater Sampling Program | PWQSA | preliminary water quality site assessment | SVOC | semivolatile organic compounds |
| N/A | not applicable | ROD | remedial action objective | VOC | volatile organic compounds |
| PAH | polynuclear aromatic hydrocarbons | | | | |

## Table 2-14
## FFS Evaluation of Alternatives for ETC-8 and FTA-1 Sites

| Site Name (Associated Sites) | Earth Technology Corporation 8 | Fire Training Area 1 |
|---|---|---|
| **EPA Evaluation Criteria[1]** | | |
| **Alternatives Considered (Selected Alternative Bolded)** | **1) Excavation and Disposal**<br>2) Institutional Control | **1) Capping**<br>2) Excavation and Off-site Disposal<br>3) Solidification and Stabilization |
| **Long-Term Effectiveness (LTE)** | Both alternatives were ranked equally for providing long-term effectiveness and permanence. | Excavation and off-site disposal (E&D) ranked higher than capping and solidification/stabilization because all soils that exceed RAOs would be removed from the site. Capping and solidification/stabilization ranked lower than E&D, but equally with one another because both would eliminate or minimize routes of exposure |
| **Implementability** | IC was ranked higher than E&D because no physical action would be required to implement ICs. | Capping and E&D were ranked equally for implementability. Solidification/stabilization was ranked lower because VOCs can interfere with bonding agents and pilot studies might be required to implement the alternative. |
| **Short-Term Effectiveness** | IC was ranked higher for short-term effectiveness than E&D because there is no physical action with IC and E&D would result in some short-term risks due to excavation and transportation. | Capping and was ranked higher than E&D or solidification/stabilization for short-term effectiveness. Capping could be implemented concurrently with the VOC remedy (SVE). E&D and solidification/stabilization would require more excavation and contaminated soil handling than capping, with more potential for exposure during remedy implementation. |
| **Reduction of Toxicity, Mobility, or Volume (TMV)** | E&D was ranked higher than IC for reduction of TMV because E&D would permanently remove contaminants from the site. | Solidification/stabilization was ranked higher for reduction of TMV than capping or E&D because it is the treatment alternative and reduces both toxicity and mobility, although it increases volume. |
| **Cost** | IC was ranked higher than E&D for cost. Estimated cost to implement and maintain ICs was $50,000; estimated cost for E&D was $180,000 – $200,000. | Capping was ranked higher than E&D or solidification/stabilization for cost. Estimated cost for capping was $1,143,000; estimated cost for E&D was $1,265,000; estimated cost for solidification/stabilization was $2,357,000. |
| **Regulatory Acceptance** | All of the alternatives are considered acceptable by the regulatory agencies. | All of the alternatives are considered acceptable by the regulatory agencies. |
| **Community Acceptance** | The community considers E&D to be the most acceptable alternative. The community is opposed to IC. | The community considers E&D to be the most acceptable alternative. The community is opposed to capping or solidification/stabilization because both would require ICs. |

**Notes**

Sources: *Comprehensive Basewide Proposed Plan–Part 2* (Jacobs, 2003); *FTA-1 Focused Feasibility Study–Volume 1: Final Remedy for Non-VOC Contamination* (Jacobs, 2002c)

[1] Information on how each considered alternative met Overall Protection of Human Health and the Environment and Compliance with ARARs ("Threshold" Criteria) can be found in the Description of Alternatives for Landfill Sites (Section 2.9).

| | | | |
|---|---|---|---|
| E&D | Excavation and off-site disposal | RAO | remedial action objectives |
| ETC-# | Earth Technology Corporation-number | SVE | soil vapor extraction |
| FTA-# | Fire Training Area-number | TMV | toxicity, mobility, or volume |
| IC | institutional controls | VOC | volatile organic compounds |
| LTE | long-term effectiveness | | |

## Table 2-15
## Comparative Analysis of FTA-1 FS Alternatives

| Remedial Alternative | Overall Protection of Human Health and the Environment | Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) | Long-Term Effectiveness and Permanence | Reduction of Toxicity, Mobility, or Volume | Short-Term Effectiveness | Implementability | Cost | Agency Acceptance | Community Acceptance | Total Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No Action Alternative: | 1 | 3 | 1 | 1 | 5 | 5 | 5 | N/A | N/A | 21 | 4 |
| SVE, Bioventing & *Ex Situ* Solidification/ Stabilization | 4 | 5 | 2 | 3 | 3 | 4 | 3 | N/A | N/A | 24 | 1 |
| SVE, Bioventing & *Ex Situ* Soil Washing | 4 | 5 | 3 | 4 | 3 | 3 | 1 | N/A | N/A | 23 | 2 |
| Thermally-Enhanced SVE & *Ex Situ* Solidification/ Stabilization | 4 | 5 | 2 | 3 | 3 | 2 | 3 | N/A | N/A | 22 | 3 |
| Thermally-Enhanced SVE & *Ex Situ* Soil Washing | 4 | 5 | 3 | 4 | 3 | 1 | 1 | N/A | N/A | 21 | 4 |

**Notes**

Source: *FTA-1 Focused Feasibility Study–Volume 1: Final Remedy for Non-VOC Contamination* (Jacobs, 2002c)

N/A Not applicable for the FS evaluation; to be addressed in the Record of Decision

## Table 2-16
## Comparative Analysis of ETC-8 FFS Alternatives

| Remedial Alternative | Overall Protection of Human Health and the Environment | Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) | Long-Term Effectiveness and Permanence | Reduction of Toxicity, Mobility, or Volume | Short-Term Effectiveness | Implementability | Cost | Agency Acceptance | Community Acceptance | Total Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Excavation and Disposal | 5 | 5 | 5 | 5 | 3 | 3 | 1 | TBD | TBD | 27 | 2 |
| Institutional Controls | 5 | 5 | 5 | 1 | 5 | 4 | 3 | TBD | TBD | 28 | 1 |

**Notes**

Source: *Comprehensive Basewide Remedial Investigation/Feasibility Study–Part 2* (CB RI/FS–Part 2) (Jacobs, 2003)

The basis for scoring the criteria is presented in Section 6.6.3 of the CB RI/FS–Part 2 (Jacobs, 2003)

FFS focused feasibility study

TBD to be addressed in the Record of Decision

## Table 2-17
## Comparative Analysis of FTA-1 FFS Alternatives

| Remedial Alternative | Overall Protection of Human Health and the Environment | Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) | Long-Term Effectiveness and Permanence | Reduction of Toxicity, Mobility, or Volume | Short-Term Effectiveness | Implementability | Cost | Agency Acceptance | Community Acceptance | Total Score | Ranking |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Capping/ Institutional Controls | 5 | 5 | 3 | 3 | 4 | 4 | 5 | TBD | TBD | 29 | 1 |
| Excavation and Offsite Disposal | 5 | 5 | 4 | 3 | 2 | 4 | 3 | TBD | TBD | 26 | 2 |
| Solidification/ Stabilization and Institutional Controls | 5 | 5 | 3 | 4 | 2 | 3 | 1 | TBD | TBD | 23 | 3 |

**Notes**

Source: *FTA-1 Focused Feasibility Study–Volume 1: Final Remedy for Non-VOC Contamination* (Jacobs, 2002c)

The basis for scoring the criteria is presented in Section 3.2.1 of the FTA-1 FFS (Jacobs, 2002c)

FFS focused feasibility study

TBD to be addressed in the Record of Decision

## Table 2-18
## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches)
## (Selected Remedy – Cap Maintenance and Monitoring and ICs and [for LF-5, DP-8, DP-8A and Landfill 5 Trenches only] Long-Term Ecological Monitoring)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **Federal**<br>National Primary Drinking Water Standards | 40 CFR 141.61 | Relevant and Appropriate | Maximum contaminant levels for drinking water and monitoring and analytical requirements. | |
| **Federal**<br>Resource Conservation and Recovery Act, Subtitle D | 40 CFR 258.60(i) | Applicable | A notification must be added to the deed or any equivalent instrument to notify a purchaser that the property was used as a landfill. | Notification of landfill use must remain with the deed in perpetuity; can only be removed if wastes removed. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20385 | Applicable | Establishes required groundwater programs, i.e., detection monitoring, evaluation monitoring, corrective action. | There are approved CPCMPs for LF-4 and LF-5 and post-closure maintenance and monitoring is ongoing. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20405 | Applicable | Establishes/defines the Point of Compliance for groundwater monitoring. | Point of Compliance wells are established for the ongoing detection monitoring program. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20415 | Applicable | General Water Quality Monitoring and System Requirements: Defines the groundwater monitoring systems (detection and evaluation monitoring and corrective action program) and sampling and analysis program requirements to ensure monitoring results that provide an accurate representation of groundwater quality at background and downgradient locations. | There are approved CPCMPs for LF-4 and LF-5 and post-closure maintenance and monitoring is ongoing. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27CCR 20420 | Applicable | Detection Monitoring Program: Establishes requirements for the detection monitoring program for a closed landfill. | There are approved CPCMPs for LF-4 and LF-5 and post-closure maintenance and detection monitoring is ongoing. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20425 | Applicable | Evaluation Monitoring Program: Establishes requirements for evaluation monitoring if detection monitoring indicates a release. | The approved CPCMPs for LF-4 and LF-5 post-closure maintenance and monitoring include evaluation monitoring programs. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20430 | Applicable | Corrective Action Program: Establishes requirements for corrective action if a release is determined to have occurred. | The approved CPCMPs for LF-4 and LF-5 post-closure maintenance and monitoring include corrective action programs. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20921 | Applicable | Gas Monitoring and Control During Closure and Post Closure: Landfill gases must be collected and analyzed; the concentration of combustible gas at the landfill boundary must be 5% or less, trace gases must be controlled to prevent adverse acute and chronic exposure to toxic and/or carcinogenic compounds. Implementation of the program is defined under 27 CCR 20923 through 20934. If the results of the gas monitoring program indicate methane levels in excess of compliance levels, controls must be implemented to abate the problem under 27 CCR 20937. | There are approved CPCMPs for LF-4 and LF-5 and post-closure maintenance and monitoring is ongoing. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20923 | Applicable | Monitoring: Requires landfill gas monitoring system to ensure requirements of 27 CCR Section 20921 are met. Requires monitoring system to be designed to detect gas migrating beyond landfill property boundary and into onsite structures, and to account for:<br>• Local soil conditions<br>• Hydrogeological conditions<br>• Locations of waste areas and structures<br>• Adjacent land use and inhabitable structures within 1,000 feet of the landfill boundary<br>• Man-made pathways<br>• Nature, age, and gas generation potential of the waste. | Same as above. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20925 | Applicable | Perimeter Monitoring Network: Requires landfill gas monitoring network around waste deposit perimeter and disposal site boundary, unless certain conditions are met. Specifies location, spacing, depth, and construction of soil gas monitoring wells, including:<br>• Location around perimeter<br>• Spacing not to exceed 1,000 ft<br>• Probe at shallow; mid-depth in waste; and at waste depth<br>• Construction as specified. | Same as above. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20932, 20933 and 20934 | Applicable | Monitoring Parameters and Frequency: Requires sampling of monitoring probes for methane and for trace gases that may pose acute or chronic exposure risk due to toxic or carcinogenic compounds. Quarterly sampling is required unless more frequent sampling is necessary because of site-specific factors to ensure compliance with 27 CCR 20921. Monitoring results must be submitted to the enforcing agency within 90 days. | Same as above. |

## Table 2-18

### Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches)

### (Selected Remedy – Cap Maintenance and Monitoring and ICs and [for LF-5, DP-8, DP-8A and Landfill 5 Trenches only] Long-Term Ecological Monitoring)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 20937 | Applicable | When gas monitoring results show methane is exceeding the levels established in 27 CCR 20921 (1.25% volume air within onsite structures or 5% at the landfill boundary), requires taking of all steps necessary to protect public health, safety, and the environment. Also requires the design and construction of a gas control system to:<br>• Prevent methane accumulation in onsite structures<br>• Reduce methane at the landfill boundary to below compliance levels<br>• Reduce trace gases<br>• Collect and treat landfill gas condensate<br>Requires a system for monitoring and adjustment to assure optimum operating efficiency. | The final closure design and gas monitoring data to date indicate that gas levels will not exceed the designated levels. Per the approved post-closure maintenance plan, appropriate actions will be implemented if the gas monitoring program indicates exceedance of the levels. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 21090 (b)(1), (c), (e)(2) | Applicable | Closure and Post-Closure Maintenance Requirements for Solid Waste Landfills: Establishes required activities for the post-closure period – maintain integrity of containment structures and final cover; maintain leachate and groundwater monitoring systems; prevent erosion and related damage; protect and maintain surveyed monuments. | Same as above. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 21170 | Applicable | Recording: A detailed description of the closed landfill, including a map, will be filed with the county in which the site is located, with the state enforcement agency (DTSC) and with the local agency responsible for the county integrated waste management plan (Merced County Environmental Health). The description will include the closure date, site boundaries, location of closure and post-closure plans and a statement that future site use is restricted in accordance with the posy-closure maintenance plan. | Information will be filed with the Merced County Recorder's Office at transfer. Approved CPCMPs designate future land use for both LF-4 and LF-5 as "nonirrigated open space." |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 21180 | Applicable | Post-Closure Maintenance: Post-closure maintenance/monitoring will be conducted for a period of not less than 30 years after completion of closure unless it can be demonstrated that the landfill does not pose a threat to public health and safety or a threat to the environment. If the threat has been eliminated, post-closure maintenance can be discontinued. Maintenance and monitoring will include site security, gas monitoring and cover integrity. | Same as above. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 21190 | Applicable | Post Closure Land Use: Site design will implement required factors in the specified section or show development as open space. | Approved CPCMPs designate future land use for both LF-4 and LF-5 as "nonirrigated open space." |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR 21200 | Applicable | Change of Ownership During Closure or Post-Closure Maintenance: A new owner must be notified of the existence of the landfill post-closure requirements before title is transferred. | In addition to deed restrictions, any change in or transfer of ownership or legal responsibility for the landfills, including transfers between government agencies, post-closure requirements and history will be disclosed. |
| **State**<br>California Maximum Contaminant Levels | 22 CCR 64444 | Relevant and Appropriate (if more stringent than the federal standard) | Maximum contaminant levels for drinking water. | |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(a) | Relevant and Appropriate | Requires imposition of appropriate limitations on land use by recorded land use covenant when hazardous substances remain on property at levels that are not suitable for unrestricted use of the land. | Limitations on future land use are addressed by CPCMPs for both LF-4 and LF-5. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(b) | Relevant and Appropriate | Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations. | Existing CPCMPs establish land use limitations (non-irrigated open space); the existing CPCMPs will be updated as appropriate to implement other ICs. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(d) | Relevant and Appropriate | Requires that the Land Use Covenant be recorded in the county where the site is located. | A State Land Use Covenant will be prepared and recorded in Merced County. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(i) | Relevant and Appropriate | Definitions | Defines terms in State Land Use Covenant regulations |
| **State**<br>California Civil Code | California Civil Code Section 1471(a) & (b) | Relevant and Appropriate | Specifies requirements for land use covenants to apply to successors in title to the land. | |
| **Federal**<br>Protection of Wetlands | E.O. 11990;<br>40 CFR 6.302(a); and<br>40 CFR 6, Appendix A | Applicable to LF-5; NA to LF-4 because no wetlands are present | Requires Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands. | Evaluation of impact minimization to wetlands required and potential mitigation. Long-term ecological monitoring is part of selected remedy. |
| **Federal**<br>Endangered Species Act of 1973 | 40 CFR 6.320(h) and 50 CFR 402 | Applicable to LF-5 (vernal pool fairy shrimp habitat); NA to LF-4 because no wetlands are present | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Long-term ecological monitoring is part of selected remedy and will be conducted in a manner so as to minimize impacts to the LF-5 wetlands. |

## Table 2-18

## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) (Selected Remedy – Cap Maintenance and Monitoring and ICs and [for LF-5, DP-8, DP-8A and Landfill 5 Trenches only] Long-Term Ecological Monitoring)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **State**<br>California Endangered Species Act | FGC Division 3, Chapter 1.5, Section 2050 et seq. | Applicable to LF-5 (Colusa grass habitat); NA to LF-4 because no wetlands are present | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Same as above. |

**Notes**

| | | | |
|---|---|---|---|
| ARARs | applicable or relevant and appropriate requirements | E.O. | Executive Order |
| CCR | California Code of Regulations | IC | institutional control |
| CFR | Code of Federal Regulations | LF | landfill |
| CPCMP | Closure Post-Closure Maintenance Plan | NA | not applicable |
| DP | disposal pit | NEPA | National Environmental Policy Act |
| DTSC | Department of Toxic Substances Control | | |

## Table 2-19
## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – ETC-8
## (Selected Remedy – Excavation and Disposal)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **State**<br>Hazardous Waste Control Law | 22 CCR 66268 | Applicable to remediation wastes (excavated soil) at the ETC-8 site | Identifies hazardous wastes that are restricted from land disposal in California | |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.3 | Applicable | Defines wastes that must be treated as hazardous. | |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.30 | Applicable | Lists RCRA hazardous wastes for California | |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.100 | Applicable | Lists criteria to identify a RCRA hazardous waste. | |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.101 | Applicable | Lists criteria to identify a non-RCRA hazardous waste | |
| **State**<br>Porter-Cologne Water Quality Control Act (California Water Code Sections 13000 et seq.) | 27 CCR 20200(c) and 20210 | Applicable | Requires that designated waste be discharged to Class I or Class II waste management units. | Applies to discharges of designated waste (nonhazardous waste that could cause degradation of surface or ground waters) to land for treatment, storage, or disposal. |
| **State**<br>Porter-Cologne Water Quality Control Act (California Water Code Sections 13000 et seq.) | 27 CCR 20200(c) and 20220 | Applicable | Requires that non-hazardous solid waste be discharged to a classified waste management unit. | Same as above. |
| **State**<br>Porter-Cologne Water Quality Control Act (California Water Code Sections 13000 et seq.) | 27 CCR 20200 | Applicable to excavated soil | Definition of nonhazardous wastes. Excavated soil will be classified and handled in accordance with this regulation. Contaminated soils that remain in the ground are not considered wastes and therefore are not subject to the waste classification requirements. | Wastes that are determined to be nonhazardous may be disposed of at any classified landfill (i.e., Class I, II, or III) that is authorized to accept such waste (27 CCR 20200). Special requirements and restrictions apply to the disposal of liquid wastes. Nonhazardous solid wastes may also be inert wastes if they do not contain hazardous or decomposable wastes or soluble pollutants at concentrations exceeding applicable water quality objectives. Inert wastes do not have to be disposed of at classified landfills. |
| **State**<br>Porter-Cologne Water Quality Control Act (California Water Code Sections 13000 et seq.) | 23 CCR 13173 | Applicable to excavated soil | Definition of designated wastes. Designated wastes are either exempted hazardous wastes or nonhazardous wastes that contain pollutants at levels that threaten water quality (23 CCR 13173). Designated wastes must be disposed of at Class I or II landfills (27 CCR 20200). | |
| **Local**<br>San Joaquin Valley Unified Air Pollution Control District | Rule 8020 | Relevant and appropriate to any on-site excavation or temporary storage of hazardous soils and remediation wastes prior to off-site transport and treatment or disposal. | Requirements for control of fine particulate matter ($PM_{10}$) from construction, demolition, excavation, and extraction. Limits fugitive particulate emissions. Requires appropriate dust control measures during excavation, soil stabilization methods for storage piles of dirt, and limits visible dust emissions from on-site unpaved roads. | Rule 8010 exempts remedial actions from these and all fugitive particulate prohibitions because they are "actions required to protect the environment by federal or state law or regulation." Therefore, fugitive particulate emissions prohibitions are not applicable, but are relevant and appropriate. Visible dust emissions comprise visible dust of such opacity as to obscure an observer's view to a degree equal to or greater than an opacity of 40% for a period or periods aggregated more than 3 minutes in any 1 hour. |

**Notes**

ARARs applicable or relevant and appropriate requirements
CCR California Code of Regulations
ETC Earth Technology Corporation
$PM_{10}$ particulate matter less than 10 microns in diameter
RCRA Resource Conservation and Recovery Act

## Table 2-20
## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – ETC-10
## (Selected Remedy – ICs and Long-Term Ecological Monitoring)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **Federal**<br>Protection of Wetlands | E.O. 11990;<br>40 CFR 6.302(a); and<br>40 CFR 6, Appendix A | Applicable (wetlands adjacent to ETC-10) | Requires Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands. | Evaluation of impact minimization to wetlands required and potential mitigation. Long-term ecological monitoring is part of selected remedy. |
| **Federal**<br>Endangered Species Act of 1973 | 40 CFR 6.320(h) and 50 CFR 402 | Applicable (vernal pool fairy shrimp habitat) | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Long-term ecological monitoring will be conducted in wetlands associated with ETC-10 to verify no deleterious impact to ecological resources. Existing controls (within BoP wetlands preservation area) and additional ICs, if appropriate, will preclude land use/activities detrimental to ecological resources. |
| **State**<br>California Endangered Species Act | FGC Division 3, Chapter 1.5, Section 2050 et seq. | Applicable (Colusa grass habitat) | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Long-term ecological monitoring will be conducted in wetlands associated with ETC-10 to verify no deleterious impact to ecological resources. Existing controls (within BoP wetlands preservation area) and additional ICs, if appropriate, will preclude land use/activities detrimental to ecological resources. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(a) | Relevant and Appropriate | Requires appropriate limitations on future use of sites where hazardous materials will remain at levels not suitable for unrestricted use of the land. Must be executed and recorded with the state (DTSC). | The BoP Preservation Area Mitigation and Management Plan currently addresses limitations on future land use. A State Land Use Covenant will be prepared and recorded. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(b) | Relevant and Appropriate | Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations. | |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(d) | Relevant and Appropriate | Requires that the Land Use Covenant be recorded in the county where the site is located. | A State Land Use Covenant will be prepared and recorded in Merced County. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(i) | Relevant and Appropriate | Definitions | Defines terms in State Land Use Covenant regulations |
| **State**<br>California Civil Code | California civil code Section 1471(a) & (e) | Relevant and Appropriate | Specifies requirements for land use covenants to apply to successors in title to the land. | |

**Notes**

| | | | |
|---|---|---|---|
| ARARs | applicable or relevant and appropriate requirements | E.O. | Executive Order |
| BoP | U.S. Bureau of Prisons | ETC | Earth Technology Corporation |
| CCR | California Code of Regulations | IC | institutional control |
| CFR | Code of Federal Regulations | NEPA | National Environmental Policy Act |
| DTSC | Department of Toxic Substances Control | | |

## Table 2-21
## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – FTA-1
## (Selected Remedy – SVE, Bioventing, Cap Maintenance and Monitoring, ICs, Long-Term Ecological Monitoring and Excavation and Disposal)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **State**<br>Hazardous Waste Control Law | 22 CCR 66268 | Applicable | Identifies hazardous wastes that are restricted from land disposal in California | Applies to remediation wastes (excavated soil) at the FTA-1 site |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.3 | Applicable | Defines wastes that must be treated as hazardous. | Applies to remediation wastes at FTA-1 |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.30 | Applicable | Lists RCRA hazardous wastes for California | |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.100 | Applicable | Lists criteria to identify a RCRA hazardous waste. | |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66261.101 | Applicable | Lists criteria to identify a non-RCRA hazardous waste | |
| **State**<br>Porter-Cologne Water Quality Control Act (California Water Code Sections 13000 et seq.) | 27 CCR 20200(c), 20210 and 20220 | Applicable | Specifies waste characterization requirements and discharge requirements for designated and non-hazardous solid waste. Defines non-hazardous solid waste. | Applies to designated and non-hazardous solid waste for treatment, storage, or disposal. |
| **State**<br>Porter-Cologne Water Quality Control Act (California Water Code Sections 13000 et seq.) | California Water Code Section 13173 | Applicable | Definition of designated wastes. Designated wastes are either exempted hazardous wastes or nonhazardous wastes that contain pollutants at levels that threaten water quality (CWCS 13173). Designated wastes must be disposed of at Class I or II landfills (27 CCR 20200). | Applies to excavated soil |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR, Subchapter 3, (Sections 20385, 20390, 20395, 20405, 20410, 20415 and 20420) | Relevant and appropriate | Definition of water quality monitoring and response programs for waste management units. | FTA-1 is not a waste management unit but the groundwater monitoring specified by Subchapter 3 listed sections are relevant and appropriate for COCs which exceed WQSA thresholds in the vadose zone. |
| **State**<br>California Integrated Waste Management Act of 1989 | 27 CCR, Subchapter 5 (Sections 20950 except 20950(d), 21090 except 21090(e), 21137, 21140(a), 21142(a), 21150 ,21180 and 21190(a)(1)(2), (d). | Relevant and appropriate | Closure and post closure maintenance standards for waste management units. | FTA-1 is not a waste management unit but the cover maintenance and monitoring requirements specified by Subchapter 5 listed sections are relevant and appropriate. The land-use restrictions provided in 21190 (a)(1)(2) and (d) are currently being implemented through an AF/BoP MOU which provides the Air Force, EPA, and State of California continued access to conduct environmental activities and restricts the BoP from any alterations at the sites without notification to the AF, EPA and State of California and written approval of the Air Force. The Air Force will obtain EPA and State of California approval of any requested alterations prior to approving BoP changes. |
| **State**<br>Hazardous Waste Control Law | 22 CCR 66262.11 | Applicable | Hazardous Waste Determination: Sets standards for generators of hazardous waste to determine whether wastes are RCRA or non-RCRA hazardous. | Applies to any hazardous wastes generated during remediation. |
| **Local**<br>San Joaquin Valley Unified Air Pollution Control District | Rule 2201, Section 4.1 | Applicable | New and modified stationary sources; best available control technology. Requires nitrogen oxide and VOC controls on new sources using best available control technology (BACT). There are BACT performance standards for carbon adsorption . | Applies to all new stationary sources. Should emissions of VOCs or nitrogen oxide exceed 2 pounds per day, the emissions unit must apply BACT to ensure greater than 95% removal of the offending analyte(s). For explicit BACT requirements under this rule, refer to San Joaquin Valley Unified Air Pollution Control District BACT Clearinghouse. BACT for Carbon Adsorption is found under Remediation and Waste and Disposal. |
| **Local**<br>San Joaquin Valley Unified Air Pollution Control District | Rule 4651 | Applicable. | Requirements for the control of volatile organic compound emissions from decontamination of soil. VOC-contaminated soil must be monitored during excavation. If VOCs are detected, the stockpile must be covered with a layer of uncontaminated soil no less than 6 inches deep or covered with tarp. | Applies to VOC emissions from the soil stockpiles |

## Table 2-21
## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – FTA-1
## (Selected Remedy – SVE, Bioventing, Cap Maintenance and Monitoring, ICs, Long-Term Ecological Monitoring and Excavation and Disposal)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **Local**<br>San Joaquin Valley Unified Air Pollution Control District | Rule 8020 | Relevant and appropriate | Requirements for control of fine particulate matter ($PM_{10}$) from construction, demolition, excavation, and extraction. Limits fugitive particulate emissions. Requires appropriate dust control measures during excavation, soil stabilization methods for storage piles of dirt, and limits visible dust emissions from on-site unpaved roads. | Rule 8010 exempts remedial actions from these and all fugitive particulate prohibitions because they are "actions required to protect the environment by federal or state law or regulation." Therefore, fugitive particulate emissions prohibitions are not applicable, but are relevant and appropriate. Visible dust emissions comprise visible dust of such opacity as to obscure an observer's view to a degree equal to or greater than an opacity of 40% for a period or periods aggregated more than 3 minutes in any 1 hour. |
| **Federal**<br>Protection of Wetlands | E.O. 11990;<br>40 CFR 6.302(a); and<br>40 CFR 6, Appendix A | Applicable | Requires Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands. | Applies to wetlands adjacent to FTA-1. Evaluation of impact minimization to wetlands required and potential mitigation. Long-term ecological monitoring is part of selected remedy. |
| **Federal**<br>Endangered Species Act of 1973 | 40 CFR 6.320(h) and 50 CFR 402 | Applicable | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Applies to vernal pool fairy shrimp habitat. Long-term ecological monitoring will be conducted in wetlands associated with FTA-1 to verify no deleterious impact to ecological resources. Existing controls (within BoP wetlands preservation area) and additional ICs, if appropriate, will preclude land use/activities detrimental to ecological resources. |
| **State**<br>California Endangered Species Act | FGC Division 3, Chapter 1.5, Section 2050 et seq. | Applicable | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Long-term ecological monitoring will be conducted in wetlands associated with FTA-1 to verify no deleterious impact to ecological resources. Existing controls (within BoP wetlands preservation area) and additional ICs, if appropriate, will preclude land use/activities detrimental to ecological resources. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(a) | Relevant and Appropriate | Requires appropriate limitations on future use of sites where hazardous materials will remain at levels not suitable for unrestricted use of the land. Must be executed and recorded with the state (DTSC). | The BoP Preservation Area Mitigation and Management Plan currently addresses limitations on future land use. A State Land Use Covenant will be prepared and recorded. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(b) | Relevant and Appropriate | Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations. | |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(d) | Relevant and Appropriate | Requires that the Land Use Covenant be recorded in the county where the site is located. | A State Land Use Covenant will be prepared and recorded in Merced County. |
| **State**<br>California Health and Safety Code | 22 CCR 67391.1(i) | Relevant and Appropriate | Definitions | Defines terms in State Land Use Covenant regulations. |
| **State**<br>California Civil Code | California Civil Code Section 1471(a) & (e) | Relevant and Appropriate | Specifies requirements for land use covenants to apply to successors in title to the land. | |

**Notes**

| | | | | | |
|---|---|---|---|---|---|
| AF | U.S. Air Force | CWCS | California Water Code Section | MOU | Memorandum of Understanding |
| ARARs | applicable or relevant and appropriate requirements | DTSC | Department of Toxic Substances Control | NEPA | National Environmental Policy Act |
| BACT | best available control technology | E.O. | Executive Order | $PM_{10}$ | particulate matter less than 10 microns in diameter |
| BoP | U.S. Bureau of Prisons | EPA | U.S. Environmental Protection Agency | RCRA | Resource Conservation and Recovery Act |
| CCR | California Code of Regulations | FGC | Fish and Game Code | SVE | soil vapor extraction |
| CFR | Code of Federal Regulations | FTA | Fire Training Area | VOC | volatile organic compound |
| COC | contaminant of concern | IC | institutional control | WQSA | Water Quality Site Assessment |

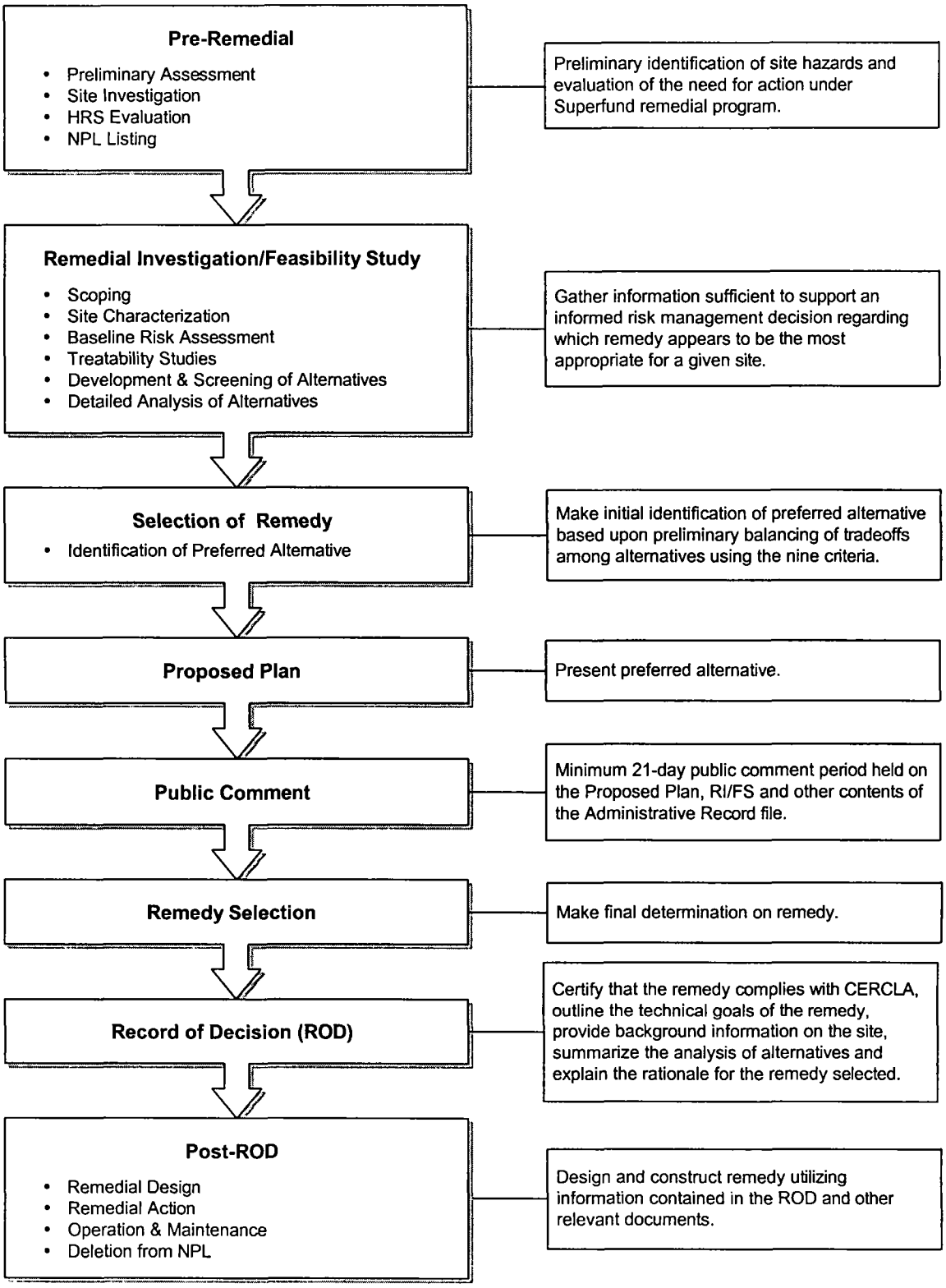
## Table 2-22
## Applicable or Relevant and Appropriate Requirements (ARARs) for Selected Remedy – ETC-12 and LF-3
## (Selected Remedy – Long-Term Ecological Monitoring)

| Regulation | Standard, Requirement, Criterion or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| **Federal**<br>Protection of Wetlands | E.O. 11990;<br>40 CFR 6.302(a); and<br>40 CFR 6, Appendix A | Applicable (wetlands adjacent to ETC-12 and to LF-3) | Requires Federal agencies to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands. | Long-term ecological monitoring will be conducted in wetlands associated with ETC-12 and LF-3 to verify no deleterious impact to ecological resources. Both ETC-12 and LF-3 located within BoP Wetlands Preservation Area. |
| **Federal**<br>Endangered Species Act of 1973 | 40 CFR 6.320(h) and 50 CFR 402 | Applicable (vernal pool fairy shrimp habitat) | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Same as above. |
| **State**<br>California Endangered Species Act | FGC Division 3, Chapter 1.5, Section 2050 et seq. | Applicable (Colusa grass habitat) | Requires that facilities or practices not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. NEPA implementation requirements may apply. | Same as above. |

**Notes**

| | |
|---|---|
| ARARs | applicable or relevant and appropriate requirements |
| BoP | U.S. Department of Justice, Federal Bureau of Prisons |
| CCR | California Code of Regulations |
| CFR | Code of Federal Regulations |
| E.O. | Executive Order |
| ETC | Earth Technology Corporation |
| LF | landfill |
| NEPA | National Environmental Policy Act |

# Figures




**LEGEND**

| | |
|---|---|
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| HRS | Hazard Ranking System |
| NPL | National Priority List |
| RI/FS | remedial investigation/feasibility study |
| ROD | record of decision |

**CERCLA Remedial Process**

*SCOU ROD Part 3*

*Castle AFB*

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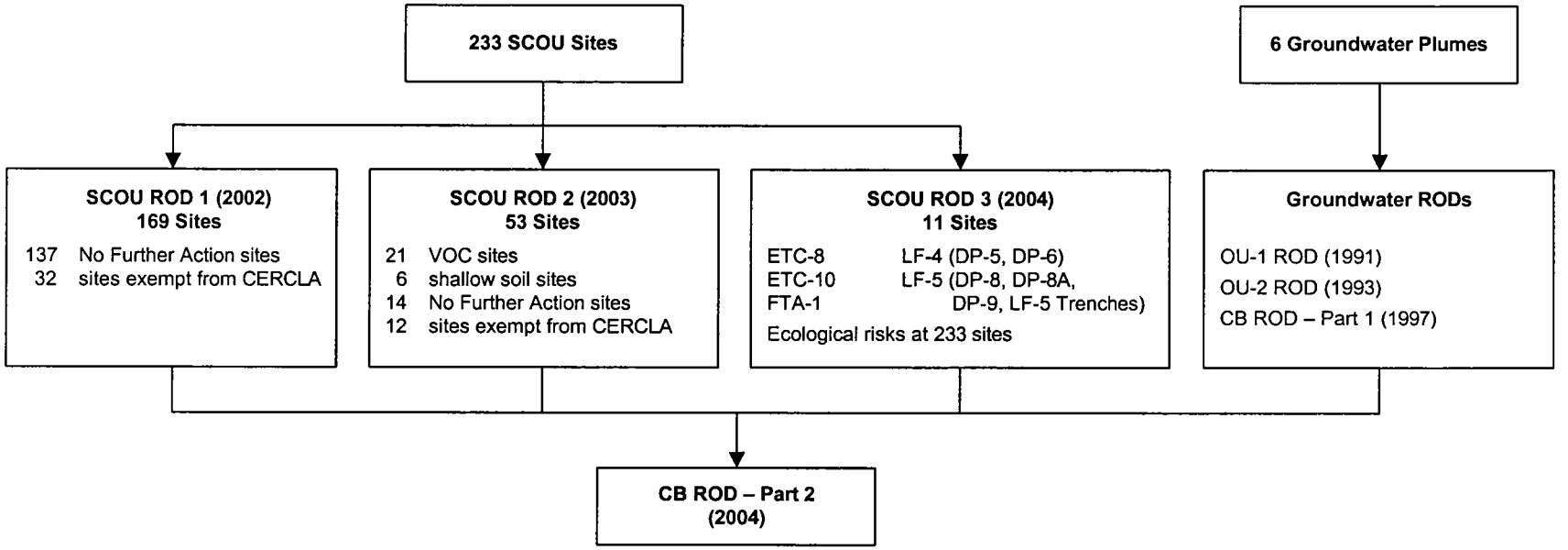
*FIGURE 2-1*




**LEGEND**

| | | | |
|---|---|---|---|
| CB | Comprehensive Basewide | RI/FS | remedial investigation/feasibility study |
| ETC | Earth Technology Coproration | ROD | record of decision |
| FTA | fire training area | SCOU | source control operable unit |
| LF | landfill | VOC | volatile organic compound |
| OU | operable unit | | |

## ROD Consolidation Flow Chart

*SCOU ROD Part 3*
*Castle AFB*

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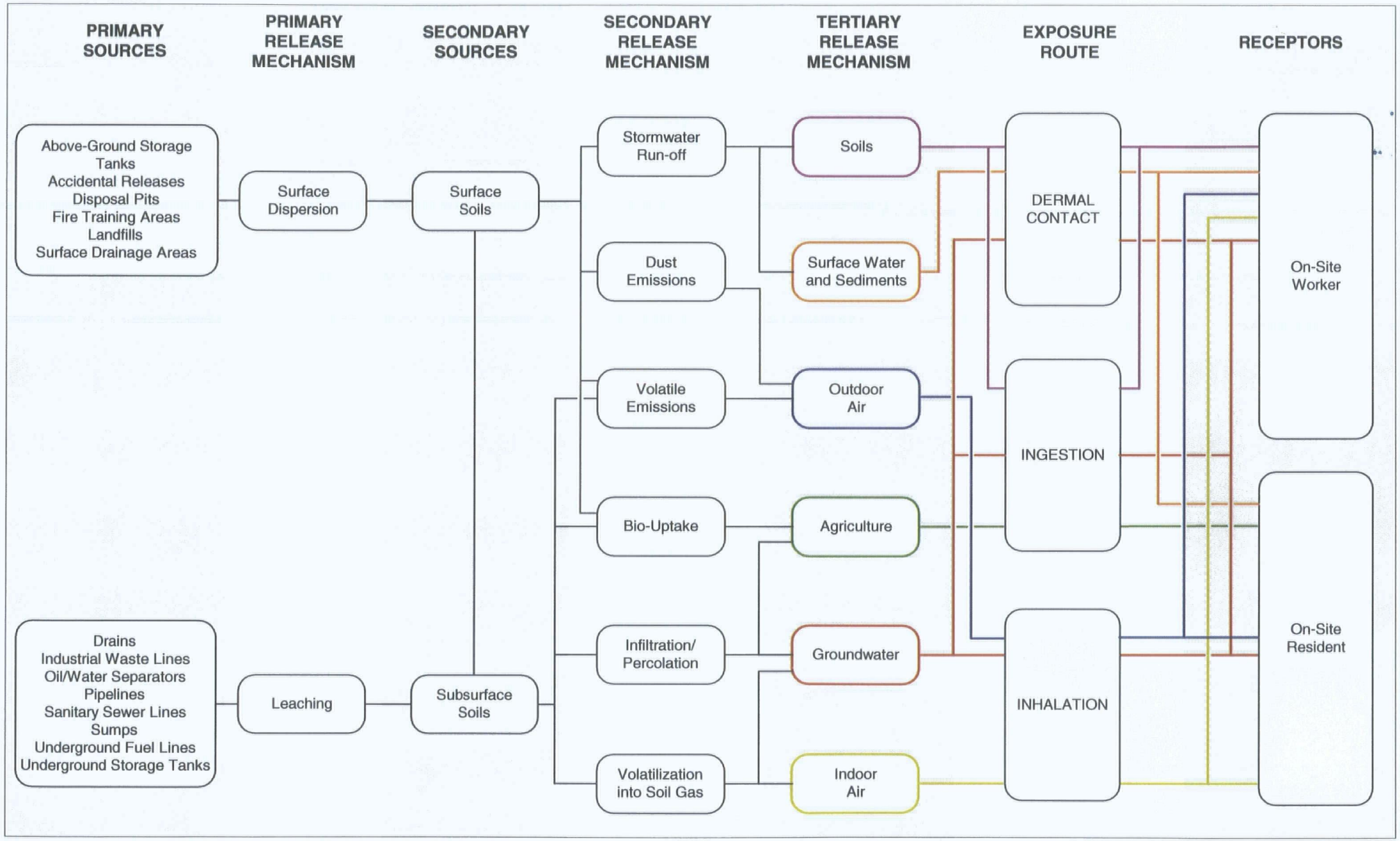
*FIGURE 2-2*




**Conceptual Exposure Pathways**

*SCOU ROD Part 3*
*Castle AFB*

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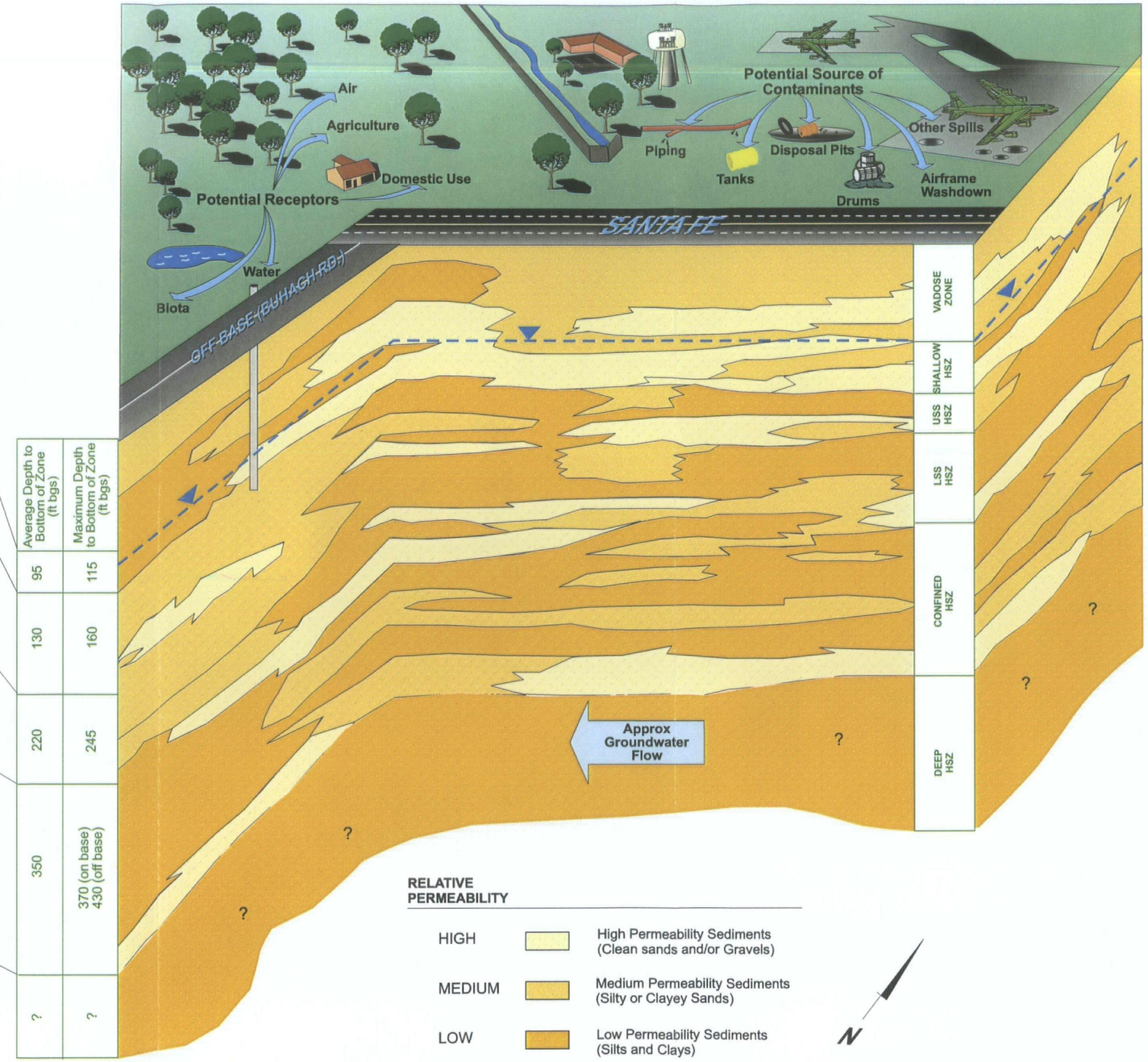
*FIGURE 2-3*

| Geologic Age: Period | Geologic Age: Epoch | Stratigraphic Name | Typical Geologic Characteristics of Predominant Water Bearing Sections | Possible Depositional Models | HSZ |
|---|---|---|---|---|---|
| Quaternary | Pleistocene | Modesto and Riverbank Formation | Gravel bearing sediments mostly beneath the Main Base Plume, based on isolith plots. The gravel bearing sediments trend in a northwest-southeast direction. These gravels pinch-out to the north and east beneath the runway, and to the southwest of Castle Air Force Base. The gravel bearing zone is mostly bordered by flood plain deposits at the pinch-out boundaries. Maximum thickness of the gravel bearing zone is in excess of 40 feet. | Braided channel deposits surrounded by flood plain deposits. Braided system exhibits shallow channelization with fairly uniform thickness. Top and bottom of gravel bearing zones are gradational with overlying and underlying sands. This information is suggestive of a transgressive-regressive aggradational fluvial-alluvial sequence likely caused by abrupt climatic change (i.e. glacial melting and precipatation with rapid increase in transport energy). | Shallow |
| Quaternary | Pleistocene | Turlock Lake Formation | Consisting of mostly fine sands, grading to medium-grained sands to the southwest. Beneath Castle Air Force Base, the water bearing zones are mostly in discontinuous sand lenses ranging in thickness from 5 to 10 feet. To the southwest, the interval between 120 and 155 feet bgs consists mostly of medium-grained sands. Based on a lithofacies plot of sand percentage, the sands appear to trend in a northwest-southeast direction. | Sinuous to meandering channel system surrounded by flood plain deposits. Flood plain sediments exhibit sequences of interbedded thin laminae of fine-grained sand and silt alternating with whitish mottled fine-grained sediments containing root casts and organic carbon residues. This suggests overbank deposits formed during flood stages with concurrent ephemeral shallow lake deposition in flood plain areas. The wet season is followed by a dry season with soil horizon formation and growth of short grasses. | Upper Subshallow (USS) |
| Quaternary | Pleistocene | Turlock Lake Formation | Consists mostly of sands, gravelly sands, and sandy gravels. In the central portion of the Main Base Plume, there is a large nongravel bearing area bordered by gravel bearing sediments to the north, south, and west. The extent of this nongravel bearing zone to the east and southeast is not known. The trend of the LSS HSZ appears to be generally northwest-southeast. | Braided channel system bordered by flood plain deposits. May have been formed in similar scenario as the gravel bearing sediments in the Shallow HSZ. | Lower Subshallow (LSS) |
| Quaternary | Pleistocene | Turlock Lake Formation | **North Merced Gravel**<br>Appears to consist of a thin (maximum thickness of about 40 feet), widespread gravel bearing zone. This zone has been encountered at numerous locations throughout Castle Airport. The zone appears to pinch out to the east and west as indicated by the Confined HSZ isolith map. | Braided channel system bordered by flood plain deposits. May have been formed in similar scenario as the gravel bearing sediments in the Shallow HSZ. | Confined |
| Tertiary | Pliocene | Laguna Formation | Continental deposits | Insufficient data. | Deep |

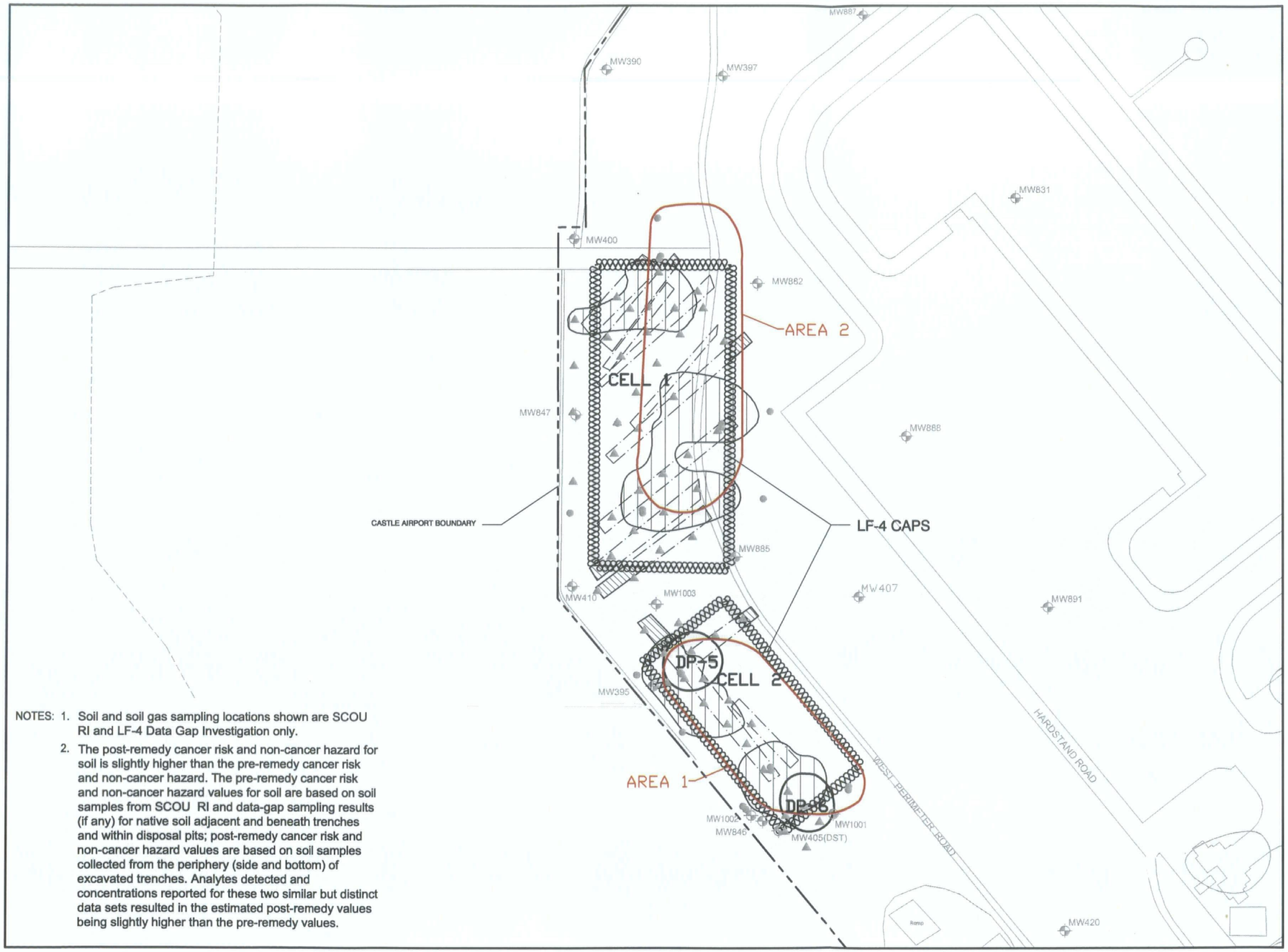



**Generalized Basewide Conceptual Model**

*SCOU ROD Part 3*

*Castle AFB*

*FIGURE 2-4*




NOTES: 1. Soil and soil gas sampling locations shown are SCOU RI and LF-4 Data Gap Investigation only.

2. The post-remedy cancer risk and non-cancer hazard for soil is slightly higher than the pre-remedy cancer risk and non-cancer hazard. The pre-remedy cancer risk and non-cancer hazard values for soil are based on soil samples from SCOU RI and data-gap sampling results (if any) for native soil adjacent and beneath trenches and within disposal pits; post-remedy cancer risk and non-cancer hazard values are based on soil samples collected from the periphery (side and bottom) of excavated trenches. Analytes detected and concentrations reported for these two similar but distinct data sets resulted in the estimated post-remedy values being slightly higher than the pre-remedy values.

## REMEDIAL RESPONSE PROCESS SUMMARY

**SITE:** LF-4 **GRID:** G6

**LINKED SITES:** DP-5 and DP-6

**DESCRIPTION:** Landfill used from 1954 through 1970 for the disposal of general refuse in shallow unlined trenches. Two disposal pits located at the southern end of the landfill received industrial wastes including spent solvents and oils and miscellaneous waste chemicals.

| POST REMOVAL ACTION CONTAMINANTS OF CONCERN | |
|---|---|
| HHRA | WQSA |
| | |

| PRE-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 1E-06 | 0.001 |
| GW: | 9E-05 | 1 |
| COMBINED: | 9E-05 | 1 |

**ECOLOGICAL HABITAT:** Good

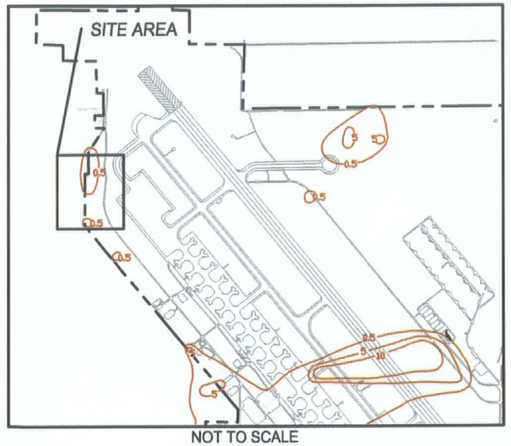
**SELECTED REMEDY:**
Cap maintenance and monitoring and ICs

| POST-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 4E-06 | 0.1 |
| GW: | 3E-06 | 0.05 |
| COMBINED: | 7E-06 | 0.2 |

**DECISION PROCESS COMMENTS:** The SCOU FS preferred alternative was landfill zoning (consolidation and capping in place). Following BCT post-FS decisions to consolidate waste from other Castle Airport landfills in LF-4, the preferred alternative was revised to consolidation (LF-4 and other authorized waste from Castle Airport SCOU sites), capping with an engineered alternative to a Class III cap and long-term monitoring with institutional control.

**STATUS:** Removal action (waste consolidation and capping) completed in September 1999. Approximately 6,500 cubic yards of waste from outlying portions of LF-4 were excavated and moved to the area to be capped. Approximately 260,000 cubic yards of waste material and contaminated soil meeting landfill acceptance criteria was imported from other Castle Airport SCOU sites and placed in the area to be capped. Closure report submitted and approved: *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b). Long-term maintenance and monitoring ongoing under an approved closure and post-closure maintenance plan (Jacobs, 1997b, 2000a and 2004d). IC's partially implemented.

### SITE LOCATION WITH RESPECT TO THE Q1/2003 SHALLOW HSZ TCE PLUME




NOT TO SCALE

LEGEND

- Building
- Site Boundary
- Background Feature
- Drainage Feature
- Monitoring Well
- Base Boundary
- Site Features
- Soil Boring
- Soil Gas Boring
- Surface Scrape
- Area with Detectable Soil Gas Contamination (5-10 ft. bgs) (VC, FC12 and Xylenes) Source: Jacobs, 2002b.
- Portion of Trench Excavated and Consolidated under Cap Source: Jacobs, 2002b.
- Outline of Cap Source: Jacobs, 2002b.
- Exposure Area
- Trenches Containing Waste Source: Jacobs, 2002b.

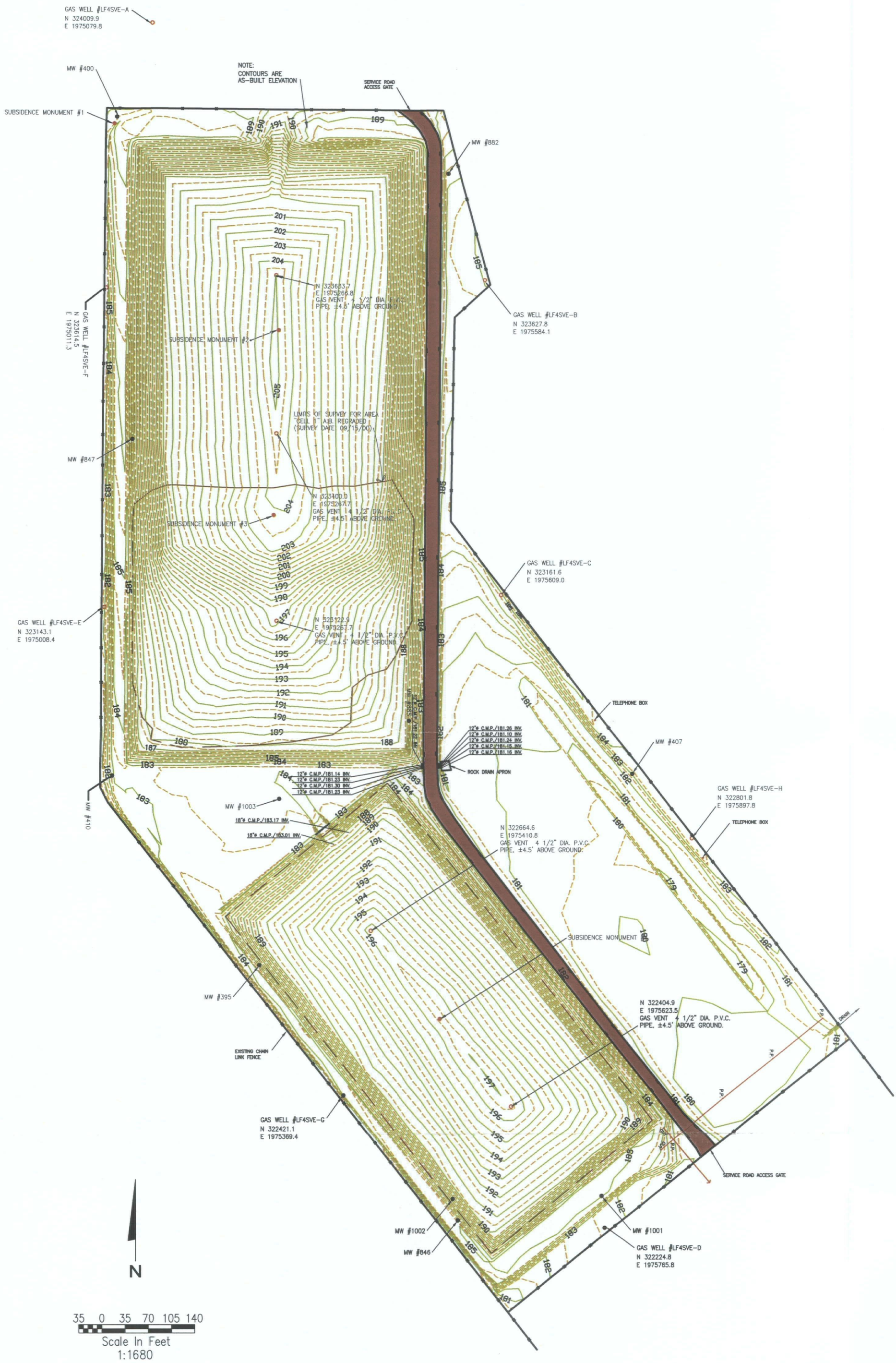
N

60 0 60 120 180 240 300
Scale In Feet
1:3600

**Landfill 4 Site Map**
*SCOU ROD Part 3*
*Castle AFB*

*FIGURE 2-5*

*4/17/01 Xv ..\cadd\05Z01001\SCOU ROD 3\Basewide.dwg*
*09/13/04 rkc*




## Landfill 4 Surface Features

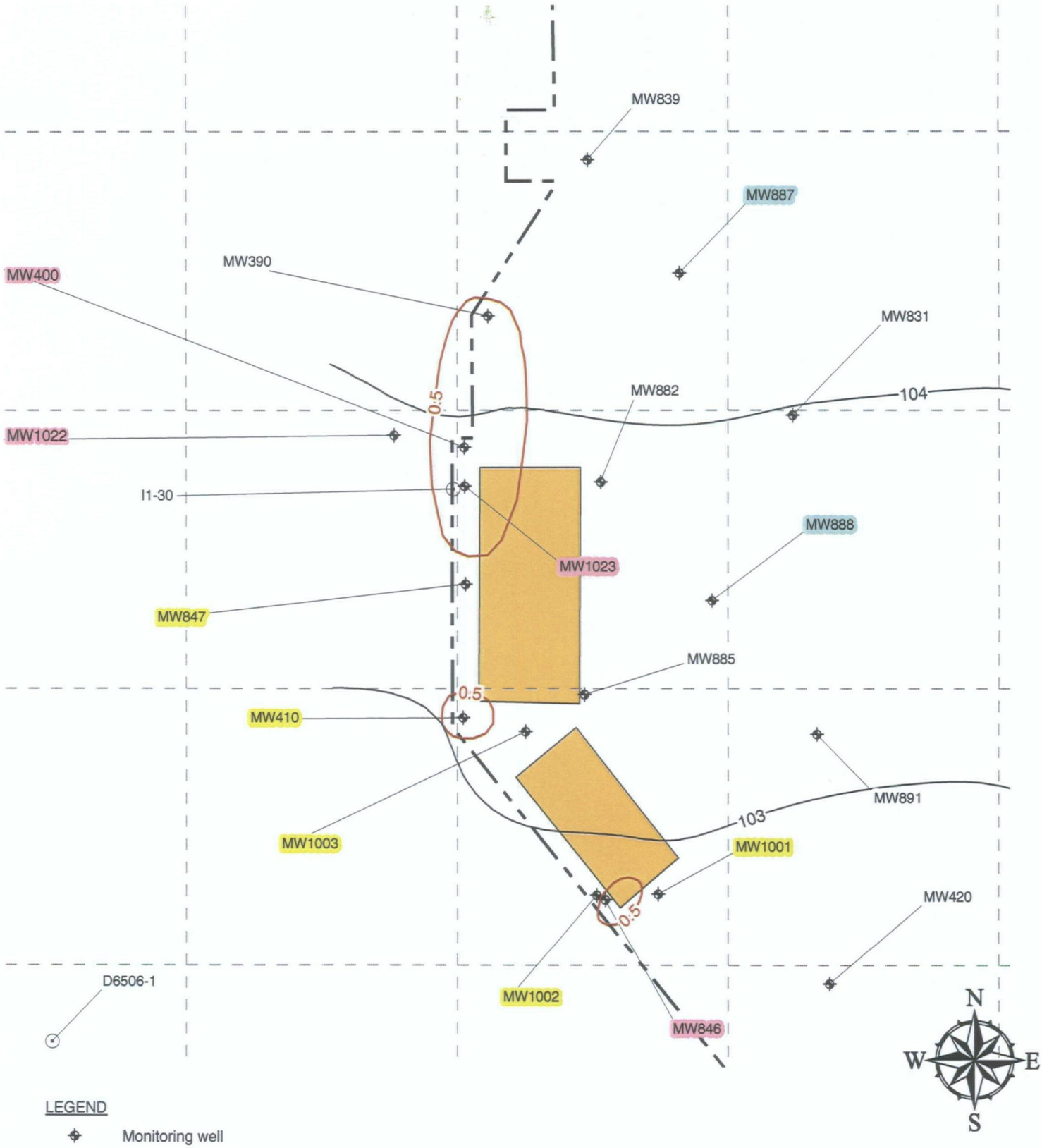
*SCOU ROD Part 3*

*Castle AFB*

*FIGURE 2-6*

*11/2/00 pr ...05z101001\SCOU ROD 3\lf4surface.dwg*

*09/13/04 rkc*




LEGEND

- Monitoring well
- Other well
- Property boundary
- Groundwater elevation contour (ft. above msl) - Shallow HSZ
- Q1/03 TCE plume contour (µg/L) - Shallow HSZ
- Landfill Cap
- MW888 Background monitoring well
- MW410 Detection and corrective action compliance monitoring well
- MW846 Corrective action compliance monitoring well

0 500

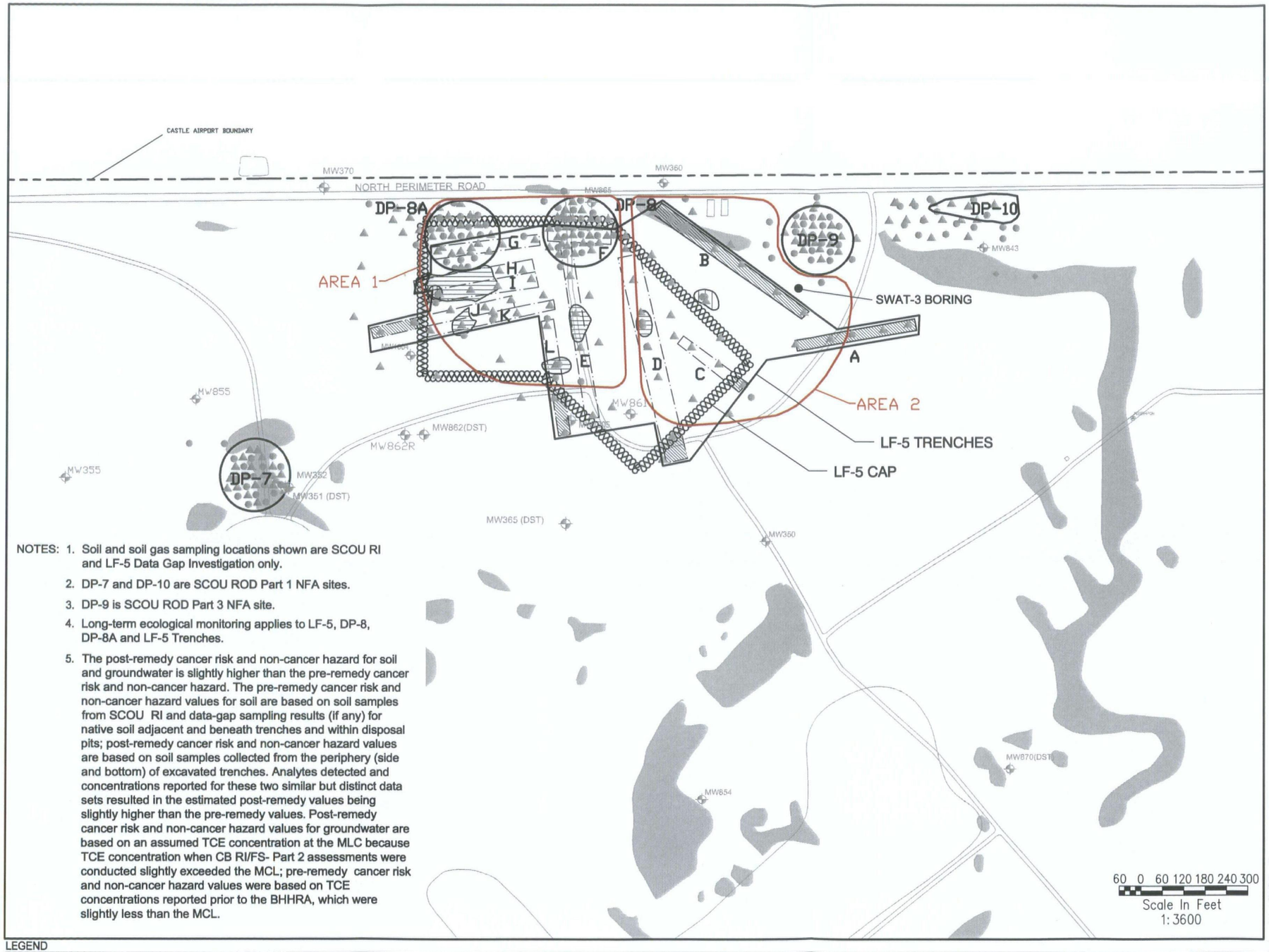
Scale in Feet
1:6,000

**Landfill 4 Post-Closure Groundwater Monitoring Plan**

*SCOU ROD Part 3*
*Castle AFB*

09/13/04 rv g:cadd\05z01001\SCOU ROD 3\monitoring_LF-4_closure.mxd 05Z01001

*Figure 2-7*




NOTES:
1. Soil and soil gas sampling locations shown are SCOU RI and LF-5 Data Gap Investigation only.
2. DP-7 and DP-10 are SCOU ROD Part 1 NFA sites.
3. DP-9 is SCOU ROD Part 3 NFA site.
4. Long-term ecological monitoring applies to LF-5, DP-8, DP-8A and LF-5 Trenches.
5. The post-remedy cancer risk and non-cancer hazard for soil and groundwater is slightly higher than the pre-remedy cancer risk and non-cancer hazard. The pre-remedy cancer risk and non-cancer hazard values for soil are based on soil samples from SCOU RI and data-gap sampling results (if any) for native soil adjacent and beneath trenches and within disposal pits; post-remedy cancer risk and non-cancer hazard values are based on soil samples collected from the periphery (side and bottom) of excavated trenches. Analytes detected and concentrations reported for these two similar but distinct data sets resulted in the estimated post-remedy values being slightly higher than the pre-remedy values. Post-remedy cancer risk and non-cancer hazard values for groundwater are based on an assumed TCE concentration at the MLC because TCE concentration when CB RI/FS- Part 2 assessments were conducted slightly exceeded the MCL; pre-remedy cancer risk and non-cancer hazard values were based on TCE concentrations reported prior to the BHHRA, which were slightly less than the MCL.

## REMEDIAL RESPONSE PROCESS SUMMARY

**SITE:** LF-5 **GRID:** E&F11/12

**LINKED SITES:** DP-7, DP-8, DP-8A, DP-9, DP-10 and Landfill 5 Trenches

**DESCRIPTION:** Landfill used from 1971 through 1977 for the disposal of general refuse and construction debris in shallow unlined trenches and disposal pits. Uncontained liquid chemical wastes and waste chemicals in 55-gallon drums may have been placed in the trenches or pits.

| FOST REMOVAL ACTION CONTAMINANTS OF CONCERN | |
|---|---|
| HHRA | WQSA |
| | |

| PRE-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 8E-07 | 0.02 |
| GW: | 2E-05 | 0.6 |
| COMBINED: | 2E-05 | 0.6 |

**ECOLOGICAL HABITAT:** Good

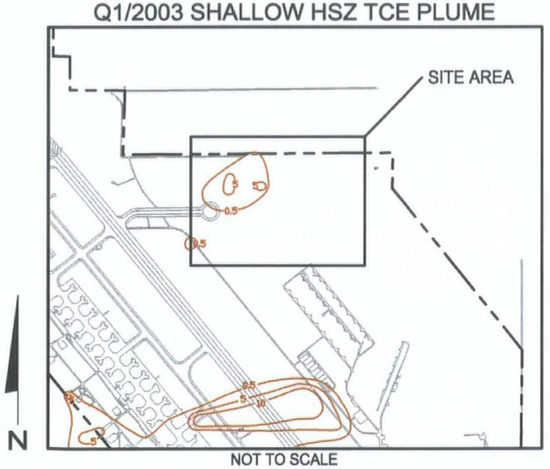
**SELECTED REMEDY:** Cap maintenance and monitoring, ICs and long-term ecological monitoring

| POST-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 4E-06 | 0.1 |
| GW: | 7E-05 | 0.7 |
| COMBINED: | 7E-05 | 0.8 |

**DECISION PROCESS COMMENTS:** The SCOU FS preferred alternative was landfill zoning (consolidation and capping in place). Following BCT post-FS decisions to consolidate waste from other Castle Airport landfills in LF-5, the preferred alternative was revised to consolidation (LF-5 and other authorized waste from Castle Airport SCOU sites), capping with an engineered alternative to a Class III cap and long-term monitoring with institutional control.

**STATUS:** Removal action (waste consolidation and capping) completed in September 1999. Approximately 19,000 cubic yards of waste from outlying portions of LF-5 were excavated and moved to the area to be capped. Approximately 100,000 cubic yards of waste material and contaminated soil meeting landfill acceptance criteria was imported from other Castle Airport SCOU sites and placed in the area to be capped. Closure report submitted and approved: *Landfill 4 and Landfill 5 Closure Report* (Jacobs, 2002b). Long-term maintenance and monitoring ongoing under an approved closure and post-closure maintenance plan (Jacobs, 1998a, 2000a and 2004d). IC's fully implemented. Long-term ecological monitoring at next 5-year review.

## SITE LOCATION WITH RESPECT TO THE Q1/2003 SHALLOW HSZ TCE PLUME



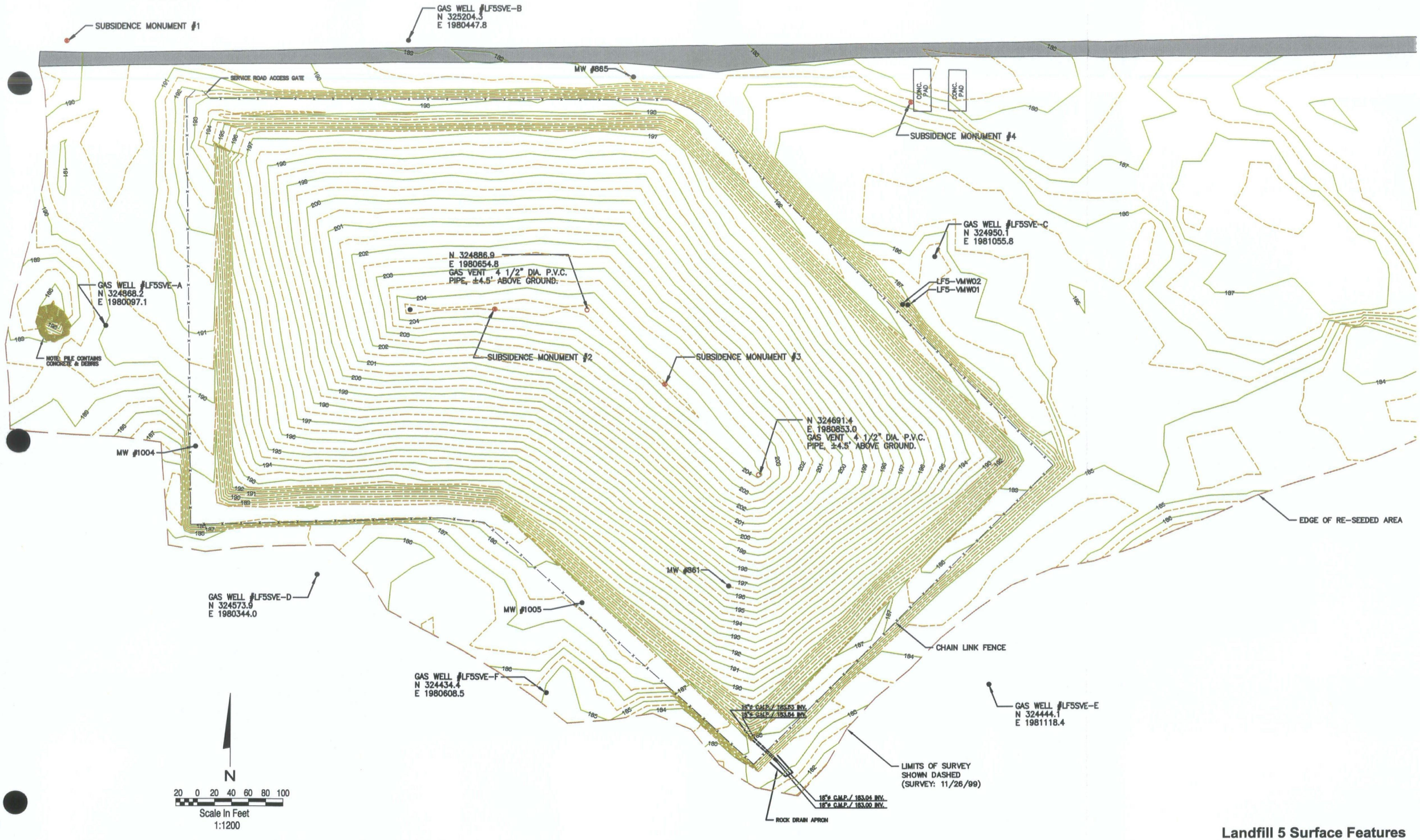

LEGEND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Building | Monitor Well | Soil Boring | Trench Containing Waste Source: Jacobs, 2002b. | Toluene Soil Gas Plumes Exceeding WQSA PRAO Criteria (10-20 ft. bgs) Source: Jacobs, 2002b. | Outline of Cap Source: Jacobs, 2002b. |
| Site Boundary | Base Boundary | Soil Gas Boring | Portion of Trench Excavated and Consolidated under Cap Source: Jacobs, 2002b. | TCE Soil Gas Plumes Exceeding WQSA PRAO Criteria (10-20 ft. bgs) Source: Jacobs, 2002b. | Exposure Area |
| Background Feature | Site Features | Surface Scrape | | | Wetlands |
| Drainage Feature | A Trench ID | Sediment Sample | | | |

**Landfill 5 Site Map**
*SCOU ROD Part 3*
*Castle AFB*

*04/17/01 Xv ..\cadd\05Z01001\SCOU ROD 3\basewide.dwg*
*09/13/04 rkc*

*FIGURE 2-8*



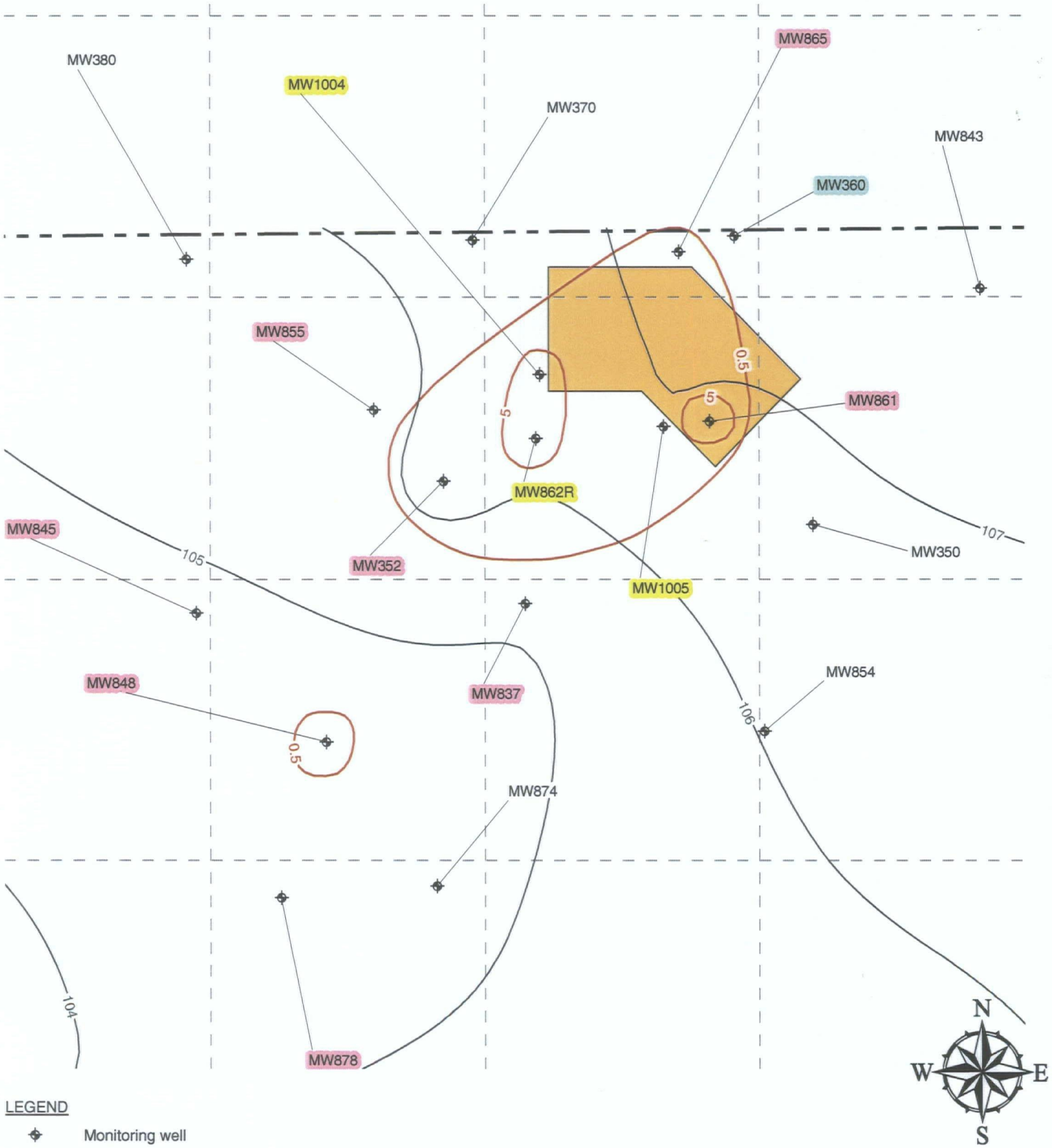

**Landfill 5 Surface Features**

*SCOU ROD Part 3*

*Castle AFB*

*FIGURE 2-9*

11/2/00 pr ...05Z010001\SCOU ROD 3\lf5surface.dwg
09/13/04 rkc




LEGEND

- Monitoring well
- Other well
- Property boundary
- Groundwater elevation contour (ft. above msl) - Shallow HSZ
- Q1/03 TCE plume contour (µg/L) - Shallow HSZ
- Landfill Cap
- MW888 Background monitoring well
- MW410 Detection and corrective action compliance monitoring well
- MW846 Corrective action compliance monitoring well

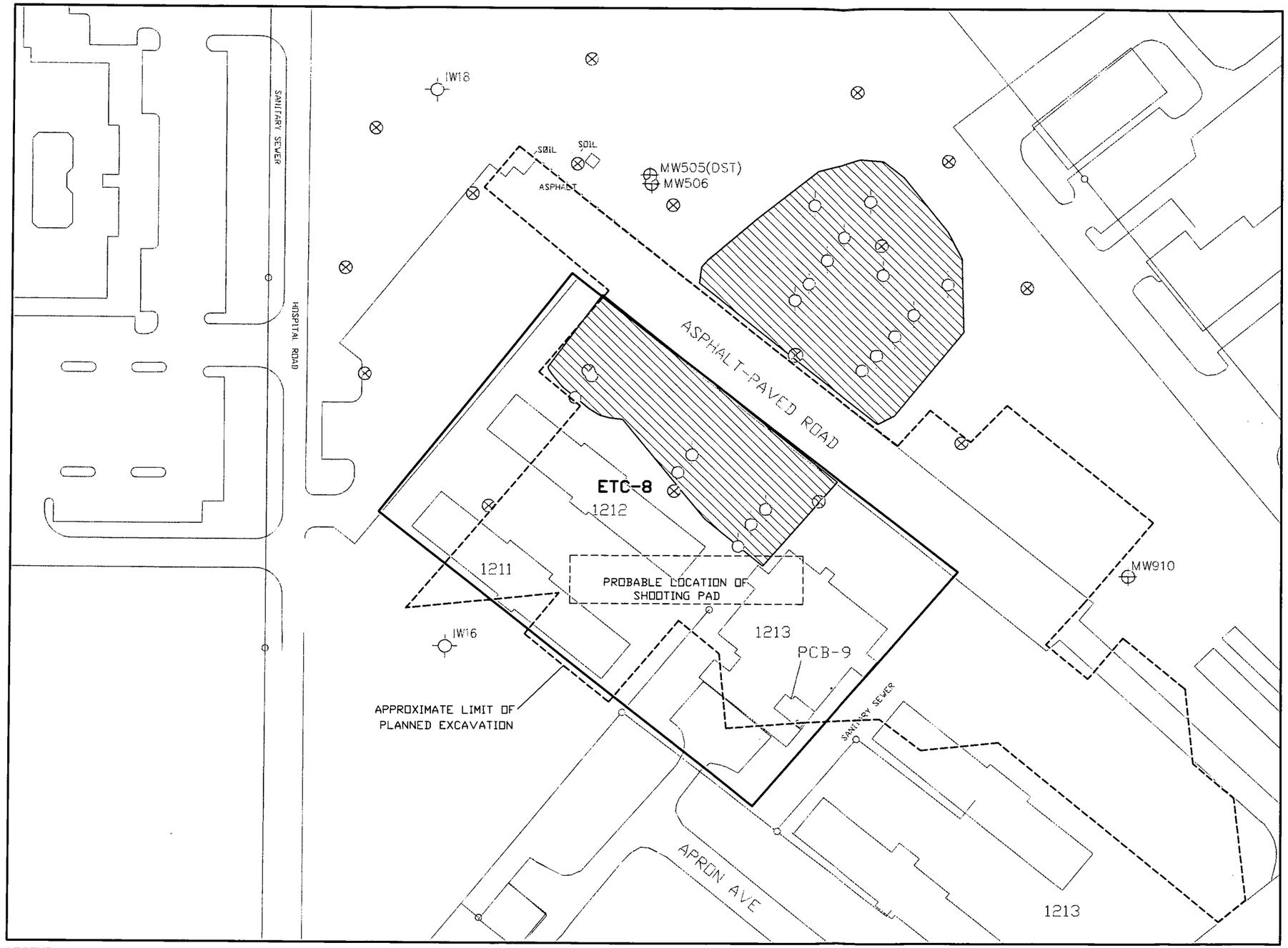
0 500
Scale in Feet
1:6,000

**Landfill 5 Post-Closure Groundwater Monitoring Plan**

*SCOU ROD Part 3*
*Castle AFB*

09/13/04 Xv g:\05Z01001\SCOU ROD 3\monitoring_LF-5_closure.mxd 05Z01001

*Figure 2-10*




## REMEDIAL RESPONSE PROCESS SUMMARY

**SITE:** ETC-8 **GRID:** N9
**LINKED SITES:** None
**DESCRIPTION:** Former skeet shooting range. Clay pigeon fragments and lead shot distributed in a fan-shaped pattern in front of the former shooting pad. See Section 3.1.3.24.

| POST REMOVAL ACTION CONTAMINANTS OF CONCERN | |
|---|---|
| **BHHRA** | **WQSA** |
| BZAA, BZAP, BZKF, DBAHA, INP123 | |

| PRE-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 2E-04 | 0.07 |
| GW: | 7E-06 | 0.8 |
| COMBINED: | 2E-04 | 0.9 |

**ECOLOGICAL HABITAT:** Marginal

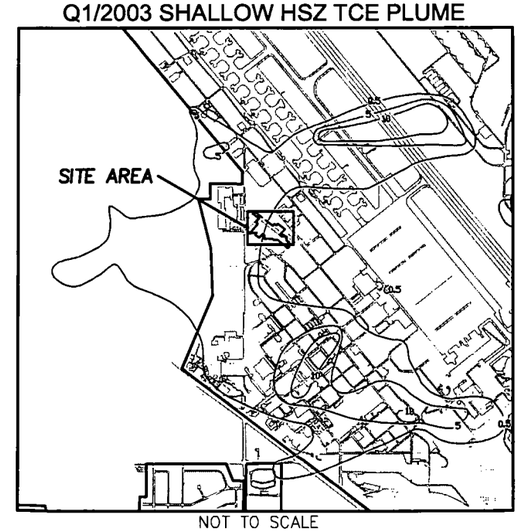
**SELECTED REMEDY:** Excavation and Disposal

| POST-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 4E-05 | 0.1 |
| GW: | 4E-10 | 0 |
| COMBINED: | 4E-05 | 0.1 |

**DECISION PROCESS COMMENTS:** SCOU FS preferred alternative was NFA. Based on data gap sampling results, the preferred alternative was changed (post-FS BCT decision) to excavation and disposal. Given that PAH-contaminated soil exceeding RAOs may remain, additional excavation and disposal will be conducted.

**STATUS:** Removal action completed in August 2000. Approximately 2,200 cubic yards of PAH-contaminated soil excavated and transported to LF-4 for disposal. Closure report for excavation and disposal: *Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation Sites* (Jacobs, 2000c). Excavation and off-site disposal of additional PAH-contaminated soil is planned.

SITE LOCATION WITH RESPECT TO THE Q1/2003 SHALLOW HSZ TCE PLUME




NOT TO SCALE

LEGEND

- Building
- Site Boundary
- Planned Excavation
- Background Feature
- Monitoring Well
- Injection Well
- Hand Auger
- Soil Scrape Sample
- Approximate Extent of PAH-Contaminated Soil Excavated (to 1-4 ft. bgs) Source: Jacobs, 2000c.

NOTE: Soil Sampling Locations Shown are SCOU RI and SCOU Data Gap Investigation Only.

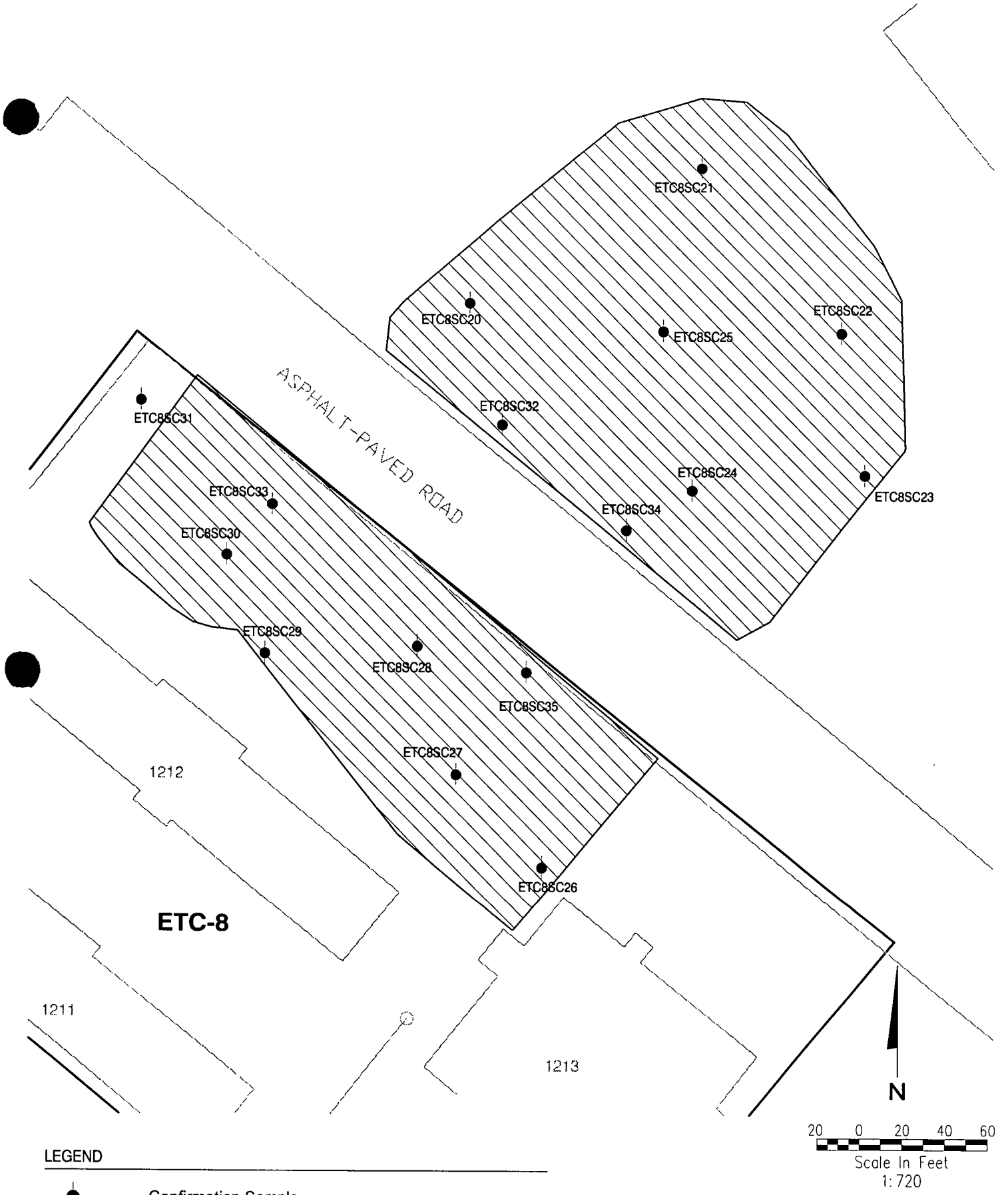
20 0 20 40 60 80 100
Scale In Feet
1:1200

N

**Earth Technology Corporation 8 Site Map**
*SCOU ROD Part 3*
*Castle AFB*

*4/17/01 Xv ..\cadd\05Z01001\SCOU ROD 3\FIGURE 2-11.dwg*
*11/29/04 Xv*

*FIGURE 2-11*




LEGEND

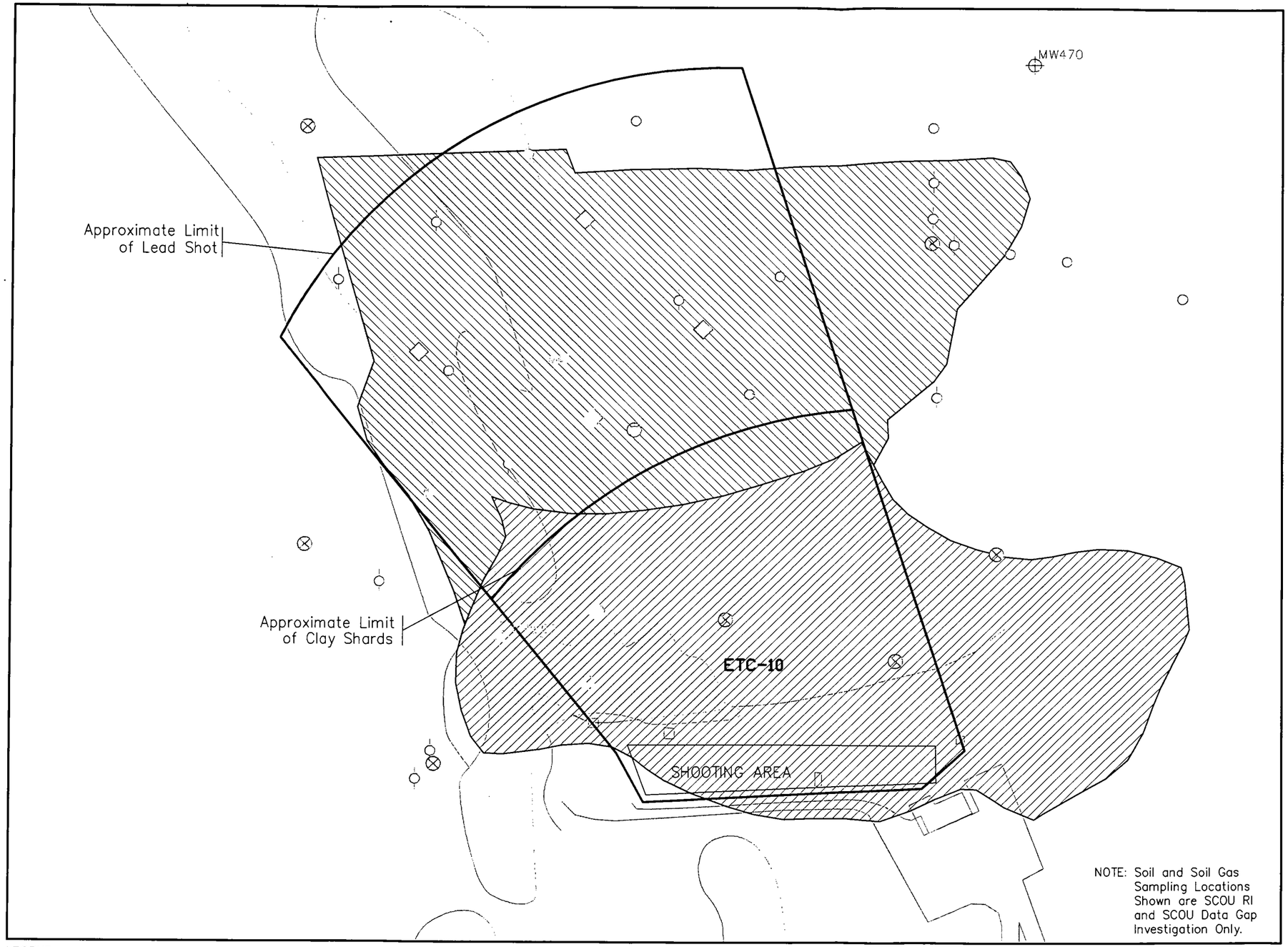
Confirmation Sample

Approximate Extent of PAH-Contaminated Soil Excavated (to 1-4 ft. bgs)
Source: Jacobs, 2000c.

**Earth Technology Corporation 8**
**Removal Action**
*SCOU ROD Part 3*
*Castle AFB*

*10/23/03 Xv*
*09/13/04 rkc*
*G:CADD\05Z01001\SCOU ROD 3\FIGURE-2-12.dwg*

*Figure 2-12*




## REMEDIAL RESPONSE PROCESS SUMMARY

**SITE:** ETC-10 **GRID:** L16
**LINKED SITES:** None
**DESCRIPTION:** Skeet shooting range active until 1995. Clay pigeon fragments and lead shot distributed in a fan-shaped pattern in front of the former shooting pad. See Section 3.1.3.25.

| POST REMOVAL ACTION CONTAMINANTS OF CONCERN | |
|---|---|
| **BHHRA** | **WQSA** |
| BZAP | |

| PRE-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 1E-03 | 30 |
| GW: | 4E-07 | 0.2 |
| COMBINED: | 1E-03 | 30 |

**ECOLOGICAL HABITAT:** Good

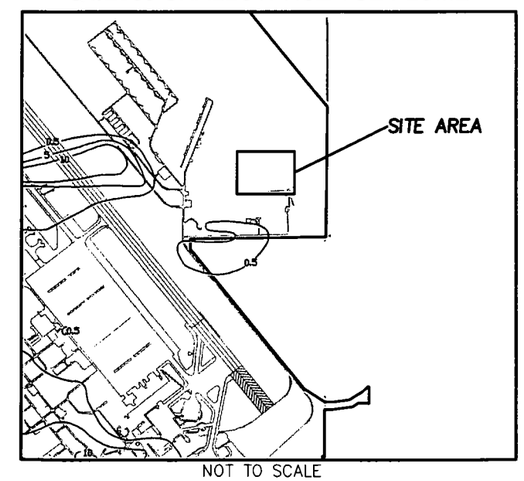
**SELECTED REMEDY:**
ICs and long-term ecological monitoring

| POST-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 4E-06 | 0.1 |
| GW: | 4E-10 | 0 |
| COMBINED: | 4E-06 | 0.1 |

**DECISION PROCESS COMMENTS:** SCOU FS preferred alternative was removal (off-site disposal). Based on data gap sampling results, the prefered alternative was changed (post-FS BCT decision) to excavation and on-site disposal. Given that the excavation removed lead-impacted soil to occupational but not residential RAOs, institutional controls will be required. Site within Bureau of Prisons property - access restricted and wetlands protected.

**STATUS:** Removal action completed in August 1998. Approximately 5,050 cubic yards of PAH and metals-impacted soil was excavated and transported to LF-5 for disposal. Closure report for excavation and disposal: *ETC-10 Closure Report* (Jacobs, 1999b). IC's fully implemented. Long-term ecological monitoring at next 5-year review.

### SITE LOCATION WITH RESPECT TO THE Q1/2003 SHALLOW HSZ TCE PLUME




NOT TO SCALE

N

20 0 20 40 60 80 100
Scale In Feet
1:1200

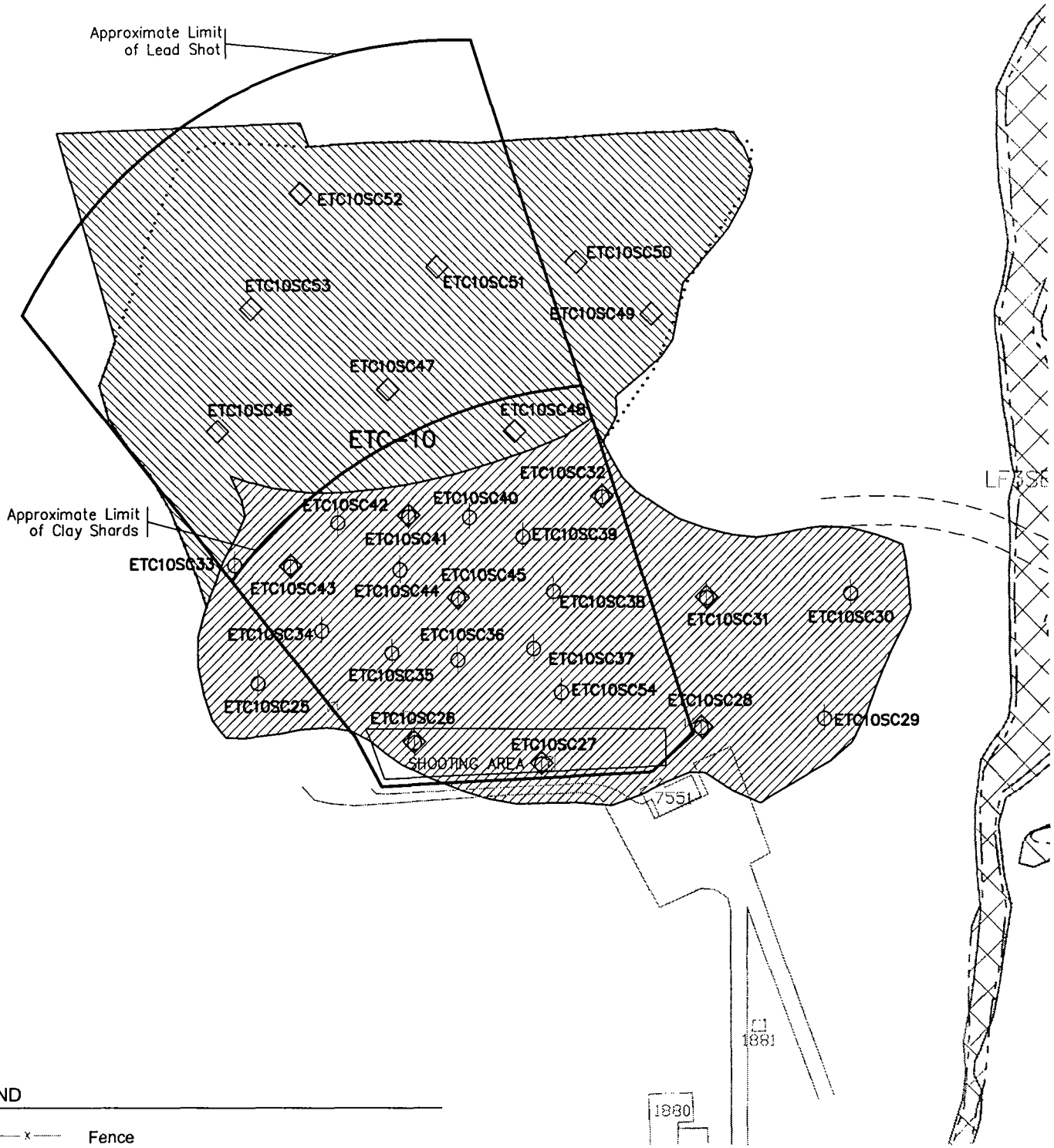
LEGEND

- Building
- Site Boundary
- Site Feature
- Background Feature
- Monitoring Well
- Drainage Feature
- Wetlands
- Hand Auger
- Eco-Risk Scrape Sample
- Surface Scrape Sample
- Approximate Extent of Metals-Contaminated Soil Excavated (to 2-4 inches) Source: Jacobs, 1999b.
- Approximate Extent of PAH-Contaminated Soil Excavated (to 30 inches) Source: Jacobs, 1999b.

**Earth Technology Corporation 10 Site Map**
*SCOU ROD Part 3*
*Castle AFB*

*4/17/01 Xv ..\cadd\05Z01001\SCOU ROD 3\FIGURE-2-13.dwg*
*09/13/04 rkc*

*FIGURE 2-13*




LEGEND

| | |
|---|---|
| —— x —— x —— | Fence |
| ◇ | Confirmation Scrape Sample for Metal Analysis |
| ⊕ | Confirmation Scrape Sample for PAH Analysis |
| | Approximate Extent of Metals-Contaminated Soil Excavated (to 2-4 inches) Source: Jacobs, 1999b. |
| | Approximate Extent of PAH-Contaminated Soil Excavated (to 30 inches) Source: Jacobs, 1999b. |

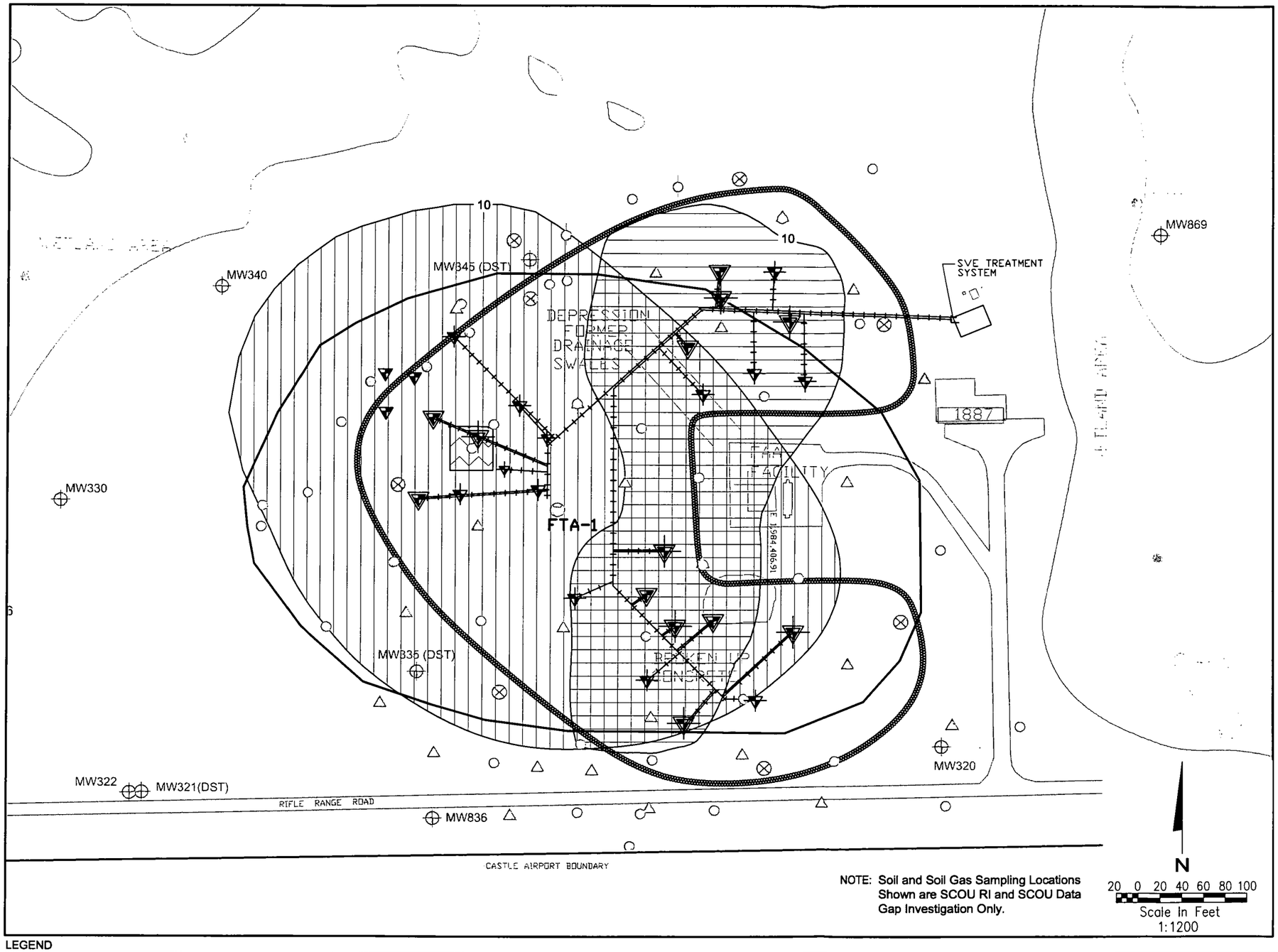
N

40 0 40 80 120 160
Scale In Feet
1:1920

**Earth Technology Corporation 10**
**Removal Action**
*SCOU ROD Part 3*
*Castle AFB*

*10/23/03 Xv*
*09/13/04 rkc*
*...\05Z01001\SCOU ROD 3\FIGURE-2-14.dwg*

*FIGURE 2-14*




NOTE: Soil and Soil Gas Sampling Locations Shown are SCOU RI and SCOU Data Gap Investigation Only.

## REMEDIAL RESPONSE PROCESS SUMMARY

**SITE:** FTA-1 **GRID:** L15
**LINKED SITES:** None
**DESCRIPTION:** Fire training exercise area from 1955 through 1975. Fuel, waste oil, waste solvents and other waste chemicals were accumulated in a storage tank and then intermittently applied directly to the soil in shallow pits and ignited. Over the years, multiple burn pits were used. See Section 3.1.3.29.

| CONTAMINANTS OF CONCERN | |
|---|---|
| **BHHRA** | **WQSA** |
| As, Cd, BZAP, Dioxins, DBCP, DCA12, BZ, DBAHA, TCE, TCPR123 | Fuels (G, D, J),TCE, BZ, BZME, EBZ, Xylenes, DCE12C, TCLME, Chrysene, As, Pb, Zn |

| PRE-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 2E-04 | 6 |
| GW: | 9E-07 | 0.4 |
| COMBINED: | 2E-04 | 6 |

**ECOLOGICAL HABITAT:** Good

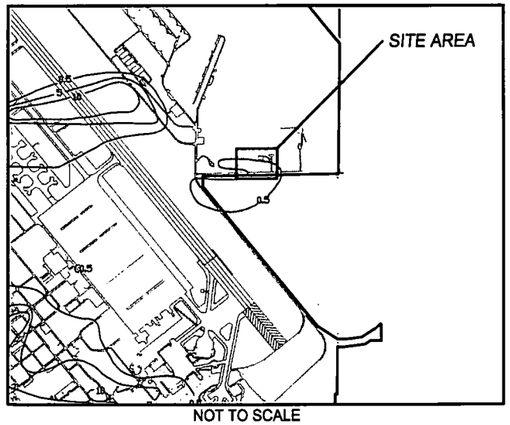
**SELECTED REMEDY:**
SVE, bioventing, excavation and disposal, cap maintenance and monitoring, ICs and long-term ecological monitoring

| POST-REMEDY HH: | CANCER RISK | NON-CANCER HAZARD |
|---|---|---|
| SOIL: | 2E-06 | 0.1 |
| GW: | 2E-06 | 0.05 |
| COMBINED: | 4E-06 | 0.2 |

**DECISION PROCESS COMMENTS:** The SCOU FS preferred alternative was SVE and soil treatment. Based on additional information regarding the nature and extent of site contamination compiled during implementation of SVE, the BCT changed the preferred alternative (post-FS decision) to SVE, bioventing, capping and institutional controls. A recently completed focused feasibility study identified capping (existing cap) with long-term maintenance and monitoring, ICs and a limited amount of excavation and off-site disposal as the prefered alternative for non-VOC contamination (*FTA-1 Focused Feasibility Study* [Jacobs, 2002c)

**STATUS:** SVE removal actions initiated during 1996. The cap was completed in July 1996. The SVE system, consisting of 29 vapor extraction and monitoring wells in three zones and (initially) two treatment systems (one thermal oxidation and one catalytic oxidation unit) was placed in operation during November/December 1996. System operated consistently (periodic pulsing events and short-term shutdowns) through the end of 1999. SVE system restarted in December 2000, then was shut down in January 2001 to convert treatment from cat-ox to vapor-phase GAC. System restarted 9 July 2001. Through mid-2003 estimated that system has removed almost 66,000 pounds of VOCs and fuels from the vadose zone. IC's fully implemented. Long-term ecological monitoring at next 5-year review. E&D in 2004.

### SITE LOCATION WITH RESPECT TO THE Q1/2003 SHALLOW HSZ TCE PLUME




NOT TO SCALE

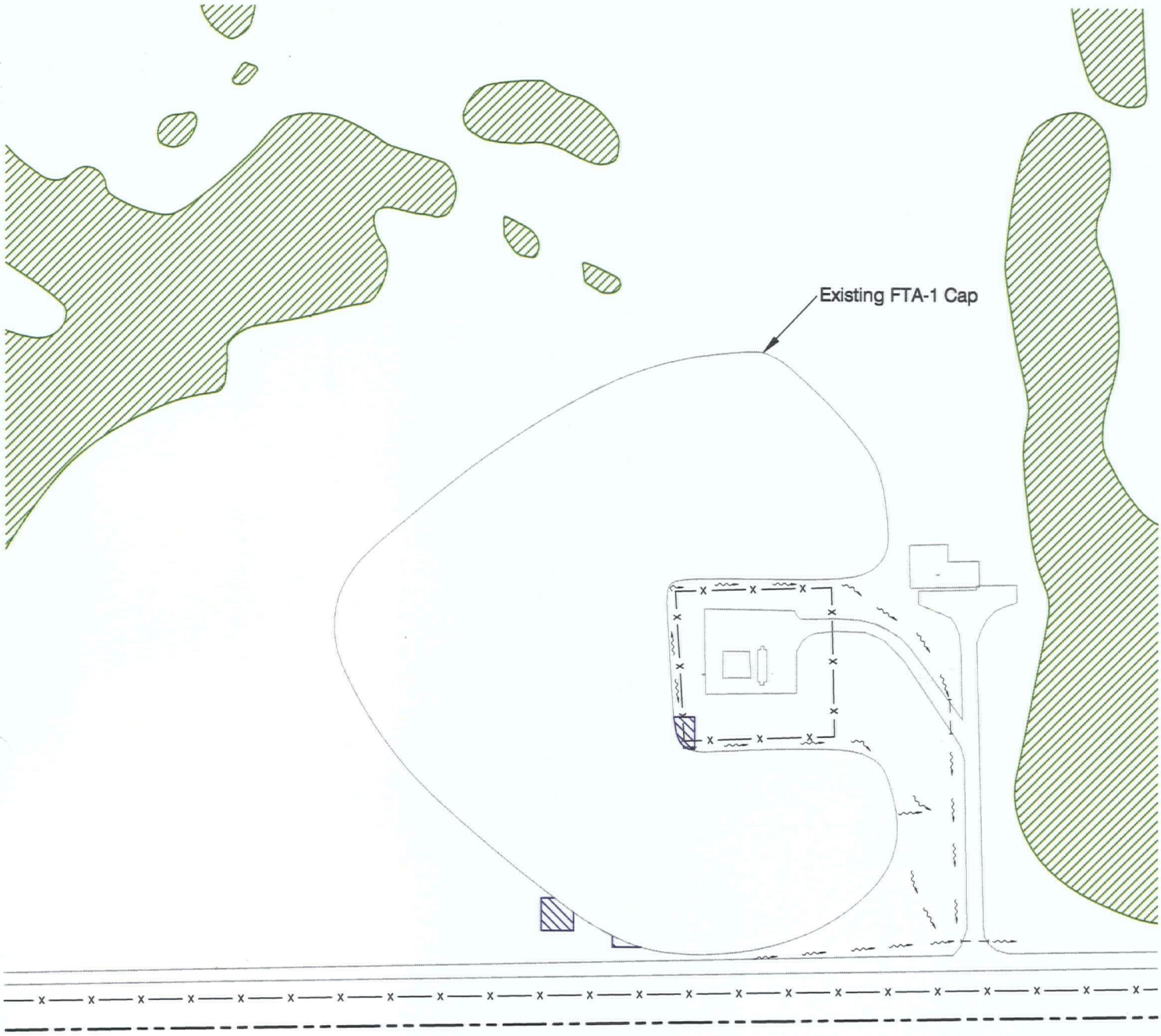
LEGEND

- Building
- Site Boundary
- Site Features
- Background Feature
- Monitoring Well
- Single Vapor Extraction Well
- Nested Vapor Extraction Well
- Soil Boring
- Soil Gas Boring
- Hand Auger
- Surface Scrape
- Base Boundary
- Lead at 3,990 µg/kg in Single Soil Sample at 2 ft. bgs Source: Jacobs, 1997a.
- Nested Vapor Monitoring Well
- Single Vapor Monitoring Well
- TCE in Soil Gas >10 µg/L Prior to Remediation (20-60 ft. bgs) Source: Jacobs, 1997a.
- Benzene in Soil Gas >10 µg/L Prior to Remediation (20-40 ft. bgs) Source: Jacobs, 1997a.
- SVE Piping Source: Jacobs, 1996b;2002c.
- Wetlands
- Outline of Cap

04/17/01 Xv ..\cadd\05Z01001\SCOU ROD 3\FIGURE-2-15.dwg
09/13/04 rkc

**Fire Training Area 1 Site Map**
*SCOU ROD Part 3*
*Castle AFB*

*FIGURE 2-15*




LEGEND

- Wetland Area
- Material to be Excavated and Disposed off Site
- Drainage Pattern

N

35 0 35 70 105 140

Scale In Feet
1:1680

**Fire Training Area 1**
**Additional Excavation Area**
*SCOU ROD Part 3*
*Castle AFB*

*10/23/03 Xv*
*09/13/04 rkc*
*...\05Z01001\SCOU ROD 3\FIGURE-2-16.dwg*

*FIGURE 2-16*

# Section 3

# 3 RESPONSIVENESS SUMMARY

This responsiveness summary documents public comments and Air Force responses for two proposed plans, presents agency comments and Air Force responses on the draft SCOU ROD Part 3 (draft entitled Landfill 4 and Landfill 5 Record of Decision) and discusses any unresolved legal or technical issues. The two proposed plans relevant to sites addressed in this ROD are the *SCOU Proposed Plan* (WPI, 1997) and the *Comprehensive Basewide Proposed Plan – Part 2* (Jacobs, 2003). The EPA, DTSC, RWQCB, the Merced County Department of Public Health and the California Integrated Waste Management Board submitted comments on the draft ROD.

## 3.1 Public Comments on the SCOU Proposed Plan

The *SCOU Proposed Plan* (WPI, 1997) was submitted for a 30-day public review period from 15 August 1997 through 15 October 1997. The SCOU Proposed Plan was available at the Merced County Library and the Information Repository located at Castle AFB. In addition, three public meetings were held to explain the proposed plan and provide opportunities for public comment, two on 26 August 1997 and one on 23 September 1997. The public was invited to review and comment, either orally or in writing, on the remedial alternatives presented in the SCOU Proposed Plan. The extended public comment period and the third public meeting were the result of agency concerns that distribution of the plan did not include enough people and that the community was provided an inadequate review period prior to the first public hearing.

A complete presentation of comments received from the public and Air Force responses were presented in the *SCOU ROD Part 1* (WPI, 2002). Only those comments directly related to the preferred alternatives for LF-4, LF-5 and their associated sites and the initial preferred alternatives for ETC-8, ETC-10 and FTA-1 are reproduced here.

### 3.1.1 Modifications Resulting From Public Comments

The *SCOU FS* (Jacobs, 1997a) recommended zoned capping, long-term maintenance and monitoring and ICs for all seven Castle AFB landfills. The community supported excavation and removal of all seven landfills with waste taken off-site for disposal. In response, the Air Force agreed to remove all waste from five of the landfills (clean closures at LF-1, LF-2,

LF-3, Castle Vista Landfill A and Castle Vista Landfill B) and consolidate wastes in LF-4 (primary) and LF-5 (secondary). Wastes from outlying disposal trenches at LF-4 and LF-5 would also be consolidated as part of the capping process.

In the SCOU Proposed Plan, the proposed remedy for FTA-1 was SVE for VOCs and capping and ICs for metal contamination. As part of the SVE removal action at FTA-1, the Air Force installed a cap. The Air Force preferred to maintain the cap as a containment measure for shallow soil that is impacted by lead (and other inorganic contaminants). The community did not support capping and leaving the waste in place or having deed restrictions. Rather, they preferred to have the contaminated soil completely cleaned or removed. The regulatory agencies were opposed to the FTA-1 cap as a non-VOC remedy because it was not considered as an alternative during FTA-1's feasibility study and was not evaluated using CERCLA criteria. The agencies were also concerned that the cap may not cover all of the contaminated soil. Because storm water runoff from FTA-1 drains to a wetland area, the contaminated soil was of particular ecological concern. Because of these concerns, the Air Force removed FTA-1 from the SCOU ROD Part 1 and initiated further study of the capping alternative and other remedial options. The *FTA-1 Focused Feasibility Study* (Jacobs, 2002c) was issued in April 2002 and provided CERCLA justification for the capping alternative. Capping and ICs with long-term ecological monitoring was presented as the preferred alternative for FTA-1 non-VOC contamination in the *Comprehensive Basewide Proposed Plan – Part 2* (Jacobs, 2003), which was issued for public comment in November 2003.

### 3.1.2 Summary of Public Comments and Air Force Responses

Comments and Air Force responses presented in the *SCOU ROD Part 1* (WPI, 2002) and pertinent to ETC-8, ETC-10, FTA-1 and LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) follow.

**Comment**: Several RAB members expressed concern over the use of deed restriction as a preferred alternative for selected SCOU sites. The community has long-stated opposition to deed restrictions (because they hinder reuse of the site) and prefers that they not be implemented.

**Air Force Response**: Institutional controls include deed restrictions and access restrictions. For a deed restriction, information is added to the property deed to notify the

public and future new owners or tenants of potential health threats associated with the site. For an access restriction, signs with hazard notification are posted and/or fences are installed to restrict access to the site.

Non-engineering mechanisms (such as institutional controls) are included in a remedy to complement and supplement the remedial action. Institutional controls are implemented using various methods and tools. The AFRPA will implement institutional controls at Castle using the layering approach. Various methods will be used to protect the remedial action. In addition, federal and state regulations have requirements for landfills closed by capping (such as LF-4 and LF-5).

Though considered long-term for the landfill sites (since 30-year monitoring is required for landfills closed by capping), deed restrictions are not necessarily permanent. To remove deed restrictions, the property owners or potential property owners would need to prove that the site no longer poses a threat to human health or the environment. It is likely active remediation would be required to remove these restrictions. Also, approval from the Air Force, the California Department of Toxic Substances Control, California Regional Water Quality Control Board, and U.S. Environmental Protection Agency would be required.

Institutional control at Landfills 4 and 5 support and complement the remedial action. For LF-4 and LF-5 and associated disposal pit sites, the remedy includes Zoned Capping with Institutional Controls and Long-term (30 years) Monitoring.

The goals and objectives of institutional controls at the landfill sites include: 1) protecting the cap from damage, 2) preventing potential human health exposure to waste buried at the site, and 3) maintaining Air Force and regulator access for periodic cap and groundwater maintenance work. There are also Federal state closure/post closure regulatory requirements that apply to Landfills 4 and 5.

**Comment**: A RAB member indicated that the community does not want restrictions that will be in place for generations. The RAB would like the need for deed restrictions to be periodically reviewed at each site until the site is ready for reuse and requested that the Air Force assume responsibility for insuring that deed restrictions are removed as soon as possible.

**Air Force Response**: Except for landfill sites (LF-4 and LF-5) where institutional controls are considered permanent (since 30-year monitoring is required for landfills closed by capping), property owners or potential property owners can seek to have deed restrictions removed if the site no longer poses a threat to human health or the environment. Removal of the deed restriction would be possible once the Air Force, California Department of Toxic Substance Control, California Regional Water Quality Control Board, and the U.S. Environmental Protection Agency concur that the site no longer poses a potential threat.

In addition, as part of the CERCLA process, all selected remedies are reviewed during a five-year review. The need for deed restrictions is also reevaluated as part of this review process. Since institutional controls are the remedy for the stain sites and part of the selected remedies at the landfill sites, they will be subject to review during the next five-year review in 2003.

**Comment**: Two RAB members expressed concern regarding the capping alternative for metals and dioxin contaminated soil at the FTA-1 site. They indicated that the community wanted the site excavated and removed from the base. The community feels that capping the area will create another unusable area similar to the landfills. One RAB member provided an estimate that it would cost only an additional 2.5 million dollars to excavate and dispose of the contaminated soil and indicated that was not a substantial amount considering over 100 million dollars had been spent studying the base and only 15 million dollars had been budgeted for restoration.

**Air Force Response**: FTA-1 has been removed from the SCOU ROD Part 1 pending resolution of issues regarding the agency concerns over the selected remedy and community concerns regarding institutional controls/deed restriction. The FTA-1 site will be addressed in the CB ROD – Part 2 (now in the SCOU ROD Part 3). The Air Force will release a CB Proposed Plan – Part 2 with the preferred alternative for FTA-1. The public will have an opportunity to comment on this Proposed Plan before the remedial decision for FTA-1 is finalized.

**Comment**: The Merced County Department of Public Health submitted the following letter dated August 25, 1997 to the Air Force at the August 26, 1997 public hearing.
(Note: Portions of this letter not relevant to ETC-8, ETC-10, FTA-1, LF-4 or LF-5 are not reproduced.)

The Division of Environmental Health has reviewed the document *Proposed Cleanup of Soil Contamination at Castle Airport* and has the following comments:

1. Not pertinent to ETC-8, ETC-10, FTA-1, LF-4 or LF-5.

2. The following list describes the preferred alternatives for cleanup of the landfills:

| | |
|---|---|
| Landfill #1 | Excavation to Landfill #4 |
| Landfill #2 | Excavation to Landfill #4 |
| Landfill #3 | Zoned Cap |
| Landfill #4 | Zoned Cap/Consolidated Landfill |
| Landfill #5 | Zoned Cap |
| Castle Vista A | Excavation to Landfill #4 |
| Castle Vista B | Excavation to Landfill #4 |

This office has taken a position that the landfills should be completely excavated and removed for the following reasons:

A. Complete excavation eliminates the possibility of currently unknown environmental problems at the landfills from leaching into the ground water.

B. Complete excavation allows full reuse of the parcel without any deed restrictions.

C. The long-term costs of capping and monitoring are eliminated.

D. Full reuse of the adjacent property is not impacted by closed landfills.

This position has been stated many times (see enclosed documents). Therefore, we once again suggest that the best long-term solution in addressing the landfills and disposal pits at Castle is complete excavation and removal. Capping and monitoring is not adequately protective of human health and the environment.

The total cost of the excavation/disposal on-site in a consolidated landfill of all seven landfills is $15,781,016 according to Plate 5-2-3 of the SCOU RI/FS. The total cost of the Department of Defense preferred option of zoning is $13,010,165. It would appear that for approximately $2.5 million in additional cost, the majority of the landfills could be excavated and the land returned to full productive reuse.

The Department of Defense initial position on landfills was to cap and monitor all seven landfills. The current position is to excavate four landfills. We are hopeful that continued progress can be achieved to protect human health and the environment and reuse of land at the base.

3. The proposed plan lists the preferred alternative for Fire Training Area 1 (FTA-1) as zoned capping. This office concurs with Cal/EPA in considering the alternative unsuitable since the Base Closure Team chose this alternative without performing a detailed analysis using the seven criteria as required by CERCLA. We suggest for the same reasons listed in item #2 that FTA-1 be excavated and removed.

4. Not pertinent to ETC-8, ETC-10, FTA-1, LF-4 or LF-5

**Air Force Response**: In response to comment 2, the SCOU RI/FS recommended Zoned Capping with Institutional Controls for all seven of the landfill sites. The cap remedy meets state and CERCLA requirements and addresses the human health risk, which is greater than one in one million ($1X10^{-6}$). Under CERCLA, the remedial preference for landfills is on-site disposal and treatment. EPA's presumptive remedy for landfills is capping. In response to community concern, the selected remedy for CVLF-A, CVLF-B, LF-1, LF-2, and LF-3 has been changed to Excavation and On-site Disposal. These landfills will be clean closed, which involves digging down until you stop finding trash, to allow unrestricted reuse. To facilitate this process, non-hazardous, non-designated, and municipal waste removed from the excavated landfills will be taken to either LF-4 or LF-5 for consolidation and capping. Designated and hazardous wastes will be taken to appropriate off-site landfills for disposal. The SCOU ROD 1 selected remedy for LF-4 and LF-5 is Zoned Capping with Institutional Controls and Long-term Monitoring.

In reference to item 2A, many measures will be taken to prevent leaching of landfill contaminants into the groundwater. Following is text from the *Record of Decision for Comprehensive Basewide – Part 1 Groundwater* regarding remedial actions for groundwater in the Landfill 4 and 5 areas.

2.4.4 Selected Remedy: Other Plumes

The AF, with the concurrence of the EPA and Cal/EPA, has determined that active remediation of the North Base [Landfill 5], Landfill 1, and Landfill 4 Plumes is not warranted at this time because action is being taken to remediate the sources, and because removing the low concentration contaminants from the ground water would provide little benefit while incurring high costs. Because several of the contaminants are above primary drinking water standards, institutional controls will be implemented to prevent the installation of ground water supply wells on Castle AFB that would jeopardize public health or the environment from North Base [Landfill 5], Landfill 1, or Landfill 4 Plumes. Additionally, long-term monitoring will be performed under the Long-Term Groundwater Sampling Program to monitor contaminant concentrations in these plume areas. Contaminant concentration levels in the ground water will be reevaluated annually. If the

> concentration levels drop below the MCL and beneficial use concentrations for one year, any institutional controls may be removed. If, at any time, monitoring or modeling indicates that the contaminants will not meet the MCL and beneficial use concentrations within a reasonable time, or at least forty years from the date of the ROD, or that significant migration of the contaminants may occur at levels above the MCL and beneficial use concentrations which impact public health or the environment, active remediation will be considered.

In reference to items 2B and 2D, there are potential reuse possibilities for the capped landfills as open areas. In addition, the locations of on-site consolidation landfills are in areas where further development is unlikely and where there are limited future prospects. The alternative of Excavation and Off-site Disposal for these landfill sites is not preferable because of its high cost. The Air Force is excavating and removing all landfills located in areas with significant development opportunities.

In reference to item 2C, the long-term cost of operation and maintenance (O&M) is included for both options: 1) zoned capping and 2) excavation/on-site disposal. The total cost of zoned capping for all seven landfills is $13 million, as referenced in the SCOU RI/FS. Capping costs $9.6 million and long-term O&M costs $3.4 million. Therefore, the O&M costs are included in the $13 million estimate. The total cost of the excavation/disposal on-site of all seven landfills in a consolidated landfill is $15.8 million. This remedy also includes costs for O&M. The cost for excavation and disposal is approximately $14.2 million, and the cost for O&M is $1.6 million.

In response to comment 3, the proposed remedy for FTA-1 in the SCOU Proposed Plan is SVE/bioventing, flexible membrane liner (FML) capping, and institutional controls. However, FTA-1 has been removed from ROD 1 and will be addressed in the CB ROD – Part 2 (now in the SCOU ROD Part 3). The Air Force will release a CB Proposed Plan – Part 2 with preferred alternatives for the FTA-1 site. The public will have an opportunity to comment on this Proposed Plan. The final remedial decision for FTA-1 will be documented in the CB ROD – Part 2, which is scheduled for release in September 1999 (now in the SCOU ROD Part 3 which is scheduled for release in the spring of 2004).

The Air Force already installed a cap over FTA-1 to cover areas contaminated with lead, and they would like to maintain the cap as a containment measure. Based on community and regulator concerns, the Air Force is further studying the capping alternative and is reviewing other remedial options. The *FTA-1 Closure Report, Volume 1: Final Remedy for*

*Non-VOC Contamination* was issued in February 1998 and includes added justification for the capping remedy (report never finalized—subsequently replaced by the *FTA-1 Focused Feasibility Study* [Jacobs, 2002c], which identified capping as the preferred alternative for non-VOC contamination).

**Comment:** The RAB would like cleanup issues addressed regarding landfills, PCB sites, and FTA-1. The RAB prefers the removal of FTA-1 and PCB sites and the consolidation/removal of landfills.

**Air Force Response:** [Note: Portions of this response not relevant to FTA-1, LF-4 or LF-5 are not reproduced here.] The RI/FS recommended zoned capping and institutional controls for the seven base landfills. The zoned capping alternative would consolidate waste into a smaller area, dispose of any hazardous or designated waste off site, and comply with RCRA requirements for long-term monitoring. The Air Force recognizes that the community supports excavating and removing the seven landfills and consolidating them into one so that the land can be reused. The Air Force has agreed to remove five of the landfills—LF-1, LF-2, LF-3, CVLF-A and CVLF-B. These landfills will be excavated and consolidated on base at LF-4 and LF-5. During excavation, the materials will be screened, and any hazardous material identified will be transported off site to an EPA-approved hazardous waste disposal site.

The proposed remedy for FTA-1 was SVE/bioventing, flexible membrane liner (FML) capping, and institutional controls. However, FTA-1 has been removed from ROD 1 and will be addressed in the CB ROD – Part 2 (now in the SCOU ROD Part 3). The Air Force will release a CB Proposed Plan – Part 2 with preferred alternatives for the FTA-1 site. The public will have an opportunity to comment on this Proposed Plan. The final remedial decision for FTA-1 will be documented in the CB ROD – Part 2, which is scheduled for release in September 1999 (now in the SCOU ROD Part 3 which is scheduled for release in the spring of 2004).

As part of SVE operations, the Air Force has already installed a cap over FTA-1. For soil contaminated with lead, the Air Force has recommended maintaining the cap as a form of containment. Cap maintenance would also require the use of deed restriction. The Air Force realizes that the community would like the contamination to be removed so that deed restrictions can be lifted. The regulators are opposed to the FTA-1 cap because this

alternative was not considered during FTA-1's feasibility study and was not evaluated using the CERCLA criteria. The regulators are also concerned that the cap may not cover all of the lead-contaminated soil. Surface soil contamination is of particular concern at FTA-1 because runoff from the site goes into a wetlands area. Based on these concerns, the Air Force is further studying the capping alternative and is reviewing other remedial options.

**Comment**: Several RAB members expressed concern regarding a statement in the SCOU Proposed Plan that indicated there would be "no new construction" at the institutional control/deed restriction sites.

**Air Force Response**: One of the nine criteria for selecting a remedial alternative is short-term effectiveness. The comment in the Proposed Plan table under short-term effectiveness was "no new construction." The "new construction" statement does not apply to reuse, but rather to no new construction required for remediation purposes.

The SCOU PART 1 ROD will not preclude future construction at the affected sites. 40 CFR Section 258.61, however, precludes any post-closure use of the site property if the use would disturb the integrity of the final cover, the integrity of the landfill containment, or the function of the monitoring systems. The state may approve any other disturbance if the owner or operator demonstrates that disturbance of the final cover, components of the containment system, including any removal of waste, will not increase the potential threat to human health or the environment.

**Comment**: Several community members requested that the Air Force include the actual deed restriction language for each site with institutional controls in the SCOU ROD. RAB members requested information about specific limitations for each site by deed restrictions and what standards the community will need to meet in the future?

**Air Force Response**: With the exception of LF-4 and LF-5 (including LF-5 Trenches and Disposal Pits 5, 6, 8, 8A, and 9), all institutional control sites have been removed from SCOU ROD 1. Actual institutional control language for the landfill sites will be developed in accordance with state and federal requirements. A description of the AFRPA management strategy for institutional controls is presented in Section 5.1.3.9 of this ROD. *[SCOU ROD 1]*

## 3.2 PUBLIC COMMENTS ON THE COMPREHENSIVE BASEWIDE PROPOSED PLAN – PART 2

The *Comprehensive Basewide Proposed Plan – Part 2* (Jacobs, 2003) was submitted for a 30-day public review period from 3 December 2003 through 5 January 2004. The CB Proposed Plan – Part 2 was made available for review at the Merced County Library and the Information Repository located at Castle AFB. In addition, a public meeting was held on 10 December 2003 to explain the proposed plan and provide an opportunity for public comment. The public was invited to review and comment, either orally or in writing, on the remedial alternatives presented in the CB Proposed Plan – Part 2.

A complete presentation of comments received from the public and Air Force responses will be presented in the Comprehensive Basewide Record of Decision – Part 2, scheduled for completion in September 2004. Only those comments directly related to the selected remedies for ETC-8, ETC-10, FTA-1, LF-4 (including DP-5 and DP-6) and LF-5 (including DP-8, DP-8A, DP-9 and Landfill 5 Trenches) and the selected remedy for ecological concerns at ETC-10, ETC-12, FTA-1, LF-3 and LF-5 are presented here.

### 3.2.1 Modifications Resulting from Public Comments

There were no modifications to selected remedies presented in the SCOU ROD Part 3 based on public comments.

### 3.2.2 Summary of Public Comments and Air Force Responses

Comments and Air Force responses on the *Comprehensive Basewide Proposed Plan – Part 2* (Jacobs, 2003) follow.

**Comment:** The map attached to the proposed plan is inconsistent with the map located in the Closure Report for Landfills 4 and 5. The map only shows the CERCLA portion of Landfill 5 and does not show the demolition debris portion of Landfill 5. The County and State recognize Landfill 5 as both the CERCLA fenced and capped area and the demolition debris area. The map should be revised to include the demolition debris area.

**Air Force Response:** Although the demolition debris area may be subject to County and State regulation, it is not included in the CERCLA remedy for LF-5. Since the Proposed Plan, as well as the Record of Decision that will memorialize the CERCLA remedy for LF-5,

are CERCLA documents, the demolition debris area will not be included in the figures for the documents. This is consistent with the joint letter issued to the Federal Bureau of Prisons (BOP) under U.S. Environmental Protection Agency (EPA) letterhead by the Castle Airport RPMs, dated June 25, 2003, on which the Division of Environmental Health was copied. As indicated in the joint letter, the BOP has the responsibility to comply with applicable State and County regulations for the demolition debris area.

**Comment:** The proposed plan does not recognize that Landfill 5 is in violation of the State law (see attached letter dated April 17, 2003).

**Air Force Response:** As noted in the previous response, the demolition debris area is not part of the CERCLA remedies contemplated for LF-5 and compliance with State and County regulations regarding the area is the responsibility of the BOP. The County's letter of April 17, 2003, referenced in the comment, is properly addressed to the BOP who has responsibility for the area.

**Comment:** An explanation should be given as to why the Air Force is not the responsible party for the demolition portion of Landfill 5 (especially since the demolition portion of Landfill 5 is in violation of the ARARs listed in the Closure document) but is the responsible party for the fenced, capped portion of Landfill 5.

**Air Force Response:** The joint letter issued to the Federal Bureau of Prisons (BOP) under U.S. EPA letterhead by the Castle Airport RPMs, dated June 25, 2003, on which the Division of Environmental Health was copied, provides the explanation requested by this comment. The relevant excerpt from the letter is provided below (italics added):

"The Castle Site Wide Remedial Investigation and Feasibility Study (RI/FS) report identified twelve waste trenches and five waste disposal pits in the 85-acre area, known as the Landfill 5 area. The Air Force consolidated these waste pits and trenches and placed a 6-acre landfill, which was capped and described as Landfill 5. The landfill cover was constructed as a CERCLA Non-Time Critical Removal Action in 1996 and was the only CERCLA action taken at the Landfill 5 area. The western portion of the Landfill 5 area also contained construction and demolition debris and it was determined that *no CERCLA remedial action was required since the debris material was not considered a hazardous substance under CERCLA and therefore not subject to CERCLA.* ... While the construction

and demolition debris, which is not a part of the fenced area at Landfill 5, and has been determined not to require any CERCLA action, therefore the reuse, removal and/or burial of the debris would be subject to any applicable State and County regulations. Regarding this area, the undersigned agree that *the BOP,* as *the current property owner, has the responsibility to comply with all applicable regulations regarding the debris.*" The undersigned for the joint letter included representatives from EPA, the Air Force and California Department of Toxic Substances Control.

**Comment:** In response to a slide indicating that the ecological risk assessment found five sites impacted with metals, an attendee asked what metals had been identified at the sites (ETC-10 and 12, FTA-1 and LF-3 and 5).

**Air Force Response:** Lead was identified as the primary metal contaminant. At ETC-10, lead, antimony and arsenic were found in association with lead shot used at the former skeet range. At FTA-1, the presence of metals, including cadmium, chromium, copper, lead, nickel, vanadium and zinc, was due to materials, such as waste oils or solvents, used or deposited at the site. At ETC-12, the presence of metals (lead, chromium and vanadium) was likely due to metallic debris that was dumped at the site. At LF-3 and LF-5, a wide variety of metals were detected in association with the general waste and refuse disposed at the sites. Metals of ecological concern at LF-3 and LF-5 include aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, molybdenum, nickel, selenium, thallium and vanadium. Overall, lead was the primary metal of ecological concern.

At each of the sites, actions have been implemented or are planned to provide protection of human health and the environment. The CB Proposed Plan Part 2 recommends that ecological monitoring be done at the wetlands associated with the five sites in order to establish their long term health. Contaminated soils at ETC-10 were excavated and consolidated beneath the LF-5 cap. A small area of metals contaminated soil was left at ETC-10 since, among other reasons, its removal would be more detrimental to associated wetlands than leaving it in place. With the exception of a small area planned for excavation in 2004, all metal-contaminated soil at FTA-1 has been capped. At ETC-12, detected metals concentrations did not exceed levels protective of human health and groundwater quality, but monitoring of wetlands associated with the site will be conducted due to metals detected in excess of background concentrations. LF-3 was completely excavated and

consolidated under the LF-5 cap. However, wetland areas associated with LF-3 will be monitored to assure their long term health. Similarly, at LF-5, all wastes have been capped but associated wetland areas will be monitored to assure their long-term health.

**Comment:** A public hearing attendee asked if the metals were mostly from the gun range or the skeet.

**Air Force Response:** Mr. Gangnuss and Mr. Watkin responded during the meeting that ETC-10 was a skeet range and ETC-12 was a surface disposal area. FTA-1 was a fire training area.

**Comment:** Mr. Mitchell asked if the lead will have impact to groundwater.

**Air Force Response:** Mr. Gangnuss responded during the meeting that it will not have impact to groundwater because it did not exceed the water quality site assessment, the WQSA. The AF will monitor the wetlands to determine if the wetlands are receiving impact from the lead that has been left in place. With the exception of FTA-1, there is no groundwater impact from solvents at these sites. At sites ETC-10, ETC-12, LF-3 and LF-5, lead is not present at concentrations in soil that pose a threat to groundwater quality. At FTA-1 there was a single sample that exceeded lead levels established for the protection of groundwater quality. This area is included under the engineered cap at FTA-1 that provides for protection of groundwater.

**Comment:** Mr. Mitchell asked for clarification on the amount of lead that was put into ETC-10, near the wetlands area, where the excavation was performed. He wanted to know what metals were found and how much was excavated? And how much [lead shot] was used out there, how many rounds were fired over a period of time. Mr. Mitchell also wanted to know where the excavated soils went.

**Air Force Response:** Mr. Gangnuss agreed during the meeting that the list [of excavated metals] would be provided to Mr. Mitchell. Mr. Watkin added that it would not be possible to estimate how many rounds were fired over time. Mr. Sjaarda added that extensive sampling was performed and even though it may not be possible to estimate how much lead shot was deposited in the area, the Air Force knows how much [contamination] was there. The area was excavated and then confirmation samples were collected, by collecting soil samples from the bottom of the excavation. Mr. Gangnuss added that both the vertical and

horizontal extent were determined prior to the excavation. The metals of concern at ETC-10 were lead, antimony and arsenic. The metals originated from the lead shot that was used at the skeet range. Contamination at the site was found 300-500 feet from the shooting pad in a fan shaped pattern that coincided with the flight path of shotgun shell discharges. The number of rounds fired over the active life of the range is not known. However, extensive sampling was conducted to determine the lateral and vertical extent of metals contamination associated with the lead shot. Polycyclic aromatic hydrocarbon (PAH) contamination, derived from the binder used in the clay skeet targets, was also found at the range. A total of approximately 4840 cubic yards of soil, 1040 cubic yards of which was metals-contaminated, was excavated from the ETC-10 site. After determination by analysis that the soil was suitable for onsite disposal, it was consolidated under the Landfill-5 cap. Lead concentrations from the metals-contaminated soil ranged from 90-670 mg/kg.

**Comment:** Mr. Palsgaard said that the Landfill 5 Map should show Landfill 5 in its entirety, including the State defined landfill, as was done in previous documents.

**Air Force Response:** Mr. Watkin clarified during the meeting that the purpose of the map was not to identify the State defined landfill. The purpose of the map is to show the completed Landfill 5 capped area since that is the area affected by the CERCLA remedy. The original delineation of the LF-5 area was based on an EPA aerial photographic survey. For the purposes of site investigation, the site delineation encompassed a large area including disposal pits and trenches as well as roadways, construction debris, disturbed ground and adjacent areas. Early maps of the area showed the entire area of investigation. The current map only depicts the capped area where all landfill wastes were consolidated. The remaining areas are not considered as subject to CERCLA since only construction and demolition debris were dumped there, not hazardous materials or wastes.

**Comment:** Mr. S. Malta asked for clarification on Landfill 4 and why it showed up as two areas on the map.

**Air Force Response:** Mr. Watkin clarified during the meeting that there are two capped areas for Landfill 4, both of which are within the fenced area.

## 3.3 AGENCY COMMENTS ON THE DRAFT FINAL SCOU ROD PART 3

A draft final SCOU ROD Part 3 was submitted to the EPA and to the State regulatory agencies (DTSC and RWQCB) on 5 May 2004. Comments on the draft final SCOU ROD Part 3 were received from the Merced County Department of Public Health on 4 June 2004, from the EPA on 9 June 2004, from the DTSC on 17 June 2004 and from the RWQCB on 30 June 2004. This draft final SCOU ROD Part 3 incorporates changes based on comments received from the regulatory agencies on the initial draft final document. Formal responses to agency comments on the initial draft final document are provided in Appendix D.

## 3.4 TECHNICAL AND LEGAL ISSUES

There are no unresolved technical or legal issues related to the selected remedies for ETC-8, ETC-10, FTA-1, LF-4 including DP-5 and DP-6, LF-5 including DP-8, DP-8A and Landfill 5 Trenches, or DP-9. In addition, there are no unresolved technical or legal issues related to the selected remedy for ecological concerns at ETC-10, ETC-12, FTA-1, LF-3 and LF-5 (including DP-8, DP-8A and Landfill 5 trenches) or any of the other 225 SCOU sites.

# Section 4

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Waste Policy Institute (WPI). 2002. Source Control Operable Unit Record of Decision Part 1. Prepared for the Air Force Center for Environmental Excellence (AFCEE), Brooks Air Force Base, Texas. November.

Waste Policy Institute (WPI). 1997. Castle Airport, Source Control Operable Unit, Proposed Plan. Prepared for the Air Force Center for Environmental Excellence (AFCEE), Brooks Air Force Base, Texas. August.

# Appendix A

## Plate 1
## Soil and Groundwater Remedial Actions at Castle Airport

# PARTIALLY SCANNED
# OVERSIZE ITEM(S)

See document # 2259485
for partially scanned image(s).

PLATE 1

For complete hardcopy version of the oversize document
contact the Region IX Superfund Records Center

# Appendix B

## Administrative Record Index

Castle AFB, CA - AR DOCUMENTS
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| DOC. DATE | SUBJECT OR TITLE | AUTHOR or CORP. AUTHOR | FILE/CD NUMBER |
|---|---|---|---|
| 28 Jan 83 | HQ SAC Letter to Base Concerning Commencement of Phase I, Records Search, TCE Contaminated Groundwater | Rasmussen, George R<br>HQ SAC/DEP | 02<br>CD 2 |
| 14 Mar 83 | Base Letter to CRWQCB Concerning TCE Groundwater Investigation | Page, Aaron, Col<br>93 CSG/CC | 06<br>CD 2 |
| 31 May 83 | HQ AFESC Message to HQ SAC Concerning Implementation of Program | HQ AFESC/DEV | 03<br>CD 2 |
| 09 Jun 83 | Phase I, Pre-Performance Meeting Minutes | Mangan, Chuck<br>Engineering-Science, Inc. | 05<br>CD 2 |
| 02 Sep 83 | Base Letter to HQ SAC Concerning Phase I, Review | Hedrick, Stephen P, Capt<br>93 MG/SGPB | 07<br>CD 2 |
| Oct 83 | Phase I, Records Search Report | Engineering-Science, Inc. | 08<br>CD 2 |
| 19 Oct 83 | CDHS Letter to MDPH Concerning Surveys for Abandoned Hazardous Waste Disposal Sites | Bailey, Thomas E<br>California Department of Health Services | 16<br>CD 2 |
| 04 Jan 84 | HQ SAC Letter to USAF OEHL Concerning Phase I, Final Report Completion and Request for Phase II to Begin | Burnett, Ronald D, Col<br>HQ SAC/SGPB | 10<br>CD 2 |
| 04 Jan 84 | CDHS Letter to HQ SAC Concerning Phase I Completion and Phase II Progression | Sandhu, Mohinder S<br>California Department of Health Services | 11<br>CD 2 |
| 04 Jan 84 | CRWQCB Letter to Base Concerning Review of Phase I, Report | Wolfson, James B<br>California Regional Water Quality Control Board | 12<br>CD 2 |

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|---|---|---|---|
| 16 Jan 84 | Base Letter to HQ SAC Concerning Community Understanding and Support for Phase II | Astorino, Loring R, Col<br>93 BMW/CC | 13<br>CD 2 |
| 02 Feb 84 | Base Letter to HQ SAC Concerning TCE Sample Results Collected from Wells 1-4 and Four Distribution Points, Jan 84 | Hedrick, Stephen P, Capt<br>93 MG/SGPB | 14<br>CD 2 |
| 03 Feb 84 | Base Letter to CRWQCB Concerning Estimated Timetable for Phase II | Dempsey, Robert E, Col<br>93 BMW/CV | 15<br>CD 2 |
| 15 Feb 84 | Base Letter to CRWQCB Concerning Public Hearing | Astorino, Loring R, Col<br>93 BMW/CC | 1019<br>CD 4 |
| 28 Feb 84 | Phase II Presurvey Meeting Minutes | Hedrick, Stephen P, Capt<br>93 MG/SGPB | 18<br>CD 2 |
| Mar 84 | Phase II, Problem Confirmation and Quantification Presurvey Report, Vol I, Technical Work Plan | Roy F Weston, Inc. | 17<br>CD 2 |
| 05 Mar 84 | Water Analysis Results, Wells 1-9 and 11, 12-18, and Four Distribution Points, 02 Feb 84 | 93 MG/SGPB | 19<br>CD 2 |
| 05 Mar 84 | RPM Meeting Minutes, 28 Feb 84 | Hedrick, Stephen P, Capt<br>93 MG/SGPB | 32<br>CD 2 |
| 26 Mar 84 | TCE Sample Results, 24 Oct 83-06 Mar 84 | 93 MG/SGPB | 20<br>CD 2 |
| 26 Mar 84 | TCE Sample Results, Mar 84 | 93 MG/SGPB | 21<br>CD 2 |

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|---|---|---|---|
| 01 May 84 | TCE Sample Results, Apr 84 | 93 MG/SGPB | 1018 CD 4 |
| Jun 84 | SOW, Phase II, Construct Water Line, Located at Wallace Road and Nearby Hospital Road | AFCEE/ESB | 906 CD 3 |
| 04 Jun 84 | TCE Sample Results, May 84 | 93 MG/SGPB | 22 CD 2 |
| 18 Jun 84 | Phase II, Stage 1, Task Description and Presurvey Report | HQ SAC/SGPB | 25 CD 2 |
| 27 Jun 84 | TCE Sample Results, Jun 84 | 93 CSG/DEEV | 23 CD 2 |
| 17 Jul 84 | HQ SAC Letter to CRWQCB Concerning Base Activity | Hauver, Robert C, Col HQ SAC/SG | 24 CD 2 |
| 24 Jul 84 | MDPH Letter to HQ SAC Concerning Review of Phase II, Stage 1 | Norman, William F Merced County Department of Public Health | 26 CD 2 |
| 28 Aug 84 | HQ SAC Letter to USAF OEHL Concerning Comments on Phase II, Stage 1, Task Description | Burnett, Ronald D, Col HQ SAC/SGPB | 27 CD 2 |
| 09 Nov 84 | Base Memorandum Concerning PCB Sample Results, BCE Storage Yard and Bldg 136 | Davis, Merritt G, Jr, Col 93 MG/SGPB | 28 CD 2 |

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|---|---|---|---|
| 31 Dec 84 | Newspaper Article, Various Articles Concerning Base Cleanup | The Atwater Signal<br>The Merced Sun Star<br>The Valley Bomber<br>The McClatchy News Service<br>The Fresno Bee<br>The Merced Sun Star | 29<br>CD 2 |
| 18 Feb 85 | Soils and Ditch Sediments Lab Reports | Roy F Weston, Inc. | 31<br>CD 2 |
| 20 Mar 85 | Toxicology Summary Report | Weston Analytical Laboratories | 34<br>CD 2 |
| 19 Apr 85 | TOC and Phenols Results - Water Samples | Weston Analytical Laboratories | 35<br>CD 2 |
| 11 Aug 85 | Base Letter to CRWQCB Concerning Inspection and Annual Review of ISD Groundwater Monitoring Program | Snow, Verne L<br>93 CSG/DEEV | 36<br>CD 2 |
| 06 Sep 85 | Contamination Investigation and Sampling of Transformers and Tanks Corrosion Control Facility Report | Harding-Lawson Associates | 37<br>CD 2 |
| Nov 85 | Phase II, Stage 1, Confirmation and Quantification Technical Report, Vol I of II | Roy F Weston, Inc. | 38<br>CD 2 |
| Nov 85 | Phase II, Stage 1, Confirmation and Quantification Report, Vol II of II, Appendices | Roy F Weston, Inc. | 39<br>CD 2 |
| Nov 85 | Newspaper Article, "Meeting Today on TCE in Mobile Home Park" | De La Cruz, Mike<br>The Merced Sun Star | 47<br>CD 2 |
| Nov 85 | Base Letter to Regulators Concerning Information Requested at RPM Meeting | Cole, John R, LtCol<br>93 BW/CVE | 180<br>CD 2 |

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|---|---|---|---|
| 12 Nov 85 | Cleanup and Abatement Order Schedule | 93 CSG/CC | 41<br>CD 2 |
| 17 Dec 85 | MDPH Letter to HQ SAC Concerning Review of Phase II, Stage 1 | Norman, William F<br>Merced County Department of Public Health | 43<br>CD 2 |
| 22 Jan 86 | Base Letter to HQ SAC Concerning Request for Initiation of Phase IVA Action Coordination Meeting | Buzak, Jan, Dr<br>Kaiser, Donald W, LtCol<br>93 CSG/DE | 44<br>CD 2 |
| 24 Jan 86 | HQ SAC Memorandum Concerning Meeting on Groundwater Cleanup | Brown, Douglas, Maj<br>HQ SAC/DEPV | 45<br>CD 2 |
| 31 Jan 86 | Newspaper Article, "CAFB Will Fund New Water Well" | De La Cruz, Mike<br>The Merced Sun Star | 33<br>CD 2 |
| 05 Feb 86 | Phase IV Coordination Meeting Minutes, 29 Jan 86 | Kaiser, Donald W, LtCol<br>93 CSG/DE | 46<br>CD 2 |
| 23 Apr 86 | EPA Comments on Phase IVA RA Plan Task Report No 1, Site Characterization Plan for Main Base, South and West Flightline Sectors | EPA Region IX | 48<br>CD 2 |
| May 86 | Base Letter to EPA Concerning Comments on Phase II, Stage 2, Draft Report for Review and Comment | Chan, Arthur D<br>93 BMW/CEV | 49<br>CD 2 |
| 19 May 86 | SOW, Phase II, Stage 2, Draft | HQ SAC/SGPB | 50<br>CD 2 |
| Jun 86 | SOW, Phase IVA, RA Plan | Hazardous Materials Technical Center | 51<br>CD 2 |

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|---|---|---|---|
| 01 Jul 86 | Base Letter to MDPH Concerning JP-4 Spill, Bldg 1350 | Snow, Verne L<br>93 CSG/DDE | 52<br>CD 2 |
| 30 Jul 86 | EPA Comments on SOW, Phase IVA, RA Plan | EPA Region IX | 53<br>CD 2 |
| 30 Jul 86 | EPA Comments on SOW, Phase II, Stage 2, | EPA Region IX | 54<br>CD 2 |
| 30 Jul 86 | EPA Letter to Base Concerning Comments on Draft MOU and Agreement for City of Atwater Portable Water Well, 20 Jun 86 | Seraydarian, Harry<br>EPA Region IX | 911<br>CD 3 |
| 30 Jul 86 | MOU, Between the Base and City of Atwater, OT-29 | 93 CSG/CC<br>City of Atwater<br>EPA Region IX<br>California Department of Health Services<br>Merced County Department of Public Health | 1050<br>CD 4 |
| Aug 86 | EPA Letter to Base Concerning Comments on Phase II, Stage 1, Confirmation and Quantification Technical Report and SOW, Phase IVA, RA Plan | Takata, Keith<br>EPA Region IX | 55<br>CD 2 |
| 07 Aug 86 | MOU, Between USAF, DoD, EPA, CDHS, and MDPH | 93 BMW/CC | 898<br>CD 3 |
| 21 Aug 86 | Boyle Engineering Letter to City of Atwater Concerning Summary of Meeting, Domestic Well and Bellevue Road Water Main Project | Reitz, Mark<br>Boyle Engineering Corp. | 56<br>CD 2 |
| 21 Aug 86 | EPA Letter to Sharpe Army Depot Concerning Comments on Draft Final Initial Compliance Agreement | Seraydarian, Harry<br>EPA Region IX | 900<br>CD 3 |

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|---|---|---|---|
| 11 Sep 86 | Phase IVA Kickoff Meeting Minutes, 29-30 Jul 86 | Kaiser, Donald W, LtCol<br>93 CSG/DEEV | 57<br>CD 2 |
| 16 Sep 86 | CRWQCB Letter to Base Concerning Review of Phase II, Stage 2, Investigation Work Plans and Agreement for Expansion of Atwater Water Supply System | Wolfson, James B<br>California Regional Water Quality Control Board | 58<br>CD 2 |
| 18 Sep 86 | Agreement for Installation of TCE Filtration System at Homeowners Residence | Kirbie, Darrel G, LtCol<br>93 CSG/DEV | 59<br>CD 2 |
| 18 Sep 86 | Phase IVA, RA Plan, Draft Task Report Community Relations Plan (CRP), No. 7 | Oak Ridge National Laboratory | 60<br>CD 2 |
| 30 Sep 86 | Base Letter to CDTSC Concerning Closure, PCB Spill Site | Volz, David E, Col<br>93 CSG/CC | 1049<br>CD 4 |
| Oct 86 | Phase II, Stage 2, HSP | Roy F Weston, Inc. | 61<br>CD 2 |
| Oct 86 | Phase II, Stage 2, Technical Operations Plan | Roy F Weston, Inc. | 62<br>CD 2 |
| 14 Oct 86 | Oak Ridge Lab Letter to HQ SAC Concerning Soil Augering at SD-13, DA-5 | Loyd, John R<br>Oak Ridge National Laboratory | 63<br>CD 2 |
| 15 Oct 86 | CDHS Letter to Base Concerning PCB Cleanup Level for Spill Site, PCB Storage Facility, Bldg 1203 | Landis, Anthony J<br>California Department of Health Services | 64<br>CD 2 |
| 13 Nov 86 | MDPH Letter to Base Concerning Petroleum Contaminated Soils at East Perimeter Road | Palsgaard, Jeff H<br>Merced County Department of Public Health | 65<br>CD 2 |

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|---|---|---|---|
| 13 Nov 86 | Base Letter to EPA Concerning Development of IAG Between Base and EPA | Volz, David E, Col<br>93 CSG/CC | 66<br>CD 2 |
| 18 Dec 86 | Base Memorandum Concerning Procedures to Obtain Permit for Installing Monitoring Wells in MID Property | Randall, Steven G<br>93 CSG/DEEV | 68<br>CD 2 |
| 23 Dec 86 | Base Letter to MID Concerning Request for Permit to Construct and Maintain Pollution Monitoring on MID Rights of Way | Kaiser, Donald W, LtCol<br>93 CSG/DE | 70<br>CD 2 |
| 87 | Base Letter to Atwater Signal Concerning Response to Concerns of Resident | Wilson, James F, Col<br>93 CSG/CC | 164<br>CD 2 |
| Jan 87 | Chemical Groundwater Quality Evaluation Report | Boyle Engineering Corp. | 86<br>CD 2 |
| 22 Jan 87 | Phase IVA Meeting Minutes, 22 Jan 87 | 93 CSG/DEEV | 87<br>CD 2 |
| 28 Jan 87 | Oak Ridge Lab Letter to HQ SAC Concerning Submittal of Alternatives for Removal of TCE from Groundwater | Loyd, John R<br>Oak Ridge National Laboratory | 88<br>CD 2 |
| Feb 87 | Phase IVA, RA Plan, Task Report No 1 Site Characterization Plan for Main Base, South and West Flightline Sectors | IT Corp. | 89<br>CD 2 |
| 26 Feb 87 | Base Letter to MID Concerning Monitoring Wells Agreement | Volz, David E, Col<br>93 CSG/CC | 1052<br>CD 4 |
| 11 Mar 87 | City of Atwater Letter to Base Concerning Status of Groundwater Investigation | Haug, John A<br>City of Atwater | 899<br>CD 3 |

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|---|---|---|---|
| 09 Apr 87 | CDHS Memorandum Concerning Preliminary Review of Phase IVA, RA Plan, Task Report No 1, Site Characterization for Main Base, South and West Sectors | Buell, Reid<br>California Department of Health Services | 71<br>CD 2 |
| 21 Apr 87 | CRWQCB Letter to Base Concerning Comments on Current Regulatory Programs and Action | Nevins, Scott<br>California Regional Water Quality Control Board | 73<br>CD 2 |
| 24 Apr 87 | EPA Letter to Base Concerning Comments on Phase IVA, Site Characterization Plan | Takata, Keith<br>EPA Region IX | 74<br>CD 2 |
| 28 Apr 87 | EPA Region IX Meeting Minutes, 27 Apr 87 | Hawkins, Ronald L, LtCol<br>93 CSG/DEEV | 75<br>CD 2 |
| 30 Apr 87 | Base Letter to CRWQCB Concerning SWAT Program Guidance for South Landfill Zone | McGuirk, Dennis P, Col<br>93 BMW/CV | 76<br>CD 2 |
| May 87 | Final Wastewater Characterization and Hazardous Waste Survey Report | USAF OEHL/TSS | 1051<br>CD 4 |
| 12 May 87 | CRWQCB Letter to Base Concerning SWAT Reports | Nevins, Scott<br>California Regional Water Quality Control Board | 81<br>CD 2 |
| 19 May 87 | Oak Ridge Lab Letter to EPA Concerning Draft CRP | Loyd, John R<br>Oak Ridge National Laboratory | 82<br>CD 2 |
| 19 May 87 | Oak Ridge Lab Letter to CDHS Concerning Submittal of Draft CRP | Loyd, John R<br>Oak Ridge National Laboratory | 83<br>CD 2 |
| 22 May 87 | CDHS Letter to Base Concerning Memos Summarizing Meeting and Conference Calls Addressing Phase IVA, Work Plan | Wang, David<br>California Department of Health Services | 84<br>CD 2 |

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|---|---|---|---|
| 22 May 87 | RA, Technical Status Report and Time Schedule | 93 CSG/DEEV | 85 CD 2 |
| Jun 87 | Phase II, Stage 2, Draft Confirmation and Quantification Technical Report, Vol I of IV | Roy F Weston, Inc. | 90 CD 2 |
| Jun 87 | Phase II, Stage 2, Draft Confirmation and Quantification Technical Report, Vol III of IV | Roy F Weston, Inc. | 91 CD 2 |
| Jun 87 | Phase II, Stage 2, Draft Confirmation and Quantification Technical Report, Vol IV of IV, Appendices | Roy F Weston, Inc. | 92 CD 2 |
| Jun 87 | SOW, SWAT Reports, Four Solid Waste Areas | AFBCA/DD Castle | 93 CD 2 |
| 13 Jul 87 | Base Letter to MID Concerning Request for Permit to Construct and Maintain Groundwater Pollution Monitoring Wells Within MID Lateral Canal Rights of Way | Hodges, Harold W, LtCol 93 BMW/CVE | 94 CD 2 |
| 22 Jul 87 | EPA Letter to Base Concerning Proposal for NPL | Zelikson, Jeffrey EPA Region IX | 95 CD 2 |
| Aug 87 | Phase IVA, Site Characterization Plan | IT Corp. | 96 CD 2 |
| 06 Aug 87 | Base Letter to EPA Concerning Response to Comments on Phase IVA, Work Plan | Hodges, Harold W, LtCol 93 BMW/CVE | 97 CD 2 |
| 21 Aug 87 | CDHS Letter to EPA Concerning Responses to Comments During Meeting, 15 Jul 87 | Buell, Reid California Department of Health Services | 98 CD 2 |

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|---|---|---|---|
| 16 Oct 87 | EPA Letter to Base Concerning Comments on Sample Plan of Phase IVA, Revised Site Characterization Plan, Appendix D. | Martyn Goforth, Kathleen A<br>EPA Region IX | 102<br>CD 2 |
| 19 Oct 87 | SOW, RI/FS and RD | Martin Marietta Energy Systems, Inc. | 103<br>CD 2 |
| 02 Nov 87 | EPA Letter to Base Concerning Comments on Phase II, Stage 2, Confirmation and Quantification Draft Report | Zimpfer, Amy K<br>EPA Region IX | 104<br>CD 2 |
| 05 Nov 87 | Base Memorandum Concerning SOV Testing for JP-4 Pipeline Project | Petersen, Alfred<br>93 BMW/CVE | 105<br>CD 2 |
| 05 Nov 87 | Newspaper Article, "Haug Clarifies CAFB Well Delay" | UNK | 905<br>CD 3 |
| 09 Nov 87 | Base Letter to Resident Concerning TCE | Chan, Arthur D<br>93 BMW/CVE | 106<br>CD 2 |
| 09 Nov 87 | CDHS Letter to Base Concerning Comments on Phase IVA, Site Characterization Work Plan | Wang, David<br>California Department of Health Services | 107<br>CD 2 |
| 13 Nov 87 | EPA Letter to Base Concerning Comments on Phase IVA, Site Characterization Plan | Zimpfer, Amy K<br>EPA Region IX | 108<br>CD 2 |
| 16 Nov 87 | DOI Letter to Base Concerning Comments on Plots of TCE Concentrations Sampled in Test Wells 13-18 | Avon, Lizanne<br>US Department of the Interior - Water Resources Division | 113<br>CD 2 |
| 23 Nov 87 | CDHS Letter to Base Concerning Comments on Phase IVA, Site Characterization Plan, HSP, Appendix B, Aug 87 | Wang, David<br>California Department of Health Services | 112<br>CD 2 |

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|---|---|---|---|
| 08 Dec 87 | Base Memorandum Concerning Agenda and Summary of Coordination Meeting with Regulatory Agencies on Phase IVA, Site Characterization Plan, 17 Dec 87 | Chan, Arthur D<br>93 BMW/CVE | 111<br>CD 2 |
| 14 Dec 87 | CDHS Letter to Base Concerning Toxic RI Conducted Over the Last Five Years | Landis, Anthony J<br>California Department of Health Services | 158<br>CD 2 |
| 15 Dec 87 | SOW, RI, Proposed JP-4 Fuel Distribution System and Update of Phase IVA, Site Characterization Plan | Martin Marietta Energy Systems, Inc. | 110<br>CD 2 |
| 30 Dec 87 | Phase IVA Meeting Minutes, 17 Dec 87 | Chan, Arthur D<br>93 BMW/CVE | 114<br>CD 2 |
| Jan 88 | SOW, Soil Contaminated with Various Petroleum Hydrocarbons | Horizon Technologies | 115<br>CD 2 |
| 08 Jan 88 | EPA Letter to Base Concerning Receipt of Phase IVA, Site Characterization Plan | Anderson, Julie<br>EPA Region IX | 125<br>CD 2 |
| 19 Jan 88 | Base Letter to USAF OEHL/TSS Concerning CDTSC Comments on Phase II, Stage 2, Draft Report, Jun 87 | Chan, Arthur D<br>93 BMW/CVE | 130<br>CD 2 |
| 21 Jan 88 | CDTSC Letter to Base Concerning Comments on Phase IVA, Work Plan and TCE Plume Characterization | Wang, David<br>California Department of Toxic Substances Control | 124<br>CD 2 |
| 27 Jan 88 | Base Letter to CDTSC Concerning Poor Progress of RI | Amerasinghe, S Felix<br>93 CSG/CVE | 123<br>CD 2 |
| 03 Feb 88 | EPA Letter to Base Concerning Phase IVA, Work Plan | Anderson, Julie<br>EPA Region IX | 122<br>CD 2 |

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|---|---|---|---|
| 04 Feb 88 | CDHS Letter to Atwater City Administrator Concerning Proposed Placement of Production Well Near Bellevue Elementary | Wang, David<br>California Department of Health Services | 910<br>CD 3 |
| 08 Feb 88 | IRP Meeting Minutes, 08 Feb 88 | Chan, Arthur D<br>93 BMW/CVE | 119<br>CD 2 |
| 24 Feb 88 | EPA Letter to Base Concerning Kickoff Meeting for Upcoming IAG Negotiations, 02 Mar 88 | Anderson, Julie<br>EPA Region IX | 121<br>CD 2 |
| 26 Feb 88 | Draft FFA | EPA Region IX | 118<br>CD 2 |
| 26 Feb 88 | Base Letter to CRWQCB Concerning Review of Requirements of Toxic Pits Cleanup Act, 84 | Chan, Arthur D<br>93 BMW/CVE | 120<br>CD 2 |
| 01 Mar 88 | Draft Interagency FFA | EPA Region IX | 117<br>CD 2 |
| 07 Mar 88 | EPA Letter to City of Atwater Concerning Oversight of Superfund RI Activities | Anderson, Julie<br>EPA Region IX | 904<br>CD 3 |
| 28 Mar 88 | Base Letter to EPA Concerning Priority of Phase IVA Work Plan and RI/FS Work Plan | Chan, Arthur D<br>93 BMW/CVE | 116<br>CD 2 |
| Apr 88 | RI/FS, Work Plan, Vol I of IV | IT Corp. | 126<br>CD 2 |
| Apr 88 | RI/FS, SAP, Vol II of IV | IT Corp. | 127<br>CD 2 |
| Apr 88 | RI/FS, HSP, Vol IV of IV | IT Corp. | 129<br>CD 2 |

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|---|---|---|---|
| 13 Apr 88 | IAG Meeting Minutes, 16-17 Mar 88 | Chan, Arthur D<br>93 BMW/CVE | 134<br>CD 2 |
| May 88 | JP-4 Fuel Line Assessment Report | IT Corp. | 133<br>CD 2 |
| May 88 | Groundwater Investigation Report, Northeast Quadrant, Vol I of II | Boyle Engineering Corp. | 135<br>CD 2 |
| May 88 | Groundwater Investigation Report, Northeast Quadrant, Vol II of II, Appendices | Boyle Engineering Corp. | 136<br>CD 2 |
| 26 May 88 | EPA Letter to Base Concerning Comments on RI/FS, Revised Basewide Work Plan, Apr 88 | Seid, Raymond<br>EPA Region IX | 138<br>CD 2 |
| 27 May 88 | CDHS Letter to Base Concerning Comments on RI/FS, Basewide Work Plan, Apr 88 | Wang, David<br>California Department of Health Services | 139<br>CD 2 |
| Jun 88 | Draft Preliminary Design Report for Production Well and Water Main | Boyle Engineering Corp. | 140<br>CD 2 |
| 22 Jun 88 | SOW, Type A Services for Environmental SWAT and TPCA Investigations | 93 BMW/LGC | 141<br>CD 2 |
| 23 Jun 88 | Well Installation Procedures, Test Wells 12-18 | 93 CSG/CVE | 142<br>CD 2 |
| 29 Jun 88 | IAG Meeting Minutes, 14 and 15 Apr 88 | Chan, Arthur D<br>93 BMW/CVE | 143<br>CD 2 |
| Jul 88 | Phase II, Stage 2, Final Confirmation/Quantification Report, Vol I of III | Roy F Weston, Inc. | 144<br>CD 2 |

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| Jul 88 | Phase II, Stage 2, Final Confirmation/Quantification Report, Vol II of III | Roy F Weston, Inc. | 145 CD 2 |
| Jul 88 | Phase II, Stage 2, Final Confirmation/Quantification Report, Vol III of III | Roy F Weston, Inc. | 146 CD 2 |
| 01 Jul 88 | IT Corp Letter to Base Concerning Responses to EPA and CDHS Comments on RI/FS, Work Plans | IT Corp. | 147 CD 2 |
| 01 Jul 88 | Base Response to EPA Comments on Phase II, Stage 2, Report | 93 CSG/DEEV | 148 CD 2 |
| 01 Jul 88 | Base Response to CDHS Comments on Phase II, Stage 2, Report | 93 CSG/DEEV | 149 CD 2 |
| 06 Jul 88 | IT Corp Letter to Base Concerning Response to EPA and CDHS Comments on RI/FS, Work Plans, Apr 88 | IT Corp. | 150 CD 2 |
| 14 Jul 88 | EPA Letter to Base Concerning Comments on Documentation Requirements for Data Validation of Non-CLP Laboratory Data | Seid, Raymond EPA Region IX | 151 CD 2 |
| 15 Jul 88 | CDHS Letter to Base Concerning Implementation of Toxic Waste Site Characterization Phase of RI/FS, Apr 88 | Wang, David California Department of Health Services | 152 CD 2 |
| 15 Jul 88 | USAF OEHL Letter to HQ SAC/DEV Concerning Responses to EPA, CDHS, and Martin Marietta Comments on Phase II, Stage 2, Report | Williams, Joanne B USAF OEHL/TSS | 153 CD 2 |

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| 18 Jul 88 | RI/FS Work Plan Meeting Minutes, 03 Jun 88 | Amerasinghe, S Felix<br>93 BMW/CVE | 154<br>CD 2 |
| 19 Aug 88 | CDHS Letter to Base Concerning RI/FS Work Plans Meeting Transcript, 03 Jun 88 and Conference Calls, 14, 27 Jun 88 | Wang, David<br>California Department of Health Services | 155<br>CD 2 |
| 29 Aug 88 | IT Corp. Letter to Martin Marietta Concerning Comments on Final Clarifications of Regulatory Comments on Work Plan, Sampling Plan, HSP, and QAPP, Jun 88 | Erikson, Dike G<br>IT Corp. | 156<br>CD 2 |
| 30 Aug 88 | Base Letter to CRWQCB Concerning Two Off Base Landfill Areas Within Property Line of Castle Vista | Chan, Arthur D<br>93 BMW/CVE | 157<br>CD 2 |
| Sep 88 | RI/FS, QAPP, Vol III of IV | IT Corp. | 128<br>CD 2 |
| 01 Sep 88 | EPA Letter to Base Concerning Failure to Receive Addendum to Work Plan, Addressing Comments on Revised Work Plan | Anderson, Julie<br>EPA Region IX | 159<br>CD 2 |
| 08 Sep 88 | CRWQCB Letter to Base Concerning Summary of Status of Regulatory Programs and Actions | Del Sarto, Glenn<br>California Regional Water Quality Control Board | 160<br>CD 2 |
| 09 Sep 88 | CRWQCB Letter to Base Concerning Landfills Found in Castle Vista Housing Area | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 161<br>CD 2 |
| 14 Sep 88 | RPM Meeting Minutes, 13 Sep 88 | Chan, Arthur D<br>93 BMW/CVE | 162<br>CD 2 |

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| DOC. DATE | SUBJECT OR TITLE | AUTHOR or CORP. AUTHOR | FILE/CD NUMBER |
|---|---|---|---|
| 14 Sep 88 | Newspaper Article, "TCE Evaluation Programs Under Way at CAFB" | The Atwater Signal | 165 CD 2 |
| 15 Sep 88 | Newspaper Article, "Please Output for Bill K, TCE Letter" | Resident The Atwater Signal | 163 CD 2 |
| Oct 88 | RI/FS, Draft Final Community Relations Plan (CRP) | IT Corp. | 166 CD 2 |
| Oct 88 | EPA Letter to Base Concerning Location of City of Atwater Proposed Production Well | Anderson, Julie EPA Region IX | 903 CD 3 |
| 04 Oct 88 | FFA With EPA Under CERCLA Section 120 | 93 CSG/DEEV | 167 CD 2 |
| 05 Oct 88 | IAG Meeting Minutes, 27-29 Sep 88 | Chan, Arthur D 93 BMW/CVE | 168 CD 2 |
| 10 Oct 88 | EPA Memorandum Concerning Review of Groundwater Documents | Joma, Hannibal EPA Region IX | 909 CD 3 |
| 19 Oct 88 | Geo/Resource Consultants Letter to EPA Concerning Review of Responses to EPA and CDHS Comments on Work Plan | Tryhorn, Alan D Vanek, Eva Geo/Resource Consultants, Inc. | 169 CD 2 |
| 27 Oct 88 | Preliminary Health Assessment Study | EPA Region IX | 204 CD 2 |
| 28 Oct 88 | EPA Letter to City of Atwater Concerning Location of Proposed Production Well | Anderson, Julie EPA Region IX | 908 CD 3 |
| 31 Oct 88 | EPA Letter to Base Concerning Approval of QAPP for Work Plan | Flaherty, Michael S EPA Region IX | 171 CD 2 |

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|---|---|---|---|
| Nov 88 | Fact Sheet, Castle Environmental Update, Vol I, No. 1 | 93 BMW/PA | 173 CD 2 |
| 22 Nov 88 | EPA Letter to Base Concerning Measures Taken to Mitigate Exposure to TCE Contaminated Water, Mobile Home Park | Flaherty, Michael S EPA Region IX | 902 CD 3 |
| 23 Nov 88 | RPM Meeting Minutes, 27 Oct 88 | Chan, Arthur D 93 BMW/CVE | 175 CD 2 |
| Dec 88 | RI/FS, Work Plans, Addendum | IT Corp. | 176 CD 2 |
| 02 Dec 88 | MDPH Letter to EPA Concerning Federal Drinking Water Regulations | Palsgaard, Jeff H Merced County Department of Public Health | 901 CD 3 |
| 05 Dec 88 | USAF OEHL Letter to Base Concerning Responses to EPA and CDHS Comments on Phase II, Stage 2, Report | Styles, Jerald E, Lt USAF OEHL/TSS | 177 CD 2 |
| 08 Dec 88 | EPA Letter to Base Concerning Comments on Phase II, Stage 2 Confirmation and Quantification Final Report | Flaherty, Michael S EPA Region IX | 178 CD 2 |
| 21 Dec 88 | Grain Size Analysis Data | IT Corp. | 179 CD 2 |
| 26 Jan 89 | Base Letter to Kleinfelder Concerning SOW for Environmental SWAT and TPCA Investigations | Houston, Walter M 93 CSG/LGCC | 182 CD 2 |
| 26 Jan 89 | Newspaper Article, "Mobile Home Park Taps City Water" | De La Cruz, Mike The Merced Sun Star | 334 CD 2 |

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|---|---|---|---|
| 08 Feb 89 | Newspaper Article, "H2O Spells Happiness for Park Residents" | De La Cruz, Mike<br>The Atwater Signal | 172<br>CD 2 |
| 16 Feb 89 | Base Letter to CRWQCB Concerning Status of SWAT/TPCA Investigation | Chan, Arthur D<br>93 BMW/CVE | 186<br>CD 2 |
| 25 Feb 89 | Press Release, New Standards for 11 Chemical Contaminants of Drinking Water, Effective 25 Feb 89 | California Regional Water Quality Control Board | 188<br>CD 2 |
| 28 Feb 89 | TCE Sampling Analysis Data | California Water Labs | 187<br>CD 2 |
| Mar 89 | Fact Sheet, Castle Environmental Update, Vol II, No. 1 | 93 BMW/PA | 189<br>CD 2 |
| Mar 89 | Draft Groundwater Treatment Feasibility Report for Organics Removal, Main Base Wells 1, 2, and 3 | Boyle Engineering Corp. | 190<br>CD 2 |
| 08 Mar 89 | TPCA Investigation Work Plan for Fire Training Areas | Kleinfelder, Inc. | 191<br>CD 2 |
| 08 Mar 89 | Solid Waste Assessment Test Proposals Report | Kleinfelder, Inc. | 192<br>CD 2 |
| 15 Mar 89 | CDHS Letter to Base Concerning Comments on Meeting to Discuss Communication and IRM Concerns, 07 Feb 89 | Wang, David<br>California Department of Health Services | 193<br>CD 2 |
| 05 Apr 89 | EPA Letter to HQ USAF Concerning Comments on Meeting at Norton AFB, 28 Mar 89 | Zelikson, Jeffrey<br>EPA Region IX | 195<br>CD 2 |

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|---|---|---|---|
| 10 Apr 89 | CRWQCB Letter to Base Concerning TPCA Investigative Work Plan | Del Sarto, Glenn<br>California Regional Water Quality Control Board | 196<br>CD 2 |
| 27 Apr 89 | EPA Letter to Base Concerning Comments on SWAT Proposal, TPCA Investigation Work Plan, and Fire Training Areas | Flaherty, Michael S<br>EPA Region IX | 198<br>CD 2 |
| 27 Apr 89 | CDHS Letter to Base Concerning Comments on CRP | O'Kane, John A, Jr<br>California Regional Water Quality Control Board | 199<br>CD 2 |
| 28 Apr 89 | CRWQCB Letter to Base Concerning Comments on SWAT Proposal Review Comments | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 200<br>CD 2 |
| May 89 | FFA, Under CERCLA Section 120 | HQ USAF<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board<br>EPA Region IX | 78<br>CD 2 |
| May 89 | Groundwater Treatment Feasibility Report for Organics Removal, Main Base Wells 1, 2, and 3 | Boyle Engineering Corp. | 201<br>CD 2 |
| 04 May 89 | EPA Letter to DOA Concerning Confirmation of IAG Negotiations, 08 May 89-12 May 89 | Zelikson, Jeffrey<br>EPA Region IX | 202<br>CD 2 |
| 10 May 89 | Martin Marietta Letter to CDHS Concerning RI/FS, Work Plan Addendum | Loyd, John R<br>Martin Marietta Energy Systems, Inc. | 203<br>CD 2 |

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|---|---|---|---|
| 11 May 89 | IAG, FFA Under CERCLA Section 120 | HQ SAC<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board<br>EPA Region IX | 208<br>CD 2 |
| Jun 89 | Geological and Water Quality Test Results for Production Well 12 | Boyle Engineering Corp. | 205<br>CD 2 |
| 13 Jun 89 | Base Memorandum Concerning CRWQCB Comments on SWAT, TPCA Work Plans | Chan, Arthur D<br>93 BMW/CVE | 207<br>CD 2 |
| 15 Jun 89 | HQ USEPA Letter to EPA Region IX Concerning Control of Air Emissions from Superfund Air Strippers at Superfund Groundwater Sites | Longest, Henry L, II<br>Emison, Gerald<br>HQ USEPA | 1763<br>CD 9 |
| 29 Jun 89 | Newspaper Article, "Family Sues AF Over Tainted Well" | McCarthy, Charles<br>The Fresno Bee | 209<br>CD 2 |
| Jul 89 | EA, Disposal and Reuse, Location and Construction of New Production Well 12 | Boyle Engineering Corp. | 210<br>CD 2 |
| Jul 89 | FFA Under CERCLA Section 120 | HQ USAF<br>EPA Region IX<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 1007<br>CD 4 |
| 10 Jul 89 | Press Release, FFA to be Signed | 93 BMW/PA | 211<br>CD 2 |
| 20 Jul 89 | EPA Letter to Base Concerning Comments on Changes to Groundwater Sampling Events and Soil Boring Locations | Flaherty, Michael S<br>EPA Region IX | 213<br>CD 2 |

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|---|---|---|---|
| 21 Jul 89 | Federal Facility Agreement | 93 WG/PA | 1245 CD 6 |
| 31 Jul 89 | CDHS Letter to Base Concerning Review of Modification to Groundwater Sampling Events and Soil Boring Locations | O'Kane, John A, Jr<br>California Department of Health Services | 215 CD 2 |
| 08 Aug 89 | Base Memorandum Concerning Retired SMSgt Visit to Waste Dump Site, DP-28 | Tekrony, Linda<br>93 BMW/CVE | 216 CD 2 |
| 10 Aug 89 | EPA Letter to Base Concerning Ongoing RI Activities | Flaherty, Michael S<br>EPA Region IX | 217 CD 2 |
| 15 Sep 89 | Geo/Resource Letter to EPA Concerning Review of Recent Water Level Data for Monitoring Wells | Vanek, Eva<br>Tryhorn, Alan D<br>Geo/Resource Consultants, Inc. | 221 CD 2 |
| 19 Sep 89 | EPA Letter to Base Concerning Comments on RPM Meeting, 10 Aug 89 | Flaherty, Michael S<br>EPA Region IX | 222 CD 2 |
| 20 Sep 89 | CRWQCB Letter to Base Concerning Review of GAC Filtration Pump Test Results | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 223 CD 2 |
| 16 Oct 89 | RPM Meeting Minutes, 20 Sep 89 | Chan, Arthur D<br>93 BMW/CVE | 225 CD 2 |
| 23 Oct 89 | 72-Hour Leaking Aquifer Pump Test Letter Report | Boyle Engineering Corp. | 228 CD 2 |
| 25 Oct 89 | Base Memorandum Concerning TRC Meeting to be Held 30 Nov 89 | Chan, Arthur D<br>93 BMW/CVE | 226 CD 2 |

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|---|---|---|---|
| 25 Oct 89 | Base Memorandum Concerning Correspondence to CRWQCB for SWAT Portion of Contract | Houston, Walter M<br>93 CSG/LGCC | 227<br>CD 2 |
| 09 Nov 89 | Base Letter to Oak Ridge Lab Concerning CRWQCB Comments on Castle Vista Landfill Investigations | Chan, Arthur D<br>93 BMW/CVE | 174<br>CD 2 |
| 21 Nov 89 | Third Quarter Sampling Results from Production Wells 5, 6, 9, 10, and 11 for Review | 93 MG/SGPB | 230<br>CD 2 |
| 28 Nov 89 | TRC Charter | Famulare, Eugene J, Col<br>93 BMW/CV | 231<br>CD 2 |
| 28 Nov 89 | SOW, RI/FS, Step 3 Tasks | Martin Marietta Energy Systems, Inc. | 369<br>CD 3 |
| 01 Dec 89 | Base Letter to Resident Concerning Drinking Water Samples | Oyelowo, Layi A<br>93 CSG/EM | 232<br>CD 2 |
| 07 Dec 89 | Kleinfelder Letter to Base Concerning Responses to EPA Comments on SWAT/TPCA Work Plans | Johnson, Christopher S<br>Carey, Russell O<br>Kleinfelder, Inc. | 234<br>CD 2 |
| 11 Dec 89 | Base Letter to CDHS Concerning Deadline for IAG Primary Documents | Fowler, John F, Col<br>93 CSG/CC | 235<br>CD 2 |
| 13 Dec 89 | Kleinfelder Letter to Base Concerning Comments on Results of Water Samples Collected From Boring B-237 in South Landfill Zone | Johnson, Christopher S<br>Kleinfelder, Inc. | 236<br>CD 2 |
| 21 Dec 89 | TRC Meeting Agenda, 10 Jan 90 | Chan, Arthur D<br>93 CSG/EM | 381<br>CD 3 |

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|---|---|---|---|
| 22 Dec 89 | Base Letter to EPA and CDHS Concerning RPM Meeting Minutes, Nov 89 | Chan, Arthur D<br>93 CSG/EM | 239<br>CD 2 |
| 22 Dec 89 | EPA Letter to Base Concerning Comments on IAG Proposed Deadlines Pursuant to Section 8 | Flaherty, Michael S<br>EPA Region IX | 240<br>CD 2 |
| Jan 90 | SOW, Close Water Wells 2, 3, 4 | 93 CSG/EM | 1020<br>CD 4 |
| 02 Jan 90 | Base Letter to HQ SAC Concerning First TRC Meeting, 10 Jan 90 | Chan, Arthur D<br>93 CSG/EM | 241<br>CD 2 |
| 03 Jan 90 | Certificate of Analysis, CAC Title 22 Drinking Water Compliance | California Water Labs | 242<br>CD 2 |
| 04 Jan 90 | EPA Letter to Base Concerning Non-Concurrence With Proposed Deadlines for Primary Documents | Flaherty, Michael S<br>EPA Region IX | 243<br>CD 2 |
| 05 Jan 90 | Base Letter to CDHS Concerning Comments on IAG Schedule | Oyelowo, Layi A<br>93 CSG/EM | 244<br>CD 2 |
| 08 Jan 90 | CDHS Letter to Base Concerning Response to Draft TRC Charter | O'Kane, John A, Jr<br>California Department of Health Services | 245<br>CD 2 |
| 10 Jan 90 | Base Letter to Martin Marietta Concerning Comments on Regulatory Review of IAG Schedule | Chan, Arthur D<br>93 CSG/EM | 246<br>CD 2 |
| 18 Jan 90 | Base Letter to EPA and CDHS Concerning Comments on RPM Meeting on Groundwater Workshop | Chan, Arthur D<br>93 CSG/EM | 247<br>CD 2 |

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|---|---|---|---|
| 19 Jan 90 | TRC Meeting Minutes, 19 Jan 90 | 93 BMW/PA | 248 CD 2 |
| 31 Jan 90 | EPA Letter to Base Concerning Comments on Draft TRC Charter | Flaherty, Michael S EPA Region IX | 250 CD 2 |
| 09 Feb 90 | RI/FS Project Status Meeting Minutes, 25 Jan 90 | Martin Marietta Energy Systems, Inc. | 251 CD 2 |
| 12 Feb 90 | Base Memorandum Concerning Regulatory Comments on Proposed TRC Charter | Oyelowo, Layi A 93 CSG/EM | 252 CD 2 |
| 13 Feb 90 | RPM Meeting Minutes, 25 Jan 90 | Chan, Arthur D 93 CSG/EM | 253 CD 2 |
| 13 Feb 90 | Base Letter to EPA and CDHS Concerning Final IAG Schedule | Chan, Arthur D 93 CSG/EM | 254 CD 2 |
| 28 Feb 90 | RPM Meeting Agenda and Location, 07 Mar 90 | Chan, Arthur D 93 CSG/EM | 255 CD 2 |
| 07 Mar 90 | EPA Letter to Base Concerning Review of Response to Comments on SWAT Work Plan | Flaherty, Michael S EPA Region IX | 256 CD 2 |
| 07 Mar 90 | RI/FS Project Meeting Minutes, 07 Mar 90 | Martin Marietta Energy Systems, Inc | 257 CD 2 |
| 21 Mar 90 | CRWQCB Letter to Base Concerning Rational for MW 713 and 714 Placements | Mosbacher, Michael H California Regional Water Quality Control Board | 259 CD 2 |
| 23 Mar 90 | CDHS Letter to Base Concerning Rational for Locating MW 713 and 714 to Determine Potential TCE Source Areas | O'Kane, John A, Jr California Department of Health Services | 260 CD 2 |

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|---|---|---|---|
| 27 Mar 90 | Base Letter to EPA and CDHS Concerning Comments on Revised IAG Schedule Presented at RPM Meeting, 07 Mar 90 | Chan, Arthur D<br>93 CSG/EM | 274<br>CD 2 |
| 28 Mar 90 | Kleinfelder Letter to Base Concerning Comments on Final Response to EPA Comments on SWAT Proposal | Johnson, Christopher S<br>Carey, Russell O<br>Kleinfelder, Inc. | 261<br>CD 2 |
| 06 Apr 90 | CDHS Letter to Base Concerning Review of IAG Final Schedule of Primary Document Deliverables | Landis, Anthony J<br>California Department of Health Services | 263<br>CD 2 |
| 06 Apr 90 | EPA Letter to Base Concerning Confirmation of Agreement with Rational Provided by Air Force for Locating MW 713 and 714 | Flaherty, Michael S<br>EPA Region IX | 264<br>CD 2 |
| 09 Apr 90 | Base Letter to EPA and CDHS Concerning RI/FS Project Meeting Minutes, 07 Mar 90 | Ridenour, Charles B<br>93 CSG/EM | 265<br>CD 2 |
| 09 Apr 90 | Applicability of Toxic Pits Cleanup Act to FTA-3 Report | Kleinfelder, Inc. | 266<br>CD 2 |
| 09 Apr 90 | Base Letter to Various Agencies Concerning Closure of MOU | Fowler, John F, Col<br>93 CSG/CC | 1055<br>CD 4 |
| 10 Apr 90 | EPA Letter to Base Concerning Delineated Wells Sampled in Rounds 3 and 4 of Groundwater Monitoring Program | Flaherty, Michael S<br>EPA Region IX | 267<br>CD 2 |
| 12 Apr 90 | Base Memorandum Concerning Kleinfelder Final Response to EPA on SWAT/TPCA Program, 07 Mar 90 | Ridenour, Charles B<br>93 CSG/EM | 268<br>CD 2 |
| 17 Apr 90 | Technical Memorandum Report, Pilot Treatment Plant | 93 CSG/EM | 269<br>CD 2 |

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| 17 Apr 90 | TRC Meeting Agenda, 25 Apr 90 | Steuck, Jay C, Lt<br>93 BMW/PA | 270<br>CD 2 |
| 25 Apr 90 | TRC Meeting Minutes, 25 Apr 90 | 93 CSG/EM | 273<br>CD 2 |
| May 90 | SWAT Work Plan, Castle Vista Landfills | IT Corp. | 275<br>CD 2 |
| 02 May 90 | RI/FS Project Meeting Minutes, 24 Apr 90 | Loyd, John R<br>Martin Marietta Energy Systems, Inc. | 272<br>CD 2 |
| 08 May 90 | SWAT Report | Kleinfelder, Inc. | 276<br>CD 2 |
| 18 May 90 | MID Letter to Base Concerning Casad Canal Right of Way to Test for Monitoring Wells | Reta, Tom<br>Merced Irrigation District | 277<br>CD 2 |
| 23 May 90 | RPM Meeting Agenda, 31 May 90 | Chan, Arthur D<br>93 CSG/EM | 278<br>CD 2 |
| 25 May 90 | EPA Letter to Base Concerning SWAT and TPCA Programs | Flaherty, Michael S<br>EPA Region IX | 280<br>CD 2 |
| 25 May 90 | SWAT Report West Landfill Zone, Vol I of II | Kleinfelder, Inc. | 281<br>CD 2 |
| 25 May 90 | SWAT Report, West Landfill Zone, Vol II of II | Kleinfelder, Inc. | 282<br>CD 2 |
| 30 May 90 | CDHS Letter to Base Concerning Comments on Technical Memorandum for Proposed Long Term Pumping Test | O'Kane, John A, Jr<br>California Department of Health Services | 283<br>CD 2 |

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| 31 May 90 | Base Memorandum Concerning RPM Meeting Minutes, 31 May 90 | Chan, Arthur D<br>93 CSG/EM | 284<br>CD 2 |
| 31 May 90 | DSMOA | Kizer, Kenneth W<br>California Department of Health Services | 359<br>CD 3 |
| Jun 90 | SOW, TCE Filtration System for Residents | 93 CSG/DEVR | 72<br>CD 2 |
| Jun 90 | Draft Community Relations Plan (CRP) | 93 BMW/PA | 285<br>CD 2 |
| Jun 90 | Fact Sheet, Environmental Update, Vol II, No 2 | 93 BMW/PA | 286<br>CD 2 |
| Jun 90 | Base Letter to Residents Concerning Monthly TCE Samples Taken from Drinking Water | Sassaman, Brian L, Lt<br>93 MG/SGPB | 287<br>CD 2 |
| Jun 90 | Base Letter to Residents Concerning Monthly TCE Samples Taken to Monitor Drinking Water Quality, OT-30 | Sassaman, Brian L, Lt<br>93 MG/SGPB | 288<br>CD 2 |
| Jun 90 | Base Letter to Resident Concerning Installation of GAC Filter to Remove TCE, OT-30 | Sassaman, Brian L, Lt<br>93 MG/SGPB | 289<br>CD 2 |
| Jun 90 | Base Letter to Resident Concerning Installation of GAC Filter at Residence to Remove TCE | Sassaman, Brian L, Lt<br>93 MG/SGPB | 290<br>CD 2 |
| Jun 90 | Base Letter to Resident Concerning Monthly TCE Samples Taken at Residence to Monitor Drinking Water Quality | Sassaman, Brian L, Lt<br>93 MG/SGPB | 292<br>CD 2 |

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| Jun 90 | Base Letter to Resident Concerning Monthly TCE Samples Taken at Residence to Monitor Drinking Water Quality | Sassaman, Brian L, Lt<br>93 MG/SGPB | 293<br>CD 2 |
| Jun 90 | Base Letter to Resident Concerning Installation of GAC Filter to Remove TCE, OT-30 | Sassaman, Brian L, Lt<br>93 MG/SGPB | 294<br>CD 2 |
| Jun 90 | Base Letter to Resident Concerning Water Sample Collected from Well by Bioenvironmental Engineering | Sassaman, Brian L, Lt<br>93 MG/SGPB | 295<br>CD 2 |
| Jun 90 | Base Letter to Residents Concerning Water Sample Collected From Well by BioEnvironmental Engineering | Sassaman, Brian L, Lt<br>93 MG/SGPB | 299<br>CD 2 |
| 01 Jun 90 | SWAT Report, South Landfill Zone, Vol I of II | Kleinfelder, Inc. | 296<br>CD 2 |
| 01 Jun 90 | SWAT Report, South Landfill Zone, Vol II of II | Kleinfelder, Inc. | 297<br>CD 2 |
| 05 Jun 90 | TRC Charter | 93 CSG/EM | 300<br>CD 2 |
| 11 Jun 90 | RPM Meeting Agenda, 22 Jun 90 | Chan, Arthur D<br>93 CSG/EM | 301<br>CD 2 |
| 11 Jun 90 | CDTSC Response to Public Comments Concerning Intent to Deny Permit to Operate Hazardous Waste Facility | California Department of Toxic Substances Control | 339<br>CD 2 |
| 12 Jun 90 | CDHS Letter to Base Concerning Review of SWAT Work Plan, Castle Vista Landfills | O'Kane, John A, Jr<br>California Department of Health Services | 302<br>CD 2 |

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| 18 Jun 90 | Base Letter to EPA and CDHS Concerning Addition of Topics to Agenda for Discussion | Chan, Arthur D<br>93 CSG/EM | 304<br>CD 2 |
| 20 Jun 90 | CRWQCB Letter to Base Concerning Completion of Review of SWAT Work Plan, Castle Vista Landfill | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 305<br>CD 2 |
| 26 Jun 90 | CRWQCB Letter to Base Concerning Completion of Review of TPCA, FTA-3 | Pinkos, Thomas R<br>California Regional Water Quality Control Board | 306<br>CD 2 |
| 28 Jun 90 | CRWQCB Letter to Base Concerning Disposal of Drill Cuttings From RI/FS Activities | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 307<br>CD 2 |
| 29 Jun 90 | Base Letter to EPA and CDHS Concerning Transmittal of Draft Work Plan II | Chan, Arthur D<br>93 CSG/EM | 308<br>CD 2 |
| 29 Jun 90 | Base Letter to City of Atwater Concerning Castle Vista Military Housing Area Landfills | Chan, Arthur D<br>93 CSG/EM | 309<br>CD 2 |
| Jul 90 | TRC Meeting Minutes, 14 Jun 90 | 93 BMW/PA | 303<br>CD 2 |
| 03 Jul 90 | EPA Letter to Base Concerning Applicability of RI/FS Requirements, Castle Vista Landfills | Work, Michael<br>EPA Region IX | 310<br>CD 2 |
| 17 Jul 90 | RPM Meeting Minutes, 22 Jun 90 | Chan, Arthur D<br>93 CSG/EM | 312<br>CD 2 |
| 20 Jul 90 | CRWQCB Letter to CDHS Concerning Comments on Preliminary Site Characterization Report | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 313<br>CD 2 |

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| 30 Jul 90 | Base Letter to Resident Concerning Merced Union High School Site | Oyelowo, Layi A<br>93 CSG/EM | 314<br>CD 2 |
| 31 Jul 90 | EPA Letter to Base Concerning Comments on Draft Preliminary Site Characterization Report | Work, Michael<br>EPA Region IX | 315<br>CD 2 |
| 31 Jul 90 | CRWQCB Letter to Base Concerning Completion, Review of South Landfill SWAT Report | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 316<br>CD 2 |
| Aug 90 | FS, Draft Report, OU-1 | IT Corp. | 317<br>CD 2 |
| 01 Aug 90 | Base Letter to EPA and CDHS Concerning Transmittal of FS, Draft Report, OU-1 | Ridenour, Charles B<br>93 CSG/EM | 318<br>CD 2 |
| 01 Aug 90 | Base Letter to Martin Marietta Concerning Comments on List of Standards for ARARs | Ridenour, Charles B<br>93 CSG/EM | 319<br>CD 2 |
| 06 Aug 90 | RPM Meeting Minutes, 24 Jul 90 | Chan, Arthur D<br>93 CSG/EM | 320<br>CD 2 |
| 06 Aug 90 | CRWQCB Letter to Base Concerning Disposal of Drill Cuttings From RI/FS Activities | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 322<br>CD 2 |
| 08 Aug 90 | EPA Letter to Base Concerning Need for RA, TCE | Work, Michael<br>EPA Region IX | 321<br>CD 2 |
| 10 Aug 90 | CDHS Letter to HQ SAC Concerning IAG | Larson, Walter J<br>California Department of Health Services | 323<br>CD 2 |

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| 10 Aug 90 | Newspaper Article, "Base Eyes Possible Past Refuse Sites" | The Valley Bomber | 324 CD 2 |
| 13 Aug 90 | RPM Meeting Agenda, 16 Aug 90 | Chan, Arthur D 93 CSG/EM | 325 CD 2 |
| 22 Aug 90 | SOW, Step III Tasks, Revision II | Martin Marietta Energy Systems, Inc. | 326 CD 2 |
| 25 Aug 90 | Response to EPA Comments on OU FS Draft | UNK | 327 CD 2 |
| 29 Aug 90 | Newspaper Article, "Public Notice, Castle AFB CRP, Public Comment Period" | The Merced Sun Star | 328 CD 2 |
| 31 Aug 90 | EPA Letter to Base Concerning Comments on RI/FS, Draft Work Plan No 2 | Work, Michael EPA Region IX | 329 CD 2 |
| Sep 90 | RI/FS, Preliminary Site Characterization Report, Vol I of III | IT Corp. | 330 CD 2 |
| Sep 90 | RI/FS, Preliminary Site Characterization Report, Vol II of III | IT Corp. | 331 CD 2 |
| Sep 90 | RI/FS, Preliminary Site Characterization Report, Vol III of III | IT Corp. | 332 CD 2 |
| Sep 90 | SOW, Maintenance and Servicing of Three Existing Culligan Activated Carbon Water Filtration Systems | 93 CSG/DEEV | 907 CD 3 |
| 14 Sep 90 | Rational for Long Term Well Sampling Program | 93 CSG/EM | 335 CD 2 |

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| 20 Sep 90 | RPM Meeting Agenda, 26-27 Sep 90 | Baker, Thomas R, LtCol<br>93 CSG/EM | 336<br>CD 2 |
| 27 Sep 90 | RI/FS Project Meeting Minutes, 26-27 Sep 90 | 93 CSG/EM | 337<br>CD 2 |
| 28 Sep 90 | RPM Meeting Minutes, 16 Aug 90 | Chan, Arthur D<br>93 CSG/EM | 338<br>CD 2 |
| Oct 90 | Fact Sheet, Base Environmental Update, Oct 90 | 93 BMW/PA | 340<br>CD 2 |
| Oct 90 | Ambient Air Monitoring Report | California Department of Health Services | 1003<br>CD 4 |
| 09 Oct 90 | IT Corp. Letter to Martin Marietta Concerning Response to EPA Comments on UV/Peroxidation, RI/FS | Grummitt, Terry P<br>IT Corp. | 343<br>CD 2 |
| 10 Oct 90 | EPA Letter to Base Concerning Upcoming Deadlines for FS, Report No 1, Proposed Plan and ROD, OU-1 | Work, Michael<br>EPA Region IX | 344<br>CD 2 |
| 12 Oct 90 | Base Letter to EPA and CDHS Concerning Draft Final Work Plan II | Chan, Arthur D<br>93 CSG/EM | 345<br>CD 2 |
| 15 Oct 90 | Base Letter to CRWQCB Concerning Response to Comments on Draft Report, South Landfill Zone | Chan, Arthur D<br>93 CSG/EM | 347<br>CD 2 |
| 16 Oct 90 | RPM Meeting Minutes, 26-27 Sep 90 | Chan, Arthur D<br>93 CSG/EM | 348<br>CD 2 |
| 19 Oct 90 | Base Letter to EPA Concerning List of OUs According to Definition in NCP | Kehoe, Michael J, Col<br>93 BMW/CV | 349<br>CD 2 |

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| 24 Oct 90 | RPM Meeting Agenda, 30 Oct 90 | Chan, Arthur D<br>93 CSG/EM | 350<br>CD 2 |
| 24 Oct 90 | EPA Letter to Base Concerning Failure to Submit Draft Final Work Plan No 2 | Work, Michael<br>EPA Region IX | 351<br>CD 2 |
| 31 Oct 90 | Base Letter to EPA and CDHS Concerning RI/FS, Draft Final Report, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 352<br>CD 2 |
| 31 Oct 90 | TRC Meeting Agenda | Leong, Linda L, Maj<br>93 BMW/PA | 353<br>CD 2 |
| Nov 90 | SWAT Draft Report, Castle Vista Landfills | IT Corp. | 354<br>CD 3 |
| Nov 90 | Work Plan No 2 | IT Corp. | 355<br>CD 3 |
| 02 Nov 90 | CDHS Letter to Base Concerning Comments on LTM Sampling Plan, Sep 90 | O'Kane, John A, Jr<br>California Department of Health Services | 356<br>CD 3 |
| 02 Nov 90 | EPA Letter to Base Concerning Comments on RI/FS Long Term Sampling Program | Work, Michael<br>EPA Region IX | 357<br>CD 3 |
| 08 Nov 90 | EPA Letter to Base Concerning Comments on FS, Interim, Draft Final Report, OU-1 | Work, Michael<br>EPA Region IX | 358<br>CD 3 |
| 13 Nov 90 | Base Letter to EPA and CDHS Concerning Response to Comments on RI/FS, Draft Work Plan No 2 | Alford, Benjamin F, Col<br>93 CSG/CC | 360<br>CD 3 |
| 15 Nov 90 | Soil Remediation Report | Horizon Technologies | 361<br>CD 3 |

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|---|---|---|---|
| 16 Nov 90 | Base Letter to EPA Concerning Comments on FS, Final Report, OU-1 | Chan, Arthur D<br>93 CSG/EM | 362<br>CD 3 |
| 16 Nov 90 | Update Pages, FS, Final Report, OU-1 | IT Corp. | 363<br>CD 3 |
| 26 Nov 90 | EPA Letter to Base Concerning Comments on Proposed Revisions to Proposed Plan | Work, Michael<br>EPA Region IX | 364<br>CD 3 |
| 27 Nov 90 | EPA Letter to Base Concerning Delivery of FS, Final Report, OU-1 | Work, Michael<br>EPA Region IX | 365<br>CD 3 |
| 27 Nov 90 | EPA Letter to Base Concerning Additional Comments on FS and Proposed Plan, OU-1 | Work, Michael<br>EPA Region IX | 366<br>CD 3 |
| 27 Nov 90 | Base Letter to Martin Marietta Concerning Proposed Plan Revisions to FS, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 367<br>CD 3 |
| 27 Nov 90 | EPA Letter to Base Concerning Review and Comments on Changes to FS and Proposed Plan, Draft Final Review Period, 30 Nov 90, OU-1 | Work, Michael<br>EPA Region IX | 368<br>CD 3 |
| 30 Nov 90 | EPA Letter to Base Concerning Additional Comments on FS and Proposed Plan, OU-1 | Work, Michael<br>EPA Region IX | 370<br>CD 3 |
| Dec 90 | Proposed Plan, Containment and Remediation of Main Groundwater Contaminant Plume | 93 BMW/PA | 371<br>CD 3 |
| Dec 90 | ROD, UFL-3, SS-17 | IT Corp. | 372<br>CD 3 |
| Dec 90 | RFA, Report | California Department of Health Services | 373<br>CD 2 |

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| Dec 90 | Draft Preliminary Health Risk Evaluation Report | IT Corp. | 374 CD 2 |
| Dec 90 | FS, Interim Report, OU-1 | IT Corp. | 375 CD 3 |
| 03 Dec 90 | EPA Letter to Base Concerning Request for Extension on Finalization of FS, Report and Proposed Plan, OU-1 | Kemmerer, John R EPA Region IX | 376 CD 3 |
| 05 Dec 90 | TRC Meeting Minutes, 31 Oct 90 | Vician, Todd M B, Lt 93 BMW/PA | 377 CD 3 |
| 07 Dec 90 | Base Letter to EPA Concerning Comments on Update Pages, FS Report, OU-1 | Baker, Thomas R, LtCol 93 CSG/DEV | 378 CD 3 |
| 11 Dec 90 | RPM Meeting Agenda, 18 Dec 90 | Oyelowo, Layi A 93 CSG/DEV | 379 CD 3 |
| 18 Dec 90 | RI/FS Project Meeting Minutes, 18 Dec 90 | 93 CSG/DEV | 383 CD 3 |
| 27 Dec 90 | Residents Vs. USAF Court Document, First Set of Interrogatories and Request for Production of Documentation | US District Court of California | 983 CD 4 |
| 91 | Storage Tank Statistics and Information Report on Contaminants Detected During 91 Tank Pull | Camp Dresser & McKee, Inc. | 513 CD 3 |
| Jan 91 | Technical Memorandum Report, Long Term Pumping Test | IT Corp. | 382 CD 3 |
| 04 Jan 91 | Newspaper Article, "Water Cleanup Public Meeting Set for Tuesday" | The Merced Sun Star | 384 CD 3 |

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|---|---|---|---|
| 08 Jan 91 | Public Meeting Minutes on Ground Cleanup Presentation, OU-1 | Vician, Todd M B, Lt<br>93 BMW/PA | 385<br>CD 3 |
| 08 Jan 91 | Newspaper Article, "Cleanup Plan is Aired" | The Modesto Bee | 386<br>CD 3 |
| 08 Jan 91 | RPM Meeting Minutes, 18 Dec 90 | Cole, John R, LtCol<br>93 CSG/DE | 389<br>CD 3 |
| 09 Jan 91 | Newspaper Article, "Castle Cleanup Plan Ready for Public Comment" | De La Cruz, Mike<br>The Merced Sun Star | 387<br>CD 3 |
| 10 Jan 91 | Newspaper Article, "Castle to Clean Up Aquifer" | The Atwater New Times<br>The Merced County Times<br>The Winton Times | 388<br>CD 3 |
| 10 Jan 91 | Base Letter to EPA and CDHS Concerning Response to Comments on Long Term Pump Test Program | Chan, Arthur D<br>93 CSG/DEV | 390<br>CD 3 |
| 15 Jan 91 | Base Letter to EPA Concerning Comments on IAG Schedule Extension Request | Alford, Benjamin F, Col<br>93 CSG/DEV | 391<br>CD 3 |
| 16 Jan 91 | EPA Letter to Base Concerning Comments on Groundwater Plume Characterization Scoping Memorandum Draft Work Plan, OU-3 | Work, Michael<br>EPA Region IX | 392<br>CD 3 |
| 16 Jan 91 | Newspaper Article, "Base Ready to Begin TCE Cleanup, Public May Still Have Questions" | De La Cruz, Mike<br>The Merced Sun Star | 393<br>CD 3 |
| 23 Jan 91 | Newspaper Article, "Castle AFB Announces Extension of Public Comment Period on Proposed Cleanup" | The Merced Sun Star | 394<br>CD 3 |

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| 24 Jan 91 | RI/FS Project Meeting Minutes, 23-24 Jan 91 | 93 CSG/DEEV | 395 CD 3 |
| 30 Jan 91 | EPA Letter to Base Concerning Timeframe for Responding to Proposed Schedule, OU-2 | Work, Michael EPA Region IX | 396 CD 3 |
| 07 Feb 91 | Base Letter to EPA and CDHS Concerning IAG Schedule Extension Request for Delivery of Decision Document, OU-1 | Cole, John R, LtCol 93 CSG/DE | 397 CD 3 |
| 11 Feb 91 | RPM Meeting Minutes, 23-24 Jan 91 | Chan, Arthur D 93 CSG/DEV | 398 CD 3 |
| 12 Feb 91 | EPA Letter to Base Concerning Schedule Changes to Currently Identified OUs and Anticipated Changes to Overall RI/FS | Kemmerer, John R EPA Region IX | 399 CD 3 |
| 20 Feb 91 | Base Letter to EPA Concerning Comments on RI/FS Schedule | Kehoe, Michael J, Col 93 BMW/CV | 401 CD 3 |
| 21 Feb 91 | EPA Letter to Base Concerning Comments on Draft Preliminary Health Risk Evaluation | Work, Michael EPA Region IX | 402 CD 3 |
| 22 Feb 91 | EPA Letter to Base Concerning Comments on Draft LTM Sampling Plan | Work, Michael EPA Region IX | 403 CD 3 |
| 22 Feb 91 | CDHS Letter to Base Concerning Comments on LTM Draft Sampling Plan | Wang, David California Department of Health Services | 404 CD 3 |
| 25 Feb 91 | Base Memorandum Concerning RPM RI/FS Working Session | Baker, Thomas R, LtCol 93 CSG/DEV | 405 CD 3 |

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|---|---|---|---|
| Mar 91 | LTM Sampling Plan | Martin Marietta Energy Systems, Inc. | 406 CD 3 |
| 01 Mar 91 | TRC Meeting Minutes, 23 Jan 90 | Vician, Todd M B, Lt 93 BMW/PA | 407 CD 3 |
| 06 Mar 91 | RPM Meeting Agenda, 13 Mar 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 408 CD 3 |
| 13 Mar 91 | Base Letter to HQ SAC Concerning Responsiveness Summary, OU-1 | Cole, John R, LtCol 93 CSG/DE | 409 CD 3 |
| 18 Mar 91 | Base Memorandum Concerning CRWQCB Comments, North Landfill Zone | Baker, Thomas R, LtCol 93 CSG/DEV | 410 CD 3 |
| 18 Mar 91 | SWAT Report, West Landfill Zone | Kleinfelder, Inc. | 411 CD 3 |
| 20 Mar 91 | Base Letter to EPA and CDHS Concerning Comments on Draft Final LTM Sampling Plan | Baker, Thomas R, LtCol 93 CSG/DEV | 412 CD 3 |
| 25 Mar 91 | EPA Letter to Base Concerning Air Stripper Emissions Remediation, OU-1 | Work, Michael EPA Region IX | 414 CD 3 |
| 26 Mar 91 | Base Letter to EPA Concerning Naming of OUs | Baker, Thomas R, LtCol 93 CSG/DEV | 415 CD 3 |
| 29 Mar 91 | Base Letter to CRWQCB Concerning Responses to Comments on Draft Report on West Landfill Zone | Chan, Arthur D 93 CSG/DEV | 416 CD 3 |
| Apr 91 | Fact Sheet, Base Environmental Update, Apr 91 | 93 BMW/PA | 417 CD 3 |

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| 01 Apr 91 | Northeast Research Tabular Data and Mass Spectra for PETREX Samples | Northeast Research Institute, Inc. | 419 CD 3 |
| 08 Apr 91 | ROD, Interim, Draft, OU-1 | IT Corp. | 418 CD 3 |
| 08 Apr 91 | Environmental Information Form, Appendix H | Baker, Thomas R, LtCol 93 CSG/DEV | 420 CD 3 |
| 11 Apr 91 | EPA Letter to Base Concerning Approval of Final LTM Sampling Plan | Work, Michael EPA Region IX | 421 CD 3 |
| 16 Apr 91 | Soil Analytical Results, Step 2 | EPA Region IX | 422 CD 3 |
| 19 Apr 91 | Kleinfelder Letter to Base Concerning Response to CRWQCB Comments on SWAT Report North Landfill Zone | Carey, Russell O Kleinfelder, Inc. | 423 CD 3 |
| 19 Apr 91 | SWAT Report, Landfill 3, LF-06 | Kleinfelder, Inc. | 424 CD 3 |
| 19 Apr 91 | SWAT Report, North Landfill Zone | Kleinfelder, Inc. | 425 CD 3 |
| 22 Apr 91 | Newspaper Article, "$100 Million Cleanup Looms for Castle" | Lopez, Pablo Thome, Joe The Modesto Bee | 426 CD 3 |
| 23 Apr 91 | RI/FS Project Meeting Minutes, 13 Mar 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 427 CD 3 |
| 26 Apr 91 | Base Letter to EPA and CDHS Concerning Comments on Proposed IAG Schedule | Kehoe, Michael J, Col 93 CSG/CV | 429 CD 3 |

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| 29 Apr 91 | RPM Meeting Agenda, 08 May 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 431<br>CD 3 |
| 30 Apr 91 | CDHS Letter to Base Concerning Comments on ROD, Draft, OU-1 | Wang, David<br>California Department of Health Services | 432<br>CD 3 |
| May 91 | Limited Record Search Report | IT Corp. | 433<br>CD 3 |
| May 91 | Rough Draft Development and Screening Report, 35 Investigative Sites | IT Corp. | 435<br>CD 3 |
| 01 May 91 | Draft Basis of Design Report, OU-1 | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 656<br>CD 3 |
| 02 May 91 | Base Letter to CRWQCB Concerning Comments on Final Presentation on Landfill 3 SWAT Studies, LF-3 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 436<br>CD 3 |
| 02 May 91 | Martin Marietta Memorandum Concerning Overview of Meeting with CDM and Woodward Clyde, 16-17 Apr 91 | Wilder, William L<br>Martin Marietta Energy Systems, Inc. | 437<br>CD 3 |
| 07 May 91 | Newspaper Article, "Treated Castle Water Could Irrigate Crops" | De La Cruz, Mike<br>The Merced Sun Star | 438<br>CD 3 |
| 08 May 91 | Base Letter to CDHS Concerning Response to Comments on Work Plan No 2 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 439<br>CD 3 |
| 14 May 91 | Newspaper Article, "Use of Castle Water Awaits State OK" | Rocha, Elisa<br>The Fresno Bee | 440<br>CD 3 |

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| 14 May 91 | Newspaper Article, "Merced Wants to Use Castle Water" | Rocha, Elisa<br>The Modesto Bee | 441<br>CD 3 |
| 14 May 91 | SWAT Report, South Landfill Zone | Kleinfelder, Inc. | 442<br>CD 3 |
| 15 May 91 | EPA Letter to Base Concerning Comments on RPM Meeting Minutes, 23-24 Jan 91 | Work, Michael<br>EPA Region IX | 443<br>CD 3 |
| 15 May 91 | Base Letter to CDHS and EPA Concerning Rational for Location of Monitoring Wells, SD-12, (DA-4) | Baker, Thomas R, LtCol<br>93 CSG/DEV | 444<br>CD 3 |
| 16 May 91 | Base Letter to Martin Marietta Concerning EPA and CRWQCB Comments on RPM Meeting Minutes, 23-24 Jan 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 445<br>CD 3 |
| 21 May 91 | CRWQCB Letter to Base Concerning Approval of Proposed Schedule Changes and Basewide RI/FS | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 446<br>CD 3 |
| 22 May 91 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 08 May 91 | Work, Michael<br>EPA Region IX | 447<br>CD 3 |
| 23 May 91 | EPA Letter to Base Concerning Comments on ROD, Draft, OU-1 | Work, Michael<br>EPA Region IX | 448<br>CD 3 |
| 24 May 91 | CDHS Letter to Base Concerning Review of Base Response to Comments on Work Plan No 2 | Wang, David<br>California Department of Health Services | 279<br>CD 2 |
| 24 May 91 | Base Letter to CRWQCB Concerning Comments on SWAT Final Report, South Landfill Zone | Chan, Arthur D<br>93 CSG/DEV | 449<br>CD 3 |

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| 28 May 91 | Base Letter to EPA and CDHS Concerning Revised IAG Schedule | Kehoe, Michael J, Col<br>93 CSG/CV | 450<br>CD 3 |
| 29 May 91 | FTA-1 Site Description, FT-01 | IT Corp. | 434<br>CD 3 |
| 29 May 91 | Base Letter to IT Corp Concerning Comments on RPM Draft Meeting Minutes, 08 May 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 452<br>CD 3 |
| 30 May 91 | Base Letter to Martin Marietta Concerning Regulatory Comments on ROD, Draft, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 453<br>CD 3 |
| 01 Jun 91 | TRC Meeting Minutes, 24 Apr 91 | Leong, Linda L, Maj<br>93 BMW/PA | 454<br>CD 3 |
| 01 Jun 91 | Newspaper Article, "Should Castle Treat, Sell Tainted Water for Crop Irrigation" | Hubbard, Greg<br>The Merced Sun Star | 455<br>CD 3 |
| 01 Jun 91 | Newspaper Article, "Treated Toxic Water Earmarked..." | The Merced Sun Star | 456<br>CD 3 |
| 04 Jun 91 | Base Letter to CDHS Concerning Response to Comments on ROD, Interim, OU-1 | Martinez, Pablo A<br>93 CSG/EM | 458<br>CD 3 |
| 07 Jun 91 | Base Letter to EPA Concerning Request for Information on Sampling Plan for Round 7 Groundwater Sampling | Chan, Arthur D<br>93 CSG/DEV | 459<br>CD 3 |
| 12 Jun 91 | Base Letter to CRWQCB Concerning ARARs, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 460<br>CD 3 |
| 17 Jun 91 | RPM Meeting Agenda, 27 Jun 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 462<br>CD 3 |

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| 18 Jun 91 | Background Sample North of Castle Vista Landfill | BSK Analytical Laboratories | 461 CD 3 |
| 27 Jun 91 | RPM Meeting Minutes, 27 Jun 91 | 93 CSG/DEVR | 464 CD 3 |
| Jul 91 | Draft Technical Memorandum Report, Two 30 Day Pump Tests | IT Corp. | 466 CD 3 |
| Jul 91 | Data Report, 15 VOC Probes Drilled in OT-30 Area | IT Corp. | 467 CD 3 |
| 01 Jul 91 | Newspaper Article, "Castle Cleanup Bill Still Under Debate" | Chan, Cecilia The Merced Sun Star | 468 CD 3 |
| 08 Jul 91 | ROD, Interim, OU-1 | IT Corp. | 469 CD 3 |
| 10 Jul 91 | Newspaper Article, "City Tests New Well Site" | Sanders, Tammy S The Atwater Signal | 470 CD 3 |
| 12 Jul 91 | Environmental Checklist Form, Appendix I | California Department of Health Services | 471 CD 3 |
| 12 Jul 91 | RPM Draft Meeting Minutes, 28 Jun 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 472 CD 3 |
| 12 Jul 91 | Base Letter to EPA and CDHS Concerning Draft Baseline Risk Assessment, OU-2 | Baker, Thomas R, LtCol 93 CSG/DEV | 473 CD 3 |
| 18 Jul 91 | EPA Letter to Base Concerning Late Receipt of Draft Risk Assessment and FFA Schedule, OU-2 | Work, Michael EPA Region IX | 475 CD 3 |

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| 19 Jul 91 | Newspaper Article, "Castle Water Recycled" | The Modesto Bee | 476 CD 3 |
| 19 Jul 91 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 27 Jun 91 | Work, Michael EPA Region IX | 477 CD 3 |
| 23 Jul 91 | EPA Letter to Base Concerning Preliminary Comments on ROD, Draft Final, OU-1 | Work, Michael EPA Region IX | 478 CD 3 |
| 29 Jul 91 | EPA Letter to Base Concerning Comments on ROD, Draft Final, OU-1 | Work, Michael EPA Region IX | 479 CD 3 |
| 30 Jul 91 | Fact Sheet, Base Environmental Update, 30 Jul 91 | 93 BMW/PA | 480 CD 3 |
| Aug 91 | ROD, Final Technical Document to Support NFA | CDM Federal Programs Corp. | 482 CD 3 |
| Aug 91 | Draft Soil Management Plan for Waste in Drums and RI Derived Waste Originating From VOC Probes | CDM Federal Programs Corp. | 483 CD 3 |
| 01 Aug 91 | Newspaper Article, "Castle AFB OU-1" | The Merced Sun Star | 485 CD 3 |
| 07 Aug 91 | ROD, Interim, OU-1 | IT Corp. | 486 CD 3 |
| 07 Aug 91 | EPA Letter to Base Concerning Extension, 30 Day Review Period for ROD, OU-1 | Work, Michael EPA Region IX | 487 CD 3 |
| 08 Aug 91 | Final RPM Meeting Minutes, 27 Jun 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 488 CD 3 |

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| 14 Aug 91 | Newspaper Article, "Notice of Public Availability, Castle AFB, DA-4 RA" | The Atwater Signal | 489 CD 3 |
| 15 Aug 91 | Newspaper Article, "Public Hearing and Notice of Application for Waste Discharge Requirements for Dept of AF, Castle AFB, Merced County" | Pearson, J Lawrence The Merced Sun Star | 490 CD 3 |
| 20 Aug 91 | RPM Draft Meeting Minutes, 01 Aug 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 491 CD 3 |
| 20 Aug 91 | RD, Work Plan, OU-1 | PRC Environmental Management, Inc. | 492 CD 3 |
| 23 Aug 91 | CDTSC Letter to Base Concerning Final FSP and QAPP, Preliminary SI | Wang, David California Department of Toxic Substances Control | 428 CD 3 |
| 26 Aug 91 | Base Letter to CDHS Concerning Comments on Monthly TCE Results | Baker, Thomas R, LtCol 93 CSG/DEV | 430 CD 3 |
| 26 Aug 91 | Base Letter to EPA Concerning Comments on Sampling Results From Groundwater Reclamation Treatment Facility, Jul 91, DA-4 | Baker, Thomas R, LtCol 93 CSG/DEV | 493 CD 3 |
| Sep 91 | Newspaper Article, "Castle Contamination a Concern, Inspection and Studies Precede Base Cleanup" | Hartsoe, Steve The Lesher News Service | 77 CD 2 |
| Sep 91 | RI/FS, Draft Report, OU-2 | Metcalf and Eddy, Inc. | 495 CD 3 |
| 04 Sep 91 | Newspaper Article, "Castle Cleanup Creates Concern; Toxic Plume Might Make Land Unusable When Base Closes" | The Merced Sun Star | 496 CD 3 |

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| 04 Sep 91 | Base Letter to EPA and CDHS Concerning Comments on Proposed Schedule for Completion of RD/RA Work Plan for Interim OU-1 | Cole, John R, LtCol<br>93 CSG/DE | 497<br>CD 3 |
| 04 Sep 91 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 01 Aug 91 | Work, Michael<br>EPA Region IX | 498<br>CD 3 |
| 11 Sep 91 | Base Letter to EPA Concerning Comments on RD/RA Schedule, OU-1 | Chan, Arthur D<br>93 CSG/DEV | 499<br>CD 3 |
| 11 Sep 91 | CDHS Letter to Base Concerning Comments on Draft Soil Management Plan, Wastes in Drums and RI Derived Waste Originating From VOC Probes | Wang, David<br>California Department of Health Services | 1021<br>CD 4 |
| 16 Sep 91 | Final RPM Meeting Minutes, 01 Apr 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 500<br>CD 3 |
| 16 Sep 91 | Base Letter to TRC Members Concerning TRC Charter | Vician, Todd M B, Lt<br>93 BMW/PA | 501<br>CD 3 |
| 17 Sep 91 | EPA Letter to Base Concerning Preliminary Comments on RI/FS, Draft Report, OU-2 | Work, Michael<br>EPA Region IX | 502<br>CD 3 |
| 19 Sep 91 | EPA Letter to Base Concerning Comments on Draft Schedule for RD/RA, OU-1 | Work, Michael<br>EPA Region IX | 503<br>CD 3 |
| 25 Sep 91 | RPM Draft Meeting Minutes, 17 Sep 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 505<br>CD 3 |
| Oct 91 | Draft Work Plan, Technical and Scoping Memorandum, OU-2 | Metcalf and Eddy, Inc. | 506<br>CD 3 |

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| Oct 91 | EPA Aerial Photographic Analysis of Base | EPA Region IX | 987 CD 4 |
| 01 Oct 91 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 17 Sep 91 | Work, Michael EPA Region IX | 507 CD 3 |
| 04 Oct 91 | Base Letter to EPA Concerning RD/RA Revised Schedule, OU-1 | Baker, Thomas R, LtCol 93 CSG/DEV | 509 CD 3 |
| 09 Oct 91 | Base Letter to CDM Concerning Comments on RPM Meeting Minutes, 17 Sep 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 510 CD 3 |
| 09 Oct 91 | RD/RA Schedule Review Meeting Minutes, 03 Oct 91 | Scruggs, Mary PRC Environmental Management, Inc. | 511 CD 3 |
| 10 Oct 91 | Castle Joint Powers Authority Agenda | Atwater City Council Chambers | 512 CD 3 |
| 10 Oct 91 | Castle Joint Powers Authority Meeting Minutes, 10 Oct 91 | Barrett, Frances M 93 CSG/DEVR | 514 CD 3 |
| 11 Oct 91 | EPA Letter to Base and HQ SAC Concerning RD/RA Proposed Schedule, OU-1 | Strauss, Alexis EPA Region IX | 515 CD 3 |
| 15 Oct 91 | CDTSC Letter to Base Concerning Review of RI/FS, Draft Report, OU-2 | Wang, David California Department of Toxic Substances Control | 516 CD 3 |
| 15 Oct 91 | EPA Letter to Base Concerning Comments on RI/FS, Draft Report, OU-2 | Work, Michael EPA Region IX | 517 CD 3 |

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| 17 Oct 91 | EPA Letter to Base Concerning Additional Groundwater RA Within Boundaries of Interim OU-1, Bldg 84 | Work, Michael<br>EPA Region IX | 518<br>CD 3 |
| 17 Oct 91 | Base Letter to EPA Concerning RD/RA, Proposed Schedule, OU-1 | Kehoe, Michael J, Col<br>93 BMW/CV | 519<br>CD 3 |
| 21 Oct 91 | TRC Meeting Minutes, 21 Oct 90 | Vician, Todd M B, Lt<br>93 BMW/PA | 520<br>CD 3 |
| 21 Oct 91 | CDTSC Letter to Base Concerning Revised Comments on RI/FS, Draft Report, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 521<br>CD 3 |
| 21 Oct 91 | CRWQCB Letter to Base Concerning Comments on RI/FS, Draft Final Report, OU-2 | Mosbacher, Michael H<br>California Regional Water Quality Control Board | 522<br>CD 3 |
| 24 Oct 91 | Newspaper Article, "Castle AFB Announces ROD Signed" | The Merced Sun Star | 523<br>CD 3 |
| 25 Oct 91 | EPA Letter to Base Concerning Comments on RI/FS, OU-2 | Work, Michael<br>EPA Region IX | 524<br>CD 3 |
| 28 Oct 91 | EPA Letter to Base Concerning RD/RA, Schedule Conclusions, OU-1 | Strauss, Alexis<br>EPA Region IX | 526<br>CD 3 |
| 31 Oct 91 | Summary of Conference Call, Critical Issues From EPA Comments on RI/FS, Draft Report, OU-2 | Wilder, William L<br>Oak Ridge National Laboratory | 529<br>CD 3 |
| Nov 91 | Draft Basewide Waste Management Plan | CDM Federal Programs Corp. | 1022<br>CD 4 |

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| DOC. DATE | SUBJECT OR TITLE | AUTHOR or CORP. AUTHOR | FILE/CD NUMBER |
|---|---|---|---|
| 04 Nov 91 | Base Letter to EPA Concerning Proposed Schedule Meeting Objectives of ROD, OU-1 | Kehoe, Michael J, Col<br>93 CSG/CV | 530<br>CD 3 |
| 04 Nov 91 | EPA Letter to HQ SAC, CDTSC, and EPA Concerning Notice of Dispute Resolution for Interim RD/RA Schedule, OU-1 | Work, Michael<br>EPA Region IX | 531<br>CD 3 |
| 07 Nov 91 | Castle Joint Powers Authority Meeting Minutes, 07 Nov 91 | Barrett, Frances M<br>93 CSG/DEVR | 532<br>CD 3 |
| 16 Nov 91 | RD/RA, Action Schedule Dispute Resolution Issue | California Department of Toxic Substances Control | 534<br>CD 3 |
| 19 Nov 91 | RPM Draft Meeting Minutes, 22 Oct 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 535<br>CD 3 |
| 20 Nov 91 | EPA Letter to Base Concerning Comments on Action Plan for Additional Domestic Well Sampling Southwest of Base | Work, Michael<br>EPA Region IX | 537<br>CD 3 |
| 21 Nov 91 | Castle Joint Powers Authority Meeting Minutes, 21 Nov 91 | Barrett, Frances M<br>93 CSG/DEVR | 538<br>CD 3 |
| 21 Nov 91 | PRC Letter to Base Concerning Comments on Position Paper for Interim RA Design Schedule, OU-1 | Scruggs, Mary<br>PRC Environmental Management, Inc. | 539<br>CD 3 |
| 22 Nov 91 | EPA Letter to HQ SAC Concerning Comments on Outline of Design Assumptions Acceptable to EPA in Design Report, Interim, OU-1 | Work, Michael<br>EPA Region IX | 541<br>CD 3 |
| 22 Nov 91 | Scoping Meeting Minutes on OU-2 Work Plan, 22 Nov 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 542<br>CD 3 |

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|---|---|---|---|
| 26 Nov 91 | RD/RA, Draft Preliminary Work Plan, Interim OU-1 | PRC Environmental Management, Inc. James M Montgomery, Inc. | 481 CD 3 |
| 26 Nov 91 | RD/RA, Draft Preliminary Work Plan, HSP, OU-1 | PRC Environmental Management, Inc. James M Montgomery, Inc. | 543 CD 3 |
| Dec 91 | RI/FS, Draft Final Baseline Risk Assessment, Vol I of II, OU-2 | Metcalf and Eddy, Inc. | 545 CD 3 |
| Dec 91 | RI/FS, Draft Final Baseline Risk Assessment, Vol II of II, OU-2 | Metcalf and Eddy, Inc. | 546 CD 3 |
| 03 Dec 91 | EPA Letter to Base Concerning Comments on Draft Work Plan, Technical and Scoping Memorandum, OU-2 | Work, Michael EPA Region IX | 547 CD 3 |
| 03 Dec 91 | Draft SAP Addendum for JP-4 Contaminated Soils Along West Flightline Sector | PRC Environmental Management, Inc. James M Montgomery, Inc. | 548 CD 3 |
| 05 Dec 91 | RA, JP-4 Contaminated Soils Along Western Flightline Sector, HSP | PRC Environmental Management, Inc. James M Montgomery, Inc. | 549 CD 3 |
| 06 Dec 91 | CDTSC Letter to Base Concerning Comments on Draft Work Plan and Technical Memorandum, OU-2 | O'Kane, John A, Jr California Department of Toxic Substances Control | 550 CD 3 |
| 06 Dec 91 | PRC Letter to Base Concerning Comments on Revised Proposed Interim RA Design Schedule, OU-1 | Scruggs, Mary PRC Environmental Management, Inc. | 551 CD 3 |

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|---|---|---|---|
| 09 Dec 91 | Newspaper Article, "War, Peace, and Cleanup - It's the Morning After for the Counsel Who are Helping with Military Downsizing" | Pfaff, Dennis<br>The San Francisco Daily Journal | 552<br>CD 3 |
| 10 Dec 91 | Data Validation Summary Report for Rounds 6 and 7 | IT Corp. | 553<br>CD 3 |
| 12 Dec 91 | Castle Joint Powers Authority Meeting Minutes, 12 Dec 91 | Barrett, Frances M<br>93 CSG/DEVR | 554<br>CD 3 |
| 16 Dec 91 | EPA Letter to Base Concerning Comments on RI/FS, Draft Final Report, OU-2 | Work, Michael<br>EPA Region IX | 555<br>CD 3 |
| 16 Dec 91 | Final RPM Meeting Minutes, 22 Oct 91 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 556<br>CD 3 |
| 18 Dec 91 | EPA Letter to Base Concerning Comments on Draft Proposed Plan, OU-2 | Work, Michael<br>EPA Region IX | 557<br>CD 3 |
| 18 Dec 91 | TRC Meeting Minutes, 13 Nov 91 | Kehoe, Michael J, Col<br>93 BMW/CV | 558<br>CD 3 |
| 20 Dec 91 | CDTSC Letter to Base Concerning Request for 30 Day Extension to Comment and Response Period for RI/FS, Draft Final Report and Proposed Plan, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 559<br>CD 3 |
| 20 Dec 91 | EPA Letter to Base Concerning Comments on Aerial Photographic Analysis From EPA Environmental Monitoring Systems Laboratory | Work, Michael<br>EPA Region IX | 560<br>CD 3 |

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|---|---|---|---|
| 20 Dec 91 | CDTSC Letter to EPA Concerning Request for 30 Day Extension on Comment and Response Period, RI/FS, Draft Final Report and Proposed Plan, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 561<br>CD 3 |
| Jan 92 | RI/FS, Draft Final Baseline Risk Assessment, Vol I of II, OU-2 | Metcalf and Eddy, Inc. | 564<br>CD 3 |
| Jan 92 | RI/FS, Draft Final Baseline Risk Assessment, Vol II of II, OU-2 | Metcalf and Eddy, Inc. | 565<br>CD 3 |
| 07 Jan 92 | CDTSC Letter to Base Concerning Comments on RI/FS, Draft Final Report and Proposed Plan, OU-2 | Mosbacher, Michael H<br>O'Kane, John A, Jr<br>California Department of Toxic Substances Control | 566<br>CD 4 |
| 09 Jan 92 | EPA Letter to Base Concerning Request for Delivery of RI/FS, Revised Report and Draft Final Proposed Plan | Work, Michael<br>EPA Region IX | 567<br>CD 4 |
| 09 Jan 92 | Castle Joint Powers Authority Meeting Minutes, 09 Jan 92 | 93 CSG/DEVR | 568<br>CD 4 |
| 14 Jan 92 | Draft Interim Design Report, OU-1 | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 598<br>CD 3 |
| 16 Jan 92 | EPA Comments on Draft Work Plan for Groundwater Plume Characterization, Scoping Memorandum, Dec 91 | EPA Region IX | 544<br>CD 3 |
| 21 Jan 92 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 17 Dec 91 | Work, Michael<br>EPA Region IX | 569<br>CD 4 |

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|---|---|---|---|
| 21 Jan 92 | Base Letter to Navy Concerning Comments on RD, Preliminary Draft Work Plan, Interim RA, OU-1 | Chan, Arthur D<br>93 BMW/CVE | 570<br>CD 4 |
| 22 Jan 92 | Base Letter to Residents Concerning TCE Sampling to Monitor Quality of Drinking Water | Baker, Thomas R, LtCol<br>93 CSG/DEV | 571<br>CD 4 |
| 22 Jan 92 | Base Letter to Resident Concerning Monthly TCE Samples Taken to Monitor Quality of Drinking Water | Baker, Thomas R, LtCol<br>93 CSG/DEV | 572<br>CD 4 |
| 22 Jan 92 | TCE Test Results, Oct-Dec 91 | 93 CSG/DEV | 573<br>CD 4 |
| 22 Jan 92 | Base Letter to CDTSC Concerning Comments on Monthly TCE Results | Baker, Thomas R, LtCol<br>93 CSG/DEV | 574<br>CD 4 |
| 22 Jan 92 | Base Letter to Resident Concerning Comments on TCE Samples Taken to Monitor Drinking Water Quality | Baker, Thomas R, LtCol<br>93 CSG/DEV | 576<br>CD 4 |
| 22 Jan 92 | Base Letter to EPA Concerning Comments on Monthly TCE Results | Baker, Thomas R, LtCol<br>93 CSG/DEV | 577<br>CD 4 |
| 22 Jan 92 | Base Letter to EPA Concerning Amendments to RI/FS, Draft Final Report, OU-2 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 578<br>CD 4 |
| 23 Jan 92 | Castle Joint Powers Authority Meeting Minutes, 23 Jan 92 | Barrett, Frances M<br>93 CSG/DEVR | 580<br>CD 4 |
| 27 Jan 92 | EPA Letter to Base Concerning Comments on Revisions to RI/FS, Draft Final Report, OU-2 | Work, Michael<br>EPA Region IX | 582<br>CD 4 |

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|---|---|---|---|
| 29 Jan 92 | Castle Vista Round 3 Data Validation Summary Report | IT Corp. | 583 CD 4 |
| 29 Jan 92 | Base Letter to EPA Concerning Comments on Draft Work Plan | Cole, John R, LtCol 93 CSG/DE | 584 CD 4 |
| 29 Jan 92 | CDTSC Letter to Base Concerning Review of RI/FS, Draft Final Report and Proposed Plan, OU-2 | O'Kane, John A, Jr California Department of Toxic Substances Control | 585 CD 4 |
| 30 Jan 92 | CRWQCB Letter to Base Concerning Comments on RI/FS, Draft Final Report and Proposed Plan, OU-2 | Vorster, Antonia K J California Regional Water Quality Control Board | 586 CD 4 |
| 30 Jan 92 | CDTSC Letter to Base Concerning Request for Extension of IAG Schedule, 29 Jan 92 | Wang, David California Department of Toxic Substances Control | 587 CD 4 |
| 31 Jan 92 | External Scoping Meeting Minutes for OU-3, 08 Jan 92 | Baker, Thomas R, LtCol 93 CSG/DEV | 588 CD 4 |
| Feb 92 | VOC Probe Results | IT Corp. | 589 CD 4 |
| Feb 92 | ARAR, TV Sewer Line Survey Report | IT Corp. | 592 CD 3 |
| Feb 92 | Draft HSP, Groundwater Plume Characterization | CDM Federal Programs Corp. Woodward-Clyde Consultants | 593 CD 3 |
| Feb 92 | Draft QAPP | CDM Federal Programs Corp. Woodward-Clyde Consultants | 594 CD 3 |
| 03 Feb 92 | Draft Work Plan and FSP, Vol I of III | CDM Federal Programs Corp. Woodward-Clyde Consultants | 590 CD 4 |

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| 03 Feb 92 | Draft Work Plan and FSP, Vol II of III | CDM Federal Programs Corp.<br>Woodward-Clyde Consultants | 591<br>CD 3 |
| 06 Feb 92 | EPA Letter to Base Concerning Receipt of Letter Requesting Extensions to FFA Schedules for RI/FS, Draft Final Report, Draft Work Plan, and Draft Final Proposed Plan | Work, Michael<br>EPA Region IX | 595<br>CD 3 |
| 10 Feb 92 | Base Letter to EPA Concerning Invoking of Force Majeure Due to Lack of Funding of DERA Projects | Kehoe, Michael J, Col<br>93 CSG/CV | 596<br>CD 3 |
| 10 Feb 92 | CDTSC Letter to Base Concerning Request for Identification of ARARs for Remediation of Groundwater Contamination, OU-2 | O'Kane, John A, Jr<br>California Department of Toxic Substances Control | 597<br>CD 3 |
| 10 Feb 92 | Interim Design Report, OU-1 | PRC Environmental Management, Inc. | 599<br>CD 3 |
| 11 Feb 92 | CDPW Letter to CDHS Concerning ARARs for Remediation of Groundwater Contamination, OU-2 | Fillebrown, Paul A<br>California Department of Public Works | 600<br>CD 3 |
| 12 Feb 92 | Base Letter to EPA Concerning Working Session and RPM Meeting Minutes, 04 Feb 92 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 601<br>CD 3 |
| 12 Feb 92 | Newspaper Article, "Carbon Filters Help Castle with Groundwater Cleanup" | The Atwater Signal | 602<br>CD 3 |
| 13 Feb 92 | EPA Letter to Base Concerning Request to Rescind FFA Schedule | Work, Michael<br>EPA Region IX | 603<br>CD 3 |
| 13 Feb 92 | Castle Joint Powers Authority Draft Meeting Minutes, 13 Feb 92 | Barrett, Frances M<br>93 CSG/DEVR | 604<br>CD 3 |

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| 13 Feb 92 | Newspaper Article, "Castle Clean-up Steps Forward" | The Winton Times | 605 CD 3 |
| 14 Feb 92 | MID Letter to Base Concerning Water Quality Results, DA-4 and Wallace Road | Selb, E C Ted, III Merced Irrigation District | 606 CD 3 |
| 14 Feb 92 | Base Letter to EPA Concerning Proposed Plan, OU-2 | Baker, Thomas R, LtCol 93 CSG/DEV | 607 CD 3 |
| 21 Feb 92 | EPA Letter to Base Concerning Delinquent Draft Final Proposed Plan, OU-2 | Work, Michael EPA Region IX | 608 CD 3 |
| 24 Feb 92 | Base Letter to EPA Concerning Decision of IAG Schedule, 13 Feb 92 | Kehoe, Michael J, Col 93 BMW/CV | 609 CD 3 |
| 24 Feb 92 | Final RPM Meeting Minutes, 17 Dec 91 | Baker, Thomas R, LtCol 93 CSG/DEV | 610 CD 3 |
| 25 Feb 92 | CDTSC Letter to Base Concerning Force Majeure of IAG | Wang, David California Department of Toxic Substances Control | 611 CD 3 |
| 25 Feb 92 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 04 Feb 92 | Work, Michael EPA Region IX | 612 CD 3 |
| 27 Feb 92 | Castle Joint Powers Authority Meeting Minutes, 27 Feb 92 | Barrett, Frances M 93 CSG/DEVR | 613 CD 3 |
| 02 Mar 92 | EPA Letter to Base Concerning RD, OU-2 | Work, Michael EPA Region IX | 614 CD 3 |
| 04 Mar 92 | CRWQCB Letter to Base Concerning Comments on Draft Work Plan and FSP, Groundwater Plume Characterization | Izzo, Victor J California Regional Water Quality Control Board | 615 CD 3 |

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| 04 Mar 92 | APCD Letter to CDTSC Concerning ARARs for Remediation of Groundwater Contamination, OU-2 | Brooks, Roland D<br>San Joaquin Valley Air Pollution Control District | 1761<br>CD 9 |
| 04 Mar 92 | Draft Final Proposed Plan, OU-2 | Metcalf & Eddy | 1762<br>CD 9 |
| 05 Mar 92 | CDTSC Letter to Base Concerning Comments on Interim Design Report, OU-1 | O'Kane, John A, Jr<br>California Department of Toxic Substances Control | 616<br>CD 3 |
| 05 Mar 92 | Newspaper Article, "Castle Cleans Groundwater" | The Atwater New Times | 617<br>CD 3 |
| 06 Mar 92 | EPA Letter to Base Concerning Comments on Draft Work Plan and FSP, Feb 92 | Work, Michael<br>EPA Region IX | 618<br>CD 3 |
| 08 Mar 92 | CRWQCB Letter to Base Concerning Proposed FFA | Pearson, J Lawrence<br>California Regional Water Quality Control Board | 619<br>CD 3 |
| 09 Mar 92 | CRWQCB Letter to Base Concerning Interim Design Report, OU-1 | Izzo, Victor J<br>California Regional Water Quality Control Board | 620<br>CD 3 |
| 10 Mar 92 | CRWQCB Letter to CDTSC Concerning ARARs, OU-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 621<br>CD 3 |
| 11 Mar 92 | EPA Letter to Base Concerning Comments on Draft Final Proposed Plan, OU-2 | Work, Michael<br>EPA Region IX | 622<br>CD 3 |
| 11 Mar 92 | EPA Letter to Base Concerning Comments on Interim Design Report, OU-1 | Work, Michael<br>EPA Region IX | 623<br>CD 3 |

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| 11 Mar 92 | EPA Letter to HQ SAC Concerning Missed Deadlines | Anderson, Julie<br>EPA Region IX | 624<br>CD 3 |
| 15 Mar 92 | Fact Sheet, Base Environmental Update, 15 Mar 92 | 93 BMW/PA | 626<br>CD 3 |
| 17 Mar 92 | EPA Letter to Base Concerning Letters on RI/FS, OU-2 | Work, Michael<br>EPA Region IX | 627<br>CD 3 |
| 20 Mar 92 | Base Letter to EPA Concerning Interim Design Report, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 628<br>CD 3 |
| 23 Mar 92 | CDTSC Letter to Base Concerning Comments on Draft Final Proposed Plan, OU-2 | O'Kane, John A, Jr<br>California Department of Toxic Substances Control | 629<br>CD 3 |
| 24 Mar 92 | CRWQCB Letter to Base Concerning Draft Final Proposed Plan, OU-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 630<br>CD 3 |
| 26 Mar 92 | Castle Joint Powers Authority Meeting Minutes, 26 Mar 92 | Barrett, Frances M<br>93 CSG/DEVR | 631<br>CD 3 |
| 28 Mar 92 | Newspaper Article, "Castle Backers Scrounge for Money" | Hansen, Don<br>The Turlock Journal | 632<br>CD 3 |
| 30 Mar 92 | EPA Letter to Base Concerning Public Comment Period, OU-2 | Work, Michael<br>EPA Region IX | 633<br>CD 3 |
| 30 Mar 92 | CRWQCB Letter to Base Concerning Data Needs for ROD, OU-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 634<br>CD 3 |

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| 31 Mar 92 | CRWQCB Letter to AFRCW Concerning Proposed Modifications to IAGs to Include CRWQCB as Signatory Party | Vorster, Antonia K J<br>California Regional Water Quality Control Board | 635<br>CD 3 |
| 31 Mar 92 | Newspaper Article, "Castle Cleanup Funding Rejected" | The Merced Sun Star | 636<br>CD 3 |
| 31 Mar 92 | Newspaper Article, "Castle Lease Could Discourage Organizations" | The Modesto Bee | 637<br>CD 3 |
| Apr 92 | Proposed Plan, Remediation of Groundwater Contamination, Wallace Road and DA-4 | 93 CSG/DEVR | 638<br>CD 3 |
| 01 Apr 92 | Newspaper Article, "Joint Power Authority Hears Anti-Prison Protest, Groundwater Cleanup Stalled" | Sanders, Tammy S<br>The Atwater Signal | 639<br>CD 3 |
| 01 Apr 92 | EPA Letter to Base Concerning Proposed Plan, OU-2 | Work, Michael<br>EPA Region IX | 640<br>CD 3 |
| 02 Apr 92 | Newspaper Article, "Lack of Money for Water Clean-up" | The Winton Times | 641<br>CD 3 |
| 03 Apr 92 | EPA Letter to Base Concerning Assessment of Stipulated Penalties | Work, Michael<br>EPA Region IX | 642<br>CD 3 |
| 04 Apr 92 | Newspaper Article, "Lack of Funding Could Stall Castle Cleanup" | Rocha, Elisa<br>The Modesto Bee | 643<br>CD 3 |
| 07 Apr 92 | Newspaper Article, "Lack of Funds No Problem" | The Merced Sun Star | 644<br>CD 3 |
| 08 Apr 92 | Newspaper Article, "Castle Cleanup Funding Through April" | Sanders, Tammy S<br>The Atwater Signal | 645<br>CD 3 |

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|---|---|---|---|
| 08 Apr 92 | EPA Letter to Base Concerning EPA Review of Aerial Photo Analysis and Draft CSA Report | Work, Michael<br>EPA Region IX | 646<br>CD 3 |
| 13 Apr 92 | Base Letter to EPA Concerning Development and Pump Test Water Disposition, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 647<br>CD 3 |
| 16 Apr 92 | EPA Letter to Base Concerning Clarification of EPA Positions, OU-2 | Anderson, Julie<br>EPA Region IX | 648<br>CD 3 |
| 17 Apr 92 | Draft Proposed Plan, Containment and Remediation of Groundwater Contamination, Wallace Road Area, DA-4 | EPA Region IX | 649<br>CD 3 |
| 20 Apr 92 | Base Letter to CDTSC Concerning Dispute Resolution Pursuant to FFA | Baker, Thomas R, LtCol<br>93 CSG/DEV | 650<br>CD 3 |
| 22 Apr 92 | Newspaper Article, "No Clean-up Unacceptable" | Fontella, Joe<br>The Atwater Signal | 651<br>CD 3 |
| 29 Apr 92 | Newspaper Article, "Castle AFB Announces Public Meeting, Comment Period Announcement on Proposed Cleanup" | The Atwater Signal | 652<br>CD 3 |
| 29 Apr 92 | Newspaper Article, "Base Facilities to Tie Into Atwater Waste Water Treatment Plant" | Sanders, Tammy S<br>The Atwater Signal | 653<br>CD 3 |
| 01 May 92 | Base Letter to PRC Environmental Concerning CRWQCB Approval of Discharging Water Generated During Aquifer Test, OU-1 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 657<br>CD 3 |
| 01 May 92 | PRC and JMM Responses to Comments of Interim Design Report, OU-1 | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 658<br>CD 3 |

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|---|---|---|---|
| 04 May 92 | EPA Letter to Base Concerning Assessment of Stipulated Penalties for Late Submittal of Draft Final Work Plan | Work, Michael<br>EPA Region IX | 659<br>CD 3 |
| 07 May 92 | Base Letter to CRWQCB Concerning Samples for 72-Hour Pump Test | Baker, Thomas R, LtCol<br>93 CSG/DEV | 660<br>CD 3 |
| 07 May 92 | Base Letter to EPA Concerning RPM Draft Meeting Minutes, 08 Apr 92 | Baker, Thomas R, LtCol<br>93 CSG/DEV | 661<br>CD 3 |
| 07 May 92 | EPA Letter to Base Concerning Development of Zero-Day Schedule | Work, Michael<br>EPA Region IX | 662<br>CD 3 |
| 08 May 92 | Newspaper Article, "Cleanup Plan Urged" | The Modesto Bee | 663<br>CD 3 |
| 11 May 92 | Newspaper Article, "Cleanup Bill Still Making Rounds" | Chan, Cecilia<br>The Merced Sun Star | 664<br>CD 3 |
| 12 May 92 | Newspaper Article, "Public Meeting Planned" | The Merced Sun Star | 665<br>CD 3 |
| 13 May 92 | Base Letter to EPA Concerning RPM Meeting, 14 May 92 | Baker, Thomas R, LtCol<br>93 CSG/DE | 666<br>CD 3 |
| 14 May 92 | Newspaper Article, "Castle's Proposed Water Clean-up Plan" | The Atwater New Times | 667<br>CD 3 |
| 15 May 92 | Base Letter to CDTSC Concerning Dispute Resolution Pursuant to FFA | Baker, Thomas R, LtCol<br>93 CSG/DE | 669<br>CD 3 |
| 15 May 92 | Base Letter to EPA Concerning Dispute Resolution Pursuant to FFA | Baker, Thomas R, LtCol<br>93 CSG/DEV | 670<br>CD 3 |

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| 20 May 92 | SOW, RI/FS, OU-3 and Installation Wide | AFCEE/ESRB | 673<br>CD 3 |
| 21 May 92 | CDTSC Letter to Base Concerning Dispute Resolution | Landis, Anthony J<br>California Department of Toxic Substances Control | 671<br>CD 3 |
| 21 May 92 | EPA Letter to Base Concerning Results of 91 EPA Field Audit, Data Validation Reports and Split Sample Analysis | Work, Michael<br>EPA Region IX | 672<br>CD 3 |
| 22 May 92 | EPA Letter to HQ SAC and CDTSC Concerning Dispute Resolution | EPA Region IX | 674<br>CD 3 |
| 29 May 92 | HQ SAC Letter to SAF/MIQ and EPA Concerning IAG Dispute Resolution Committee | Mack, Robert D<br>HQ SAC/CEV | 675<br>CD 3 |
| 29 May 92 | EPA Letter to Base Concerning Draft ROD and Requested Extension, OU-2 | Anderson, Julie<br>EPA Region IX | 676<br>CD 3 |
| 29 May 92 | RA, Draft Basis of Design Report, OU-1 | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 678<br>CD 3 |
| 29 May 92 | RA, Draft Work Plan, OU-1 | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 679<br>CD 3 |
| 30 May 92 | Newspaper Article, "Base Cleanup Considered" | The Merced Sun Star | 680<br>CD 3 |
| Jun 92 | ROD, Draft, OU-2 | EPA Region IX | 681<br>CD 3 |

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| 03 Jun 92 | CDTSC Letter to Base Concerning Comments on Proposed Plan, OU-2 | Austreng, James C<br>California Department of Toxic Substances Control | 682<br>CD 3 |
| 03 Jun 92 | CRWQCB Letter to Base Concerning Comments on Proposed Plan, OU-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 683<br>CD 3 |
| 09 Jun 92 | RPM Meeting Minutes, 02 Jun 92 | Hicks, Brad<br>93 CSG/CEVR | 684<br>CD 3 |
| 15 Jun 92 | Base Letter to CDTSC Concerning Draft Work Plan and FSP | Baker, Thomas R, LtCol<br>93 CSG/DEV | 685<br>CD 3 |
| 19 Jun 92 | SAF Letter to EPA and CDTSC Concerning Dispute Resolution and Seven Day Extension | Vest, Gary D<br>Deputy Assistant Secretary of the Air Force | 686<br>CD 3 |
| 14 Jul 92 | CRWQCB Letter to Water Quality Attorneys Concerning ARARs, SCOU | McChesney, Frances<br>Marshack, Jon<br>California Regional Water Quality Control Board | 1189<br>CD 6 |
| 15 Jul 92 | CRWQCB Letter to Base Concerning Draft 100% Design Documents, RA, Draft Work Plan, OU-1 | Izzo, Victor J<br>California Regional Water Quality Control Board | 687<br>CD 3 |
| 16 Jul 92 | SAF Letter to EPA and CDTSC Concerning Dispute Resolution | Vest, Gary D<br>Deputy Assistant Secretary of the Air Force | 688<br>CD 3 |
| 17 Jul 92 | Newspaper Article, "State Issues Stern Warning on Cleanup" | The Merced Sun Star | 689<br>CD 3 |

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| 18 Jul 92 | Newspaper Article, "Castle Cleanup Boosted, Funding Vote Set Thursday" | The Merced Sun Star | 690 CD 3 |
| 18 Jul 92 | Newspaper Article, "State EPA Issues Warning on Some Merced Water, US Assailed for Failure in Cleanup Efforts" | Schwartz, Stephen The San Francisco Chronicle | 691 CD 3 |
| 18 Jul 92 | Newspaper Article, "Cash to Cleanup Castle, Congress to Boost Efforts to Remove Contamination at Bases" | Doyle, Michael The Modesto Bee | 692 CD 3 |
| 18 Jul 92 | Newspaper Article, "State Orders Castle Cleanup to Continue" | The Turlock Journal | 693 CD 3 |
| 21 Jul 92 | CDPH Letter to Base Concerning Base Landfills | Palsgaard, Jeff H California Department of Public Health | 695 CD 3 |
| 22 Jul 92 | IAG, FFA Under CERCLA Section 120 | EPA Region IX | 694 CD 3 |
| 22 Jul 92 | EPA Letter to SAF/MIQ and CDTSC Concerning Dispute Resolution | McGovern, Daniel W EPA Region IX | 696 CD 3 |
| 22 Jul 92 | CRWRCB Letter to AFRCW Concerning Proposed Modifications to IAGs to Include CRWQCB as Signatory Parties | McChesney, Frances California Regional Water Quality Control Board | 697 CD 3 |
| 28 Jul 92 | EPA Letter to Base Concerning Zero-Day Based Schedule, 20 Jul 92 | Work, Michael EPA Region IX | 699 CD 3 |
| 29 Jul 92 | Joint Power Authority Letter to Base Concerning Latest TRC Meeting | Martin, Richard D Castle Joint Powers Authority | 698 CD 3 |

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|---|---|---|---|
| 29 Jul 92 | Newspaper Article, "Atwater in Line for Big Federal Grant, $1.5 Million Would Pay to Connect Castle AFB Sewer Lines to Treatment Plant" | De La Cruz, Mike<br>The Merced Sun Star | 700<br>CD 3 |
| 31 Jul 92 | CDTSC Letter to Base Concerning Closure of PCB Storage Area and Corrosion Control Paint Booth Water Tank | Pappas, James M<br>California Department of Toxic Substances Control | 701<br>CD 3 |
| 05 Aug 92 | EPA Letter to Base, CRWQCB, and CDTSC Concerning Review of ROD, Draft, OU-2 | Work, Michael<br>EPA Region IX | 702<br>CD 3 |
| 07 Aug 92 | ROD Responsiveness Summary Report, OU-2 | 93 BMW/CVE | 703<br>CD 3 |
| 10 Aug 92 | Draft Final Basis of Design Report, OU-1 | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 704<br>CD 3 |
| 10 Aug 92 | Draft Final Basis of Design Report, OU-1, Appendix C | PRC Environmental Management, Inc.<br>James M Montgomery, Inc. | 705<br>CD 3 |
| 11 Aug 92 | EPA Letter to Base Concerning Revised FFA Schedule, 14 Aug 92 | Work, Michael<br>EPA Region IX | 706<br>CD 3 |
| 11 Aug 92 | CRWQCB Letter to EPA Concerning Comments Deadline for Draft ROD, OU-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 707<br>CD 3 |
| 11 Aug 92 | CDTSC Letter to EPA Concerning Comments on ROD, Draft, OU-2 | Austreng, James C<br>California Department of Toxic Substances Control | 708<br>CD 3 |

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|---|---|---|---|
| 11 Aug 92 | PRC Letter to Base Concerning Response to EPA Comments on Draft 100% Design Documents and RA, Draft Work Plan, OU-1 | Scruggs, Mary<br>PRC Environmental Management, Inc. | 709<br>CD 3 |
| 12 Aug 92 | EPA Letter to Base Concerning Review of Draft Meeting Minutes, 29 Jul 92 | Work, Michael<br>EPA Region IX | 710<br>CD 3 |
| 13 Aug 92 | Base Letter to EPA Concerning Comments on ROD, Draft, OU-2 | Hicks, Brad<br>93 CSG/DEVR | 712<br>CD 3 |
| 13 Aug 92 | EPA Letter to Base Concerning RA, Draft Memorandum, SS-61 | Work, Michael<br>EPA Region IX | 1193<br>CD 6 |
| 14 Aug 92 | CRWQCB Letter to Base Concerning Comments on ROD, Draft, OU-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 713<br>CD 3 |
| 18 Aug 92 | RPM Conference Call Meeting Minutes, 30 Jul 92 | Scruggs, Mary<br>PRC Environmental Management, Inc. | 714<br>CD 3 |
| 18 Aug 92 | EPA Letter to Base, CDTSC, and CRWQCB Concerning Request for Review of Draft Responsiveness Summary, OU-2, 09 Sep 92 | Work, Michael<br>EPA Region IX | 715<br>CD 3 |
| 20 Aug 92 | EPA Letter to Base Concerning Draft OU-1 100% Design Report and Contractor Response to EPA Comments | Work, Michael<br>EPA Region IX | 716<br>CD 3 |
| 28 Aug 92 | RA, Draft Final Work Plan, OU-1 | PRC Environmental Management, Inc. | 717<br>CD 3 |
| 28 Aug 92 | RA, Draft Final Basis of Design Report, Vol I of II, OU-1 | PRC Environmental Management, Inc. | 718<br>CD 3 |

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|---|---|---|---|
| 28 Aug 92 | RA, Draft Final Basis of Design Report, Vol II of II, Appendix C, OU-1 | PRC Environmental Management, Inc. | 719 CD 3 |
| Sep 92 | Base Comments Concerning Design, OU-1 | Hicks, Brad 93 CES/DEVR | 720 CD 3 |
| Sep 92 | ROD, Draft Final, OU-2 | EPA Region IX | 726 CD 3 |
| 03 Sep 92 | CRWQCB Letter to Base Concerning Comments on Draft Responsiveness Summary, OU-2 | Izzo, Victor J California Regional Water Quality Control Board | 721 CD 3 |
| 04 Sep 92 | SOW, RI/FS, Installation Wide | 93 CES/CEVR | 958 CD 3 |
| 08 Sep 92 | CRWQCB Letter to Base Concerning Free Floating Product at Monitoring Well #120, Affect on Treatment Systems, Bldg 84, OU-1 | Izzo, Victor J California Regional Water Quality Control Board | 722 CD 3 |
| 10 Sep 92 | HQ EPA Letter to SAF/MIQ and CDTSC Concerning Base Dispute Resolution | McCall, Thomas L, Jr HQ USEPA | 723 CD 3 |
| 11 Sep 92 | CRWQCB Letter to Base Concerning Review of RA Memorandum, Bldg 84 | Izzo, Victor J California Regional Water Quality Control Board | 724 CD 3 |
| 14 Sep 92 | Base Letter to Regulators Concerning Installation Wide Work Plan | Cole, John R, LtCol 93 BMW/CVE | 40 CD 2 |
| 21 Sep 92 | EPA Letter to Base Concerning Comments on Draft Final 100% Design Report, OU-1 | Work, Michael EPA Region IX | 727 CD 3 |

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|---|---|---|---|
| 21 Sep 92 | EPA Letter to Base Concerning ROD, Draft Final, OU-2 | Work, Michael<br>EPA Region IX | 728<br>CD 3 |
| 22 Sep 92 | CRWQCB Draft Memorandum Concerning Effluent Discharge Standards, OU-1 | Izzo, Victor J<br>California Regional Water Quality Control Board | 729<br>CD 3 |
| 24 Sep 92 | Base Letter to Regulators Concerning Retraction of ROD, Draft Final, OU-2 | Cole, John R, LtCol<br>93 BMW/CVE | 730<br>CD 3 |
| 24 Sep 92 | EPA Letter to Base Concerning Conference Call and Comments on Draft Final 100% Design Report, OU-1 | Work, Michael<br>EPA Region IX | 731<br>CD 3 |
| 25 Sep 92 | EPA Letter to Base Concerning Base Cleanup Information | Takata, Keith<br>EPA Region IX | 732<br>CD 3 |
| 28 Sep 92 | Base Letter to Regulators Concerning Proposed FFA Schedule | Cole, John R, LtCol<br>93 BMW/CVE | 733<br>CD 3 |
| 29 Sep 92 | CDTSC Letter to Base and EPA Concerning Dispute Resolution | Wang, David<br>California Department of Toxic Substances Control | 734<br>CD 3 |
| 29 Sep 92 | RA, Final Basis of Design Report, Vol II of II, Appendix C, OU-1 | PRC Environmental Management, Inc. | 735<br>CD 3 |
| 30 Sep 92 | Base Letter to EPA and CDTSC Concerning Issues of Dispute Resolution Committee | Cole, John R, LtCol<br>93 BMW/CVE | 736<br>CD 3 |
| 30 Sep 92 | CDTSC Letter to HQ/ACC Concerning Dispute Resolution | Wang, David<br>California Department of Toxic Substances Control | 737<br>CD 3 |

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|---|---|---|---|
| Oct 92 | ROD, Draft Final, OU-2 | 93 BMW/CVE | 197 CD 2 |
| Oct 92 | ROD, Draft Final, OU-2 | 93 CES/CEV | 739 CD 3 |
| 06 Oct 92 | CRWQCB Letter to Base, EPA, and CDTSC Concerning Pre-Meeting on Dispute of RD, Report and RA, Work Plan, OU-1 | Izzo, Victor J California Regional Water Quality Control Board | 740 CD 3 |
| 09 Oct 92 | EPA Letter to Base Concerning Comments on Draft RPM Meeting Minutes, 16 Sep 92 | Work, Michael EPA Region IX | 742 CD 3 |
| 13 Oct 92 | EPA Letter to Base Concerning Comments on Draft Proposed FFA Schedule | Work, Michael EPA Region IX | 743 CD 3 |
| 14 Oct 92 | HQ ACC Letter to CDTSC and EPA Concerning Dispute, OU-1 | HQ ACC/CEV | 744 CD 3 |
| 15 Oct 92 | Newspaper Article, "Bill Would Free Up Clean Parts of Castle, Legislation Now on President's Desk" | The Merced Sun Star | 745 CD 3 |
| 20 Oct 92 | EPA Letter to HQ ACC and CDTSC Concerning Dispute Resolution for RD, OU-1 | Takata, Keith EPA Region IX | 747 CD 3 |
| 21 Oct 92 | RPM Meeting Agenda, 04 Nov 92 | Cole, John R, LtCol 93 BMW/CVE | 748 CD 3 |
| 23 Oct 92 | RPM Meeting Minutes, 16 Sep 92 | Cole, John R, LtCol 93 BMW/CVE | 749 CD 3 |
| 26 Oct 92 | Base Letter to Regulators Concerning Proposed FFA Schedule | Baker, Thomas R, LtCol 93 BMW/CVE | 750 CD 3 |

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|---|---|---|---|
| 29 Oct 92 | Newspaper Article, "Base Cleanup Efforts Accelerated, Air Force Wants Polluted Facility Suitable for New Occupants by 95" | De La Cruz, Mike<br>The Merced Sun Star | 751<br>CD 3 |
| 29 Oct 92 | EPA Letter to Base Concerning Comments on ROD, Draft Final, OU-2 | Work, Michael<br>EPA Region IX | 752<br>CD 3 |
| Nov 92 | Working Copy, QAPP, SCOU | Jacobs Engineering Group, Inc. | 753<br>CD 5 |
| Nov 92 | Stage 5, Draft HSP, SCOU | Jacobs Engineering Group, Inc. | 754<br>CD 5 |
| Nov 92 | Installation Wide Contaminant Source Assessment Study, Vol I of II | Jacobs Engineering Group, Inc. | 755<br>CD 5 |
| Nov 92 | Installation Wide Contaminant Source Assessment Study, Vol II of II | Jacobs Engineering Group, Inc. | 756<br>CD 5 |
| Nov 92 | SAP, SCOU | Jacobs Engineering Group, Inc. | 757<br>CD 5 |
| 02 Nov 92 | Base Letter to Regulators Concerning EPA Comments on ROD, Draft Final, OU-2 | Baker, Thomas R, LtCol<br>93 CES/CEVR | 759<br>CD 3 |
| 03 Nov 92 | CRWQCB Letter to HQ ACC, EPA, and CDTSC Concerning Dispute Resolution, OU-1 | Pearson, J Lawrence<br>California Regional Water Quality Control Board | 760<br>CD 3 |
| 04 Nov 92 | RPM Meeting Minutes, 04 Nov 92 | Reith, Charles<br>Jacobs Engineering Group, Inc. | 761<br>CD 3 |
| 04 Nov 92 | HQ USEPA Letter to SAF/MIQ and CDTSC Concerning Dispute Resolution | McCall, Thomas L, Jr<br>HQ USEPA | 762<br>CD 3 |

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|---|---|---|---|
| 04 Nov 92 | EPA Letter to HQ ACC and CDTSC Concerning Dispute Resolution of Interim OU-1 100% RD, Draft Final Report and RA, Work Plan | Takata, Keith<br>EPA Region IX | 763<br>CD 3 |
| 05 Nov 92 | CDTSC Letter to EPA and HQ ACC Concerning Dispute Resolution | Ward, Daniel T<br>California Department of Toxic Substances Control | 767<br>CD 4 |
| 05 Nov 92 | CRWQCB Letter to Base Concerning Approval of RA, Bldg 84 | Izzo, Victor J<br>California Regional Water Quality Control Board | 768<br>CD 4 |
| 09 Nov 92 | EPA Letter to Base Concerning Comments on Draft Final FFA Schedule | Work, Michael<br>EPA Region IX | 770<br>CD 4 |
| 09 Nov 92 | Fact Sheet, Base Environmental Update, 09 Nov 92 | 93 BW/PA | 784<br>CD 3 |
| 11 Nov 92 | Draft Working Copy, QAPP, SCOU | Jacobs Engineering Group, Inc. | 771<br>CD 4 |
| 20 Nov 92 | EPA Letter to Base Concerning Comments on RD/RA, Draft Preliminary Accelerated Schedule, OU-2 | Work, Michael<br>EPA Region IX | 772<br>CD 3 |
| 23 Nov 92 | HQ ACC Letter to Regulators Concerning Unanimous Opinion of Dispute Resolution Committee, OU-1 | Moore, Robert M<br>HQ ACC/CEVR | 773<br>CD 3 |
| 25 Nov 92 | EPA Letter to HQ ACC, CDTSC, and CRWQCB Concerning Dispute Resolution, ROD, OU-2 | Takata, Keith<br>EPA Region IX | 774<br>CD 3 |

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|---|---|---|---|
| 27 Nov 92 | Newspaper Article, "Public Notice, Intent to Operate Liquid Granular Activated Carbon Filter" | The Merced Sun Star | 775 CD 3 |
| 27 Nov 92 | Base Letter to Navy Concerning Modification of Design Documents, OU-1 | Baker, Thomas R, LtCol 93 CES/CEV | 776 CD 3 |
| Dec 92 | Draft QAPP, SCOU | Jacobs Engineering Group, Inc. | 781 CD 3 |
| 02 Dec 92 | Newspaper Article, "Public Notice on the Intent to Operate Liquid Granular Activated Carbon Filter at CAFB" | The Atwater Signal | 777 CD 3 |
| 03 Dec 92 | CDTSC Letter to Base Concerning NOD for Draft PCB Closure Plan | Hong, Eric California Department of Toxic Substances Control | 787 CD 3 |
| 04 Dec 92 | Newspaper Article, "Funds for Base Cleanup" | The Merced Sun Star | 778 CD 3 |
| 10 Dec 92 | Newspaper Article, "Castle AFB Receives $21 Million for Cleanup" | The Winton Times | 779 CD 3 |
| 10 Dec 92 | RA, Final Basis of Design Report, Vol I of II, OU-1 | PRC Environmental Management, Inc. | 782 CD 3 |
| 10 Dec 92 | RA, Final Work Plan, OU-1 | PRC Environmental Management, Inc. | 783 CD 3 |
| 14 Dec 92 | SOW, Title I Services for Groundwater Treatment, OU-2 and Title II Services for Groundwater Treatment, OU-1 | Jacobs Engineering Group, Inc. | 946 CD 3 |

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|---|---|---|---|
| 15 Dec 92 | CRWQCB Letter to Base Concerning Draft Update of Monitoring and Reporting Program of Board Order Number | Izzo, Victor J<br>California Regional Water Quality Control Board | 785<br>CD 3 |
| 16 Dec 92 | Newspaper Article, "Castle Gets Cleanup Funding" | Parker, Scarlette P, TSgt<br>The Atwater Signal | 786<br>CD 3 |
| 24 Dec 92 | Behavior of Eight Inches Diameter Monitoring Well, DA4-1 | Martinez, Pablo A<br>93 CES/CEV | 795<br>CD 3 |
| 05 Jan 93 | TRC Meeting Minutes, 18 Nov 92 | Bishop, Raymond C, Col<br>93 BW/CV | 788<br>CD 3 |
| 06 Jan 93 | RPM Meeting Agenda, 20 Jan 93 | Cole, John R, LtCol<br>93 BW/CVE | 789<br>CD 3 |
| 11 Jan 93 | EPA Letter to Base Concerning Draft QAPP | Work, Michael<br>EPA Region IX | 790<br>CD 3 |
| 12 Jan 93 | EPA Letter to HQ ACC, CDTSC, and CRWQCB Concerning Dispute Resolution, ROD, OU-2 | Takata, Keith<br>EPA Region IX | 791<br>CD 3 |
| 14 Jan 93 | CDTSC Letter to EPA Concerning Dispute Resolution, ROD, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 792<br>CD 3 |
| 20 Jan 93 | Consensus Statement, Major Deficiencies of Work Plan, SCOU | Work, Michael<br>Austreng, James C<br>Izzo, Victor J<br>EPA Region IX<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 793<br>CD 3 |

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|---|---|---|---|
| 20 Jan 93 | RPM Draft Meeting Minutes, 20 Jan 93 | 93 CES/CEV | 794 CD 3 |
| 20 Jan 93 | Base Letter to CRWQCB Concerning GAC Unit Taken Off Line, Bldg 84 | Cole, John R, LtCol 93 BW/CVE | 942 CD 3 |
| Feb 93 | RI, Advance Draft Comprehensive Basewide Groundwater, QAPP, Vol I of II | Jacobs Engineering Group, Inc. | 796 CD 3 |
| Feb 93 | RI, Advance Draft Comprehensive Basewide Groundwater, SAP, Vol II of II | Jacobs Engineering Group, Inc. | 797 CD 3 |
| Feb 93 | RD, Draft Work Plan, OU-2 | Jacobs Engineering Group, Inc. | 798 CD 3 |
| Feb 93 | Draft Conceptual Design Support Document Technical Memorandum Report, OU-2 | Jacobs Engineering Group, Inc. | 799 CD 3 |
| Feb 93 | Base Letter to CDTSC Concerning Response to NOD on Draft Closure Plan, PCB Storage Facility | Cole, John R, LtCol 93 BW/CVE | 812 CD 3 |
| Feb 93 | RI, Comprehensive Basewide Groundwater HSP | Jacobs Engineering Group, Inc. | 959 CD 4 |
| 03 Feb 93 | Base Letters to Residents Concerning Sampling Results | Baker, Thomas R, LtCol 93 CES/CEV | 801 CD 3 |
| 04 Feb 93 | EPA Letter to Base Concerning Comments on Draft Meeting Minutes, 04 Feb 93 | Work, Michael EPA Region IX | 802 CD 3 |
| 08 Feb 93 | Base Letter to Regulators Concerning RD/RA, Draft Final Schedule, OU-2 | Cole, John R, LtCol 93 BW/CVE | 803 CD 3 |

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|---|---|---|---|
| 08 Feb 93 | Final RPM Meeting Minutes, 04 Nov 92 | Baker, Thomas R, LtCol<br>93 CES/CEV | 804<br>CD 3 |
| 09 Feb 93 | EPA Letter to Base Concerning Comments on Draft Meeting Minutes, 20 Jan 93 | Work, Michael<br>EPA Region IX | 805<br>CD 3 |
| 09 Feb 93 | MDPH Letter to EPA Concerning Base Cleanup Levels | Palsgaard, Jeff H<br>Merced County Department of Public Health | 806<br>CD 3 |
| 12 Feb 93 | RI/FS, Draft Amendments to Comprehensive Work Plan | James M Montgomery, Inc. | 807<br>CD 3 |
| 15 Feb 93 | CDTSC Letter to Base Concerning Comments on Work Plan, SCOU | Austreng, James C<br>California Department of Toxic Substances Control | 808<br>CD 3 |
| 16 Feb 93 | CRWQCB Memorandum Concerning Work Plan, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 809<br>CD 3 |
| 16 Feb 93 | EPA Letter to Base Concerning Comments on Draft Work Plan, SCOU | Work, Michael<br>EPA Region IX | 810<br>CD 3 |
| 16 Feb 93 | CRWQCB Letter to Base Concerning Draft Work Plan, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 811<br>CD 3 |
| 19 Feb 93 | CDTSC Letter to EPA Concerning Extension of Review Period, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 813<br>CD 3 |
| 22 Feb 93 | EPA Letter to Base Concerning Work Plan and Universe of Potential Sources, SCOU | Work, Michael<br>EPA Region IX | 814<br>CD 3 |

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|---|---|---|---|
| 22 Feb 93 | EPA Letter to Base Concerning Need for Chromium Groundwater Sampling | Work, Michael<br>EPA Region IX | 815<br>CD 3 |
| 23 Feb 93 | Base Letter to Regulators Concerning Phone Conversation on Approval of Contaminated Groundwater Disposal | Baker, Thomas R, LtCol<br>93 CES/CEV | 816<br>CD 3 |
| 23 Feb 93 | EPA Letter to Base Concerning Comments on Example FSP Package and Proposed Approach for Work Plan, SCOU | Work, Michael<br>EPA Region IX | 817<br>CD 3 |
| Mar 93 | Stage 5, Draft HSP, SCOU | Jacobs Engineering Group, Inc. | 818<br>CD 5 |
| Mar 93 | RI, Draft Comprehensive Basewide Groundwater SAP, Vol I of II | Jacobs Engineering Group, Inc. | 819<br>CD 5 |
| Mar 93 | RI, Draft Comprehensive Basewide Groundwater SAP, Vol II of II | Jacobs Engineering Group, Inc. | 820<br>CD 3 |
| Mar 93 | RI/FS, Work Plan and SAP Table of Contents, SCOU | Jacobs Engineering Group, Inc. | 845<br>CD 3 |
| 01 Mar 93 | MDPH Letter to Resident Concerning Response to Comments | Palsgaard, Jeff H<br>Merced County Department of Public Health | 821<br>CD 3 |
| 01 Mar 93 | EPA Draft Preliminary Remediation Goals Table Report Update | EPA Region IX | 826<br>CD 3 |
| 03 Mar 93 | CRWQCB Letter to Base Concerning Comments on Example FSP, Disposal Area 3 | Izzo, Victor J<br>California Regional Water Quality Control Board | 822<br>CD 3 |

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|---|---|---|---|
| 04 Mar 93 | EPA Letter to Base Concerning Comments on Work Plan, SCOU | Work, Michael<br>EPA Region IX | 823<br>CD 3 |
| 08 Mar 93 | EPA Letter to MDPH Concerning Letters, 09 and 11 Feb 93 | Work, Michael<br>EPA Region IX | 825<br>CD 3 |
| 09 Mar 93 | CDTSC Letter to Base Concerning Comments on Conceptual Site Model and Site Specific FSP | Austreng, James C<br>California Department of Toxic Substances Control | 827<br>CD 3 |
| 09 Mar 93 | EPA Letter to Base Concerning Late Delivery and Incomplete Submission of RI/FS, Draft Basewide Work Plan | Work, Michael<br>EPA Region IX | 828<br>CD 3 |
| 11 Mar 93 | Base Letter to Regulators Concerning RI/FS, Draft Comprehensive Basewide Work Plan | Cole, John R, LtCol<br>93 BW/CVE | 829<br>CD 3 |
| 11 Mar 93 | EPA Letter to Base Concerning Draft Work Plan, SCOU | Work, Michael<br>EPA Region IX | 830<br>CD 3 |
| 15 Mar 93 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 18 Feb 93 | Work, Michael<br>EPA Region IX | 832<br>CD 3 |
| 17 Mar 93 | CIWMB Letter to Base Concerning Landfill Areas 1-5 | Johnson, Albert M<br>California Integrated Waste Management Board | 833<br>CD 3 |
| 19 Mar 93 | Fact Sheet, Base Environmental Update, 19 Mar 93 | 93 BW/PA | 834<br>CD 3 |
| 22 Mar 93 | EPA Letter to HQ ACC, CDTSC, and CRWQCB Concerning Dispute Resolution, ROD, OU-2 | Takata, Keith<br>EPA Region IX | 835<br>CD 3 |

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|---|---|---|---|
| 22 Mar 93 | Base Letter to Residents Concerning Comments on Results From Well Water Sampling | Baker, Thomas R, LtCol<br>93 CES/CEV | 836<br>CD 3 |
| 23 Mar 93 | Newspaper Article, "Cleanup Efforts at Castle Continue" | Lindsay, Alvie<br>The Modesto Bee | 838<br>CD 3 |
| 24 Mar 93 | CDTSC Letter to EPA Concerning Extension of Review Period, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 839<br>CD 3 |
| 31 Mar 93 | Bechtel Letter to EPA Concerning TRC Comments on Draft FSP, SCOU | Haskins, Greg<br>Bechtel Environmental, Inc. | 844<br>CD 3 |
| Apr 93 | RI/FS, Draft Final QAPP, Vol I of II | Jacobs Engineering Group, Inc. | 840<br>CD 3 |
| Apr 93 | RI/FS, Draft Final QAPP, Vol II of II | Jacobs Engineering Group, Inc. | 841<br>CD 3 |
| Apr 93 | Site Construction Quality Plan | EA Engineering, Science, and Technology, Inc. | 960<br>CD 4 |
| Apr 93 | RI/FS, Draft Final Work Plan, SAP, SCOU | Jacobs Engineering Group, Inc. | 961<br>CD 5 |
| 01 Apr 93 | Base Letter to Residents Concerning Comments on Monthly TCE Samples | Baker, Thomas R, LtCol<br>93 CES/CEV | 843<br>CD 3 |
| 06 Apr 93 | EPA Letter to Base Concerning Comments on Universe of Sites, SCOU | Work, Michael<br>EPA Region IX | 846<br>CD 3 |
| 07 Apr 93 | HQ ACC Letter to EPA Concerning Concurrence with 60 day review extension for Dispute Resolution, ROD, OU-2 | Mogge, John W, Col<br>HQ ACC/CEV | 847<br>CD 3 |

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|---|---|---|---|
| 09 Apr 93 | CRWQCB Letter to Base Concerning ARARs, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 848<br>CD 3 |
| 12 Apr 93 | EPA Letter to Base Concerning Comments on FSP, North and East Base Sectors | Work, Michael<br>EPA Region IX | 850<br>CD 3 |
| 14 Apr 93 | EPA Letter to Base Concerning Comments on Conceptual Design Support Technical Memorandum, OU-2 | Work, Michael<br>EPA Region IX | 851<br>CD 3 |
| 15 Apr 93 | Base Letter to CDTSC Concerning Draft Closure Plan, Former PCB Storage Facility | Baker, Thomas R, LtCol<br>93 CES/CEV | 852<br>CD 3 |
| 19 Apr 93 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 25 Mar 93 | Work, Michael<br>EPA Region IX | 853<br>CD 3 |
| 23 Apr 93 | EPA Letter to Resident Concerning Response to Questions on Base Contamination | Work, Michael<br>EPA Region IX | 854<br>CD 3 |
| 26 Apr 93 | Base Letter to Regulators Concerning FFA Schedule | Cole, John R, LtCol<br>93 BW/CVE | 855<br>CD 3 |
| 29 Apr 93 | Base Letter to Resident Concerning Well Sampling | Baker, Thomas R, LtCol<br>93 CES/CEV | 856<br>CD 3 |
| 30 Apr 93 | CRWQCB Letter to Base Concerning Comments on Draft Final FSP, SCOU, North and East Base Sectors | Izzo, Victor J<br>California Regional Water Quality Control Board | 857<br>CD 3 |
| May 93 | Draft Final Conceptual Design Support Document Technical Memorandum Report, OU-2 | Jacobs Engineering Group, Inc. | 858<br>CD 3 |

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|---|---|---|---|
| 01 May 93 | TRC Meeting Minutes, 24 Mar 93 | 93 BW/PA | 859 CD 3 |
| 03 May 93 | CRWQCB Letter to Base Concerning RI, Draft Comprehensive Basewide Groundwater Work Plan | Izzo, Victor J California Regional Water Quality Control Board | 860 CD 3 |
| 03 May 93 | EPA Letter to Base Concerning Comments on Comprehensive Basewide Work Plan | Work, Michael EPA Region IX | 861 CD 3 |
| 03 May 93 | CDTSC Letter to Base Concerning Comments on RI, Comprehensive Basewide Groundwater SAP | Austreng, James C California Department of Toxic Substances Control | 862 CD 3 |
| 04 May 93 | Base Letter to CDTSC Concerning Plans and Specifications for Project Titled Upgrade and Closure Plan, OWS | Baker, Thomas R, LtCol 93 CES/CEV | 863 CD 3 |
| 07 May 93 | EPA Letter to Base Concerning Review and Finalization of SCOU Work Plan | Work, Michael EPA Region IX | 864 CD 3 |
| 07 May 93 | MDPH Letter to Base Concerning RI, Comprehensive Basewide Groundwater SAP | Palsgaard, Jeff H Merced County Department of Public Health | 865 CD 3 |
| 10 May 93 | RPM Draft Meeting Minutes, 29 Apr 93 | Watkin, Geoff W Jacobs Engineering Group, Inc. | 866 CD 3 |
| 11 May 93 | EPA Letter to Base Concerning Request to Extend Period for Finalization of Draft Final Work Plan, SCOU | Work, Michael EPA Region IX | 867 CD 3 |
| 12 May 93 | EPA Letter to Base Concerning Comments on Draft Final Work Plan, SCOU | Work, Michael EPA Region IX | 868 CD 3 |

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|---|---|---|---|
| 13 May 93 | Base Letter to Regulators Concerning Agreement to Extend Period for Finalization of Draft Final Work Plan, SCOU | Cole, John R, LtCol<br>93 BW/CVE | 869<br>CD 3 |
| 13 May 93 | EPA Letter to Base Concerning Need for Delineation of Wetlands | Work, Michael<br>EPA Region IX | 870<br>CD 3 |
| 13 May 93 | HQ ACC Letter to EPA Concerning Dispute Resolution, ROD, OU-2 | Mogge, John W, Col<br>HQ ACC/CEV | 871<br>CD 3 |
| 13 May 93 | CDTSC Letter to Base Concerning Permitting and Site Mitigation Activities | Pappas, James M<br>California Department of Toxic Substances Control | 1023<br>CD 4 |
| 14 May 93 | Base Letter to CRWQCB Concerning Waste Soil Disposal, OU-2 | Cole, John R, LtCol<br>93 BW/CVE | 872<br>CD 3 |
| 17 May 93 | CDTSC Letter to Base Concerning Comments on Draft Final Work Plan, SAP, SCOU | Austreng, James C<br>California Department of Toxic Substances Control | 873<br>CD 3 |
| 18 May 93 | CRWQCB Letter to Base Concerning Draft Final Work Plan, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 874<br>CD 3 |
| 18 May 93 | Base Letter to CRWQCB Concerning Waste Water Disposal, OU-2 | Cole, John R, LtCol<br>93 BW/CVE | 875<br>CD 3 |
| 18 May 93 | Technical Memorandum Report, Air Stripper Pilot Study, OU-1 | PRC Environmental Management, Inc. | 876<br>CD 3 |
| 18 May 93 | Technical Memorandum Report, Aquifer Pumping Test, OU-1 | PRC Environmental Management, Inc. | 877<br>CD 3 |

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|---|---|---|---|
| 19 May 93 | Newspaper Article, Various Articles on Base Closure and Reuse | The Modesto Bee<br>The Atwater Signal | 109<br>CD 2 |
| 20 May 93 | Newspaper Article, "Locals Testify Before Senate Base Closure Committee" | Hartsoe, Steve<br>The Winton Times | 137<br>CD 2 |
| 20 May 93 | Newspaper Article, "Joint Power Authority Proposes a Mixed Bag of Activities" | Hartsoe, Steve<br>The Winton Times | 194<br>CD 2 |
| 20 May 93 | Newspaper Article, "A View from the Inside" | Cardoza, Dennis<br>The Winton Times | 212<br>CD 2 |
| 21 May 93 | EPA Letter to Base Concerning Comments on Revised Conceptual Design Support Technical Memorandum, OU-2 | Work, Michael<br>EPA Region IX | 878<br>CD 3 |
| 24 May 93 | EPA Letter to Base Concerning RPM Draft Meeting Minutes, 29 Apr 93 | Work, Michael<br>EPA Region IX | 879<br>CD 3 |
| 26 May 93 | Base Letter to Regulators Concerning FFA Schedule | Cole, John R, LtCol<br>93 BW/CVE | 880<br>CD 3 |
| 26 May 93 | HQ ACC Letter to EPA Concerning Dispute Resolution, ROD, Cost to Comply Summary, OU-2 | Mogge, John W, Col<br>HQ ACC/CEV | 881<br>CD 3 |
| 27 May 93 | EPA Letter to Base Concerning Work Plan, Revised Appendix B, SCOU | Work, Michael<br>EPA Region IX | 882<br>CD 3 |
| 28 May 93 | CRWQCB Letter to EPA Concerning ROD Dispute Resolution, OU-2 | Pearson, J Lawrence<br>California Regional Water Quality Control Board | 1764<br>CD 9 |

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|---|---|---|---|
| Jun 93 | RI/FS, Draft Final Comprehensive Basewide Work Plan, SAP, Vol II of II, Appendix B-1 | Jacobs Engineering Group, Inc. | 885 CD 5 |
| Jun 93 | RI/FS, Draft Final QAPP, Vol I of II | Jacobs Engineering Group, Inc. | 886 CD 3 |
| Jun 93 | RI/FS, Draft Final Work Plan, SAP, SCOU | Jacobs Engineering Group, Inc. | 887 CD 5 |
| Jun 93 | LTM Sampling Plan | Jacobs Engineering Group, Inc. | 888 CD 5 |
| Jun 93 | Site HSP, Groundwater Remediation System Installation, OU-1 | EA Engineering, Science, and Technology, Inc. | 965 CD 4 |
| 01 Jun 93 | EPA Letter to Base Concerning Protection of Wetlands During RI | Work, Michael EPA Region IX | 889 CD 5 |
| 02 Jun 93 | Final Closure Plan, Former PCB Storage Facility | Jonas & Associates, Inc. | 1058 CD 4 |
| 03 Jun 93 | Base Letter to Jacobs Concerning Disposition of Waste Generated, OU-2 | Baker, Thomas R, LtCol 93 BW/CVE | 890 CD 5 |
| 04 Jun 93 | Work Plan Amendment, EE/CA for JP-4 Contaminated Soils, Western Flightline Sector, FS-1, FS-2 | PRC Environmental Management, Inc. | 891 CD 5 |
| 09 Jun 93 | EPA Letter to Base, CDTSC, and CRWQCB Concerning Finalization of Draft Final Work Plan, SCOU | Work, Michael EPA Region IX | 893 CD 5 |
| 09 Jun 93 | RA, JP-4 Contaminated Soils Along Western Flightline Sector, Addendum to HSP, FS-1, FS-2 | PRC Environmental Management, Inc. | 895 CD 3 |

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|---|---|---|---|
| 11 Jun 93 | HQ ACC Letter to EPA Concerning ROD, Dispute Resolution, OU-2 | Burnet, Gilbert N<br>HQ ACC/CEV | 04<br>CD 2 |
| 15 Jun 93 | HQ ACC Letter to EPA Concerning ROD, Dispute Resolution, OU-2 | Mogge, John W, Col<br>HQ ACC/CEV | 30<br>CD 2 |
| 16 Jun 93 | Base Letter to EPA Concerning Draft Final Work Plan, SCOU | Cole, John R, LtCol<br>93 BW/CVE | 42<br>CD 2 |
| 17 Jun 93 | Fact Sheet, Draft Basewide Cleanup Newsletter | 93 BW/PA | 67<br>CD 2 |
| 17 Jun 93 | Base Letter to Regulators Concerning Proposed RPM Meeting Agenda, 29 Jun 93 | Cole, John R, LtCol<br>93 BW/CVE | 69<br>CD 2 |
| 21 Jun 93 | EPA Letter to Base Concerning Comments on Revised Draft Final Work Plan, SCOU | Work, Michael<br>EPA Region IX | 214<br>CD 2 |
| 22 Jun 93 | EPA Letter to HQ ACC, CDTSC, and CRWQCB Concerning ROD, Dispute Resolution, OU-2 | Takata, Keith<br>EPA Region IX | 218<br>CD 2 |
| 22 Jun 93 | Base Letter to CRWQCB Concerning Temporary Shut Down, DA-4 | Baker, Thomas R, LtCol<br>93 CES/CEV | 219<br>CD 2 |
| 23 Jun 93 | EPA Letter to Base Concerning Sampling of GAC Groundwater Treatment Unit, DA-4 | Dean, Steve M<br>EPA Region IX | 943<br>CD 3 |
| 28 Jun 93 | RPM Meeting Minutes, 20 May 93 | Baker, Thomas R, LtCol<br>93 CES/CEV | 224<br>CD 2 |

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|---|---|---|---|
| 29 Jun 93 | CDTSC and CRWQCB Letter to Base Concerning Submittal of Individual Site FSP, SCOU | Izzo, Victor J<br>Austreng, James C<br>California Regional Water Quality Control Board<br>California Department of Toxic Substances Control | 249<br>CD 2 |
| 29 Jun 93 | CDTSC Letter to EPA Concerning Extension of Review Period for dispute, OU-2 | Wang, David<br>California Department of Toxic Substances Control | 258<br>CD 2 |
| Jul 93 | Draft Site Construction Quality Control Program, Pump and Treat System | EA Engineering, Science, and Technology, Inc. | 966<br>CD 4 |
| 01 Jul 93 | TRC Meeting Minutes, 09 Jun 93 | Bishop, Raymond C, Col<br>93 BW/CVE | 311<br>CD 2 |
| 12 Jul 93 | EPA Letter to Base Concerning Comments on Technical Memorandum for Risk Assessment | Work, Michael<br>EPA Region IX | 341<br>CD 2 |
| 12 Jul 93 | Right of Entry Agreement With Resident to Inspect Property for the Release of Hazardous Substances | Kotyk, Jack W<br>AFBDA/OL-I | 342<br>CD 2 |
| 12 Jul 93 | HQ ACC Letter to EPA Concerning ROD, Dispute Resolution, Cost to Comply Summary, OU-2 | Mogge, John W, Col<br>HQ ACC/CEV | 346<br>CD 2 |
| 13 Jul 93 | Base Letter to CRWQCB Concerning Summary Sheet of All Monthly TCE Results | Baker, Thomas R, LtCol<br>93 CES/CEV | 380<br>CD 3 |
| 16 Jul 93 | Base Letter to Resident Concerning Their Culligan Water Filter | Baker, Thomas R, LtCol<br>93 CES/CEV | 400<br>CD 3 |

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|---|---|---|---|
| 18 Jul 93 | RPM Meeting Agenda, 22 Jul 93 | Cole, John R, LtCol<br>93 BW/CVE | 413<br>CD 3 |
| 21 Jul 93 | CRWQCB Letter to Base Concerning Comments on FSP, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 451<br>CD 3 |
| 30 Jul 93 | Agreement With Resident for Right of Entry, Environmental Testing and Monitoring | 93 CES/CEVR | 457<br>CD 3 |
| 30 Jul 93 | CDTSC Letter to Base Concerning Comments on RI, Draft Final Comprehensive Basewide Groundwater SAP | Austreng, James C<br>California Department of Toxic Substances Control | 463<br>CD 3 |
| Aug 93 | RI/FS, Draft Final Comprehensive Basewide Work Plan, SAP, Vol I of II | Jacobs Engineering Group, Inc. | 962<br>CD 5 |
| Aug 93 | RI/FS, Draft Final Comprehensive Basewide Work Plan, SAP, Vol II of II | Jacobs Engineering Group, Inc. | 963<br>CD 5 |
| 03 Aug 93 | RPM Meeting Minutes, 22 Jul 93 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 474<br>CD 3 |
| 06 Aug 93 | CRWQCB Letter to HQ ACC Concerning Remaining Dispute Issues, OU-2 | Pearson, J Lawrence<br>California Regional Water Quality Control Board | 484<br>CD 3 |
| 09 Aug 93 | Base Letter to Resident Concerning Comments on Water Sample Results | Fraher, Jeffrey T, Maj<br>93 CES/CEV | 494<br>CD 3 |
| 09 Aug 93 | EPA Letter to CRWQCB Concerning ROD Dispute Issues, OU-2 | Anderson, Julie<br>EPA Region IX | 504<br>CD 3 |

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|---|---|---|---|
| 09 Aug 93 | CRWQCB Letter to Regulators and Base Concerning Phase II Groundwater Reinjection Standards, OT-29 | Pearson, J Lawrence<br>California Regional Water Quality Control Board | 1199<br>CD 6 |
| 12 Aug 93 | Base Letter to Regulators Concerning Waste Water Disposal | Baker, Thomas R, LtCol<br>93 CES/CEV | 508<br>CD 3 |
| 12 Aug 93 | CRWQCB Letter to Base Concerning Comments on FSP, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 525<br>CD 3 |
| 13 Aug 93 | RPM Meeting Agenda, 19 Aug 93 | Baker, Thomas R, LtCol<br>93 CES/CEV | 527<br>CD 3 |
| 16 Aug 93 | Base Letter to Regulators Concerning Waste Management Plan and Non-Source Waste Areas | Baker, Thomas R, LtCol<br>93 CES/CEV | 528<br>CD 3 |
| 16 Aug 93 | EPA Letter to Base Concerning Comments on Updated Long Term Groundwater Sampling Plan | Work, Michael<br>EPA Region IX | 533<br>CD 3 |
| 16 Aug 93 | Bechtel Letter to Jacobs Concerning FSP Review | Haskins, Greg<br>Bechtel Environmental, Inc. | 536<br>CD 3 |
| 19 Aug 93 | Dispute Resolution Meeting Minutes, OU-2, 10 Aug 93, | Vorster, Antonia K J<br>California Regional Water Quality Control Board | 540<br>CD 3 |
| 23 Aug 93 | CRWQCB Letter to Base Concerning FSP Addendum | Izzo, Victor J<br>California Regional Water Quality Control Board | 563<br>CD 3 |
| 23 Aug 93 | SOW, RI/FS, SCOU and CBOU | AFCEE/ESB | 945<br>CD 3 |

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|---|---|---|---|
| 24 Aug 93 | CRWQCB Letter to Base Concerning Comments on FSP, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 575<br>CD 4 |
| 25 Aug 93 | RPM Meeting Agenda, 08 Sep 93 | Fraher, Jeffrey T, Maj<br>93 BW/CVE | 579<br>CD 4 |
| 25 Aug 93 | EPA Letter to CRWQCB Concerning Comments on Draft Meeting Minutes, 10 Aug 93, OU-2 | Work, Michael<br>EPA Region IX | 581<br>CD 4 |
| 27 Aug 93 | TAC Meeting Announcement, 01 Sep 93 | Bain, Diane<br>CH2M Hill | 625<br>CD 3 |
| 27 Aug 93 | CRWQCB Letter to HQ ACC, CDHS, and EPA Concerning Resolution of Dispute, OU-2 | Pearson, J Lawrence<br>California Regional Water Quality Control Board | 654<br>CD 3 |
| 31 Aug 93 | RPM Draft Meeting Minutes, 19 Aug 93 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 655<br>CD 3 |
| Sep 93 | EPA Superfund Technical Assistance Grants | HQ USEPA | 238<br>CD 2 |
| Sep 93 | Advance Draft Hydrogeological Technical Memorandum Report, OU-2 | Jacobs Engineering Group, Inc. | 668<br>CD 3 |
| 01 Sep 93 | TRC Meeting Agenda, 08 Sep 93 | Parker, Scarlette P, TSgt<br>93 BW/PA | 711<br>CD 3 |
| 01 Sep 93 | EPA Letter to CRWQCB Concerning Comments on Draft Meeting Minutes, 10 Aug 93 and Draft Waste Discharge Requirement, OU-2 | Work, Michael<br>EPA Region IX | 738<br>CD 3 |

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|---|---|---|---|
| 02 Sep 93 | CRWQCB Letter to Base Concerning FSP Addendum | Izzo, Victor J<br>California Regional Water Quality Control Board | 132<br>CD 2 |
| 02 Sep 93 | CRWQCB Letter to Base Concerning Comments on FSP, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 800<br>CD 3 |
| 02 Sep 93 | CRWQCB Letter to Base Concerning Comments on FSP, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 837<br>CD 3 |
| 02 Sep 93 | EPA Letter to HQ ACC, CDTSC, and CRWQCB Concerning Comments on Dispute Resolution, ROD, OU-2 | Takata, Keith<br>EPA Region IX | 849<br>CD 3 |
| 03 Sep 93 | HQ ACC Letter to CDTSC and CRWQCB Concerning ROD, Dispute Resolution, OU-2 | Burnet, Gilbert N<br>HQ ACC/CEV | 183<br>CD 2 |
| 08 Sep 93 | RPM Meeting Minutes, 19 Aug 93 | Fraher, Jeffrey T, Maj<br>93 BW/CVE | 233<br>CD 2 |
| 14 Sep 93 | Base Letter to Regulators Concerning Rinsing of Groundskeeper Equipment on Soil | Chan, Arthur D<br>93 BW/CVE | 298<br>CD 2 |
| 14 Sep 93 | Situs Investments Letter to Base Concerning Permission to Enter for Testing Parcels of Land | Smith, Frederick W, Jr<br>Situs Investments, Inc. | 333<br>CD 2 |
| 15 Sep 93 | Base Letter to Resident Concerning Well Sampling Information | Morris, Brett, Capt<br>93 BW/CVE | 758<br>CD 3 |
| 16 Sep 93 | CRWQCB Letter to Base Concerning LTM Sampling Plan, Jun 93 | Izzo, Victor J<br>California Regional Water Quality Control Board | 741<br>CD 3 |

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|---|---|---|---|
| 17 Sep 93 | Base Letter to Regulators Concerning Proposed Agenda for RPM Meeting, 14 Oct 93 | Cole, John R, LtCol<br>93 BW/CVE | 824<br>CD 3 |
| 20 Sep 93 | EPA Letter to Base Concerning ROD, Revised Draft Final, OU-2 | Work, Michael<br>EPA Region IX | 831<br>CD 3 |
| 22 Sep 93 | EPA Letter to Base Concerning Delayed Draft Preliminary Conceptual Design Document, OU-2 | Work, Michael<br>EPA Region IX | 725<br>CD 3 |
| 22 Sep 93 | CRWQCB Letter to Base Concerning Finalizing Waste Management Plan | Izzo, Victor J<br>California Regional Water Quality Control Board | 766<br>CD 4 |
| 22 Sep 93 | HQ ACC Letter to Base Concerning ROD, Revised Draft Final, OU-2 | Battaglia, Michael R<br>HQ ACC/CEVR | 780<br>CD 3 |
| 22 Sep 93 | EA Letter to HSC Concerning Comments on Requested Modeling of Groundwater Flow and Contaminant Dispersion, OU-1 | Bugica, David M<br>EA Engineering, Science, and Technology, Inc. | 953<br>CD 3 |
| 24 Sep 93 | HQ ACC Letter to Regulators Concerning Dispute Resolution, Draft Final ROD Submission, OU-2 | Burnet, Gilbert N<br>HQ ACC/CEV | 677<br>CD 3 |
| 12 Oct 93 | RPM Meeting Minutes, 08 Sep 93 | Chan, Arthur D<br>93 BW/CVE | 220<br>CD 2 |
| 15 Oct 93 | CDTSC Letter to Base Concerning Interfacing of RCRA Units With CERCLA Activities | Pappas, James M<br>California Department of Toxic Substances Control | 229<br>CD 2 |
| 19 Oct 93 | Management Action Plan (MAP) | Earth Technology Corp. | 237<br>CD 2 |

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|---|---|---|---|
| 22 Oct 93 | EPA Letter to Base Concerning Draft Test Study for Millipurge Method for 4th Quarter Groundwater Sampling | Work, Michael<br>EPA Region IX | 262<br>CD 2 |
| 22 Oct 93 | EPA Letter to Base Concerning Comments on ROD, Revised Draft Final, OU-2 | Work, Michael<br>EPA Region IX | 271<br>CD 2 |
| 22 Oct 93 | CDTSC Letter to Base Concerning Request for Assistance in Planning for Implementation of RAB | Wang, David<br>California Department of Toxic Substances Control | 956<br>CD 3 |
| 27 Oct 93 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on ROD, Revised Draft Final, OU-2 | Ward, Daniel T<br>California Department of Toxic Substances Control | 562<br>CD 3 |
| 27 Oct 93 | EPA Letter to Base Concerning Ecological Risk Assessment Outline | Work, Michael<br>EPA Region IX | 883<br>CD 3 |
| 28 Oct 93 | EPA Letter to Base Concerning Draft, Characterization Technical Memorandum Vol I, Fuel Spill No. 1 and 2 | Work, Michael<br>EPA Region IX | 892<br>CD 5 |
| Nov 93 | ROD, Final, OU-2 | 93 CES/CEVR | 206<br>CD 2 |
| Nov 93 | Hydrogeological Technical Memorandum Report, Raw Field Data, OU-2 | Jacobs Engineering Group, Inc. | 968<br>CD 4 |
| 03 Nov 93 | Base Letter to EPA Concerning Request for Extension on Start Up Date, OU-1 | Baker, Thomas R, LtCol<br>93 BW/CVE | 746<br>CD 3 |
| 04 Nov 93 | EPA Letter to Base Concerning Comparison of SCOU Sites List and FSP | Work, Michael<br>EPA Region IX | 291<br>CD 2 |

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|---|---|---|---|
| 08 Nov 93 | EPA Letter to Base Concerning Comments on ROD, Revised Draft Final, OU-2 | Work, Michael<br>EPA Region IX | 181<br>CD 2 |
| 10 Nov 93 | Base Letter to Regulators Concerning Requested Update Pages, Final ROD, OU-2 | Cole, John R, LtCol<br>93 BW/CVE | 184<br>CD 2 |
| 12 Nov 93 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Hydrogeologic Technical Memorandum, OU-2 | Ward, Daniel T<br>California Department of Toxic Substances Control | 185<br>CD 2 |
| 15 Nov 93 | EPA Letter to Base Concerning Comments on Draft Hydrogeological Technical Memorandum, OU-2 | Work, Michael<br>EPA Region IX | 99<br>CD 2 |
| 15 Nov 93 | Finalized Boring Logs, Revised Appendix A, OU-2 | Jacobs Engineering Group, Inc. | 969<br>CD 4 |
| 18 Nov 93 | Action Memorandum, Closure of Former PCB Storage Facility and Recoverable JP-4 Tanks | 93 BW/CVE | 100<br>CD 2 |
| 19 Nov 93 | Technical Memorandum Report, Site Characterization, Addendum, Performance of Bench Scale Treatability Study, JP-4 Contaminated Soils | PRC Environmental Management, Inc. | 80<br>CD 2 |
| 19 Nov 93 | EPA Letter to Base Concerning Draft Preliminary Conceptual Design, OU-2 | Work, Michael<br>EPA Region IX | 101<br>CD 2 |
| 22 Nov 93 | SOW, RI/FS, Comprehensive Basewide Program, and LTM Program, SCOU | 93 CES/CEVR | 970<br>CD 4 |
| 26 Nov 93 | SOW, RI/FS, Comprehensive Basewide Program, and LTM Program, SCOU | 93 CES/CEVR | 972<br>CD 4 |

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|---|---|---|---|
| Dec 93 | Base Letter to Regulators Concerning Proposed RPM Meeting Agenda, 02 Dec 93 | Cole, John R, LtCol<br>93 BW/CVE | 79<br>CD 2 |
| Dec 93 | SOW, ATSDR Ecological Risk Assessment | AFCEE/ESB | 921<br>CD 3 |
| 08 Dec 93 | Basewide Environmental Baseline Survey (EBS), OU-1, OU-2, SCOU | The Earth Technology Corp. | 1765<br>CD 9 |
| 13 Dec 93 | AFBCA Letter to EPA Concerning Request for Concurrence of On-Base Uncontaminated Property Determination | Olsen, Alan K<br>AFBCA/DR | 925<br>CD 3 |
| 14 Dec 93 | Base Letter to CDHS, CRWQCB, and Jacobs Concerning Monthly TCE Results | Chan, Arthur D<br>93 BW/CV | 1024<br>CD 4 |
| 16 Dec 93 | EPA Letter to Base Concerning Comments on Draft Basewide Management Plan | Roberts, David E<br>EPA Region IX | 919<br>CD 3 |
| Jan 94 | Final Hydrogeological Technical Memorandum Report, Vol I of II, OT-30, SD-12 | Jacobs Engineering Group, Inc. | 764<br>CD 3 |
| Jan 94 | Final Hydrogeological Technical Memorandum Report, Vol II of II, OT-30, SD-12 | Jacobs Engineering Group, Inc. | 765<br>CD 4 |
| Jan 94 | Basewide Ecological Risk Assessment, Preliminary Draft Work Plan | Jacobs Engineering Group, Inc. | 944<br>CD 3 |
| Jan 94 | LTM Sampling Plan Update | Jacobs Engineering Group, Inc. | 974<br>CD 5 |

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| 05 Jan 94 | Conversation Confirmer Teleconference Minutes, Upper Subshallow HSZ Data Gaps, OU-2 | Heller, Noah R<br>Jacobs Engineering Group, Inc. | 932<br>CD 3 |
| 05 Jan 94 | RPM Meeting Minutes, 09 Dec 94 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 951<br>CD 3 |
| 06 Jan 94 | Base Letter to CRWQCB Concerning RA, Breaking Through Second GAC Unit, DA-4 | Fraher, Jeffrey T, Maj<br>93 CES/CC | 941<br>CD 3 |
| 12 Jan 94 | TRC Meeting Minutes, 08 Dec 93 | 93 BW/CV | 1025<br>CD 4 |
| 21 Jan 94 | RPM Meeting Minutes, Dec 93 | Cole, John R, LtCol<br>93 BW/CVE | 1026<br>CD 4 |
| 04 Feb 94 | EPA Letter to HQ USEPA Concerning Accuracy of Some Information Presented by Defense Environmental Response Task Force | Kemmerer, John R<br>EPA Region IX | 915<br>CD 3 |
| 08 Feb 94 | RPM Meeting Minutes, 27 Jan 94 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 950<br>CD 3 |
| 11 Feb 94 | Technical Memorandum Report, Site Characterization, FS-1 | PRC Environmental Management, Inc. | 976<br>CD 4 |
| 11 Feb 94 | Technical Memorandum Report, Site Characterization, FS-2 | PRC Environmental Management, Inc. | 977<br>CD 4 |
| 18 Feb 94 | MDPH Letter to Base Concerning Review of Basewide EBS | Palsgaard, Jeff H<br>Merced County Department of Public Health | 1507<br>CD 6 |
| 28 Feb 94 | RPM Meeting Agenda, 02 Mar 94 | Salgado, Rogelio R<br>93 CES/CEV | 1027<br>CD 4 |

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|---|---|---|---|
| Mar 94 | RAB Meeting Proposed Agenda, 09 Mar 94 | Bishop, Raymond C, Col<br>93 BW/CV | 957<br>CD 3 |
| Mar 94 | Phase II, Draft Risk Assessment Technical Memorandum Report, SCOU | Jacobs Engineering Group, Inc. | 978<br>CD 4 |
| 02 Mar 94 | Final RPM Meeting Minutes, 27 Jan 94 | Salgado, Rogelio R<br>93 BW/CVE | 926<br>CD 3 |
| 07 Mar 94 | Fact Sheet, Base Environmental Update, 07 Mar 94 | 93 BW/PA | 984<br>CD 4 |
| 09 Mar 94 | Newspaper Article, "Advisory Board Meets" | The Merced Sun Star | 985<br>CD 4 |
| 14 Mar 94 | EPA Letter to Base Concerning Comments on LTM Sampling Plan | Roberts, David E<br>EPA Region IX | 1201<br>CD 6 |
| 16 Mar 94 | CRWQCB Letter to CDTSC Concerning RPM Meeting Notes, 02 Mar 94 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1028<br>CD 4 |
| 21 Mar 94 | RPM Meeting Minutes, 02 Mar 94 | Cole, John R, LtCol<br>93 BW/CVE | 1029<br>CD 4 |
| 22 Mar 94 | SOW, Title I Services for Groundwater Treatment, OU-2 and Title II Services for Groundwater Treatment, OU-1 | Jacobs Engineering Group, Inc. | 947<br>CD 3 |
| 25 Mar 94 | Investigative Derived Waste Disposition Data | 93 CES/CEVR | 1030<br>CD 4 |
| 29 Mar 94 | EPA Letter to Base Concerning Millipurge Test Study | Roberts, David E<br>EPA Region IX | 1202<br>CD 6 |

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|---|---|---|---|
| 30 Mar 94 | EPA Letter to Jacobs Concerning Comments on Ecological Risk Assessment Samples | Roberts, David E<br>EPA Region IX | 1031<br>CD 4 |
| Apr 94 | BRAC Cleanup Plan (BCP) | The Earth Technology Corp. | 981<br>CD 4 |
| Apr 94 | EE/CA, Draft Final, JP-4 Removal from Vadose Zone, FS-1, FS-2 | PRC Environmental Management, Inc. | 982<br>CD 4 |
| 01 Apr 94 | RAB Meeting Minutes, 09 Mar 94 | Bishop, Raymond C, Col<br>93 BW/CV | 1032<br>CD 4 |
| 06 Apr 94 | RPM Meeting Minutes, 24 Mar 94 | Jacobs Engineering Group, Inc. | 949<br>CD 3 |
| 15 Apr 94 | AFBCA Letter to Distribution Concerning Invitation to DoD RAB Workshop | Olsen, Alan K<br>AFBCA/DR | 922<br>CD 3 |
| 18 Apr 94 | Comprehensive Basewide Mud Rotary Drilling Program Modification Report | Jacobs Engineering Group, Inc. | 933<br>CD 3 |
| 18 Apr 94 | CDTSC Letter to EPA Concerning Review of EBS | Wang, David<br>California Department of Toxic Substances Control | 952<br>CD 3 |
| 19 Apr 94 | Base Letter to Regulators Concerning RPM Meeting Minutes, 24 Mar 94 | Cole, John R, LtCol<br>93 BW/CVE | 954<br>CD 3 |
| 19 Apr 94 | Press Release, EPA Announces Identification of Uncontaminated Property Available for Reuse | Chan, Arthur D<br>93 BMW/CVE | 973<br>CD 4 |
| 20 Apr 94 | RAB Revised Charter, 20 Apr 94 | Bishop, Raymond C, Col<br>93 BW/CV | 1033<br>CD 4 |

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|---|---|---|---|
| 26 Apr 94 | Base Letter to CRWQCB Concerning Notification of RA Taken Off Line, OT-30 | Chan, Arthur D<br>93 CES/CE | 1203<br>CD 6 |
| 28 Apr 94 | AFBCA Letter to EPA Concerning Comments on ROD Signature Page, OU-2 | Carr, John P<br>AFBCA/NW | 929<br>CD 3 |
| 28 Apr 94 | Action Items for SCOU RI from RPM Meeting Minutes, 13 Apr 94 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 939<br>CD 3 |
| 28 Apr 94 | RAB Executive Meeting Minutes, 22 Apr 94 | Bishop, Raymond C, Col<br>93 BW/CV | 1034<br>CD 4 |
| 28 Apr 94 | EPA Letter to Base Concerning Interim RA, Extraction Well SE-7, 95% Design Review, OU-2 | Roberts, David E<br>EPA Region IX | 1035<br>CD 4 |
| 28 Apr 94 | EPA Letter to Base Concerning Request for Extension of FFA Schedule, RI/FS, SCOU | Roberts, David E<br>EPA Region IX | 1210<br>CD 6 |
| 29 Apr 94 | Conceptual Design Report, Vol I of II, OU-2 | Jacobs Engineering Group, Inc. | 979<br>CD 4 |
| 29 Apr 94 | Conceptual Design Report, Outline Specification, Vol II of II, OU-2 | Jacobs Engineering Group, Inc. | 980<br>CD 4 |
| 02 May 94 | EPA Letter to Base Concerning Draft Final Basewide Waste Management Plan | Roberts, David E<br>EPA Region IX | 918<br>CD 3 |
| 05 May 94 | Background Data and Information, SCOU | Jacobs Engineering Group, Inc. | 924<br>CD 3 |
| 06 May 94 | CDTSC Letter to Base Concerning Approval to Proceed With Dismantling of Surface Features, Two RCRA Sites | Austreng, James C<br>California Department of Toxic Substances Control | 1036<br>CD 4 |

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|---|---|---|---|
| 06 May 94 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on LTM Sampling Plan, Draft Final Waste Management Plan, Draft VLEACH Benzene Results, and Construction of TCE Extraction Well | Austreng, James C<br>California Department of Toxic Substances Control | 1037<br>CD 4 |
| 09 May 94 | Jacobs Letter to AFCEE/ESR Concerning Response to EPA Comments on Draft Conceptual Design Report, Groundwater Treatment, OU-2 | Leach, James D<br>Jacobs Engineering Group, Inc. | 928<br>CD 3 |
| 10 May 94 | RPM Draft Meeting Minutes, 28 Apr 94 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 927<br>CD 3 |
| 11 May 94 | EPA Letter to AFBCA Concerning Review of Proposal to Lease Bldgs 1862 and 1863 | Roberts, David E<br>EPA Region IX | 917<br>CD 3 |
| 13 May 94 | Final Basewide Waste Management Plan | IT Corp. | 912<br>CD 3 |
| 17 May 94 | CRWQCB Letter to CDTSC Concerning Comments on Draft O&M Manual, OU-1 | Izzo, Victor J<br>California Regional Water Quality Control Board | 920<br>CD 3 |
| 17 May 94 | EE/CA, Final, FS-1, FS-2 | PRC Environmental Management, Inc. | 988<br>CD 4 |
| 17 May 94 | Technical Memorandum Report, Final Site Characterization, FS-1 | PRC Environmental Management, Inc. | 989<br>CD 4 |
| 17 May 94 | Technical Memorandum Report, Final Site Characterization, FS-2 | PRC Environmental Management, Inc. | 990<br>CD 4 |
| 20 May 94 | RPM Meeting Minutes, 28 Apr 94 | Cole, John R, LtCol<br>93 BW/CVE | 1038<br>CD 4 |

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|---|---|---|---|
| 23 May 94 | Newspaper Article, "Notice of Public Comment Period on Projected Construction of a TCE Extraction Well Behind Bldg 1200" | The Merced Sun Star | 1039 CD 4 |
| 23 May 94 | Newspaper Article, "Notice of Public Comment Period on the EE/CA Report on Jet Fuel (JP-4) Removal From Fuel Spill Sites 1 and 2" | The Merced Sun Star | 1040 CD 4 |
| 26 May 94 | Base Letter to Regulators Concerning Documentation of Meetings With Local Property Owners Impacted by Environmental Cleanup Efforts | Gaddy, Armon T, Jr, TSgt 93 BW/PA | 923 CD 3 |
| 26 May 94 | RPM Meeting Minutes, 26 May 94 | 93 CES/CEVR | 1215 CD 6 |
| Jun 94 | Phase II, Risk Assessment, Technical Memorandum Report, CBOU | Jacobs Engineering Group, Inc. | 931 CD 3 |
| Jun 94 | LTM Sampling Program, Draft Summary of Groundwater Monitoring Report, 2nd Quarter 94 | Jacobs Engineering Group, Inc. | 991 CD 4 |
| Jun 94 | Jacobs Response to EPA and CRWQCB Comments on Draft Final Conceptual Design Report, OU-2 | Jacobs Engineering Group, Inc. | 1041 CD 4 |
| 01 Jun 94 | Fact Sheet, Base Environmental Update, 01 Jun 94 | 93 BW/PA | 971 CD 4 |
| 09 Jun 94 | CRWQCB Letter to CDTSC Concerning Inadequacy of Preliminary RI/FS, Draft Report, SCOU | Izzo, Victor J California Regional Water Quality Control Board | 934 CD 3 |

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| 09 Jun 94 | RPM Draft Meeting Minutes, 26 May 94 | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 948<br>CD 3 |
| 13 Jun 94 | AFBCA and ATSDR Meeting Minutes for Health Consultations and Data Gap Reviews, 5-6 May 94 | Stokes, Mark H, Col<br>AFBCA-AL/OEM | 1042<br>CD 4 |
| 14 Jun 94 | Jacobs Letter to AFCEE Concerning Response to EPA and CRWQCB Comments on LTM Sampling Plan | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 896<br>CD 3 |
| 14 Jun 94 | RAB Meeting Minutes, 14 Jun 94 | Mollison, John C Jr, Col<br>93 CES/CC | 1217<br>CD 6 |
| 15 Jun 94 | RA, Work Plan, OU-2 | Jacobs Engineering Group, Inc. | 897<br>CD 3 |
| 16 Jun 94 | EPA Letter to Base Concerning Inadequacy of RI/FS, Draft Report, SCOU | Roberts, David E<br>EPA Region IX | 916<br>CD 3 |
| 17 Jun 94 | EPA Letter to Base Concerning Selection of Service Center to Administer RD/RA Contract, OU-2 | Roberts, David E<br>EPA Region IX | 930<br>CD 3 |
| 17 Jun 94 | CDTSC Draft Memorandum Concerning Initial Review of RI/FS, Draft Report, SCOU | Scruggs, Mary<br>California Department of Toxic Substances Control | 938<br>CD 3 |
| 18 Jun 94 | Jacobs Letter to AFCEE Concerning Quality of RI/FS, Draft Report, SCOU | Jacobs Engineering Group, Inc. | 913<br>CD 3 |
| 23 Jun 94 | Jacobs Response to Data Quality Concerning RI/FS, Report, SCOU | Jacobs Engineering Group, Inc. | 940<br>CD 3 |

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|---|---|---|---|
| 23 Jun 94 | SOW, Full Scale Treatability Study, Fuel Spill Sites I and II | AFCEE/ESB | 1043 CD 4 |
| 27 Jun 94 | TWG Meeting Action Items, 23 Jun 94 | Watkin, Geoff W Jacobs Engineering Group, Inc. | 936 CD 3 |
| 28 Jun 94 | Maps and Figures, SCOU | 93 CES/CEVR | 914 CD 3 |
| 30 Jun 94 | TWG Meeting Action Items, 28 Jun 94 | Watkin, Geoff W Jacobs Engineering Group, Inc. | 937 CD 3 |
| 07 Jul 94 | Dioxin/Furan Analysis, Landfill I | Jacobs Engineering Group, Inc. | 955 CD 3 |
| 20 Jul 94 | Base Letter to CDTSC and EPA Concerning Request for Extension on FFA Schedule | Cole, John R, LtCol 93 BW/CVE | 1216 CD 6 |
| 20 Jul 94 | Final Specification for Petroleum Storage Tank Removal | HQ ACC/CES | 1293 CD 6 |
| 29 Jul 94 | Groundwater Pump and Treat System Operational Data, OU-1 | EA Engineering, Science, and Technology, Inc. | 992 CD 4 |
| 03 Aug 94 | HQ ACC Letter to EPA Concerning Assessment of Stipulated Penalties, OU-1 | Scarborough, Ramsey T HQ ACC/CEVR | 993 CD 4 |
| 03 Aug 94 | EPA Letter to AFCEE Concerning Comments on SOW, OU-2, SS-17, SS-18 | Roberts, David E EPA Region IX | 1045 CD 4 |
| 10 Aug 94 | EPA Letter to Base Concerning Violation of FFA and Monitoring and Reporting Requirements, OU-1 | Anderson, Julie EPA Region IX | 994 CD 4 |

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| 16 Aug 94 | HQ ACC Letter to EPA Concerning Comments on Violation of FFA, Monitoring and Reporting Requirements, OT-29 | Madrid, Marcos J, Col<br>HQ ACC/CEV | 1218<br>CD 6 |
| 19 Aug 94 | Technical Memorandum Report, TCE Biodegradation Bench Scale Study | Montgomery Watson | 995<br>CD 4 |
| 19 Aug 94 | TCE Biodegradation Bench Scale Study, Final Report, Appendix A, Evaluation of Bioremediation for TCE Contaminated Soils | Montgomery Watson | 996<br>CD 4 |
| 25 Aug 94 | Summary of Modeling Recommendations and Anticipated Actions Report, SD-012, OT-030 | Utah State University | 997<br>CD 4 |
| Sep 94 | Report of First Month Operation, Groundwater Pump and Treat, OU-1 | EA Engineering, Science, and Technology, Inc. | 998<br>CD 4 |
| Sep 94 | Fact Sheet, Enviro Progress Newsletter, Edition 1 | 93 BW/PA | 999<br>CD 4 |
| Sep 94 | Fact Sheet, Enviro Progress Newsletter, Edition 1 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1066<br>CD 4 |
| 29 Sep 94 | CDTSC Letter to Base Concerning Review of RI/FS, Draft Report, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1001<br>CD 4 |
| 30 Sep 94 | EPA Letter to Base Concerning Review of RI/FS, Draft Report, SCOU | Roberts, David E<br>EPA Region IX | 1002<br>CD 4 |
| 04 Oct 94 | Peer Review Meeting Summary | Sayger, Susan<br>Resources Applications, Inc. | 1004<br>CD 4 |

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|---|---|---|---|
| 06 Oct 94 | TWG Meeting Minutes, 5-6 Oct 94 | Jacobs Engineering Group, Inc. | 1005 CD 4 |
| 06 Oct 94 | RPM Meeting Minutes, 22 Sep 94 | Hicks, Brad 93 CES/CEVR | 1006 CD 4 |
| 17 Oct 94 | EPA Letter to Base Concerning Additional Comments on RI/FS, Draft Report, SCOU | Roberts, David E EPA Region IX | 1008 CD 4 |
| 21 Oct 94 | CDTSC Letter to Base Concerning Comments on CRP | Schumacher, Nathan California Department of Toxic Substances Control | 1009 CD 4 |
| 21 Oct 94 | Public Health Assessment Data Gap Study | AL/OEM | 1432 CD 6 |
| 25 Oct 94 | EPA Letter to Base Concerning Review of Preliminary Draft Explanation of Significance Difference for ROD, OU-2 | Roberts, David E EPA Region IX | 1010 CD 4 |
| 27 Oct 94 | RAB Meeting Minutes, 13 Sep 94 | Mollison, John C, Jr, Col 93 SPTG/CC | 1011 CD 4 |
| 28 Oct 94 | SOW, O&M and Monitoring, OU-1 | 93 CES/CEVR | 1046 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report and Data Summary, Vol I of VII | Quanterra Environmental Services, Inc. | 1078 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report, Isomer Specific Initial Calibration Data, Vol II of VII | Quanterra Environmental Services, Inc. | 1079 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report, Isomer Specific Continuing Calibration Data, Vol III of VII | Quanterra Environmental Services, Inc. | 1080 CD 4 |

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|---|---|---|---|
| 28 Oct 94 | Final Dioxin/Furan Report, Total Dioxin/Furan Initial Calibration Data, Vol IV of VII | Quanterra Environmental Services, Inc. | 1081 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report, Total Dioxin/Furan Continuing Calibration Data, Vol V of VII | Quanterra Environmental Services, Inc. | 1082 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report, Isomer Specific Data, Vol VI of VII | Quanterra Environmental Services, Inc. | 1083 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report, Total Dioxin/Furan Data, Vol VIIA of VII | Quanterra Environmental Services, Inc. | 1084 CD 4 |
| 28 Oct 94 | Final Dioxin/Furan Report, Total Dioxin/Furan Data, Vol VIIB of VII | Quanterra Environmental Services, Inc. | 1085 CD 4 |
| 31 Oct 94 | SOW, LTM Program and Millipurge Study | AFCEE/ESB | 1044 CD 4 |
| Nov 94 | Fact Sheet, Enviro Progress Newsletter, Edition 2 | 93 BW/PA | 1013 CD 4 |
| Nov 94 | Final Report First Quarter of Operation, Groundwater Pump and Treat, OU-1 | EA Engineering, Science, and Technology, Inc. | 1060 CD 4 |
| Nov 94 | Fact Sheet, Enviro Progress Newsletter, Edition 2 | Kumanchik, Cynthia Gutierrez-Palmenberg, Inc. | 1067 CD 4 |
| Nov 94 | Final EIS, Disposal and Reuse | AFBDA/OL-J | 2081 CD 11 |
| 01 Nov 94 | CRWQCB Letter to Base Concerning Violation of Waste Discharge Requirements | Vorster, Antonia K J California Regional Water Quality Control Board | 1209 CD 6 |

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|---|---|---|---|
| 10 Nov 94 | Jacobs Letter to AFCEE/ESR Concerning Response to CDTSC Comments on RI/FS, Revised Draft Report, SCOU | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 1228<br>CD 6 |
| 11 Nov 94 | LTM Sampling Program, Summary of Groundwater Monitoring Report, 3rd Quarter, 94 | Jacobs Engineering Group, Inc. | 1012<br>CD 4 |
| 28 Nov 94 | RPM Meeting Minutes, 02 Nov 94 | Polhmeier, Mark A, Capt<br>93 BW/CEV | 1014<br>CD 4 |
| 28 Nov 94 | CDTSC Letter to Base Concerning Comments on Draft Treatability Study, SS-17, SS-18 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1230<br>CD 6 |
| 29 Nov 94 | CDTSC Letter to AFCEE Concerning CRWQCB Comments on SOW, Draft LTM Sampling Program, OT-29 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1231<br>CD 6 |
| Dec 94 | Community Relations Plan (CRP) | Gutierrez - Palmenberg, Inc. | 1015<br>CD 4 |
| Dec 94 | Environmental Remediation QPP | Jacobs Engineering Group, Inc. | 1174<br>CD 6 |
| 02 Dec 94 | EPA Letter to Base Concerning Response to Comments on RI/FS, Draft Report, SCOU | Roberts, David E<br>EPA Region IX | 1232<br>CD 6 |
| 05 Dec 94 | AFCEE Letter to Jacobs Concerning Comments on RI/FS, Draft Comprehensive Basewide Report | Hobbins, Christopher D<br>AFCEE/ERB | 1212<br>CD 6 |
| 07 Dec 94 | RI/FS, ROD, Final Draft Explanation of Significant Difference, OU-2 | 93 CES/CEVR<br>EPA Region IX<br>California Department of Toxic Substances Control | 1063<br>CD 4 |

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|---|---|---|---|
| 14 Dec 94 | GEMS Letter to Brown and Root Concerning Closure of Former PCB Storage Facility, Bldg 1203 | Camacho, Richard<br>Ogamba, Briggs<br>General Environmental Management Services | 1057<br>CD 4 |
| 15 Dec 94 | EPA Letter to Base Concerning Comments on RI/FS, Comprehensive Basewide Draft Report | Roberts, David E<br>EPA Region IX | 1016<br>CD 4 |
| 15 Dec 94 | CDTSC Letter to Base Concerning Review of RI/FS, Draft Comprehensive Basewide Report | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1017<br>CD 4 |
| Jan 95 | LTM Sampling Plan | Jacobs Engineering Group, Inc. | 1124<br>CD 5 |
| Jan 95 | Newspaper Article, "Groundwater Cleanup to Cost $12 Million" | Hartsoe, Steve<br>The Atwater Signal | 1233<br>CD 6 |
| 10 Jan 95 | Newspaper Article, "Announcement of ESD for Change to Granular Activated Carbon for Treatment of Contaminated Groundwater" | The Merced Sun Star | 1235<br>CD 6 |
| 10 Jan 95 | EPA and CDTSC Letter to Base Concerning FFA Violation of Failure to Perform Required Monitoring and Reporting, OT-29 | Ghazi, Rizgar A<br>Roberts, David E<br>California Department of Toxic Substances Control<br>EPA Region IX | 1236<br>CD 6 |
| 12 Jan 95 | EPA Letter to Base Concerning Responses to Comments on RI/FS, Draft Report, SCOU | Roberts, David E<br>EPA Region IX | 1238<br>CD 6 |
| 17 Jan 95 | Newspaper Article, "TCE Cleanup Long and Costly Process" | Hartsoe, Steve<br>The Merced Sun Star | 1240<br>CD 6 |

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| 24 Jan 95 | Conceptual Site Model Figures | Metcalf and Eddy, Inc. | 1373 CD 6 |
| 27 Jan 95 | EPA Letter to Base Concerning Comments on RI/FS Prototype Site, SS-82 | Roberts, David E EPA Region IX | 1241 CD 6 |
| Feb 95 | Phase I, Installation Test Letter Report, SS-17, SS-18 | Jacobs Engineering Group, Inc. | 1107 CD 5 |
| 07 Feb 95 | CDTSC Letter to Base Concerning Proposed Screening Process for Vadose Zone Source Area, SCOU | Ghazi, Rizgar A California Department of Toxic Substances Control | 1242 CD 6 |
| 14 Feb 95 | Jacobs Letter to AFCEE Concerning Response to Comments on Millipurge Test Study and Decontamination of Pneumatic Pumps | McLeod, Campbell Jacobs Engineering Group, Inc. | 1251 CD 6 |
| 17 Feb 95 | RAB Meeting Minutes, 10 Jan 95 | Mollison, John C Jr, Col AFBCA/OL-I | 1254 CD 6 |
| 22 Feb 95 | Draft Sampling and Analysis Report for Chlorinated Dibenz Dioxins in Wastewater and Sediments | LABAT-ANDERSON INCORPORATED | 1093 CD 4 |
| Mar 95 | Fact Sheet, Enviro Progress Newsletter, Edition 4 | Kumanchik, Cynthia Gutierrez-Palmenberg, Inc. | 1089 CD 4 |
| Mar 95 | Final Report, 2nd Quarter of Operation, OU-1 | EA Engineering, Science, and Technology, Inc. | 1096 CD 4 |
| Mar 95 | Fact Sheet, Enviro Fact Sheet, Mar 95 | Kumanchik, Cynthia Gutierrez-Palmenberg, Inc. | 1256 CD 6 |

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| 02 Mar 95 | Site Characterization Report, Airport Surveillance Radar Facility | Research Management Consultants, Inc. | 1349 CD 6 |
| 03 Mar 95 | Initial Air Monitoring and Risk Assessment Study, Airport Surveillance Radar Facility | Research Management Consultants, Inc. | 1095 CD 4 |
| 08 Mar 95 | EPA and CDTSC Letter to Base Concerning Request for Removal of Vapor Phase Carbon and Steam Regeneration Features, OU-1 | Roberts, David E<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1092 CD 4 |
| 09 Mar 95 | EPA and CDTSC Letter to Base Concerning RI/FS, Draft Final Report, SCOU | Ghazi, Rizgar A<br>Roberts, David E<br>California Department of Toxic Substances Control<br>EPA Region IX | 1263 CD 6 |
| 14 Mar 95 | RAB Meeting Minutes, 14 Mar 95 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1091 CD 4 |
| 15 Mar 95 | RPM Meeting Minutes, 15 Mar 95 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1090 CD 4 |
| 17 Mar 95 | AFCEE Letter to Base Concerning Responses to Agency Comments on RI/FS, Comprehensive Basewide Report | Hobbins, Christopher D<br>AFCEE/ERB | 1094 CD 4 |
| 27 Mar 95 | CDTSC Memorandum Concerning Low Purge Rate Monitoring Well Sampling | Vest, Mark<br>California Department of Toxic Substances Control | 1266 CD 6 |
| 28 Mar 95 | CRWQCB Letter to CDTSC Concerning CERCLA Petroleum Exclusion, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1270 CD 6 |

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| 30 Mar 95 | Armstrong Lab Letter to Base Concerning Survey Summary, Weapons Storage Area | Montgomery, James D, Jr, LtCol<br>Armstrong Laboratory | 1088<br>CD 4 |
| 31 Mar 95 | Ecological Risk Assessment Study, Site Recommendations for No Further Ecological Investigation | Jacobs Engineering Group, Inc. | 1086<br>CD 4 |
| 31 Mar 95 | CDTSC Letter to Base Concerning Review of LTM Sampling Plan Draft Millipurge Test Study Work Plan | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1273<br>CD 6 |
| Apr 95 | Summary of Groundwater Monitoring Report, 1st Quarter, OT-29, OT-30 | Jacobs Engineering Group, Inc. | 1125<br>CD 5 |
| 03 Apr 95 | EPA Letter to Base Concerning Comments on Millipurge Test Study | Roberts, David E<br>EPA Region IX | 1274<br>CD 6 |
| 11 Apr 95 | LTM Program, Summary of Domestic Well Sampling Results, Feb 95 | Jacobs Engineering Group, Inc. | 1102<br>CD 5 |
| 11 Apr 95 | Summary of Domestic Well Sampling Results, Mar 95 | Jacobs Engineering Group, Inc. | 1103<br>CD 5 |
| 11 Apr 95 | Base Letter to CDTSC and EPA Concerning Completion Plan for RI/FS, SCOU | Mollison, John C Jr, Col<br>AFBCA/OL-I | 1277<br>CD 6 |
| 14 Apr 95 | EPA Letter to Base Concerning Comments on RI/FS, Draft Final Report, SCOU | Roberts, David E<br>EPA Region IX | 1100<br>CD 5 |
| 19 Apr 95 | Base Letter to Distribution Concerning Response to EPA Comments on Millipurge Study Work Plan | Hobbins, Christopher D<br>AFCEE/ERB | 1278<br>CD 6 |
| 26 Apr 95 | TWG Meeting Minutes, 24-26 Apr 95 | AFBCA/OL-I | 1099<br>CD 5 |

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| 28 Apr 95 | Base Letter to EPA and CDTSC Concerning RPM Agreement on Resolving Issues, RI/FS, SCOU | Mollison, John C, Jr, Col AFBCA/OL-I | 1097 CD 4 |
| May 95 | Technical Memorandum Report, Performance Evaluation Pump and Treat System, OU-1 | EA Engineering, Science, and Technology, Inc. | 1068 CD 4 |
| May 95 | Environmental Baseline Survey (EBS), Twenty-Five Parcels of Land | Geo-Marine, Inc. | 1069 CD 4 |
| May 95 | Fact Sheet, Enviro Progress Newsletter, Edition 5 | Kumanchik, Cynthia Gutierrez-Palmenberg, Inc. | 1077 CD 4 |
| May 95 | Final QPP, Groundwater Treatment System, Vol I of II, OU-2 | Jacobs Engineering Group, Inc. | 1156 CD 5 |
| May 95 | Final QPP, Groundwater Treatment System, Vol II of II, OU-2 | Jacobs Engineering Group, Inc. | 1160 CD 5 |
| May 95 | Final Environmental Cleanup Plan, Groundwater Treatment System, OU-2 | Jacobs Engineering Group, Inc. | 1162 CD 5 |
| 10 May 95 | CDHS Letter to CDTSC Concerning Base Landfills, RI/FS, SCOU | Palsgaard, Jeff H California Department of Health Services | 1279 CD 6 |
| 11 May 95 | EPA Letter to AFCEE Concerning SOW, RA, FT-01, SS-21, DP-115, SD-12 | Roberts, David E EPA Region IX | 1292 CD 6 |
| 12 May 95 | HQ ACC Letter to Base Concerning Landfill-1 Issue | Battaglia, Michael R. HQ ACC CES/ESV | 1070 CD 4 |

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|---|---|---|---|
| 17 May 95 | EPA and CDTSC Letter to Base Concerning Comments on RI/FS, Draft Final Report, SCOU | Baker, Gregory<br>Ward, Daniel T<br>EPA Region IX<br>California Department of Toxic Substances Control | 1101<br>CD 5 |
| 24 May 95 | Agreement From Technical Working Group Session Further Delineating Contents of RI/FS, 24 May 95, CB, SCOU | Hicks, Brad<br>Roberts, David E<br>Ghazi, Rizgar A<br>Izzo, Victor J<br>AFBCA/OL-I<br>EPA Region IX<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 1073<br>CD 4 |
| Jun 95 | Fact Sheet, Enviro Fact Sheet, Edition 2 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1104<br>CD 5 |
| Jun 95 | Fact Sheet, Enviro Fact Sheet, Edition 3 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1105<br>CD 5 |
| Jun 95 | Draft Report, 3rd Quarter of Operation, Groundwater Pump and Treat, OU-1 | Jacobs Engineering Group, Inc. | 1110<br>CD 5 |
| 01 Jun 95 | CDTSC Letter to Base Concerning Comments on Ecological Risk Assessment, Phase I Technical Memorandum | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1075<br>CD 4 |
| 16 Jun 95 | Action Plan Concerning Additional Work to Address Agency Concerns on RI/FS, Draft Final Report, SCOU | AFCEE/ERB | 1076<br>CD 4 |
| 20 Jun 95 | LTM Program Report, Preliminary Findings of Millipurge Study | Jacobs Engineering Group, Inc. | 1295<br>CD 6 |

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|---|---|---|---|
| 29 Jun 95 | EPA Letter to Base Concerning Plan for RI/FS, SCOU | Roberts, David E<br>EPA Region IX | 1298<br>CD 6 |
| Jul 95 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Talking Paper NFA Decision, Fuel Spill Site-2 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1116<br>CD 5 |
| Jul 95 | Summary of Groundwater Monitoring Report, 2nd Quarter 95 | Jacobs Engineering Group, Inc. | 1137<br>CD 5 |
| 07 Jul 95 | Domestic Well Sampling Results, Jun 95 | Jacobs Engineering Group, Inc. | 1108<br>CD 5 |
| 07 Jul 95 | Low Flow Rate Purge Study Report | Jacobs Engineering Group, Inc. | 1109<br>CD 5 |
| 12 Jul 95 | CRWQCB Letter to CDTSC Concerning Deleting the RA, Fuel Spill-2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1111<br>CD 4 |
| 12 Jul 95 | Base Letter to Distribution Concerning Proposed Well Abandonment Work Plan, Well Sampling Results and LTM Sampling Plan | Matthews, Robert R<br>AFBCA/OL-I | 1306<br>CD 6 |
| 14 Jul 95 | CRWQCB Letter to Base Concerning Closure Plan, Fuel Hydrant System | Izzo, Victor J<br>California Regional Water Quality Control Board | 1307<br>CD 6 |
| 18 Jul 95 | RPM Meeting Minutes, 18 Jul 95 | AFBCA/OL-I | 1112<br>CD 4 |
| 18 Jul 95 | RPM and TWG Draft Meeting Minutes, Jul 95 | AFBCA/OL-I | 1114<br>CD 5 |

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|---|---|---|---|
| 26 Jul 95 | EPA Letter to Base Concerning Talking Paper Justification for NFA, Fuel Spill Site-2 | Roberts, David E<br>EPA Region IX | 1115<br>CD 5 |
| 27 Jul 95 | EPA Letter to Base Concerning Comments on LTM Sampling Plan, Low Flow Rate Purge Study Reports | Roberts, David E<br>EPA Region IX | 1117<br>CD 5 |
| 27 Jul 95 | CRWQCB Letter to CDTSC Concerning Work Plan for Proposed Well Abandonment | Izzo, Victor J<br>California Regional Water Quality Control Board | 1308<br>CD 6 |
| 01 Aug 95 | EPA Letter to Base Concerning Final Approved Position, LTM Sampling Plan, Low-Flow Rate Purge Study Report | Roberts, David E<br>EPA Region IX | 1129<br>CD 5 |
| 11 Aug 95 | Base Letter to CDTSC and EPA Concerning Request for Extension of the FFA Schedule, Revised Design Basis Report, OU-1 | Matthews, Robert R<br>AFBCA/OL-I | 1126<br>CD 5 |
| 16 Aug 95 | EPA and CDTSC Letter to Base Concerning Response and Conditions to Granting FFA Extension, Revised Design Basis Report, OU-1 | Roberts, David E<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1127<br>CD 5 |
| 17 Aug 95 | CDTSC Memorandum Concerning LTM Program Work Plan | Scruggs, Mary<br>California Department of Toxic Substances Control | 1313<br>CD 6 |
| 23 Aug 95 | FSP, SVE Optimization, Fuel Spill-1 | Jacobs Engineering Group, Inc. | 1128<br>CD 5 |
| 24 Aug 95 | CRWQCB Letter to CDTSC Concerning Report of 3rd Quarter Groundwater Pump and Treat | Izzo, Victor J<br>California Regional Water Quality Control Board | 1326<br>CD 6 |

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|---|---|---|---|
| 28 Aug 95 | Summary of Domestic Well Monitoring Data, LTM Program, May-Jul 95 | Jacobs Engineering Group, Inc. | 1120 CD 5 |
| 28 Aug 95 | FSP, SVE Optimization, Fuel Spill-1 | Jacobs Engineering Group, Inc. | 1121 CD 5 |
| 30 Aug 95 | Base Letter to EPA and CDTSC Concerning Request for Extension of FFA Schedule for CB and RI/FS, Draft Final Report, SCOU | Matthews, Robert R AFBCA/OL-I | 1122 CD 5 |
| 30 Aug 95 | CDTSC Letter to Resident Concerning RAB Meeting, 05 Sep 95 | Owens, Ron California Department of Toxic Substances Control | 1329 CD 6 |
| Sep 95 | Fact Sheet, Enviro Progress Newsletter, Edition 6 | Kumanchik, Cynthia Gutierrez-Palmenberg, Inc. | 1141 CD 5 |
| 01 Sep 95 | Final O&M Plan | Laguna Construction Company Inc | 1926 CD 10 |
| 07 Sep 95 | Final Action Memorandum, Removal Action, FTA-1, DA-4, DBF, and Bldg 871 | AFBCA/OL-I | 1139 CD 5 |
| 11 Sep 95 | CRWQCB Letter to Base Concerning Proposal for Background Compared to On-Base Dioxins | Izzo, Victor J California Regional Water Quality Control Board | 1132 CD 5 |
| 11 Sep 95 | Jacobs Letter to AFCEE Concerning Response to EPA and CRWQCB Comments on Work Plan, Proposed Well Abandonment | McLeod, Campbell Jacobs Engineering Group, Inc. | 1136 CD 5 |
| 11 Sep 95 | CRWQCB Letter to CDTSC Concerning Request for Landfill Remediation | Izzo, Victor J California Regional Water Quality Control Board | 1138 CD 5 |

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|---|---|---|---|
| 12 Sep 95 | RAB Meeting Minutes, 12 Sep 95 | AFBCA/OL-I | 1135 CD 5 |
| 12 Sep 95 | RPM Meeting Minutes, 12 Sep 95 | AFBCA/OL-I | 1145 CD 5 |
| 14 Sep 95 | Summary of Domestic Well Monitoring Report, LTM Program, Aug 95 | Jacobs Engineering Group, Inc. | 1134 CD 5 |
| 14 Sep 95 | Final Action Plan for Additional Work to Address Regulatory Comments on RI/FS, SCOU | AFCEE/ERB | 1418 CD 6 |
| 15 Sep 95 | Final Management Plan | Laguna Construction Company Inc | 1925 CD 10 |
| 20 Sep 95 | EPA Letter to Base Concerning Comments on Ecological Risk Assessment, Phase I Technical Memorandum | Roberts, David E EPA Region IX | 1131 CD 5 |
| 21 Sep 95 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Draft Groundwater Pump and Treat Report, 3rd Quarter, OT-29 | Ghazi, Rizgar A California Department of Toxic Substances Control | 1331 CD 6 |
| 28 Sep 95 | TWG Meeting Minutes, 28 Sep 95 | Jacobs Engineering Group, Inc. | 1133 CD 5 |
| 28 Sep 95 | Base Letter to CRWQCB Concerning No Point Source of Dioxins on Base | Matthews, Robert R AFBCA/OL-I | 1140 CD 5 |
| Oct 95 | Summary of Groundwater Monitoring, 3rd Quarter 95 | Jacobs Engineering Group, Inc. | 1165 CD 6 |
| Oct 95 | Final Construction Quality Plan Addendum | Laguna Construction Company Inc | 1927 CD 10 |

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|---|---|---|---|
| 03 Oct 95 | TWG Meeting Minutes, 03-05 Oct 95 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1146<br>CD 5 |
| 03 Oct 95 | CRWQCB Letter to CDTSC Concerning Soil Gas Data Quality Analysis | Izzo, Victor J<br>California Regional Water Quality Control Board | 1355<br>CD 6 |
| 17 Oct 95 | Final Addendum to Work Plan for Proposed Well Abandonment | Jacobs Engineering Group, Inc. | 1130<br>CD 5 |
| 17 Oct 95 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Soil Gas Data Quality | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1143<br>CD 5 |
| 18 Oct 95 | RPM Draft Meeting Minutes, 18 Oct 95 | AFBCA/OL-I | 1144<br>CD 5 |
| 25 Oct 95 | CDTSC Letter to Base Concerning NOD, RCRA Closure Plan, Hazardous Waste Drum Storage Facility | O'Neal, Douglas P<br>California Department of Toxic Substances Control | 1422<br>CD 6 |
| 26 Oct 95 | CDTSC Letter to RAB Members Concerning Community Member Caucus | Owens, Ron<br>California Department of Toxic Substances Control | 1374<br>CD 6 |
| 27 Oct 95 | Establishing Threshold Background Values Study for Inorganic Constituents in Soils | Mitre Corp. | 1421<br>CD 6 |
| Nov 95 | Fact Sheet, Enviro Fact Sheet, Edition 4 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1142<br>CD 5 |
| Nov 95 | Fact Sheet, Enviro Progress Newsletter, Edition 7 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1147<br>CD 5 |

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|---|---|---|---|
| 01 Nov 95 | SOW, RA Draft | AFBCA/OL-I | 1427 CD 6 |
| 01 Nov 95 | Removal Actions, Presentation Slides, DBF, FTA-1, DA-4, Bldg 871 | Guyer, Keith Jacobs Engineering Group, Inc. | 1428 CD 6 |
| 02 Nov 95 | Final Quality Program Plan, Parts 1 and 3 | Jacobs Engineering Group Inc | 1928 CD 10 |
| 08 Nov 95 | MDPH Letter to CDTSC Concerning Comments on Basewide EBS, FOST, and FOSL | Palsgaard, Jeff H Merced County Department of Public Health | 09 CD 2 |
| 08 Nov 95 | Jacobs Letter to AFCEE Concerning FSP Review, Bldg 551 and Aircraft Maintenance Hangar F-4 | Lange, Peter Jacobs Engineering Group, Inc. | 1415 CD 6 |
| 13 Nov 95 | MDPH Letter to Base Concerning Landfills | Palsgaard, Jeff H Merced County Department of Public Health | 1506 CD 6 |
| 15 Nov 95 | Jacobs Letter to AFCEE Concerning Draft SCOU Unit Work Plan and FSP Update, Proposed Sampling Figure | Lange, Peter Jacobs Engineering Group, Inc. | 1200 CD 6 |
| 21 Nov 95 | RAB Meeting Minutes, 21 Nov 95 | Kumanchik, Cynthia Gutierrez-Palmenberg, Inc. | 1151 CD 5 |
| 27 Nov 95 | Office of Historic Preservation Letter to AFCEE Concerning Archeological Investigation | Widell, Cherilyn Historic Preservation, Department of Parks and Recreation | 1148 CD 5 |
| 28 Nov 95 | EPA Letter to Base Concerning Superfund Boundaries | Roberts, David E EPA Region IX | 1766 CD 9 |

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|---|---|---|---|
| 29 Nov 95 | Jacobs Letter to AFCEE Concerning FSP, Bldg 1205, Structure 1201, Sewer Segment 6 and DA-2 | Lange, Peter<br>Jacobs Engineering Group, Inc. | 1416<br>CD 6 |
| Dec 95 | Treatability Study and SVE Demonstration Project Report, Fuel Spill-1, Fuel Spill-2 | Jacobs Engineering Group, Inc. | 1150<br>CD 5 |
| Dec 95 | RI, Draft Final Report, Addenda to Section 7, Not Requiring Additional RI Field Work, SCOU | Jacobs Engineering Group, Inc. | 1152<br>CD 5 |
| Dec 95 | Final HSP Addendum | Laguna Construction Company Inc | 1929<br>CD 10 |
| Dec 95 | Comprehensive Basewide Scoping and Phase I Ecological Risk Assessment Study | Jacobs Engineering Group, Inc. | 1930<br>CD 10 |
| 06 Dec 95 | CRWQCB Letter to Base Concerning SAP for Removal Actions, FT-01, SD-12, SS-70 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1375<br>CD 6 |
| 06 Dec 95 | EPA Letter to Base Concerning Comments on Environmental SAP | Roberts, David E<br>EPA Region IX | 1377<br>CD 6 |
| 12 Dec 95 | RPM Meeting Minutes, 12 Dec 95 | Matthews, Robert R<br>AFBCA/OL-I | 1190<br>CD 6 |
| 18 Dec 95 | Jacobs Letter to AFCEE Concerning FSP Review, QAPP Addendum | Lange, Peter<br>Jacobs Engineering Group, Inc. | 1417<br>CD 6 |
| Jan 96 | LTM Sampling Plan, OT-29, OT-30, SD-12 | Jacobs Engineering Group, Inc. | 1170<br>CD 6 |
| Jan 96 | Fact Sheet, Enviro Progress Newsletter, Edition 8 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1180<br>CD 6 |

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|---|---|---|---|
| 11 Jan 96 | Regulators Letter to Base Concerning NOV of ROD and FFA, OT-29 | Roberts, David E<br>Ghazi, Rizgar A<br>Izzo, Victor J<br>EPA Region IX<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 1381<br>CD 6 |
| 16 Jan 96 | CERCLA, 42 USC Chapter 103 | HQ USEPA | 1528<br>CD 6 |
| 20 Jan 96 | Update Pages, RI/FS, Final Comprehensive Basewide Groundwater Report | Jacobs Engineering Group, Inc. | 1768<br>CD 9 |
| 22 Jan 96 | Jacobs Letter to AFCEE/ERB Concerning Response to Comments on Draft SAP for Removal Actions, Bldg 871, FTA-1, DA-4 | Guyer, Keith<br>Jacobs Engineering Group, Inc. | 1179<br>CD 6 |
| 23 Jan 96 | RAB Meeting Minutes, 23 Jan 96 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1149<br>CD 5 |
| 23 Jan 96 | RPM Meeting Minutes, 23 Jan 96 | AFBCA/OL-I | 1175<br>CD 6 |
| 23 Jan 96 | CDTSC Letter to MDPH Concerning Landfills | Ward, Daniel T<br>California Department of Toxic Substances Control | 1211<br>CD 6 |
| 23 Jan 96 | CDTSC Letter to MDPH Concerning Comments on Base Landfills | Ward, Daniel T<br>California Department of Toxic Substances Control | 1931<br>CD 10 |
| 25 Jan 96 | Base Letter to Regulators Concerning Septic Tank Reuse Proposal | Matthews, Robert R<br>AFBCA/OL-I | 1183<br>CD 6 |

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|---|---|---|---|
| 30 Jan 96 | EPA Memorandum Concerning QAPP Addendum, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1208<br>CD 6 |
| 30 Jan 96 | EPA Letter to Base Concerning SVE Demonstration Project Report, SS-18 | Roberts, David E<br>EPA Region IX | 1382<br>CD 6 |
| 30 Jan 96 | Base Letter to Regulators Concerning NOV, ROD and FFA, OT-29 | Matthews, Robert R<br>AFBCA/OL-I | 1386<br>CD 6 |
| 30 Jan 96 | EPA Letter to Resident Concerning Participation at Current RAB Meeting | Roberts, David E<br>EPA Region IX | 1767<br>CD 9 |
| Feb 96 | Fact Sheet, Enviro Fact Sheet, Edition 5 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1154<br>CD 5 |
| Feb 96 | RA, Final QPP, Part 2, Detonation and Burn Facility, FT-01, DA-4, Bldg 871 | Jacobs Engineering Group, Inc. | 1155<br>CD 5 |
| 01 Feb 96 | Regulators Letter to Base Concerning Base Response to NOV of ROD and FFA, OU-1 | Roberts, David E<br>Ghazi, Rizgar A<br>Izzo, Victor J<br>EPA Region IX<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 1178<br>CD 6 |
| 05 Feb 96 | EPA Letter to Base Concerning Reuse of Septic Systems, SS-116 | Roberts, David E<br>EPA Region IX | 1387<br>CD 6 |
| 06 Feb 96 | CDTSC Letter to Base Concerning Request for Review Extension on RI/FS, Draft Final Comprehensive Basewide Report, Part I Groundwater | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1177<br>CD 6 |

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|---|---|---|---|
| 08 Feb 96 | TWG Meeting Minutes, 08 Feb 96 | Matthews, Robert R<br>AFBCA/OL-I | 1196<br>CD 6 |
| 08 Feb 96 | Draft Update Field Work Status Report, SCOU | Jacobs Engineering Group, Inc. | 1413<br>CD 6 |
| 08 Feb 96 | Draft Position Paper Report, Inorganic Background for RI, Revised Draft Final Report, SCOU | Jacobs Engineering Group, Inc. | 1414<br>CD 6 |
| 12 Feb 96 | Base Letter to Regulators Concerning Reuse of Septic System, SS-116 | Matthews, Robert R<br>AFBCA/OL-I | 1390<br>CD 6 |
| 15 Feb 96 | RI, Draft Final Report, Addenda to Section 7, Sites Not Requiring Additional RI Field Work, SCOU | Jacobs Engineering Group, Inc. | 1153<br>CD 5 |
| 15 Feb 96 | EPA Letter to Base Concerning Comments on RI/FS, Draft Final Comprehensive Basewide Report, Part I | Roberts, David E<br>EPA Region IX | 1214<br>CD 6 |
| 16 Feb 96 | Revised TWG Meeting Minutes and Conversion Confirmer, 08 Feb 96 | Matthews, Robert R<br>AFBCA/OL-I | 1173<br>CD 6 |
| 16 Feb 96 | Base Letter to Distribution Concerning Draft FFA Schedule | Matthews, Robert R<br>AFBCA/OL-I | 1195<br>CD 6 |
| 21 Feb 96 | RPM Draft Meeting Minutes, 21 Feb 96 | Kumanchik, Cynthia<br>Gutierrez-Palmenberg, Inc. | 1171<br>CD 6 |
| 26 Feb 96 | TWG Meeting Minutes, 26 Feb 96 | Phillips, Larry<br>Jacobs Engineering Group, Inc. | 1192<br>CD 6 |

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|---|---|---|---|
| 29 Feb 96 | CRWQCB Letter to CDTSC Concerning Comments on RI/FS, Draft Final Comprehensive Basewide Report, Part I | Izzo, Victor J<br>California Regional Water Quality Control Board | 1169<br>CD 6 |
| Mar 96 | Fact Sheet, Enviro Progress Newsletter, Edition 9 | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1319<br>CD 6 |
| Mar 96 | Treatability Study and Technical Report, SS-17, SS-18 | Jacobs Engineering Group, Inc. | 1391<br>CD 6 |
| 01 Mar 96 | Preliminary Data Figures, SCOU | Phillips, Larry<br>Jacobs Engineering Group, Inc. | 1309<br>CD 6 |
| 06 Mar 96 | MDPH Letter to EPA Concerning NFA Required, LF-34 | Palsgaard, Jeff H<br>Merced County Department of Public Health | 1168<br>CD 6 |
| 06 Mar 96 | BCT/TWG Draft Meeting Minutes, 05 Mar 96 | Matthews, Robert R<br>AFBCA/OL-I | 1194<br>CD 6 |
| 12 Mar 96 | CDTSC Memorandum Concerning Comments on Revised Draft Basis of Design Report | Scruggs, Mary<br>California Department of Toxic Substances Control | 1167<br>CD 6 |
| 14 Mar 96 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Revised Draft Basis of Design Report | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1166<br>CD 6 |
| 14 Mar 96 | Base Letter to Regulators Concerning Revised Basis of Design Report Issues From BCT Meeting | Matthews, Robert R<br>AFBCA/OL-I | 1184<br>CD 6 |
| 15 Mar 96 | EPA Letter to Base Concerning Comments on the Revised Draft Basis of Design Report | Roberts, David E<br>EPA Region IX | 1185<br>CD 6 |

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|---|---|---|---|
| 18 Mar 96 | Jacobs Letter to AFCEE Concerning Response to Agency Comments on FS, Draft Report, SCOU | Jacobs Engineering Group, Inc. | 1198 CD 6 |
| 19 Mar 96 | Step-Out and Metals Sampling Locations and Analysis, SCOU | Jacobs Engineering Group, Inc. | 1164 CD 5 |
| 22 Mar 96 | Jacobs Letter to AFCEE Concerning Draft Response to Agency Comments on RI/FS, Comprehensive Basewide Report | Phillips, Larry Jacobs Engineering Group, Inc. | 1297 CD 6 |
| 25 Mar 96 | EPA Letter to Base Concerning Comments on Preliminary Draft Comprehensive Basewide Groundwater Proposed Plan, Part I | Roberts, David E EPA Region IX | 1206 CD 6 |
| 26 Mar 96 | CDTSC Letter to EPA Concerning Denial for NFA, Castle Vista Landfill A | Ghazi, Rizgar A California Department of Toxic Substances Control | 1163 CD 5 |
| 26 Mar 96 | RAB Draft Meeting Minutes, 26 Mar 96 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1181 CD 6 |
| 26 Mar 96 | RPM Draft Meeting Minutes, 26 Mar 96 | Matthews, Robert R AFBCA/OL-I | 1191 CD 6 |
| 26 Mar 96 | RPM Meeting Minutes, 26 Mar 96 | Matthews, Robert R AFBCA/OL-I | 1223 CD 6 |
| 26 Mar 96 | CDTSC Letter to EPA Concerning NFA Decision, Castle Vista Landfill A | Ward, Daniel T California Department of Toxic Substances Control | 1234 CD 6 |
| 27 Mar 96 | Base Letter to EPA and Bechtel Concerning Final FSP for RA, Bldg 871, Detonation and Burn Facility, FT-01, and DA-4 | Matthews, Robert R AFBCA/OL-I | 1186 CD 6 |

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|---|---|---|---|
| Apr 96 | RA, Proposed Plan, Draft Final Groundwater, Comprehensive Basewide Program, Part I | Jacobs Engineering Group, Inc. | 1229 CD 6 |
| Apr 96 | Fact Sheet, Enviro Fact Sheet, Edition 6 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1314 CD 6 |
| 02 Apr 96 | Base Letter to EPA and CDTSC Concerning Request for Extension on RI/FS, Comprehensive Basewide Draft Final Report, Part I | Matthews, Robert R AFBCA/OL-I | 1161 CD 5 |
| 03 Apr 96 | RI/FS Conference Call Meeting Minutes, 03 Apr 96 | Allen, Elizabeth Jacobs Engineering Group, Inc. | 1197 CD 6 |
| 03 Apr 96 | CDTSC Comments on Preliminary Draft Comprehensive Basewide Part I Groundwater Proposed Plan | California Department of Toxic Substances Control | 1296 CD 6 |
| 05 Apr 96 | AFBCA Letter Concerning Extension to Deadlines for RI/FS at BRAC Installations on NPL | Olsen, Alan K AFBCA/DR | 1159 CD 5 |
| 05 Apr 96 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on SVE Demonstration Project Report, Fuel Spill 2 | Ghazi, Rizgar A California Department of Toxic Substances Control | 1294 CD 6 |
| 08 Apr 96 | EPA Letter to Base Concerning Review of Response to Comments on RI/FS, Draft Final Risk Assessment, SCOU | Roberts, David E EPA Region IX | 1158 CD 5 |
| 08 Apr 96 | Joint Power Authority Letter to Base Concerning Production Well Closure | Martin, Richard D Castle Joint Powers Authority | 1205 CD 6 |

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|---|---|---|---|
| 09 Apr 96 | EPA and CDTSC Letter to Base Concerning Approval of Request for Extension, FFA for RI/FS, Comprehensive Basewide Draft Final Report, Part I | Roberts, David E<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1157<br>CD 5 |
| 10 Apr 96 | EPA Letter to Base Concerning Base Responses to EPA Comments on RI/FS, Draft Final Report, SCOU | Roberts, David E<br>EPA Region IX | 1303<br>CD 6 |
| 11 Apr 96 | CRWQCB Letter to CDTSC Concerning Review of RI/FS Response to Comments, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1204<br>CD 6 |
| 11 Apr 96 | TWG Meeting Minutes, 11 Apr 96 | Phillips, Larry<br>Jacobs Engineering Group, Inc. | 1224<br>CD 6 |
| 18 Apr 96 | MDPH Letter to Joint Power Authority Concerning Draft Resolution on Landfill Closures | Palsgaard, Jeff H<br>Merced County Department of Public Health | 1504<br>CD 6 |
| 18 Apr 96 | MDPH Letter to Base Concerning RAB Meeting Discussion of Landfill Issues | Palsgaard, Jeff H<br>Merced County Department of Public Health | 1505<br>CD 6 |
| 22 Apr 96 | EPA Letter to Base Concerning Restart Sampling Plan Revision, OT-29 | Roberts, David E<br>EPA Region IX | 1396<br>CD 6 |
| 23 Apr 96 | Base Letter to San Joaquin Valley Concerning ERC Background Information | Matthews, Robert R<br>AFBCA/OL-I | 1227<br>CD 6 |
| 24 Apr 96 | CRWQCB Letter to CDTSC Concerning Review of Response to Comments on RI/FS, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1220<br>CD 6 |

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| 24 Apr 96 | RPM Meeting Minutes, 24 Apr 96 | Matthews, Robert R<br>AFBCA/OL-I | 1221<br>CD 6 |
| 24 Apr 96 | CDTSC Letter to Base Concerning Review of Response to Agency Comments on RI, Draft Final Report, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1225<br>CD 6 |
| 24 Apr 96 | RPM Draft Meeting Minutes, 24 Apr 96 | Matthews, Robert R<br>AFBCA/OL-I | 1226<br>CD 6 |
| 24 Apr 96 | CRWQCB Letter to Base Concerning Update of Order No. 92-181 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1302<br>CD 6 |
| May 96 | Fact Sheet, Enviro Progress Newsletter, Edition 10 | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1320<br>CD 6 |
| May 96 | RAB Meeting Minutes, May 96 | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1342<br>CD 6 |
| 01 May 96 | ROD, Draft Comprehensive Basewide, Part I Groundwater | AFBCA/OL-I | 1187<br>CD 6 |
| 08 May 96 | EPA Letter to Base Concerning Annual Report, O&M and Monitoring, Groundwater Pump and Treat, OU-1 | Roberts, David E<br>EPA Region IX | 1305<br>CD 6 |
| 08 May 96 | ROD, Proposed VOC Remediation Language | AFBCA/OL-I | 2082<br>CD 11 |
| 09 May 96 | Jacobs Letter to Base Concerning Response to Comments on RI/FS, Draft Comprehensive Basewide Report, Part I | Phillips, Larry<br>Jacobs Engineering Group, Inc. | 1213<br>CD 6 |

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|---|---|---|---|
| 09 May 96 | RPM/TWG Meeting Minutes, 09 May 96 | Matthews, Robert R<br>AFBCA/OL-I | 1222<br>CD 6 |
| 13 May 96 | CDTSC Memorandum Concerning Comments on Scoping and Phase I Ecological Risk Assessment | Chernoff, Gerald F<br>California Department of Toxic Substances Control | 2083<br>CD 11 |
| 16 May 96 | EPA Letter to Base Concerning Comments on Draft Final Comprehensive Basewide Part I, Groundwater Proposed Plan | Roberts, David E<br>EPA Region IX | 1304<br>CD 6 |
| 20 May 96 | CRWQCB Letter to Base Concerning Review of Annual Report of O&M and Monitoring, OT-29 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1397<br>CD 6 |
| 21 May 96 | Base Letter to USACE Concerning Notification of Proposed Action, ETC-10 | Matthews, Robert R<br>AFBCA/OL-I | 1237<br>CD 6 |
| 23 May 96 | CDTSC Memorandum Concerning Draft Verification/Validation Phase II Ecological Risk Assessment, SAP | Chernoff, Gerald F<br>California Department of Toxic Substances Control | 2084<br>CD 11 |
| 23 May 96 | EPA Memorandum Concerning Draft Verification/Validation Phase II Ecological Risk Assessment, SAP | Black, Ned<br>EPA Region IX | 2085<br>CD 11 |
| 28 May 96 | EPA Letter to Base Concerning Draft Verification/Validation Phase II Ecological Risk Assessment, SAP | Roberts, David E<br>EPA Region IX | 2086<br>CD 11 |
| 30 May 96 | Press Release, RAB Announcement, The Next Castle RAB Meeting Will be Held 30 May 96 | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1219<br>CD 6 |
| 31 May 96 | FAA Letter to Base Concerning FAA and Base MOA | Wilkerson, Robin F<br>Federal Aviation Administration | 1379<br>CD 6 |

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| 31 May 96 | CDTSC Letter to Base Concerning Draft Verification/Validation Phase II Ecological Risk Assessment, SAP | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 2087<br>CD 11 |
| 31 May 96 | Base Memorandum Concerning Draft Verification/Validation Phase II Ecological Risk Assessment, SAP | Porter, Ron PhD<br>AL/OEMH | 2088<br>CD 11 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendix B, Vol II of III | Jacobs Engineering Group, Inc. | 1059<br>CD 4 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendix F | Jacobs Engineering Group, Inc. | 1061<br>CD 4 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol III of III | Jacobs Engineering Group, Inc. | 1062<br>CD 4 |
| Jun 96 | RI/FS, Final, Comprehensive Basewide Groundwater, Part I, Baseline Human Health Risk Assessment, Vol II of III | Jacobs Engineering Group, Inc. | 1065<br>CD 4 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendices C, D and E | Jacobs Engineering Group, Inc. | 1071<br>CD 5 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendices G, H, I, J, K, L and M | Jacobs Engineering Group, Inc. | 1072<br>CD 5 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendix B, Vol III of III | Jacobs Engineering Group, Inc. | 1074<br>CD 4 |

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|---|---|---|---|
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendix A | Jacobs Engineering Group, Inc. | 1098 CD 5 |
| Jun 96 | RI/FS, Final Comprehensive Basewide Groundwater Report, Part I, Vol I of III, Appendix B, Vol I of III | Jacobs Engineering Group, Inc. | 1106 CD 5 |
| Jun 96 | Draft Final Comprehensive Basewide Part I, Proposed Plan | AFBCA/OL-I | 1182 CD 6 |
| Jun 96 | RA, Draft Technical Report, SS-70 | Jacobs Engineering Group, Inc. | 1283 CD 6 |
| Jun 96 | Fact Sheet, Enviro Fact Sheet, Edition 7 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1315 CD 6 |
| Jun 96 | Newspaper Article, "Leftover Landfills Raise Castle Reuse Questions" | Carlson, Ken The Merced Sun Star | 1336 CD 6 |
| Jun 96 | RA, Final Proposed Plan for Groundwater, Comprehensive Basewide Program, Part 1 | Jacobs Engineering Group, Inc. | 1771 CD 9 |
| 05 Jun 96 | CDTSC Letter to Base Concerning Phase I Ecological Risk Assessment | Ghazi, Rizgar A California Department of Toxic Substances Control | 2089 CD 11 |
| 10 Jun 96 | Newspaper Article, "Public Comment Period and Meeting Announcement on Comprehensive Basewide Program Part 1-Proposed Plan for RA of Groundwater" | AFBCA/OL-I | 2091 CD 11 |
| 13 Jun 96 | EPA Letter to Base Concerning Draft Comprehensive Basewide Program-Part 1 ROD | Roberts, David E EPA Region IX | 2090 CD 11 |

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|---|---|---|---|
| 19 Jun 96 | Base Letter to Regulators Concerning Revised Figure 2 for Air Monitoring, OU-1 | Matthews, Robert R<br>AFBCA/OL-I | 1769<br>CD 9 |
| 24 Jun 96 | CDTSC Letter to Base Concerning ARARs, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1378<br>CD 6 |
| 24 Jun 96 | Base Letter to Regulators Concerning Final Removal Actions Update, OT-30, SD-12, SS-61 | Matthews, Robert R<br>AFBCA/OL-I | 1399<br>CD 6 |
| 24 Jun 96 | Base Letter to AFCEE Concerning Submittal of Final Comprehensive Basewide Groundwater Proposed Plan, Part 1 | Matthews, Robert R<br>AFBCA/OL-I | 1770<br>CD 9 |
| 25 Jun 96 | Draft Technical Report, Detonation Burn Facility | Jacobs Engineering Group, Inc. | 1284<br>CD 6 |
| 25 Jun 96 | RAB Base Tour Summary | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1343<br>CD 6 |
| 27 Jun 96 | RPM Meeting Minutes, 27 Jun 96 | Matthews, Robert R<br>AFBCA/OL-I | 1286<br>CD 6 |
| Jul 96 | LTM Sampling Plan, Semiannual Report, OT-29, OT-30, SD-12 | Jacobs Engineering Group, Inc. | 1172<br>CD 6 |
| Jul 96 | RA, Design Letter Report, DA-4 | Jacobs Engineering Group, Inc. | 1239<br>CD 6 |
| Jul 96 | Draft QAPP | Jacobs Engineering Group, Inc. | 1287<br>CD 6 |
| Jul 96 | Fact Sheet, Enviro Progress Newsletter, Edition 11 | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1321<br>CD 6 |

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|---|---|---|---|
| Jul 96 | RA, Repair Enhancement and Future Expansion, Well Installation Report, OU-1 | Jacobs Engineering Group, Inc. | 1360<br>CD 6 |
| Jul 96 | FSP, Addendum, OU-1 | AFBCA/OL-I | 1772<br>CD 9 |
| 01 Jul 96 | EPA Letter to Base Concerning Review of Addendum to Work Plan, OU-1 | Lowe, Debbie<br>EPA Region IX | 1775<br>CD 9 |
| 08 Jul 96 | EPA and CDTSC Letter to Base Concerning Request for Extension on FFA Schedule for SCOU Draft Final RI/FS | Lowe, Debbie<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 2092<br>CD 11 |
| 09 Jul 96 | CDTSC Letter to Base Concerning Action Memoranda, SCOU, DA-8, PCB-9, ETC-10 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1404<br>CD 6 |
| 15 Jul 96 | CRWQCB Letter to Base Concerning Proposed Cleanup Level Evaluation, UST and OWS Removal Program | Izzo, Victor J<br>California Regional Water Quality Control Board | 1401<br>CD 6 |
| 15 Jul 96 | CDTSC Letter to Base Concerning Comments on Draft Explanation of Significant Difference, OU-1 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 2093<br>CD 11 |
| 23 Jul 96 | Base, EPA, and CDTSC Letter to Bureau of Prisons Concerning Detonation Burn Facility | Matthews, Robert R<br>Lowe, Debbie<br>Ghazi, Rizgar A<br>AFBCA/OL-I<br>EPA Region IX<br>California Department of Toxic Substances Control | 1280<br>CD 6 |

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|---|---|---|---|
| 23 Jul 96 | Public Meeting Transcript, Comprehensive Basewide Part I Proposed Plan, 23 Jul 96 | Maciel, Teresa<br>Certified Shorthand Reporter | 1341<br>CD 6 |
| 24 Jul 96 | RPM Meeting Minutes, 24 Jul 96 | Matthews, Robert R<br>AFBCA/OL-I | 1310<br>CD 6 |
| 25 Jul 96 | Fact Sheet, Proposed Range Rule | AFBCA/OL-I | 1299<br>CD 6 |
| Aug 96 | Final Technical Report, Detonation Burn Facility | Jacobs Engineering Group, Inc. | 1285<br>CD 6 |
| Aug 96 | Journal Article, "A Needle in a Haystack" | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1363<br>CD 6 |
| 02 Aug 96 | Base Letter to Distribution Concerning Response to Comments on Basewide Cleanup Level Evaluation, UST and OWS Removal Program | Matthews, Robert R<br>AFBCA/OL-I | 1402<br>CD 6 |
| 06 Aug 96 | Base Letter to Regulators Concerning Response to Agency Comments on Revised Final Basis of Design Report | Matthews, Robert R<br>AFBCA/OL-I | 1359<br>CD 6 |
| 07 Aug 96 | Newspaper Article, "Groundwater Contamination Moving West" | Kayser, Jim<br>The Atwater Signal | 1340<br>CD 6 |
| 07 Aug 96 | MDPH Letter to Base Concerning Comments on RA, Proposed Plan for Groundwater | Palsgaard, Jeff H<br>Merced County Department of Public Health | 1774<br>CD 9 |
| 09 Aug 96 | Base Letter to AFCEE Concerning Draft Final Explanation of Significant Difference, OU-1 | Matthews, Robert R<br>AFBCA/OL-I | 1773<br>CD 9 |

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|---|---|---|---|
| 14 Aug 96 | Newspaper Article, "Groundwater Plume Worries Leslie Drive Residents" | Kayser, Jim<br>The Atwater Signal | 1339<br>CD 6 |
| 14 Aug 96 | CIWMB Letter to CDTSC Concerning Closure Requirements, Castle Vista Landfill A | Zielinski, Tamara S<br>California Integrated Waste Management Board | 1400<br>CD 6 |
| 21 Aug 96 | Base Memorandum Concerning ARAR Support for Time Critical Action Memorandums, Removal Action on Two SCOU Sites | Matthews, Robert R<br>AFBCA/OL-I | 2094<br>CD 11 |
| 24 Aug 96 | Newspaper Article, "Public Notice, What is Happening at Castle Airport? Meet Castle's RAB" | The Merced Sun Star | 1330<br>CD 6 |
| 26 Aug 96 | CDTSC Letter to Base Concerning Comments on RA, Draft Technical Report, Bldg 871 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1243<br>CD 6 |
| 26 Aug 96 | CDTSC Letter to Base Concerning NFA Decision, Detonation Burn Facility | Landis, Anthony J<br>California Department of Toxic Substances Control | 1244<br>CD 6 |
| 27 Aug 96 | Base Letter to Regulators Concerning Draft QPP and Work Plan Addendum | Matthews, Robert R<br>AFBCA/OL-I | 1290<br>CD 6 |
| 27 Aug 96 | RAB Meeting Minutes, 27 Aug 96 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1361<br>CD 6 |
| 27 Aug 96 | PFFA Meeting Slides Concerning EPA Risk Execution Strategy for Clean-Up | Lee, Charles E<br>EPA Region IX | 1383<br>CD 6 |
| 28 Aug 96 | RPM/TWG Meeting Minutes, 28 Aug 96 | Matthews, Robert R<br>AFBCA/OL-I | 1362<br>CD 6 |

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|---|---|---|---|
| 28 Aug 96 | Fact Sheet, Air Emissions From Primary Air Stripper at Treatment Plant | AFBCA/OL-I | 1371 CD 6 |
| 28 Aug 96 | Explanation of Significant Difference, Discontinuation of Vapor Phase Treatment of Air Stripper Off Gas and Non-Implementation of Biological Enhancement, OU-I | Jacobs Engineering Group, Inc. | 1380 CD 6 |
| 29 Aug 96 | Base Letter to EPA Concerning Distributed Items From RPM Meeting, 28 Aug 96 | Matthews, Robert R AFBCA/OL-I | 1394 CD 6 |
| Sep 96 | RA, Design Letter Report, FT-01 | AFBCA/OL-I | 1246 CD 6 |
| Sep 96 | Fact Sheet, Enviro Progress Newsletter, Edition 12 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1322 CD 6 |
| Sep 96 | Community Relations Plan (CRP) | Gutierrez-Palmenberg, Inc. | 1325 CD 6 |
| Sep 96 | RAB Meeting Minutes, Sep 96 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1344 CD 6 |
| Sep 96 | Design Letter Report for Removal Action, FT-001 | Jacobs Engineering Group, Inc. | 2095 CD 11 |
| 04 Sep 96 | AFLSA Letter to Base Concerning Comments on ARAR Table in ROD, Draft, CBOU | Bee, Arlen Eric, Capt AFLSA/JACE-WR | 1389 CD 6 |
| 19 Sep 96 | CDTSC Letter to Base Concerning Comments on RI, Preliminary Draft Final Addenda for Action Plan Sites, SCOU | Ghazi, Rizgar A California Department of Toxic Substances Control | 1395 CD 6 |

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|---|---|---|---|
| 20 Sep 96 | Results of Jacobs Checkout of System Repair and Expansion, OU-1 | Jacobs Engineering Group, Inc. | 1384 CD 6 |
| 20 Sep 96 | Resident Letter to Mayor of Atwater Concerning City of Atwater Water System | Resident | 1388 CD 6 |
| 23 Sep 96 | EPA Letter to Program Managers Concerning Potential Impacts of the Eureka Laboratory Fraud Case on Federal Facilities Cleanup | Opalski, Daniel D EPA Region IX | 1398 CD 6 |
| Oct 96 | RA, SVE Startup Letter Report, DA-4 | AFBCA/OL-I | 1248 CD 6 |
| Oct 96 | Draft SVE-Bioventing Transition Letter Report, Fuel Spill 1 | Jacobs Engineering Group, Inc. | 1252 CD 6 |
| Oct 96 | RAB Meeting Minutes, Oct 96 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1345 CD 6 |
| Oct 96 | RA, Final Technical Report, SS-70 | Jacobs Engineering Group, Inc. | 1419 CD 6 |
| Oct 96 | SVE Startup Letter Report, DA-4 | Jacobs Engineering Group, Inc. | 1440 CD 6 |
| 01 Oct 96 | Base Letter to EPA and CRWQCB Concerning Final RCRA Closure Plan, Hazardous Waste Drum Storage Area | Matthews, Robert R AFBCA/OL-I | 1288 CD 6 |
| 02 Oct 96 | Action Memorandum, Removal Action, DA-8 | AFBCA/OL-I | 1403 CD 6 |

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|---|---|---|---|
| 07 Oct 96 | Newspaper Article, "Public Notice, The USAF Announces Finalization of the Explanation of Significant Difference Document for the Discontinuation of Vapor Phase Treatment of Air Stripper Off Gas and Non-Implementation of Biological Enhancement" | The Merced Sun Star | 1332 CD 6 |
| 08 Oct 96 | Action Memorandum, Removal Action, ETC-10 | AFBCA/OL-I | 1247 CD 6 |
| 16 Oct 96 | Base Letter to Regulators Concerning RA, Final Technical Report, Bldg 871 | Matthews, Robert R AFBCA/OL-I | 1249 CD 6 |
| 16 Oct 96 | Base Letter to Regulators Concerning Response to Comments on Demonstration Project Report, Fuel Spill 2 | Matthews, Robert R AFBCA/OL-I | 1250 CD 6 |
| 17 Oct 96 | Base Letter to Regulators Concerning Disclaimer Included in Base Reports | Matthews, Robert R AFBCA/OL-I | 1289 CD 6 |
| 21 Oct 96 | CDTSC Letter to Base Concerning Review of RA, Action Memorandum, DA-8 | Ghazi, Rizgar A California Department of Toxic Substances Control | 1253 CD 6 |
| 23 Oct 96 | RPM Meeting Minutes, 23 Oct 96 | Woolfolk, Lisa Gutierrez-Palmenberg, Inc. | 1311 CD 6 |
| 24 Oct 96 | MDPH Letter to Base Concerning RAB | Palsgaard, Jeff H Merced County Department of Public Health | 1393 CD 6 |
| 30 Oct 96 | Newspaper Article, "Castle Vista Landfills To Be Removed" | Kayser, Jim The Atwater Signal | 1337 CD 6 |

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|---|---|---|---|
| Nov 96 | Fact Sheet, Enviro Fact Sheet, Edition 8 | Woolfolk, Lisa<br>Gutierrez-Palmenberg, Inc. | 1316<br>CD 6 |
| Nov 96 | RAB Meeting Minutes, Nov 96 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1346<br>CD 6 |
| 04 Nov 96 | Jacobs Letter to CDTSC Concerning Comprehensive Basewide Part II SCOU, Site Risk on Isopleth Maps | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 1372<br>CD 6 |
| 13 Nov 96 | EPA Letter to Base Concerning Comments on Draft QAPP | Hanusiak, Lisa<br>EPA Region IX | 1776<br>CD 9 |
| 20 Nov 96 | Newspaper Article, "Public Notice, The United States Air Force Announces the Intent to Operate a SVE System at Castle Air Force Base" | The Merced Sun Star | 1255<br>CD 6 |
| 20 Nov 96 | EPA and CDTSC Letter to Base Concerning FAA Schedule Extension for Comprehensive Basewide ROD, Part I | Hanusiak, Lisa<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1392<br>CD 6 |
| 21 Nov 96 | Base Letter to Regulators Concerning Public Notice for RA, DA-8 | Matthews, Robert R<br>AFBCA/OL-I | 1777<br>CD 9 |
| 23 Nov 96 | Newspaper Article, "Come and See Our Progress at Castle Airport" | The Merced Sun Star | 1328<br>CD 6 |
| 23 Nov 96 | Newspaper Article, "Castle Cleanup Begins" | White, Bob<br>The Merced Sun Star | 1334<br>CD 6 |
| 26 Nov 96 | Newspaper Article, "New Process Cleans Water" | Groves, Randy<br>The Merced Sun Star | 1333<br>CD 6 |

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|---|---|---|---|
| 29 Nov 96 | EPA Letter to Base Concerning RI/FS, Draft Final Report, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1629<br>CD 8 |
| Dec 96 | Fact Sheet, Enviro Progress Newsletter, Edition 13 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1323<br>CD 6 |
| 02 Dec 96 | EPA Letter to Base Concerning Final Aviation and Development Center CRP | Hanusiak, Lisa<br>EPA Region IX | 1376<br>CD 6 |
| 02 Dec 96 | CDTSC Letter to Base Concerning Comments on RI/FS, Draft Final Report, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1631<br>CD 8 |
| 03 Dec 96 | EPA Letter to Base Concerning SVE Startup Letter Report for RA, DA-4 | Hanusiak, Lisa<br>EPA Region IX | 1257<br>CD 6 |
| 03 Dec 96 | EPA Letter to Base Concerning Draft SVE-Bioventing Transition Letter Report, Fuel Spill 1 | Hanusiak, Lisa<br>EPA Region IX | 1258<br>CD 6 |
| 03 Dec 96 | City of Atwater Water System Evaluation Scenarios | Boyle Engineering Corp. | 1301<br>CD 6 |
| 04 Dec 96 | Newspaper Article, "OU-2, Castle Groundwater Treatment Plant Dedicated" | Kayser, Jim<br>The Atwater Signal | 1335<br>CD 6 |
| 04 Dec 96 | EPA Letter to Base Concerning Revised Verification/Validation Phase II Ecological Risk Assessment Work Plan | Hanusiak, Lisa<br>EPA Region IX | 2096<br>CD 11 |
| 11 Dec 96 | CDTSC Letter to Base Concerning Review of the Draft QAPP | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1259<br>CD 6 |

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|---|---|---|---|
| 11 Dec 96 | CDTSC Memorandum Concerning Review of Part II, Draft SAP for Removal Actions, DA-8, PCB-9, ETC-10 | Scruggs, Mary<br>California Department of Toxic Substances Control | 1260<br>CD 6 |
| 12 Dec 96 | CDTSC Letter to Base Concerning Review of RA, Final Technical Report, Bldg 871 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1261<br>CD 6 |
| 12 Dec 96 | EPA Letter to Base Concerning FFA Schedule Extension for Draft Comprehensive Basewide Report, Part 2 | Hanusiak, Lisa<br>Ghazi, Rizgar A<br>EPA Region IX | 1778<br>CD 9 |
| 18 Dec 96 | RPM Meeting Minutes, 18 Dec 96 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1312<br>CD 6 |
| 18 Dec 96 | Meeting Notes, Evaluation of Alternative Pumping Rates for City Wells | McLeod, Campbell<br>Jacobs Engineering Group, Inc. | 1356<br>CD 6 |
| 20 Dec 96 | Base Letter to EPA Concerning Analytical Laboratories | Matthews, Robert R<br>AFBCA/OL-I | 1300<br>CD 6 |
| 31 Dec 96 | EPA Letter to Base Concerning Design Letter Report for RA, FT-01 | Hanusiak, Lisa<br>EPA Region IX | 1262<br>CD 6 |
| 97 | Basewide Environmental Baseline Survey (EBS), Supplement, Parcel A | AFBCA/OL-I | 1603<br>CD 8 |
| Jan 97 | LTM Sampling Plan, OT-29, OT-30 | Jacobs Engineering Group, Inc. | 1056<br>CD 5 |
| Jan 97 | Final QPP, Part I HSP, Part II SAP, Part III CQP | Jacobs Engineering Group, Inc. | 1267<br>CD 6 |

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|---|---|---|---|
| Jan 97 | Fact Sheet, Enviro Fact Sheet, Edition 9 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1317<br>CD 6 |
| Jan 97 | RAB Meeting Minutes, Jan 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1347<br>CD 6 |
| Jan 97 | Final Functional Acceptance Testing Report, OT-30, SD-12 | Booz-Allen and Hamilton, Inc. | 1420<br>CD 6 |
| 10 Jan 97 | CDTSC Letter to Base Concerning Review of Part II Draft SAP for Removal Actions, DA-8, PCB-9, ETC-10 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1264<br>CD 6 |
| 10 Jan 97 | CRWQCB Letter to Base Concerning Demonstration Project Report, Fuel Spill 2 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1265<br>CD 6 |
| 10 Jan 97 | CRWQCB Letter to Base Concerning Comments on Draft SVE-Bioventing Transition Letter Report, SS-017 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1268<br>CD 6 |
| 10 Jan 97 | CRWQCB Letter to Base Concerning Petroleum Only Contaminated Sites | Izzo, Victor J<br>California Regional Water Quality Control Board | 1569<br>CD 8 |
| 13 Jan 97 | CDTSC Letter to Base Concerning Review of Final ROD, Comprehensive Basewide Groundwater Report, Part 1 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1781<br>CD 9 |
| 15 Jan 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Preliminary Draft Proposed Plan, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1628<br>CD 8 |
| 16 Jan 97 | RPM Meeting Minutes, 16 Jan 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1364<br>CD 6 |

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|---|---|---|---|
| 21 Jan 97 | EPA Letter to Base Concerning RA, Action Memorandum, ETC-10 | Hanusiak, Lisa<br>EPA Region IX | 1269<br>CD 6 |
| 25 Jan 97 | Press Release, Public Notice, Concerned About Your Communities Future? Attend the Castle RAB Meeting | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1327<br>CD 6 |
| 29 Jan 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on RA, SVE Startup Letter Report, DA-4 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1619<br>CD 8 |
| 30 Jan 97 | EPA Letter to Base Concerning Comments on Phase II Groundwater Treatment System Design Specifications | Hanusiak, Lisa<br>EPA Region IX | 1354<br>CD 6 |
| 30 Jan 97 | Site Review Meeting Minutes, 30 Jan 97 | Marx, Richard<br>Louis Berger & Associates | 1577<br>CD 8 |
| 30 Jan 97 | Base Letter to CRWQCB Concerning POL Sites | Matthews, Robert R<br>AFBCA/OL-I | 1600<br>CD 8 |
| 31 Jan 97 | CRWQCB Letter to CDTSC Concerning Performance Based Criteria for Termination of SVE Projects | Izzo, Victor J<br>California Regional Water Quality Control Board | 1271<br>CD 6 |
| 31 Jan 97 | ROD, Final Comprehensive Basewide, Part I Groundwater | AFBCA/OL-I | 1586<br>CD 8 |
| 31 Jan 97 | Base Letter to AFCEE Concerning ROD Revisions, SCOU | Matthews, Robert R<br>AFBCA/DB Castle | 1779<br>CD 9 |
| Feb 97 | Fact Sheet, Enviro Progress Newsletter, Edition 14 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1324<br>CD 6 |

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| Feb 97 | RAB Meeting Minutes, Feb 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1348<br>CD 6 |
| 03 Feb 97 | Base Letter to San Joaquin Valley Concerning Comments on Monitoring Results for Remediation Systems | Matthews, Robert R<br>AFBCA/OL-I | 1272<br>CD 6 |
| 03 Feb 97 | Base Letter to USFWS and USACE Concerning Invitation to RAB Meeting | Matthews, Robert R<br>AFBCA/OL-I | 1275<br>CD 6 |
| 03 Feb 97 | CIWMB Letter to CDTSC Concerning Review of Response to Comments on FS, SCOU | Zielinski, Tamara S<br>California Integrated Waste Management Board | 1783<br>CD 9 |
| 03 Feb 97 | EPA Letter to AFLSA/JACE-WR Concerning Changes to Comprehensive Basewide Final ROD, Part 1 | Estrada, Thelma<br>EPA Region IX | 1785<br>CD 9 |
| 04 Feb 97 | CRWQCB Letter to CDTSC Concerning Response to Agency Comments on RI/FS, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1630<br>CD 8 |
| 04 Feb 97 | CRWQCB Letter to CDTSC Concerning Response to Comments on RI/FS, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1784<br>CD 9 |
| 05 Feb 97 | Base Letter to RAB Members Concerning Responsiveness Summary to Comprehensive Basewide ROD, Part 1 | Matthews, Robert R<br>AFBCA/DB Castle | 1786<br>CD 9 |
| 05 Feb 97 | EPA Letter to Base Concerning Response to Comments on RI/FS, Draft Final Report, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1787<br>CD 9 |

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|---|---|---|---|
| 05 Feb 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Outstanding Comments on RI/FS, Draft Final Report, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1788<br>CD 9 |
| 06 Feb 97 | SOW, Video Survey School Irrigation Well | AFBCA/OL-I | 1353<br>CD 6 |
| 13 Feb 97 | EPA and CDTSC Letter to Base Concerning Review of ROD, SCOU | Hanusiak, Lisa<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1626<br>CD 8 |
| 13 Feb 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Performance Based Criteria for Termination of SVE Projects | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1789<br>CD 9 |
| 19 Feb 97 | Summary of Network Model for City of Atwater Water System Report | Boyle Engineering Corp. | 1350<br>CD 6 |
| 24 Feb 97 | CDTSC Letter to Base Concerning Comments on Phase II, RA, Draft Environmental Cleanup Plan, QPP Addenda | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1358<br>CD 6 |
| 24 Feb 97 | CRWQCB Letter to Base Concerning Request for Extension on Submittal of Work Plan | Izzo, Victor J<br>California Regional Water Quality Control Board | 1725<br>CD 6 |
| 25 Feb 97 | RPM Meeting Minutes, 25 Feb 97 | Matthews, Robert R<br>AFBCA/OL-I | 1365<br>CD 6 |
| 27 Feb 97 | EPA Letter to Base Concerning Comments on Proposed Sampling Locations, Castle Vista Plume | Hanusiak, Lisa<br>EPA Region IX | 1351<br>CD 6 |

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|---|---|---|---|
| 27 Feb 97 | EPA Letter to Base Concerning Comments on Alternative RA Pilot Study, Density-Driven Convection Pilot Study Plan, Castle Vista Landfill B | Hanusiak, Lisa<br>EPA Region IX | 1352<br>CD 6 |
| Mar 97 | Fact Sheet, Enviro Fact Sheet, Edition 10 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1318<br>CD 6 |
| Mar 97 | Slides Concerning Discussion of Site Closure, DA-4 | AFBCA/OL-I | 1423<br>CD 6 |
| Mar 97 | Final Design Letter Report, DA-8 | Jacobs Engineering Group, Inc. | 1437<br>CD 6 |
| 06 Mar 97 | Base Letter to FAA Concerning FTA-1 | Matthews, Robert R<br>AFBCA/OL-I | 1276<br>CD 6 |
| 10 Mar 97 | CDTSC Memorandum Concerning RI/FS, Comprehensive Basewide Human Health Risk Assessments Part 2 | Chernoff, Gerald F<br>California Department of Toxic Substances Control | 1790<br>CD 9 |
| 11 Mar 97 | EPA Letter to Base Concerning Comments on RPM Draft Meeting Minutes, 25 Feb 97 | Hanusiak, Lisa<br>EPA Region IX | 1791<br>CD 9 |
| 17 Mar 97 | Jacobs Letter to Base Concerning Quarterly Monitoring Program, FS-1 | Jacobs Engineering Group, Inc. | 1291<br>CD 6 |
| 18 Mar 97 | Base Letter to Distribution Concerning FFA Schedule, Request for Extension, SCOU | Matthews, Robert R<br>AFBCA/OL-I | 1595<br>CD 8 |
| 18 Mar 97 | Project Note 8, Data Gap, DA-8 and PCB-9 | Jacobs Engineering Group, Inc. | 2097<br>CD 11 |

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|---|---|---|---|
| 19 Mar 97 | Base Letter to Regulators Concerning Response to Comments on RA, Design Letter Report, FT-001 | Matthews, Robert R<br>AFBCA/OL-I | 1281<br>CD 6 |
| 19 Mar 97 | Base Letter to Regulators Concerning Response to Comments on Draft SVE-Bioventing Transition Letter Report, Fuel Spill 1 | Matthews, Robert R<br>AFBCA/OL-I | 1282<br>CD 6 |
| 21 Mar 97 | EPA Letter to Base Concerning Comments on Phase II, RA, Draft Environmental Cleanup Plan, QPP Addenda | Hanusiak, Lisa<br>EPA Region IX | 1357<br>CD 6 |
| 21 Mar 97 | EPA and CDTSC Letter to Base Concerning FFA Schedule Extension for Draft Final Proposed Plan, SCOU | Hanusiak, Lisa<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1638<br>CD 8 |
| 24 Mar 97 | CDTSC Letter to Base Concerning Comments on RI/FS, Comprehensive Basewide Draft Report, Part II | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1622<br>CD 8 |
| 24 Mar 97 | EPA Letter to Base Concerning RI/FS, Draft Comprehensive Basewide, Part II | Hanusiak, Lisa<br>EPA Region IX | 1639<br>CD 8 |
| 24 Mar 97 | EPA Letter to Base Concerning Phase II, Comprehensive Basewide Ecological Risk Assessment | Hanusiak, Lisa<br>EPA Region IX | 1640<br>CD 8 |
| 26 Mar 97 | EPA Letter to Base Concerning Proposal to Reduce Sampling Frequency at Groundwater Treatment Plant, OU-1 | Hanusiak, Lisa<br>EPA Region IX | 1608<br>CD 8 |
| 27 Mar 97 | Newspaper Article, "These Grasses Are Not Meant For Mowing" | McNally, Pat<br>The Merced Sun Star | 1338<br>CD 6 |

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|---|---|---|---|
| 31 Mar 97 | EPA Letter to Base Concerning Draft LTM Sampling Plan, 97 Update | Hanusiak, Lisa<br>EPA Region IX | 1614<br>CD 8 |
| Apr 97 | Fact Sheet, Enviro Progress Newsletter, Edition 15 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1424<br>CD 6 |
| 08 Apr 97 | CRWQCB Letter to CDTSC Concerning Response to Comments on RI/FS, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1573<br>CD 8 |
| 08 Apr 97 | EPA Letter to Base Concerning RA, Draft Final Proposed Plan, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1627<br>CD 8 |
| 08 Apr 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Response to Comments on RI/FS, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1632<br>CD 8 |
| 09 Apr 97 | RPM Meeting Minutes, 09 Apr 97 | Matthews, Robert R<br>AFBCA/OL-I | 1366<br>CD 6 |
| 14 Apr 97 | CRWQCB Letter to CDTSC Concerning Draft Final Proposed Plan, SCOU | Izzo, Victor J<br>California Regional Water Quality Control Board | 1634<br>CD 8 |
| 18 Apr 97 | Base Letter to CRWQCB Concerning RA, Design Letter Report, FT-001 | Matthews, Robert R<br>AFBCA/OL-I | 1454<br>CD 6 |
| 18 Apr 97 | CDTSC Letter to Base Concerning Review of Draft Final Proposed Plan, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1558<br>CD 8 |
| 18 Apr 97 | CRWQCB Letter to CDTSC Concerning Closure Certification Report Vol II, Closure and Removal of OWS | Izzo, Victor J<br>California Regional Water Quality Control Board | 2098<br>CD 11 |

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|---|---|---|---|
| 21 Apr 97 | EPA Letter to Base Concerning Evaluation of Response to Comments on RI/FS, Draft Final Report, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1633<br>CD 8 |
| 22 Apr 97 | RPM/TWG Meeting Minutes, 22 Apr 97 | Matthews, Robert R<br>AFBCA/OL-1 | 1367<br>CD 6 |
| 22 Apr 97 | RAB Meeting Minutes, 22 Apr 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1368<br>CD 6 |
| 29 Apr 97 | EPA Letter to Base Concerning Response to Comments on RA, Design Letter Report, FT-001 | Hanusiak, Lisa<br>EPA Region IX | 1453<br>CD 6 |
| May 97 | Draft Final Basic Contract QPP | Jacobs Engineering Group, Inc. | 967<br>CD 4 |
| May 97 | Phase II, Risk Assessment, Final Environmental Cleanup Plan, QPP Addenda | Jacobs Engineering Group, Inc. | 1123<br>CD 8 |
| May 97 | Fact Sheet, Enviro Fact Sheet, Edition 11 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1425<br>CD 6 |
| May 97 | Final Start-Up Letter Report, FT-001 | Jacobs Engineering Group, Inc. | 1442<br>CD 6 |
| May 97 | RI/FS, Final Report, Part I, Vol I of IX, SCOU | Jacobs Engineering Group, Inc. | 1730<br>CD 6 |
| May 97 | RI/FS, Final Report, Part I, Vol II of IX, SCOU | Jacobs Engineering Group, Inc. | 1731<br>CD 8 |
| May 97 | RI/FS, Final Report, Part I, Vol III of IX, SCOU | Jacobs Engineering Group, Inc. | 1732<br>CD 7 |

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|---|---|---|---|
| May 97 | RI/FS, Final Report, Part I, Vol IV of IX, SCOU | Jacobs Engineering Group, Inc. | 1733 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol V of IX, SCOU | Jacobs Engineering Group, Inc. | 1734 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol VI of IX, SCOU | Jacobs Engineering Group, Inc. | 1735 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol VII of IX, SCOU | Jacobs Engineering Group, Inc. | 1736 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol VIII of IX, SCOU | Jacobs Engineering Group, Inc. | 1737 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol IX of IX, SCOU | Jacobs Engineering Group, Inc. | 1738 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol I of III, Appendices, SCOU | Jacobs Engineering Group, Inc. | 1739 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol II of III, Appendices, SCOU | Jacobs Engineering Group, Inc. | 1740 CD 7 |
| May 97 | RI/FS, Final Report, Part I, Vol III of III, Supplemental Appendices, SCOU | Jacobs Engineering Group, Inc. | 1741 CD 7 |
| May 97 | RI/FS, Final Baseline Human Health Risk Assessment, Part II, SCOU | Jacobs Engineering Group, Inc. | 1742 CD 7 |
| May 97 | RI/FS, Final Baseline Human Health Risk Assessment, Part II, Appendices B, C, SCOU | Jacobs Engineering Group, Inc. | 1743 CD 8 |
| May 97 | RI/FS, Final Report, Part III, SCOU | Jacobs Engineering Group, Inc. | 1744 CD 7 |

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|---|---|---|---|
| May 97 | Jacobs Response to Agency Comments on RI/FS, Final Report, SCOU | Jacobs Engineering Group, Inc. | 1745 CD 7 |
| 05 May 97 | EPA Letter to Base Concerning Comments on Phase II, Draft Final Environmental Cleanup Plan | Hanusiak, Lisa EPA Region IX | 1426 CD 6 |
| 06 May 97 | EPA Letter to Base Concerning Public Comment Period for RA, Further Action Data Gap Sites and Requiring Technical and Economic Evaluations, SCOU | Hanusiak, Lisa EPA Region IX | 1637 CD 8 |
| 06 May 97 | Base Letter to AFCEE Concerning Response to Comments and Preface for RI/FS, Final Report, SCOU | Matthews, Robert R AFBCA/DB Castle | 1792 CD 9 |
| 07 May 97 | Base Letter to Regulators Concerning Response to Comments on Draft Final QAPP | Matthews, Robert R AFBCA/OL-I | 1499 CD 6 |
| 08 May 97 | RPM/TWG Meeting Minutes, 08 May 97 | Matthews, Robert R AFBCA/OL-I | 1369 CD 6 |
| 08 May 97 | Remediation Public Meeting Minutes, 08 May 97 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1370 CD 6 |
| 08 May 97 | Public Meeting Summary, Castle Vista Groundwater Remediation, 08 May 97 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1527 CD 6 |
| 14 May 97 | Base Letter to Distribution Concerning Response to Comments on Phase II, Draft Comprehensive Basewide Ecological Risk Assessment | Matthews, Robert R AFBCA/OL-I | 1623 CD 8 |
| 16 May 97 | Base Memorandum Concerning AM6 and AM17 Sampling Results | Lanning, Todd AFBCA/OL-I | 1601 CD 8 |

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|---|---|---|---|
| 16 May 97 | CRWQCB Letter to CDTSC Concerning Comments on RA, Draft Predesign Characterization Report for Groundwater, Castle Vista Landfill B | Russell, John<br>California Regional Water Quality Control Board | 1618<br>CD 8 |
| 19 May 97 | CDTSC Memorandum Concerning Review of Draft Predesign Characterization Report, Environmental Cleanup Plan, and FSP Addendum for Groundwater RA, Castle Vista Landfill B | Scruggs, Mary<br>California Department of Toxic Substances Control | 1617<br>CD 8 |
| 21 May 97 | EPA Letter to Base Concerning Draft Closure Certification Report, Vol III, UST and OWS Remediation Program | Hanusiak, Lisa<br>EPA Region IX | 1554<br>CD 8 |
| 21 May 97 | EPA Letter to Base Concerning ROD, Final, Comprehensive Basewide Groundwater, Part I | Opalski, Daniel D.<br>EPA Region IX | 1719<br>CD 6 |
| 24 May 97 | Newspaper Article, "Public Notice, Base Environmental Tour and RAB Meeting" | The Merced Sun Star | 1407<br>CD 6 |
| 28 May 97 | RAB Meeting Minutes, 28 May 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1405<br>CD 6 |
| 28 May 97 | RPM Meeting Minutes, 28 May 97 | Matthews, Robert R<br>AFBCA/OL-I | 1406<br>CD 6 |
| 28 May 97 | Proposed Plan, SCOU | AFBCA/OL-I | 1435<br>CD 6 |
| 28 May 97 | RA, Field Monitoring and Static Rebound | AFBCA/OL-I | 1579<br>CD 8 |

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|---|---|---|---|
| 29 May 97 | EPA Letter to Base Concerning Extension of FFA on Review of Draft Final Basic Contract QPP | Hanusiak, Lisa<br>EPA Region IX | 1429<br>CD 6 |
| Jun 97 | Fact Sheet, Enviro Fact Sheet, Edition 12 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1430<br>CD 6 |
| Jun 97 | Fact Sheet, Enviro Progress Newsletter, Edition 16 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1431<br>CD 6 |
| Jun 97 | Final Start-Up Letter Report, DA-8 | Jacobs Engineering Group, Inc. | 1438<br>CD 6 |
| Jun 97 | In Situ Respiration Test Report, FS-1 | Jacobs Engineering Group, Inc. | 1441<br>CD 6 |
| Jun 97 | Draft Report to Lawrence Livermore National Laboratory, Risk-Based Remediation of Petroleum, Oils, and Lubricants, Fuel Farm Area | Parsons Engineering Science, Inc. | 1443<br>CD 6 |
| Jun 97 | PFFA Intrinsic Remediation Sampling Report | Jacobs Engineering Group, Inc. | 1575<br>CD 8 |
| 03 Jun 97 | Action Memorandum, Removal Action, Castle Vista Landfills A and B, and Castle Airport Landfills 2 and 4 | Jacobs Engineering Group, Inc. | 1576<br>CD 8 |
| 05 Jun 97 | Base Letter to Regulators Concerning Use, Capping as Final Remedy for Metal and Dioxin Contaminated Soil, FTA-1 | Matthews, Robert R<br>AFBCA/OL-I | 1459<br>CD 6 |
| 05 Jun 97 | EPA Letter to Base Concerning Work Plan Addendum, Proposed Destruction of 20 Monitoring Wells | Hanusiak, Lisa<br>EPA Region IX | 1553<br>CD 8 |

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|---|---|---|---|
| 09 Jun 97 | Base Letter to AFCEE Concerning ROD, Final, Comprehensive Basewide Groundwater, Part I | Matthews, Robert R<br>AFBCA/OL-I | 1718<br>CD 6 |
| 11 Jun 97 | Base Letter to Regulators Concerning Response to Comments on RA, Design Letter Report, FT-001 | Matthews, Robert R<br>AFBCA/OL-I | 1452<br>CD 6 |
| 12 Jun 97 | Base Letter to Regulators Concerning Response to Comments on Demonstration Project Report, Fuel Spill 2 | Matthews, Robert R<br>AFBCA/OL-I | 1448<br>CD 6 |
| 12 Jun 97 | EPA Letter to Base Concerning Comments on Phase II, RA, Environmental Cleanup Plan, QPP Addenda | Hanusiak, Lisa<br>EPA Region IX | 1578<br>CD 8 |
| 16 Jun 97 | EPA Letter to Base Concerning Phase II, Comprehensive Basewide Ecological Risk Assessment | Hanusiak, Lisa<br>EPA Region IX | 1549<br>CD 8 |
| 17 Jun 97 | Base Letter to EPA Concerning State Request for Additional 30 Days to Review Castle Landfill Work Plan | Matthews, Robert R<br>AFBCA/OL-I | 1574<br>CD 8 |
| 19 Jun 97 | EPA Letter to Base Concerning Response to Comments on Draft SVE-Bioventing Transition Letter Report, Fuel Spill 1 | Hanusiak, Lisa<br>EPA Region IX | 1552<br>CD 8 |
| 24 Jun 97 | RAB Meeting Minutes, 24 Jun 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1408<br>CD 6 |
| 27 Jun 97 | Contractor Response to Base Comments on Risk Assessment, PCB-9 | Jacobs Engineering Group, Inc. | 2099<br>CD 11 |
| Jul 97 | LTM Sampling Plan, LF-34, OT-29, OT-30 | Jacobs Engineering Group, Inc. | 1054<br>CD 4 |

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|---|---|---|---|
| Jul 97 | Community Relations Plan (CRP), Aviation and Development Center | Gutierrez-Palmenberg, Inc. | 1409 CD 6 |
| Jul 97 | Fact Sheet, Enviro Progress Newsletter, Edition 17 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1446 CD 6 |
| 02 Jul 97 | CRWQCB Letter to CDTSC Concerning Comments on RA, Draft Project Activities Work Plan and QPP Addenda, Vol I, SCOU | Russell, John California Regional Water Quality Control Board | 1673 CD 8 |
| 02 Jul 97 | EPA Letter to Base Concerning RA, Draft Action Memorandum, Castle Vista Landfills A and B, Landfills 2 and 4 | Hanusiak, Lisa EPA Region IX | 1680 CD 8 |
| 03 Jul 97 | EPA Letter to Base Concerning Predesign Characterization Report and Environmental Cleanup Plan, QPP Addenda for Groundwater RA, Castle Vista Landfill B | Hanusiak, Lisa EPA Region IX | 1548 CD 8 |
| 03 Jul 97 | CRWQCB Letter to CDTSC and Base Concerning Comments on RA Project Activities Work Plan and QPP Addenda, Vol I, SCOU | Russell, John California Regional Water Quality Control Board | 1551 CD 8 |
| 07 Jul 97 | CDTSC Letter to Base Concerning Comments on RA Project Activities Work Plan and QPP Addenda, SCOU | Ghazi, Rizgar A California Department of Toxic Substances Control | 1550 CD 8 |
| 11 Jul 97 | EPA Letter to Base Concerning RA, Draft Final Proposed Plan, SCOU | Hanusiak, Lisa EPA Region IX | 1545 CD 8 |
| 11 Jul 97 | CDTSC Letter to Base Concerning Comments on Phase II, Draft Final Comprehensive Basewide Ecological Risk Assessment | Ghazi, Rizgar A California Department of Toxic Substances Control | 1716 CD 6 |

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|---|---|---|---|
| 14 Jul 97 | EPA Letter to Base Concerning Rational and Justification, Capping as Final Remedy for Metals and Dioxin Contaminated Soils, FTA-1 | Hanusiak, Lisa<br>EPA Region IX | 1451<br>CD 6 |
| 14 Jul 97 | EPA Letter to Base Concerning ROD, Preliminary Draft, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1546<br>CD 8 |
| 14 Jul 97 | EPA Letter to Base Concerning Final Response to Comments on Phase II, RA, Environmental Cleanup Plan, QPP Addenda | Hanusiak, Lisa<br>EPA Region IX | 1559<br>CD 8 |
| 14 Jul 97 | EPA Letter to Base Concerning Draft Closure Report, DA-4 | Hanusiak, Lisa<br>EPA Region IX | 1560<br>CD 8 |
| 15 Jul 97 | CRWQCB Letter to CDTSC Concerning RA, Action Memorandum, Castle Vista A and B, Landfills 2, 4 | Russell, John<br>California Regional Water Quality Control Board | 1655<br>CD 8 |
| 15 Jul 97 | CDTSC Letter to Base Concerning RA, Action Memorandum, Castle Vista B, Landfills 2 and 4 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1681<br>CD 8 |
| 17 Jul 97 | RPM Meeting Minutes, 25 Jun 97 | Matthews, Robert R<br>AFBCA/OL-I | 1410<br>CD 6 |
| 17 Jul 97 | CRWQCB Letter to CDTSC Concerning Review of Closure Report, DA-4 | Izzo, Victor J<br>California Regional Water Quality Control Board | 1793<br>CD 9 |
| 19 Jul 97 | Newspaper Article, "Public Notice, USAF Announces the Intent to Perform an Excavation at Castle Air Force Base, ETC-10" | The Merced Sun Star | 1411<br>CD 6 |

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|---|---|---|---|
| 22 Jul 97 | RAB Meeting Minutes, 22 Jul 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1475<br>CD 6 |
| 22 Jul 97 | USFWS Letter to Base Concerning Formal Consultation on the Former Skeet Range Remediation Project | White, Wayne S<br>US Fish and Wildlife Service | 1636<br>CD 8 |
| 22 Jul 97 | Jacobs Response to EPA Comments on RI/FS, Draft Final Report, SCOU | Jacobs Engineering Group, Inc. | 1713<br>CD 6 |
| 22 Jul 97 | CDTSC Letter to Base Concerning Comments on Closure Report, DA-4 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1794<br>CD 9 |
| 23 Jul 97 | RPM Meeting Minutes, 23 Jul 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1474<br>CD 6 |
| 24 Jul 97 | EPA Letter to Base Concerning Draft Final Basic Contract QPP | Hanusiak, Lisa<br>EPA Region IX | 1501<br>CD 6 |
| 28 Jul 97 | CDTSC Letter to Base Concerning Review of Draft Final Proposed Plan, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 2100<br>CD 11 |
| 30 Jul 97 | CDTSC Memorandum Concerning Comments on Draft Closure and Post-Closure Maintenance Plan, Landfills | Scruggs, Mary<br>California Department of Toxic Substances Control | 1555<br>CD 8 |
| 30 Jul 97 | EPA Letter to Base Concerning Draft Closure and Post-Closure Maintenance Plan, Landfills 2 and 4, Castle Vista Landfills A and B | Hanusiak, Lisa<br>EPA Region IX | 1678<br>CD 8 |
| Aug 97 | Phase II, Final Comprehensive Basewide, Ecological Risk Assessment Study | Jacobs Engineering Group, Inc. | 1436<br>CD 6 |

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| Aug 97 | Draft FSP, DA-8 | Jacobs Engineering Group, Inc. | 1439 CD 6 |
| Aug 97 | Fact Sheet, Enviro Fact Sheet, Edition 13 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1455 CD 6 |
| Aug 97 | Update Pages, Draft Final Closure and Post-Closure Maintenance Plan, Landfills 2, 4, Castle Vista A/B. LF-005, LF-007, LF-034 | Jacobs Engineering Group, Inc. | 2105 CD 11 |
| 02 Aug 97 | Press Release, Public Notice, USAF Announces a Public Meeting on the CAFB Landfill RA | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1412 CD 6 |
| 04 Aug 97 | EPA Letter to Base Concerning Addendum QPP, Plant Closures and Storm Drain System Cleanup | Hanusiak, Lisa EPA Region IX | 1557 CD 8 |
| 06 Aug 97 | Jacobs Response to Agency Comments on RA Project Activities Work Plan and QPP Addenda, Vol I, SCOU | Jacobs Engineering Group, Inc. | 1714 CD 6 |
| 07 Aug 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Draft Closure and Post-Closure Maintenance Plan, Landfills | Ghazi, Rizgar A California Department of Toxic Substances Control | 1675 CD 8 |
| 08 Aug 97 | Base Letter to Regulators Concerning Response to Comments on SVE-Bioventing Transition Letter Report, Fuel Spill 1 | Matthews, Robert R AFBCA/OL-I | 1447 CD 6 |
| 08 Aug 97 | EPA Letter to Base Concerning RA, Public Notice Landfill | Hanusiak, Lisa EPA Region IX | 1690 CD 8 |

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| 08 Aug 97 | CDTSC Letter to Base Concerning Comments on Justification Letter, Cap as Final Remedy for Metal and Dioxin Contaminated Soil, FTA-1 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1729<br>CD 6 |
| 09 Aug 97 | Newspaper Article, "Public Notice, USAF Announces a Public Meeting and Comment Period on the CAFB SCOU Proposed Plan" | The Merced Sun Star | 1433<br>CD 6 |
| 12 Aug 97 | Newspaper Article, "Public Notice, USAF Announces a Public Meeting on the Castle AFB Landfill RA" | The Merced Sun Star | 1434<br>CD 6 |
| 13 Aug 97 | Newspaper Article, "Base Cleanup Plan Outlined" | Jones, Gary L<br>The Merced Sun Star | 1487<br>CD 6 |
| 14 Aug 97 | Base Letter to Regulators Concerning RA, SCOU Project Activities Work Plan, QPP Addenda, Vol I and Closure and Post-Closure Maintenance Plan, Landfill 2, 4, and Castle Vista A/B, LF-005, LF-007, LF-034 | Matthews, Robert R<br>AFBCA/DD Castle | 2186<br>CD 11 |
| 15 Aug 97 | Newspaper Article, "Castle Joint Power Authority Challenges Air Force to Clean Mess" | Jones, Gary L<br>The Merced Sun Star | 1486<br>CD 6 |
| 15 Aug 97 | Superfund Site, Proposed Plan, SCOU | Waste Policy Institute | 1585<br>CD 7 |
| 16 Aug 97 | Newspaper Article, "Time to Unearth Castle Cover-up" | The Merced Sun Star | 1485<br>CD 6 |
| 19 Aug 97 | Newspaper Article, "Castle Cleanup Plan Finished" | White, Bob<br>The Modesto Bee | 1484<br>CD 6 |

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| 19 Aug 97 | EPA Letter to Base Concerning RA, Action Memorandum, Castle Vista Landfills A and B, Landfills 2 and 4 | Hanusiak, Lisa<br>EPA Region IX | 1679<br>CD 8 |
| 19 Aug 97 | Project Note 10, Data Gap Soil Gas Survey, LF-4 | Jacobs Engineering Group, Inc. | 2102<br>CD 11 |
| 20 Aug 97 | Base Letter Concerning FFA Schedule, CB Part II, SCOU | Matthews, Robert R<br>AFBCA/OL-I | 1612<br>CD 8 |
| 22 Aug 97 | Base Letter to Regulators Concerning Response to Comments on Rational and Justification for Capping as Final Remedy for Metal and Dioxin Contaminated Soil, FTA-1 | Matthews, Robert R<br>AFBCA/OL-I | 1450<br>CD 6 |
| 22 Aug 97 | Newspaper Article, "Air Force to Move Landfill" | White, Bob<br>The Modesto Bee | 1480<br>CD 6 |
| 22 Aug 97 | Newspaper Article, "Air Force Will Clean Up Castle Landfill" | Jones, Gary L<br>The Merced Sun Star | 1481<br>CD 6 |
| 22 Aug 97 | CDTSC Letter to Base Concerning CRWQCB Comments on RA, Draft Final Action Memorandum, Castle Vista A and B, Landfills 2 and 4 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1682<br>CD 8 |
| 25 Aug 97 | Newspaper Article, "Castle Cleanup Topic of Hearing" | Jones, Gary L<br>The Merced Sun Star | 1476<br>CD 6 |
| 25 Aug 97 | MDPH Letter to Base Concerning Comments on the Proposed Cleanup of Soil Contamination | Palsgaard, Jeff H<br>Merced County Department of Public Health | 1508<br>CD 6 |
| 26 Aug 97 | RAB Meeting Minutes, 26 Aug 97 | Gutierrez-Palmenberg, Inc. | 1471<br>CD 6 |

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|---|---|---|---|
| 26 Aug 97 | Public Meeting Transcript, Proposed Plan, SCOU, 26 Aug 97 | Barakatt, Sherrie L<br>Barakatt Reporting Service | 1523<br>CD 6 |
| 26 Aug 97 | Public Meeting Transcript, Proposed Plan, SCOU, 26 Aug 97 | Barakatt, Sherrie L<br>Barakatt Reporting Service | 1524<br>CD 6 |
| 26 Aug 97 | Public Meeting Transcript, Landfill Removal Actions, 26 Aug 97 | Barakatt, Sherrie L<br>Barakatt Reporting Service | 1525<br>CD 6 |
| 26 Aug 97 | Public Meeting Transcript, Landfill Removal Actions, 26 Aug 97 | Barakatt, Sherrie L<br>Barakatt Reporting Service | 1526<br>CD 6 |
| 27 Aug 97 | RPM Meeting Minutes, 27 Aug 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1470<br>CD 6 |
| 27 Aug 97 | Newspaper Article, "Public Wants Complete Cleanup of Castle" | Jones, Gary L<br>The Merced Sun Star | 1477<br>CD 6 |
| 27 Aug 97 | Newspaper Article, "Castle Cleanup Draws Protest" | White, Bob<br>The Modesto Bee | 1479<br>CD 6 |
| 28 Aug 97 | EPA Letter to Base Concerning Public Notification and Distribution of Proposed Plan, SCOU | Hanusiak, Lisa<br>Ghazi, Rizgar A<br>EPA Region IX<br>California Department of Toxic Substances Control | 1456<br>CD 6 |
| 28 Aug 97 | Newspaper Article, "Light Shed on Landfill Questions" | Jones, Gary L<br>The Merced Sun Star | 1478<br>CD 6 |
| 28 Aug 97 | Base Letter to Distribution Concerning Final Response to Comments on Draft Final Basic Contract QPP | Matthews, Robert R<br>AFBCA/OL-I | 1621<br>CD 8 |

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|---|---|---|---|
| Sep 97 | Fact Sheet, Enviro Progress Newsletter, Edition 18 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1457<br>CD 6 |
| 02 Sep 97 | EPA Letter to Base Concerning RA, Action Memorandum, PCB Site 9 | Hanusiak, Lisa<br>EPA Region IX | 1720<br>CD 6 |
| 04 Sep 97 | Base Letter to Regulators Concerning Modifications to Landfill 4 Design, LF-007 | Matthews, Robert R<br>AFBCA/DB Castle | 1795<br>CD 9 |
| 09 Sep 97 | EPA Letter to Base Concerning Draft FSP, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1562<br>CD 8 |
| 11 Sep 97 | EPA Letter to Base Concerning Remedial Project Activities Draft Final Work Plan and QPP Addenda, Vol I, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1672<br>CD 8 |
| 11 Sep 97 | EPA Letter to Base Concerning Draft Final Closure and Post-Closure Maintenance Plan, Landfills 2, 4, and Castle Vista A/B | Hanusiak, Lisa<br>EPA Region IX | 1677<br>CD 8 |
| 11 Sep 97 | EPA Letter to Base Concerning Draft Final Closure and Post-Closure Maintenance Plan, Landfills 2 and 4, Castle Vista Landfills A and B | Hanusiak, Lisa<br>EPA Region IX | 1710<br>CD 6 |
| 12 Sep 97 | Newspaper Article, "Joint Power Authority Tussles With EPA Over Cleanup" | Jones, Gary L<br>The Merced Sun Star | 1473<br>CD 6 |
| 15 Sep 97 | Project Note 11, Monitoring Report, FS-1 | Jacobs Engineering Group, Inc. | 1449<br>CD 6 |
| 15 Sep 97 | CRWQCB Letter to CDTSC Concerning Comments on Draft Final Landfill Work Plan and Closure, Post-Closure Maintenance Plan, SCOU | Russell, John<br>California Regional Water Quality Control Board | 1676<br>CD 8 |

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|---|---|---|---|
| 17 Sep 97 | AFBCA Memorandum Concerning Responsibility for Additional Environmental Cleanup After Transfer of Real Property | Smith, John<br>AFBCA/EVS | 1594<br>CD 8 |
| 18 Sep 97 | EPA E-mail to Jacobs Concerning Example DQO Table, Bldg 1325 | Hanusiak, Lisa<br>EPA Region IX | 1580<br>CD 8 |
| 18 Sep 97 | EPA Letter to Base Concerning Response to Comments on RA, Design Letter Report, FT-001 | Hanusiak, Lisa<br>EPA Region IX | 1722<br>CD 6 |
| 19 Sep 97 | EPA Letter to Base Concerning Response to Comments on Draft Final Predesign Characterization Report, Environmental Cleanup Plan, QPP Addenda, Groundwater RA, Castle Vista Landfill B | Hanusiak, Lisa<br>EPA Region IX | 1723<br>CD 6 |
| 20 Sep 97 | Newspaper Article, "Public Notice, Castle RAB Meets Tuesday" | The Merced Sun Star | 1467<br>CD 6 |
| 20 Sep 97 | Newspaper Article, "Public Notice, USAF Announces an Extension to the Public Comment Period for the SCOU Proposed Plan" | The Merced Sun Star | 1643<br>CD 8 |
| 22 Sep 97 | City of Atwater Letter to Base Concerning Proposed Plan, SCOU | DeVoe, Kenneth<br>City of Atwater | 1469<br>CD 6 |
| 22 Sep 97 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on RA, Draft Final Project Activities Work Plan and QPP Addenda and Closure and Post-Closure Maintenance Plan, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1674<br>CD 8 |
| 23 Sep 97 | RAB Meeting Minutes, 23 Sep 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1466<br>CD 6 |

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|---|---|---|---|
| 23 Sep 97 | Master Program Schedule, Sep Updates | Jacobs Engineering Group, Inc. | 1609<br>CD 8 |
| 23 Sep 97 | Newspaper Article, "Bill Seeks Better Base Conversions" | The Merced Sun Star | 1652<br>CD 8 |
| 23 Sep 97 | Base Letter to AFCEE Concerning Response to EPA Comments on RI/FS, Comprehensive Basewide Draft Report, Part II | Matthews, Robert R<br>AFBCA/OL-I | 1715<br>CD 6 |
| 24 Sep 97 | RPM Meeting Minutes, 24 Sep 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1464<br>CD 6 |
| 24 Sep 97 | Newspaper Article, "Castle Cleanup 'Stinks'" | Jones, Gary L<br>The Merced Sun Star | 1472<br>CD 6 |
| 24 Sep 97 | Draft Agenda for Hydrocarbon Cleanup Demonstration Program Expert Committee Site Visit | AFBCA/OL-I | 1598<br>CD 8 |
| 24 Sep 97 | Base Letter to AFCEE Concerning ROD Outline, SCOU | Matthews, Robert R<br>AFBCA/OL-I | 1703<br>CD 6 |
| 24 Sep 97 | Base Letter to AFCEE Concerning RA, Draft Objectives, SCOU | Matthews, Robert R<br>AFBCA/OL-I | 1704<br>CD 6 |
| 25 Sep 97 | Newspaper Article, "Garbage Dump is Likely to Stay at Castle" | White, Bob<br>The Modesto Bee | 1653<br>CD 8 |
| 29 Sep 97 | EPA Letter to Base Concerning Draft FSP, DA-8 | Hanusiak, Lisa<br>EPA Region IX | 1502<br>CD 6 |

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|---|---|---|---|
| 29 Sep 97 | CDTSC Letter to Base Concerning RI/FS, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1712<br>CD 6 |
| Oct 97 | Final FSP, SCOU | Jacobs Engineering Group, Inc. | 1053<br>CD 4 |
| Oct 97 | RA, Final Groundwater Predesign Characterization Report, Part I, Environmental Clean-Up Plan, Part II, LF-34 | Jacobs Engineering Group, Inc. | 1188<br>CD 6 |
| Oct 97 | Fact Sheet, Enviro Fact Sheet, Edition 14 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1458<br>CD 6 |
| 01 Oct 97 | CDTSC Memorandum Concerning Review of Draft FSP, SCOU | Scruggs, Mary<br>California Department of Toxic Substances Control | 1625<br>CD 8 |
| 01 Oct 97 | Project Note 19, Data Gap Sampling Results, Landfills 1, 3, 4, and 5 | Jacobs Engineering Group, Inc. | 2103<br>CD 11 |
| 06 Oct 97 | CRWQCB Letter to Base Concerning Draft Final Addendum Work Plan, Storm Drain | Russell, John<br>California Regional Water Quality Control Board | 1596<br>CD 8 |
| 08 Oct 97 | Base Letter to Regulators Concerning Response to Comments on SCOU RA Project Activities Work Plan and Quality Program Plan Addenda, Vol I and Update Pages, Closure and Post-Closure Maintenance Plan | Matthews, Robert R<br>AFBCA/OL-I | 2104<br>CD 11 |
| 15 Oct 97 | Jacobs Letter to AFCEE Concerning Response to Regulator Comments on Draft FSP, SCOU | Batra, Roger<br>Jacobs Engineering Group, Inc. | 1460<br>CD 6 |

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|---|---|---|---|
| 15 Oct 97 | Jacobs Letter to AFCEE Concerning Response to Agency Comments on Draft FSP, SCOU | Batra, Roger<br>Jacobs Engineering Group, Inc. | 1539<br>CD 8 |
| 15 Oct 97 | Recommendations for Disposition of ERA Sites | Sjaarda, Nick<br>Jacobs Engineering Group, Inc. | 1543<br>CD 8 |
| 17 Oct 97 | Base Letter to Regulators Concerning Appendix to RA Project Activities Work Plan and QPP Addenda, Vol I, SCOU | Matthews, Robert R<br>AFBCA/OL-I | 1489<br>CD 6 |
| 20 Oct 97 | EPA Letter to Base Concerning Ecorisk-Based RA, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1582<br>CD 8 |
| 20 Oct 97 | Jacobs Letter to AFCEE Concerning Submittal of Table 8-8 for Draft Final Closure and Post Closure Maintenance Plan for Landfills | Loftin, Dean<br>Jacobs Engineering Group, Inc. | 1796<br>CD 9 |
| 20 Oct 97 | Base Letter to Regulators Concerning Data Gap Sampling Results for Landfills 1, 3, 4, 5 | Matthews, Robert R<br>AFBCA/DB Castle | 1797<br>CD 9 |
| 25 Oct 97 | Newspaper Article, "Public Notice, Castle RAB Meets Tuesday" | The Merced Sun Star | 1468<br>CD 6 |
| 28 Oct 97 | RAB Meeting Minutes, 28 Oct 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1445<br>CD 6 |
| 29 Oct 97 | RPM Meeting Minutes, 29 Oct 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1461<br>CD 6 |
| 29 Oct 97 | Base Letter to Distribution Concerning FFA Schedule | Matthews, Robert R<br>AFBCA/OL-I | 1611<br>CD 8 |

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|---|---|---|---|
| 30 Oct 97 | Newspaper Article, "Board Critical of Air Force, EPA Efforts" | Jones, Gary L<br>The Merced Sun Star | 1465<br>CD 6 |
| 30 Oct 97 | EPA Letter to Base Concerning Response to Comments on Draft Final Basic Contract QPP | Hanusiak, Lisa<br>EPA Region IX | 1563<br>CD 8 |
| Nov 97 | Fact Sheet, Enviro Progress Newsletter, Edition 19 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1482<br>CD 6 |
| 04 Nov 97 | USFWS Letter to Bureau of Prisons Concerning Formal Consultation on Penitentiary and Landfill Remediation Project | White, Wayne S.<br>US Fish and Wildlife Service | 1544<br>CD 8 |
| 05 Nov 97 | Base Letter to Regulators Concerning Soil Gas Data, DA-8 | Matthews, Robert R<br>AFBCA/OL-I | 1498<br>CD 6 |
| 06 Nov 97 | Community Relations Meeting Notes, 06 Nov 97 | Geissinger, Linda<br>AFBCA/DM | 1592<br>CD 8 |
| 10 Nov 97 | EPA Letter to Base Concerning Final Groundwater Treatment System O&M Plan, OU-2 | Hanusiak, Lisa<br>EPA Region IX | 1613<br>CD 8 |
| 12 Nov 97 | Bureau of Prisons Letter to Base Concerning Environmental Mitigation, Parcel B | Dorworth, David J<br>Federal Bureau of Prisons | 1512<br>CD 6 |
| 12 Nov 97 | EPA Letter to Base Concerning Draft Final O&M Plan, Castle Vista Landfill | Hanusiak, Lisa<br>EPA Region IX | 1616<br>CD 8 |
| 12 Nov 97 | EPA Letter to Base Concerning RA, Elements of Initial Five-Year Review, OU-1 | Hanusiak, Lisa<br>EPA Region IX | 1620<br>CD 8 |

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|---|---|---|---|
| 12 Nov 97 | EPA Letter to Base Concerning Phase II, RA, Draft Final O&M Plan | Hanusiak, Lisa<br>EPA Region IX | 1624<br>CD 8 |
| 13 Nov 97 | Newspaper Article, "Air Force Continues Clean-up at Castle Vista" | Paulson, Michelle<br>The Atwater New Times | 1463<br>CD 6 |
| 13 Nov 97 | Base Letter to CRWQCB Concerning Foundation Material, Landfill 4 | Matthews, Robert R<br>AFBCA/OL-I | 1513<br>CD 6 |
| 13 Nov 97 | Agency Review Minutes, On-Site Mitigation Proposal, 13 Nov 97 | Louis Berger & Associates, Inc. | 1606<br>CD 8 |
| 14 Nov 97 | Draft Final Airport PFFA Site Assessment Review Letter Report | AFBCA/OL-I | 1514<br>CD 6 |
| 14 Nov 97 | LLNL Letter to Base Concerning Draft Final Assessment, Adequacy of Available Site Characterization Data of Risk-Based Corrective Action, POL Fuel Farm Area | Rice, David W<br>Lawrence Livermore National Laboratory | 1702<br>CD 6 |
| 18 Nov 97 | RPM Meeting Minutes, 18 Nov 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1521<br>CD 6 |
| 19 Nov 97 | Newspaper Article, "Castle Clean-up a Puzzle" | White, Bob<br>The Modesto Bee | 1462<br>CD 6 |
| 19 Nov 97 | Data Gap Spreadsheet, RI/FS, Revised Draft Final, SCOU | Jacobs Engineering Group, Inc. | 1515<br>CD 6 |
| 20 Nov 97 | EPA Letter to Base Concerning Changes to ROD, Comprehensive Basewide Part I, Groundwater | Hanusiak, Lisa<br>EPA Region IX | 1605<br>CD 8 |

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|---|---|---|---|
| 22 Nov 97 | Newspaper Article, "Citizens of Atwater, Winton, Merced: The Castle RAB Meets Tuesday" | The Merced Sun Star | 1644 CD 8 |
| 25 Nov 97 | RAB Meeting Minutes, 25 Nov 97 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1522 CD 6 |
| 26 Nov 97 | Newspaper Article, "Castle RAB Meets" | The Atwater Signal | 1444 CD 6 |
| Dec 97 | Fact Sheet, Enviro Fact Sheet, Edition 15 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1483 CD 6 |
| Dec 97 | Draft Closure Report, FS-2 | Jacobs Engineering Group, Inc. | 1516 CD 6 |
| Dec 97 | Draft Closure Report, FS-1 | Jacobs Engineering Group, Inc. | 1517 CD 6 |
| Dec 97 | Final Bioventing Pilot Test Work Plan, PFFA | Parsons Engineering Science, Inc. | 1518 CD 6 |
| Dec 97 | Final Basic Contract QPP | Jacobs Engineering Group, Inc. | 1534 CD 6 |
| Dec 97 | Newspaper Article, "Revised Public Notice, Castle AFB Superfund Site Technical Assistance Grant" | The Merced Sun Star | 1645 CD 8 |
| 01 Dec 97 | EPA Letter to US Representative Concerning RAB Issues on Community Involvement | Marcus, Felicia EPA Region IX | 1492 CD 6 |

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|---|---|---|---|
| 01 Dec 97 | EPA Letter to Base Concerning RA, Draft Groundwater Work Plan Addendum, Castle Vista Landfill B | Hanusiak, Lisa<br>EPA Region IX | 1615<br>CD 8 |
| 03 Dec 97 | EPA Letter to Base Concerning Project Note No. 017, Elimination of Redundant Monitoring Wells | Hanusiak, Lisa<br>EPA Region IX | 1610<br>CD 8 |
| 05 Dec 97 | EPA Letter to Base Concerning Field Oversight Sampling Report for Landfill B | Hanusiak, Lisa<br>EPA Region IX | 1798<br>CD 9 |
| 05 Dec 97 | EPA Letter to Base Concerning Recommendation for Ecological Risk Management and Removal Action Completion, ETC-10, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1800<br>CD 9 |
| 08 Dec 97 | Base Letter to Regulators Concerning SVE Well Destruction, DA-4 | Matthews, Robert R<br>AFBCA/OL-I | 1493<br>CD 6 |
| 08 Dec 97 | Jacobs Letter to AFCEE Concerning Response to Comments on RA, Draft Objectives, SCOU | Watkin, Geoff W<br>Jacobs Engineering Group, Inc. | 1726<br>CD 6 |
| 09 Dec 97 | Final Site Characterization Letter Report, SD-193 | Jacobs Engineering Group, Inc. | 1520<br>CD 6 |
| 09 Dec 97 | RPM Meeting Minutes, 09 Dec 97 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1530<br>CD 6 |
| 10 Dec 97 | Update Pages, RA, Draft Final Appendix to Project Activities Work Plan and QPP Addenda, Vol I, SCOU | Jacobs Engineering Group, Inc. | 1490<br>CD 6 |
| 10 Dec 97 | Base Letter to Regulators Concerning Final Basic Contract Quality Program Plan | Matthews, Robert R<br>AFBCA/DD Castle | 1801<br>CD 9 |

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| 22 Dec 97 | Final Field Sampling Oversight Report, Landfill B | Bechtel Environmental, Inc. | 1799 CD 9 |
| 22 Dec 97 | Field Sampling Oversight Report | Bechtel Environmental, Inc. | 1804 CD 9 |
| Jan 98 | Fact Sheet, Enviro Progress Newsletter, Edition 20 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1496 CD 6 |
| Jan 98 | Final BRAC Cleanup Plan (BCP) | Earth Tech, Inc | 1536 CD 6 |
| Jan 98 | LTM Sampling Program, 97 Annual Report | Jacobs Engineering Group, Inc. | 1537 CD 6 |
| 05 Jan 98 | CDTSC Letter to Base Concerning ROD, Draft, SCOU | Ghazi, Rizgar A California Department of Toxic Substances Control | 1500 CD 6 |
| 05 Jan 98 | HQ USEPA Letter to EPA Region IX Concerning Role of Baseline Risk Assessment in Superfund Remedy Selection Decisions | Clay, Donald R HQ USEPA | 1802 CD 9 |
| 09 Jan 98 | CDTSC Letter to Base Concerning Requirements for Risk Standards, SCOU | Ward, Daniel T California Department of Toxic Substances Control | 1780 CD 9 |
| 09 Jan 98 | Base Letter to CRWQCB Concerning Closure Report, DA-4 | Matthews, Robert R AFBCA/DD Castle | 1782 CD 9 |
| 09 Jan 98 | RA, Mid-Term Assessment Report, FT-001 | Jacobs Engineering Group, Inc. | 1932 CD 10 |

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|---|---|---|---|
| 12 Jan 98 | EPA Letter to Base Concerning Comments on LTM Sampling QAPP | Hanusiak, Lisa<br>EPA Region IX | 1503<br>CD 6 |
| 21 Jan 98 | EPA Letter to Base Concerning Action Memorandum, RA for PCB | Hanusiak, Lisa<br>EPA Region IX | 1491<br>CD 6 |
| 23 Jan 98 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on RA, Draft Groundwater Work Plan Addendum, LF-34 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1509<br>CD 6 |
| 23 Jan 98 | EPA Letter to Base Concerning ROD, Draft, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1727<br>CD 6 |
| 24 Jan 98 | Newspaper Article, "Public Notice, RAB Meeting" | The Merced Sun Star | 1531<br>CD 6 |
| 26 Jan 98 | EPA Letter to Base Concerning Comments on Final Basic Contract QPP | Hanusiak, Lisa<br>EPA Region IX | 1510<br>CD 6 |
| 27 Jan 98 | RAB Meeting Minutes, 27 Jan 98 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1533<br>CD 6 |
| 28 Jan 98 | Newspaper Article, "Public Notice, RA at PCB-9" | The Merced Sun Star | 1519<br>CD 6 |
| 28 Jan 98 | RPM Meeting Minutes, 28 Jan 98 | Gutierrez-Palmenberg, Inc. | 1532<br>CD 6 |
| Feb 98 | Draft Closure Report, Final Remedy for Non-VOC Contamination, Vol I, FTA-1 | Jacobs Engineering Group, Inc. | 1535<br>CD 6 |
| Feb 98 | Fact Sheet, Enviro Fact Sheet, Edition 16 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1540<br>CD 8 |

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|---|---|---|---|
| Feb 98 | Draft Final Closure Report, DA-4 | Jacobs Engineering Group, Inc. | 1758 CD 9 |
| 02 Feb 98 | EPA Letter to Base Concerning Draft Closure Report, Fuel Spill 2 | Hanusiak, Lisa EPA Region IX | 1494 CD 6 |
| 02 Feb 98 | EPA Letter to Base Concerning Draft Closure Report, Fuel Spill 1 | Hanusiak, Lisa EPA Region IX | 1495 CD 6 |
| 05 Feb 98 | CDTSC Letter to Base Concerning Comments on ROD, Draft, SCOU | Ghazi, Rizgar A California Department of Toxic Substances Control | 1728 CD 6 |
| 06 Feb 98 | Action Memorandum, Removal Action for PCB, Site 9 | Jacobs Engineering Group, Inc. | 1803 CD 9 |
| 10 Feb 98 | Base Letter to Regulators Concerning Basic Contract QPP | Matthews, Robert R AFBCA/DD Castle | 1488 CD 6 |
| 12 Feb 98 | Base Letter to Distribution Concerning Response to Comments on ROD, Draft, SCOU | Matthews, Robert R AFBCA/DD Castle | 1541 CD 8 |
| 17 Feb 98 | EPA Letter to Base Concerning Phase III, Part I, Planned Groundwater Model Update | Hanusiak, Lisa EPA Region IX | 1542 CD 8 |
| 20 Feb 98 | CRWQCB Letter to Base Concerning Comments on Closure Report, FS-1, SS-017 | Russell, John California Regional Water Quality Control Board | 1529 CD 6 |
| 21 Feb 98 | Newspaper Article, "RAB Meeting Public Notice" | The Merced Sun Star | 1497 CD 6 |

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| 24 Feb 98 | RAB Meeting Minutes, 24 Feb 98 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1564<br>CD 8 |
| 25 Feb 98 | RPM Meeting Minutes, 25 Feb 98 | Gutierrez-Palmenberg, Inc. | 1538<br>CD 8 |
| Mar 98 | Fact Sheet, Enviro Progress Newsletter, Edition 21 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1556<br>CD 8 |
| 09 Mar 98 | Regulators Letter to Base Concerning Response to Request for a ROD, Second Draft, SCOU | Hanusiak, Lisa<br>Ghazi, Rizgar A<br>Russell, John<br>EPA Region IX<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 1709<br>CD 6 |
| 10 Mar 98 | CDTSC Letter to Base Concerning Comments on Draft Final Closure Report, DA-4 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1717<br>CD 6 |
| 10 Mar 98 | CRWQCB Letter to CDTSC Concerning Comments on Draft Final Closure Report, DA-4 | Russell, John<br>California Regional Water Quality Control Board | 1805<br>CD 9 |
| 10 Mar 98 | EPA Letter to Base Concerning Draft Final Closure Report, DA-4 | Hanusiak, Lisa<br>EPA Region IX | 2107<br>CD 11 |
| 21 Mar 98 | Newspaper Article, "Public Notice, Castle RAB Meets" | The Merced Sun Star | 1567<br>CD 8 |
| 24 Mar 98 | Newspaper Article, "Castle RAB Meets" | The Merced Sun Star | 1566<br>CD 8 |

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| 24 Mar 98 | RAB Meeting Minutes, 24 Mar 98 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1591<br>CD 8 |
| 25 Mar 98 | RPM Meeting Minutes, 25 Mar 98 | Gutierrez-Palmenberg, Inc. | 1588<br>CD 8 |
| 25 Mar 98 | Consensus Statement on Process to Resolve, DA-4 | Tier I Team | 2108<br>CD 11 |
| 27 Mar 98 | Newspaper Article, "Storms Delay Castle Cleanup" | Jones, Gary L<br>The Merced Sun Star | 1565<br>CD 8 |
| 30 Mar 98 | EPA Letter to Base Concerning Comments on Draft Final LTM Sampling QAPP Addendum | Hanusiak, Lisa<br>EPA Region IX | 1561<br>CD 8 |
| Apr 98 | Final LTM Sampling Program, QAPP Addendum | Jacobs Engineering Group, Inc. | 1119<br>CD 5 |
| Apr 98 | Update Pages, Final Closure Report, DA-4 | Jacobs Engineering Group, Inc. | 1511<br>CD 6 |
| Apr 98 | Fact Sheet, Enviro Fact Sheet, Edition 17 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1568<br>CD 8 |
| Apr 98 | CDTSC Comments on Draft Data Gap Investigation Report, SCOU | California Department of Toxic Substances Control | 1760<br>CD 9 |
| Apr 98 | Preservation Area Mitigation and Management Plan, USP | Louis Berger & Associates, Inc. | 2109<br>CD 11 |
| 01 Apr 98 | Newspaper Article, "RAB Calls for Wastewater Structure Removal" | The Atwater Signal | 1590<br>CD 8 |

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|---|---|---|---|
| 06 Apr 98 | Base Letter to CDTSC and CRWQCB Concerning Closure Report, SD-12 | Matthews, Robert R<br>AFBCA/DD Castle | 1570<br>CD 8 |
| 08 Apr 98 | Consensus Statement Meeting Minutes, 08 Apr 98 | Tier I Team | 2110<br>CD 11 |
| 10 Apr 98 | EPA Letter to Base Concerning Comments on Data Gap Investigation Draft Report, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1571<br>CD 8 |
| 10 Apr 98 | EPA Letter to Base Concerning FS, Draft Closure Report, Vol I, FT-001 | Hanusiak, Lisa<br>EPA Region IX | 1721<br>CD 6 |
| 10 Apr 98 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on FFS/Closure Report, FT-001 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1806<br>CD 9 |
| 13 Apr 98 | CRWQCB Letter to CDTSC Concerning Comments on Data Gap Investigation Draft Report, SCOU | Russell, John<br>California Regional Water Quality Control Board | 1572<br>CD 8 |
| 14 Apr 98 | Base Letter to Regulators Concerning Reschedule of ROD, Draft Final, SCOU | Matthews, Robert R<br>AFBCA/DD Castle | 1686<br>CD 8 |
| 22 Apr 98 | EPA Letter to Base Concerning Landfill Corrective Action Plan, Field Oversight Sampling Report, Castle Vista Landfill B | Hanusiak, Lisa<br>EPA Region IX | 1711<br>CD 6 |
| 23 Apr 98 | EPA Letter to Base Concerning Draft CRP | Hanusiak, Lisa<br>EPA Region IX | 1724<br>CD 6 |
| 25 Apr 98 | Newspaper Article, "Citizens of Merced County: The Castle RAB Meets Tuesday" | The Merced Sun Star | 1646<br>CD 8 |

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| 27 Apr 98 | Newspaper Article, "Castle Cleanup Group Meets" | The Merced Sun Star | 1589 CD 8 |
| 28 Apr 98 | RAB Meeting Minutes, 28 Apr 98 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1587 CD 8 |
| May 98 | Fact Sheet, Enviro Progress Newsletter, Edition 22 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1583 CD 8 |
| May 98 | Jacobs Response to EPA Comments on Draft Data Gap Investigation Report, SCOU | Jacobs Engineering Group, Inc. | 1687 CD 8 |
| 16 May 98 | Newspaper Article, "Public Meeting the USAF Invites You to Review and Comment on the Remedies for the Cleanup of Contaminated Soil at the Former Castle AFB" | The Merced Sun Star | 1647 CD 8 |
| 18 May 98 | EPA Letter to Base Concerning LTM Sampling, QAPP Addendum | Hanusiak, Lisa EPA Region IX | 1593 CD 8 |
| 18 May 98 | EPA Letter to Base Concerning Documentation of RA Completion, OT-30, SD-12 | Hanusiak, Lisa EPA Region IX | 1597 CD 8 |
| 19 May 98 | Jacobs Letter to EPA Concerning Comments on ROD, Draft, SCOU | Matin, Amir Jacobs Engineering Group, Inc. | 1581 CD 8 |
| 20 May 98 | ROD Public Meeting Minutes, 20 May 98, SCOU | Gutierrez-Palmenberg, Inc. | 1669 CD 8 |
| 21 May 98 | RPM Meeting Minutes, 21 May 98 | Gutierrez-Palmenberg, Inc. | 1668 CD 8 |

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| DOC. DATE | SUBJECT OR TITLE | AUTHOR or CORP. AUTHOR | FILE/CD NUMBER |
|---|---|---|---|
| Jun 98 | ROD, Version III, SCOU | Waste Policy Institute | 1113 CD 4 |
| Jun 98 | Fact Sheet, Enviro Fact Sheet, Edition 18 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1599 CD 8 |
| Jun 98 | EPA Comments on ROD, Version III, SCOU | EPA Region IX | 1602 CD 8 |
| Jun 98 | Final Data Gap Investigation Report, DA-8, SCOU | Jacobs Engineering Group, Inc. | 1700 CD 8 |
| 01 Jun 98 | EPA Letter to Base Concerning Comments on RA, Draft Final Groundwater Work Plan Addendum, LF-34 | Hanusiak, Lisa EPA Region IX | 1604 CD 8 |
| 12 Jun 98 | EPA Letter to Base Concerning Comments on LTM Sampling, Annual and Semiannual Reports | Hanusiak, Lisa EPA Region IX | 1607 CD 8 |
| 13 Jun 98 | Newspaper Article, "Castle Environmental Cleanup Tour, The AFBCA Invites the Public to Take a Tour of the Environmental Sites Being Restored" | The Merced Sun Star | 1648 CD 8 |
| 15 Jun 98 | Newspaper Article, "Agency Holds Cleanup Tour" | The Merced Sun Star | 1584 CD 8 |
| 16 Jun 98 | RAB Meeting Minutes, 16 Jun 98 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1670 CD 8 |

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|---|---|---|---|
| 22 Jun 98 | CDTSC and CRWQCB Letter to Base Concerning Closure Status, SD-12 | Ward, Daniel T<br>Vorster, Antonia K J<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 1635<br>CD 8 |
| 30 Jun 98 | RPM Meeting Minutes, 30 Jun 98 | Gutierrez-Palmenberg, Inc. | 1667<br>CD 8 |
| Jul 98 | LTM Sampling Program, 98 Semiannual Report | Jacobs Engineering Group, Inc. | 1671<br>CD 8 |
| Jul 98 | SVE Design Report, Castle Vista Landfill B | Jacobs Engineering Group, Inc. | 1693<br>CD 8 |
| Jul 98 | Fact Sheet, Enviro Progress Newsletter, Edition 23 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1694<br>CD 8 |
| Jul 98 | RA, Data Gap Investigation Draft Final Report, Vol II of II, SCOU | Jacobs Engineering Group, Inc. | 1924<br>CD 9 |
| 08 Jul 98 | Newspaper Article, "Base Hit: Castle Prospers in Post-Air Force Days" | Barnes, Brooks<br>The Wall Street Journal | 1657<br>CD 8 |
| 09 Jul 98 | TWG Meeting Minutes, 07 Jul 98 | Hoge, John<br>Jacobs Engineering Group Inc | 1933<br>CD 10 |
| 10 Jul 98 | EPA Letter to Base Concerning Remedial Decisions, SCOU, PCB Sites | Hanusiak, Lisa<br>EPA Region IX | 1705<br>CD 6 |
| 15 Jul 98 | EPA Comments on ROD, Version III, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1701<br>CD 8 |

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| 21 Jul 98 | EPA Comments on ROD, Version III, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1706<br>CD 6 |
| 23 Jul 98 | EPA Comments on ROD, Version III, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1707<br>CD 6 |
| 24 Jul 98 | EPA Comments on ROD Version III, Second Set, SCOU | EPA Region IX | 1746<br>CD 7 |
| 25 Jul 98 | Newspaper Article, "Attention: The Castle RAB Meets Tuesday" | The Merced Sun Star | 1649<br>CD 8 |
| 27 Jul 98 | EPA Comments on ROD, Version III, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1708<br>CD 6 |
| 28 Jul 98 | RPM/TWG Meeting Minutes, 28 Jul 98 | Gutierrez-Palmenberg, Inc. | 1664<br>CD 8 |
| 28 Jul 98 | RAB Meeting Minutes, 28 Jul 98 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1666<br>CD 8 |
| 29 Jul 98 | RPM Meeting Minutes, 29 Jul 98 | Gutierrez-Palmenberg, Inc. | 1665<br>CD 8 |
| Aug 98 | Draft Final Data Gap Investigation Report, Vol I of II, SCOU | Jacobs Engineering Group, Inc. | 1047<br>CD 5 |
| Aug 98 | Draft Final Data Gap Investigation Report, Vol II of II, SCOU | Jacobs Engineering Group, Inc. | 1048<br>CD 8 |
| Aug 98 | Fact Sheet, Enviro Fact Sheet, Edition 19 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1747<br>CD 7 |

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|---|---|---|---|
| Aug 98 | Closure and Post-Closure Maintenance Plan, Landfills 2, 4, and Castle Vista A/B, LF-005, LF-007, LF-034 | Jacobs Engineering Group, Inc. | 2187 CD 11 |
| 06 Aug 98 | EPA Letter to Base Concerning Comments on ROD Version III, SCOU | Hanusiak, Lisa EPA Region IX | 1748 CD 7 |
| 06 Aug 98 | Base Letter to Regulators Concerning ROD, Version III, SCOU | Matthews, Robert R AFBCA/DD Castle | 1749 CD 7 |
| 07 Aug 98 | EPA Letter to Base Concerning RA, Draft Five Year Review, OU-1, OU-2 | Hanusiak, Lisa EPA Region IX | 1809 CD 9 |
| 11 Aug 98 | Newspaper Article, "Castle Cleanup Concerns Taken to Colorado" | Jones, Gary L The Merced Sun Star | 1658 CD 8 |
| 17 Aug 98 | Newspaper Article, "Clean Water Still Major Concern" | The Merced Sun Star | 1661 CD 8 |
| 17 Aug 98 | CRWQCB Letter to CDTSC Concerning Review of Version 3 ROD, SCOU | Russell, John California Regional Water Quality Control Board | 1808 CD 9 |
| 19 Aug 98 | EPA Letter to Base Concerning Comments on PCB Draft Closure Report, Site 9 | Hanusiak, Lisa EPA Region IX | 1807 CD 9 |
| 20 Aug 98 | Kleinfelder Letter to MDPH Concerning Preliminary Comments on ROD, SCOU | Cook, Dave Kleinfelder, Inc. | 1811 CD 9 |
| 21 Aug 98 | EPA Letter to Base Concerning Obligation for Off-Site Response Actions, Castle Vista Landfill A | Hanusiak, Lisa EPA Region IX | 1683 CD 8 |

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|---|---|---|---|
| 22 Aug 98 | Newspaper Article, "The Castle RAB Meets Tuesday" | The Merced Sun Star | 1650 CD 8 |
| 25 Aug 98 | RAB Meeting Minutes, 25 Aug 98 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1663 CD 8 |
| 26 Aug 98 | Newspaper Article, "Air Force Delays Cleanup Document" | Jones, Gary L The Merced Sun Star | 1659 CD 8 |
| 26 Aug 98 | RPM Meeting Minutes, 25-26 Aug 98 | Gutierrez-Palmenberg, Inc. | 1662 CD 8 |
| 28 Aug 98 | CDTSC Letter to Base Concerning Comments on LTM Sampling Program Annual Report, 97 | Ghazi, Rizgar A California Department of Toxic Substances Control | 1750 CD 7 |
| 31 Aug 98 | Newspaper Article, "Politicos Conspicuously Absent from Meeting" | Stepp, Lloyd The Merced Sun Star | 1660 CD 8 |
| 31 Aug 98 | CDTSC Letter to Base Concerning Review of PCB-9 Draft Closure Report, SS-048 | Ghazi, Rizgar A California Department of Toxic Substances Control | 1810 CD 9 |
| Sep 98 | Fact Sheet, Enviro Progress Newsletter, Edition 24 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1751 CD 7 |
| Sep 98 | Jacobs Revisions to Data Gap Spreadsheet, RI/FS, Draft Final Report, SCOU | Jacobs Engineering Group, Inc. | 1753 CD 7 |
| 03 Sep 98 | EPA Letter to Base Concerning Draft Action Memorandum, LF-04, LF-06 | Hanusiak, Lisa EPA Region IX | 1752 CD 7 |

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|---|---|---|---|
| 03 Sep 98 | EPA Letter to Base Concerning Review of Draft Action Memorandum for Landfills 1 and 3 | Hanusiak, Lisa<br>EPA Region IX | 1814<br>CD 9 |
| 04 Sep 98 | Base Letter to Regulators Concerning Landfill Public Notice | Matthews, Robert R<br>AFBCA/DD Castle | 1815<br>CD 9 |
| 09 Sep 98 | CRWQCB Letter to CDTSC Concerning RA, Final Work Plan, LF-34 | Russell, John<br>California Regional Water Quality Control Board | 1754<br>CD 7 |
| 09 Sep 98 | CRWQCB Letter to CDTSC Concerning Review of Landfill Closure Documents | Russell, John<br>California Regional Water Quality Control Board | 1819<br>CD 9 |
| 15 Sep 98 | Base Letter to EPA Concerning FFA Schedule Modification Request | Jackson, Dale O<br>AFBCA/DD Castle | 1812<br>CD 9 |
| 17 Sep 98 | CDTSC Letter to Base Concerning Comments on ROD, Version 3, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1813<br>CD 9 |
| 18 Sep 98 | CRWQCB Letter to CDTSC Concerning Review of Draft Closure and Post Closure Maintenance Plan, LF-004, LF-006, LF-008 | Russell, John<br>California Regional Water Quality Control Board | 1820<br>CD 9 |
| 18 Sep 98 | EPA Letter to Base Concerning Review of Technical Documents Associated With Removal Actions, LF-004, LF-006, LF-008 | Hanusiak, Lisa<br>EPA Region IX | 1821<br>CD 9 |
| 23 Sep 98 | RPM Meeting Minutes, 22-23 Sep 98 | Gutierrez-Palmenberg, Inc. | 1641<br>CD 8 |

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|---|---|---|---|
| 24 Sep 98 | CDTSC Letter to Base Concerning Review of RA, Final Groundwater Work Plan Addendum, LF-34 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1755<br>CD 7 |
| 29 Sep 98 | EPA Letter to Base Concerning Request for FFA Schedule Modification and Extension, SCOU | Smith, Barbara M<br>EPA Region IX | 1816<br>CD 9 |
| 29 Sep 98 | CDTSC Letter to Base Concerning Review of Draft Action Memorandum, LF-004, LF-006 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1822<br>CD 9 |
| Oct 98 | Fact Sheet, Enviro Fact Sheet, Edition 20 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1756<br>CD 7 |
| Oct 98 | RA, Risk Based Draft Plan, Fuel Farm Area, ST-33 | Parsons Engineering Science, Inc. | 1759<br>CD 9 |
| 03 Oct 98 | Newspaper Article, "Public Notice, The USAF Announces the Intent to Perform Excavations and On-Site Disposal at Castle AFB" | The Merced Sun Star | 1651<br>CD 8 |
| 05 Oct 98 | CDTSC Letter to Base Concerning Request for FFA Schedule Modification and Extension, SCOU | Ward, Daniel T<br>Vorster, Antonia K J<br>California Department of Toxic Substances Control | 1818<br>CD 9 |
| 05 Oct 98 | Base Letter to Regulators Concerning Public Notice for Removal Action, LF-004, LF-006, LF-008 | Matthews, Robert R<br>AFBCA/DD Castle | 1823<br>CD 9 |
| 05 Oct 98 | CDTSC Letter to Base Concerning Review of Landfill Closure Documents, LF-004, LF-006 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1824<br>CD 9 |

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|---|---|---|---|
| 06 Oct 98 | Base Letter to Regulators Concerning Extension for Submission of Draft Final CRP | Matthews, Robert R<br>AFBCA/DD Castle | 1642<br>CD 8 |
| 16 Oct 98 | CRWQCB Letter to EPA Concerning Bechtel Report, Evaluation of Groundwater Remedy, LF-34 | Russell, John<br>California Regional Water Quality Control Board | 1757<br>CD 7 |
| 19 Oct 98 | ATSDR Letter to Base Concerning Public Comments on Public Health Assessment | Howie, Max M, Jr<br>Agency for Toxic Substances and Disease Registry | 1825<br>CD 9 |
| 22 Oct 98 | CRWQCB Letter to CDTSC Concerning Draft Final Data Gap Investigation Report, SCOU | Russell, John<br>California Regional Water Quality Control Board | 1087<br>CD 4 |
| 26 Oct 98 | Base Letter to CRWQCB Concerning Foundation Material, Landfill 5 | Matthews, Robert R<br>AFBCA/DD Castle | 1684<br>CD 8 |
| 26 Oct 98 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Draft Final Data Gap Investigation Report, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1688<br>CD 8 |
| 27 Oct 98 | EPA Letter to Base Concerning Comments on Draft Final Data Gap Investigation Report, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1689<br>CD 8 |
| 27 Oct 98 | RAB Meeting Minutes, 27 Oct 98 | Gutierrez-Palmenberg, Inc. | 1698<br>CD 8 |
| 27 Oct 98 | CDTSC Letter to Base Concerning Review of PCB Draft Final Closure Report and NFA Proposal, SS-048 | Landis, Anthony J<br>California Department of Toxic Substances Control | 1817<br>CD 9 |

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|---|---|---|---|
| 29 Oct 98 | EPA Letter to Base Concerning Comments on Draft Final Action Memorandum, LF-004, LF-006, LF-008 | Hanusiak, Lisa<br>EPA Region IX | 1826<br>CD 9 |
| Nov 98 | Fact Sheet, Enviro Progress Newsletter, Edition 25 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 170<br>CD 2 |
| Nov 98 | Final Closure Report, PCB-9 | Jacobs Engineering Group, Inc. | 1691<br>CD 8 |
| Nov 98 | Draft ETC-10 Closure Report, SS-189 | Jacobs Engineering Group, Inc. | 1692<br>CD 8 |
| Nov 98 | RA, Final Five Year Review Report | Jacobs Engineering Group, Inc. | 1827<br>CD 9 |
| 02 Nov 98 | EPA Letter to Base Concerning Review of PCB-9 Draft Final Closure Report, SS-048 | Hanusiak, Lisa<br>EPA Region IX | 1828<br>CD 9 |
| 04 Nov 98 | CRWQCB Letter to CDTSC Concerning Draft Final Action Memorandum, LF-04, LF-06, LF-08 | Russell, John<br>California Regional Water Quality Control Board | 1064<br>CD 4 |
| 04 Nov 98 | Newspaper Article, "Merced Wins Grants" | The Modesto Bee | 1654<br>CD 8 |
| 05 Nov 98 | CDTSC Letter to Base Concerning Review of Draft Final Action Memorandum, LF-04, LF-06 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 131<br>CD 2 |
| 12 Nov 98 | Final Action Memorandum, Landfills 1, 3, 5 | AFBCA/DD Castle | 1685<br>CD 8 |
| 16 Nov 98 | RPM Meeting Minutes, 27-28 Oct 98 | Gutierrez-Palmenberg, Inc. | 1697<br>CD 8 |

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|---|---|---|---|
| 17 Nov 98 | EPA Letter to Base Concerning Groundwater Remediation and Municipal Well, LF-34 | Hanusiak, Lisa<br>EPA Region IX | 769<br>CD 4 |
| 18 Nov 98 | RPM Meeting Minutes, 18 Nov 98 | Gutierrez-Palmenberg, Inc. | 1696<br>CD 8 |
| 20 Nov 98 | Jacobs Letter to AFCEE Concerning Surface Cap Maintenance Report, FT-001 | Hoge, John<br>Jacobs Engineering Group Inc | 1934<br>CD 10 |
| 23 Nov 98 | EPA Letter to Base Concerning Comments on Revised Technical Documents for Removal Action, LF-004, LF-006, LF-008 | Hanusiak, Lisa<br>EPA Region IX | 1829<br>CD 9 |
| 24 Nov 98 | EPA Letter to ATSDR Concerning Review of Public Health Assessment | Hanusiak, Lisa<br>EPA Region IX | 1830<br>CD 9 |
| 24 Nov 98 | Jacobs Letter to AFCEE Concerning RA, Dioxin Sampling Report, FT-001 | Sajadi, Mike<br>Jacobs Engineering Group Inc | 1935<br>CD 10 |
| 29 Nov 98 | Public Health Assessment Study | Agency for Toxic Substances and Disease Registry | 1656<br>CD 8 |
| 30 Nov 98 | CRWQCB Letter to CDTSC Concerning ROD, Draft Part I, SCOU | Russell, John<br>California Regional Water Quality Control Board | 935<br>CD 3 |
| 30 Nov 98 | CRWQCB Letter to Base Concerning Transmittal of Order Rescinding Requirements | Vorster, Antonia K J<br>California Regional Water Quality Control Board | 1831<br>CD 9 |
| Dec 98 | Fact Sheet, Enviro Fact Sheet, Edition 21 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 986<br>CD 4 |

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|---|---|---|---|
| Dec 98 | Update Pages, QPP for Removal Action, Part 1 Final HSP, Part 2 Draft SAP, Part 3 Final CQP | Jacobs Engineering Group, Inc. | 1832 CD 9 |
| Dec 98 | Update Pages, Final Closure and Post-Closure Maintenance Plan, Landfills 1, 3 and 5 | Jacobs Engineering Group, Inc. | 2112 CD 11 |
| 03 Dec 98 | EPA Letter to Base Concerning ROD, Draft, Part I, SCOU | Hanusiak, Lisa EPA Region IX | 465 CD 3 |
| 08 Dec 98 | RPM Meeting Minutes, 08 Dec 98 | Gutierrez-Palmenberg, Inc. | 1695 CD 8 |
| 21 Dec 98 | CRWQCB Letter to Base Concerning Draft Technical and Economic Evaluation Report | Russell, John California Regional Water Quality Control Board | 1833 CD 9 |
| 23 Dec 98 | EPA Letter to Base Concerning Draft Technical and Economic Evaluation Report | Hanusiak, Lisa EPA Region IX | 1834 CD 9 |
| Jan 99 | Fact Sheet, Enviro Progress Newsletter, Edition 26 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 884 CD 3 |
| Jan 99 | LTM Sampling Program, Annual Report 98 | Jacobs Engineering Group, Inc. | 1699 CD 7 |
| 04 Jan 99 | EPA Letter to AFBCA/DR Concerning Comments on RA, Draft Final Five Year Review | Opalski, Daniel D EPA Region IX | 1835 CD 9 |
| 04 Jan 99 | Base Letter to Regulators Concerning Final Closure and Post-Closure Maintenance Plan, Landfills 1, 3, and 5 | Matthews, Robert R AFBCA/DD Castle | 2111 CD 11 |

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|---|---|---|---|
| 05 Jan 99 | Base Letter to Regulators Concerning Request for Extension on ROD, Part I, SCOU | Matthews, Robert R<br>AFBCA/DD Castle | 964<br>CD 4 |
| 06 Jan 99 | EPA Letter to Base Concerning Review of Draft Final CRP | Hanusiak, Lisa<br>EPA Region IX | 1836<br>CD 9 |
| 23 Jan 99 | Newspaper Article, "RAB Meeting, 26 Jan 99" | The Merced Sun Star | 1870<br>CD 9 |
| 26 Jan 99 | RAB Meeting Minutes, 26 Jan 99 | Gutierrez-Palmenberg, Inc. | 1000<br>CD 4 |
| 26 Jan 99 | Base Letter to Regulators Concerning SVE Optimization Efforts for Castle Vista Landfill B, LF-034 | Matthews, Robert R<br>AFBCA/DD Castle | 1839<br>CD 9 |
| Feb 99 | Fact Sheet, Enviro Fact Sheet, Edition 22 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1176<br>CD 6 |
| 05 Feb 99 | Base Letter to Regulators Concerning Excavating Trenches, LF-008 | Matthews, Robert R<br>AFBCA/DD Castle | 1838<br>CD 9 |
| 11 Feb 99 | EPA Letter to Base Concerning Review of Draft QPP, Part 2 | Hanusiak, Lisa<br>EPA Region IX | 1837<br>CD 9 |
| 19 Feb 99 | Tier I/II Meeting Minutes, 27-28 Jan 99 | Gutierrez-Palmenberg, Inc. | 1207<br>CD 6 |
| 23 Feb 99 | CRWQCB Letter to CDTSC Concerning Excavated Soils From OWS, SS-64, LF-07, LF-08 | Russell, John<br>California Regional Water Quality Control Board | 1385<br>CD 6 |
| 23 Feb 99 | EPA Letter to Base Concerning Draft ETC-10 Closure Report, SS-189 | Hanusiak, Lisa<br>EPA Region IX | 1840<br>CD 9 |

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| 25 Feb 99 | Base Letter to Regulators Concerning SVE Optimization Efforts, FTA-1 | Matthews, Robert R<br>AFBCA/DD Castle | 2113<br>CD 11 |
| 25 Feb 99 | Base Letter to Regulators Concerning Excavation at Landfill 5 Trenches | Matthews, Robert R<br>AFBCA/DD Castle | 2115<br>CD 11 |
| Mar 99 | Fact Sheet, Enviro Progress Newsletter, Edition 27 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1547<br>CD 8 |
| Mar 99 | Castle Vista Landfill B SVE Start-up Report, LF-034 | Jacobs Engineering Group, Inc. | 1841<br>CD 9 |
| 04 Mar 99 | Base Letter to Regulators Concerning Excavation of Landfill 5 Trenches, LF-008 | Matthews, Robert R<br>AFBCA/DD Castle | 1842<br>CD 9 |
| 08 Mar 99 | ROD, Draft Final, Part I, SCOU | Waste Policy Institute | 1118<br>CD 5 |
| 08 Mar 99 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Draft ETC-10 Closure Report, SS-189 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1843<br>CD 9 |
| 20 Mar 99 | Newspaper Article, "RAB Meeting, 23 Mar 99" | The Merced Sun Star | 1871<br>CD 9 |
| 22 Mar 99 | CRWQCB Letter to Base Concerning Review Comments on Fuel Spill-1 Closure Report, SS-017 | Russell, John<br>California Regional Water Quality Control Board | 1844<br>CD 9 |
| 22 Mar 99 | CRWQCB Letter to CDTSC Concerning Comments on VOC Cleanup Project Report | Russell, John<br>California Regional Water Quality Control Board | 1847<br>CD 9 |

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| 23 Mar 99 | RAB Meeting Minutes, 23 Mar 99 | Gutierrez-Palmenberg, Inc. | 1845 CD 9 |
| 23 Mar 99 | CDTSC Letter to Base Concerning CRWQCB Comments on Soil Tank Removal and Site Restoration Excavation for Bioremediation of Soils | Ghazi, Rizgar A California Department of Toxic Substances Control | 1846 CD 9 |
| 29 Mar 99 | Final Public Health Assessment Study | Agency for Toxic Substances and Disease Registry | 842 CD 3 |
| Apr 99 | Fact Sheet, Enviro Fact Sheet, Edition 23 | Stowe, Russell A Gutierrez-Palmenberg, Inc. | 1848 CD 9 |
| Apr 99 | Responses to Agency Comments on Draft Final Data Gap Investigation Report, SCOU | Jacobs Engineering Group, Inc. | 1852 CD 9 |
| Apr 99 | Final QPP for Removal Action, Part 2 | Jacobs Engineering Group, Inc. | 1865 CD 9 |
| 06 Apr 99 | CDTSC Letter to Base Concerning Comments on Excavated Soils, SS-64 | Ghazi, Rizgar A California Department of Toxic Substances Control | 975 CD 5 |
| 08 Apr 99 | Update Pages, Draft QPP, FT-001, SS-017, SS-018 | AFBCA/DD Castle | 1849 CD 9 |
| 12 Apr 99 | EPA Letter to Base Concerning Draft Closure Report, Castle Vista Landfill A and Landfill 2 | Hanusiak, Lisa EPA Region IX | 1853 CD 9 |
| 12 Apr 99 | CDTSC Letter to Base Concerning Review of Closure Report for Removal Action at Bldg 785 | Landis, Anthony J California Department of Toxic Substances Control | 1854 CD 9 |

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| 20 Apr 99 | EPA Letter to Base Concerning Review of Changes to CRP | Hanusiak, Lisa<br>EPA Region IX | 1855<br>CD 9 |
| 21 Apr 99 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Fuel Spill 1 and VOC Cleanup Project | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1850<br>CD 9 |
| 21 Apr 99 | RPM Meeting Minutes, 24 Mar 99 | Gutierrez-Palmenberg, Inc. | 1851<br>CD 9 |
| May 99 | Fact Sheet, Enviro Progress Newsletter, Edition 28 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1856<br>CD 9 |
| May 99 | Update Pages, Draft Final ETC-10 Removal Action Completion Report, SS-189 | Jacobs Engineering Group, Inc. | 1860<br>CD 9 |
| May 99 | Update Pages, Draft Final ETC-10 Removal Action Completion Report, SS-189 | Jacobs Engineering Group, Inc. | 1862<br>CD 9 |
| May 99 | Final Closure Report, Castle Vista Landfill A and Landfill 2, LF-005, LF-034 | Jacobs Engineering Group, Inc. | 1866<br>CD 9 |
| 04 May 99 | EPA Letter to Base Concerning Comments on ROD, Draft Final Part 1, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1857<br>CD 9 |
| 06 May 99 | CRWQCB Letter to CDTSC Concerning Review of ROD, Draft Final Part 1, SCOU | Russell, John<br>California Regional Water Quality Control Board | 1859<br>CD 9 |
| 10 May 99 | CDTSC Letter to Base Concerning Review of Closure Report, Castle Vista Landfill A and Landfill 2 | Landis, Anthony J<br>California Department of Toxic Substances Control | 1864<br>CD 9 |

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| 11 May 99 | Base Letter to HQ AFBCA/DD Concerning Information on Environmental Clean-up Actions for Landfill A, LF-034 | Floyd, Alice M<br>AFBCA/DD Castle | 1867<br>CD 9 |
| 20 May 99 | RPM Meeting Minutes, 27 Apr 99 | Gutierrez-Palmenberg, Inc. | 1858<br>CD 9 |
| 22 May 99 | Newspaper Article, "RAB Meeting, 25 May 99" | The Merced Sun Star | 1872<br>CD 9 |
| 25 May 99 | RAB Meeting Minutes, 25 May 99 | Gutierrez-Palmenberg, Inc. | 1861<br>CD 9 |
| Jun 99 | Fact Sheet, Enviro Fact Sheet, Edition 24 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1868<br>CD 9 |
| 01 Jun 99 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on ROD, Part 1, SCOU | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1869<br>CD 9 |
| 10 Jun 99 | Base Letter to Regulators Concerning Response to Comments on RA, Risk-Based Plan, ST-033 | Matthews, Robert R<br>AFBCA/DD Castle | 1907<br>CD 9 |
| 23 Jun 99 | EPA Letter to Base Concerning Comments on Draft Final ETC-10 Removal Action Completion Report, SS-189 | Hanusiak, Lisa<br>EPA Region IX | 1873<br>CD 9 |
| 23 Jun 99 | Update Pages, Closure Certification Report, Hazardous Waste Drum Storage Area | Jacobs Engineering Group, Inc. | 2116<br>CD 11 |
| 25 Jun 99 | EPA Letter to Base Concerning Review of Castle Vista Landfill A and Landfill 2 Draft Final Closure Report | Hanusiak, Lisa<br>EPA Region IX | 1863<br>CD 9 |

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|---|---|---|---|
| 25 Jun 99 | CDTSC Letter to Base Concerning Closure Certification, Hazardous Waste Drum Storage | Pappas, James M<br>California Department of Toxic Substances Control | 2117<br>CD 11 |
| 28 Jun 99 | Base Letter to Regulators Concerning Draft Action Memorandum for Firing Range, SS-104 | Matthews, Robert R<br>AFBCA/DD Castle | 1874<br>CD 9 |
| Jul 99 | Fact Sheet, Enviro Progress Newsletter, Edition 29 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1875<br>CD 9 |
| Jul 99 | Long-Term Groundwater Sampling Program, 99 Semiannual Report | Jacobs Engineering Group, Inc. | 1876<br>CD 9 |
| Jul 99 | Final ETC-10 Removal Action Completion Report, SS-189 | Jacobs Engineering Group, Inc. | 1883<br>CD 9 |
| Jul 99 | Update Pages, Final ETC-10 Removal Action Completion Report, SS-189 | Jacobs Engineering Group, Inc. | 1893<br>CD 9 |
| Jul 99 | RA, Data Gap Investigation Final Report, Vol I of II, SCOU | Jacobs Engineering Group, Inc. | 1923<br>CD 9 |
| 19 Jul 99 | EPA Letter to Base Concerning Acceptance of Final Closure Report, Castle Vista Landfill A and Landfill 2, LF-005, LF-034 | Hanusiak, Lisa<br>EPA Region IX | 1879<br>CD 9 |
| 22 Jul 99 | EPA Letter to Base Concerning Response to QA Program Concern on Draft Final ETC-10 Removal Action Completion Report, SS-189 | Hanusiak, Lisa<br>EPA Region IX | 1877<br>CD 9 |
| 23 Jul 99 | RPM Meeting Minutes, 29 Jun 99 | Gutierrez-Palmenberg, Inc. | 1878<br>CD 9 |

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|---|---|---|---|
| 24 Jul 99 | Newspaper Article, "Public Notice, Air Force Announces Intent to Perform an Excavation and On-Site Disposal" | The Merced Sun Star | 1880 CD 9 |
| 24 Jul 99 | Newspaper Article, "AFBCA Invites Public to Tour Active Environmental Cleanup Sites" | The Merced Sun Star | 1881 CD 9 |
| 27 Jul 99 | RAB Meeting Minutes, 27 Jul 99 | Gutierrez-Palmenberg, Inc. | 1882 CD 9 |
| Aug 99 | Fact Sheet, Enviro Fact Sheet, Edition 25 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1884 CD 9 |
| Aug 99 | Final Closure Report, Fuel Spill 2, SS-018 | Jacobs Engineering Group, Inc. | 1889 CD 9 |
| 04 Aug 99 | CDTSC Letter to Base Concerning CDTSC and CRWQCB Comments on Draft Action Memorandum and Project Activities Work Plan, SS-104 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1899 CD 9 |
| 20 Aug 99 | RPM Meeting Minutes, 27-28 Jul 99 | Gutierrez-Palmenberg, Inc. | 1885 CD 9 |
| 23 Aug 99 | CRWQCB Letter to Base Concerning Review of Final Closure Report for Fuel Spill 2, SS-018 | Russell, John<br>California Regional Water Quality Control Board | 1886 CD 9 |
| 23 Aug 99 | Draft Final Action Memorandum, SS-104 | Jacobs Engineering Group, Inc. | 1887 CD 9 |
| 24 Aug 99 | CDTSC Letter to Base Concerning Review of Draft Final ETC-10 Removal Action Completion Report, SS-189 | Landis, Anthony J<br>California Department of Toxic Substances Control | 1888 CD 9 |

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|---|---|---|---|
| 27 Aug 99 | Base Letter to CRWQCB Concerning Foundation Material from Other Remediation Sites, LF-008 | Matthews, Robert R<br>AFBCA/DD Castle | 1890<br>CD 9 |
| Sep 99 | Fact Sheet, Enviro Progress Newsletter, Edition 30 | Stowe, Russell A<br>Gutierrez-Palmenberg, Inc. | 1891<br>CD 9 |
| Sep 99 | RA, Project Activities Work Plan, QPP Addenda, Change 2 to Final, SCOU | Jacobs Engineering Group, Inc. | 1896<br>CD 9 |
| 07 Sep 99 | EPA Letter to Base Concerning Review of Draft Final Action Memorandum, SS-104 | Hanusiak, Lisa<br>EPA Region IX | 1900<br>CD 9 |
| 13 Sep 99 | EPA Letter to Base Concerning Closure of Fuel Spill 2, SS-018 | Hanusiak, Lisa<br>EPA Region IX | 1892<br>CD 9 |
| 24 Sep 99 | CDTSC Letter to Base Concerning Implementation of California Health and Safety Code Section 25157.8, LF-008 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1898<br>CD 9 |
| 25 Sep 99 | Newspaper Article, "RAB Meeting, 28 Sep 99" | The Merced Sun Star | 1894<br>CD 9 |
| 27 Sep 99 | RPM Meeting Minutes, 25 Aug 99 | Gutierrez-Palmenberg, Inc. | 1897<br>CD 9 |
| 28 Sep 99 | RAB Meeting Minutes, 28 Sep 99 | Gutierrez-Palmenberg, Inc. | 1901<br>CD 9 |
| Oct 99 | RA, Phase III, Environmental Cleanup Final Plan, Project Activities Work Plan and QPP Addenda | Jacobs Engineering Group, Inc. | 1902<br>CD 9 |

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|---|---|---|---|
| 14 Oct 99 | CDTSC Letter to Base Concerning Review of Draft Final Action Memorandum and Project Activities Work Plan, SS-104 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1903<br>CD 9 |
| 14 Oct 99 | CDTSC Letter to Base Concerning Comments on Draft Final Action Memorandum and Project Activities Work Plan, SS-104 | Ghazi, Rizgar A<br>California Department of Toxic Substances Control | 1936<br>CD 10 |
| 15 Oct 99 | EPA Letter to Base Concerning Comments on RA, Work Plan, SCOU | Hanusiak, Lisa<br>EPA Region IX | 1937<br>CD 10 |
| 18 Oct 99 | RPM Meeting Minutes, 29 Sep 99 | Gutierrez-Palmenberg, Inc. | 1904<br>CD 9 |
| 23 Nov 99 | RPM Meeting Minutes, 23 Nov 99 | Gutierrez-Palmenberg, Inc. | 1905<br>CD 9 |
| 23 Nov 99 | RAB Meeting Minutes, 23 Nov 99 | Gutierrez-Palmenberg, Inc. | 1906<br>CD 9 |
| 30 Nov 99 | CRWQCB Letter to Base Concerning Draft Closure and Post-Closure Maintenance Plan Update, LF-007, LF-008 | Trommer, Robert<br>California Regional Water Quality Control Board | 1895<br>CD 9 |
| Dec 99 | Fact Sheet, Enviro Fact Sheet, Edition 26 | Hunt, Julie<br>Gutierrez-Palmenberg, Inc. | 1908<br>CD 9 |
| 01 Dec 99 | EPA Letter to Base Concerning Comments on Draft Closure and Post-Closure Maintenance Plan Update, LF-007, LF-008 | Hanusiak, Lisa<br>EPA Region IX | 1910<br>CD 9 |
| 13 Dec 99 | EPA Letter to Base Concerning Comments on Operations and Emissions Monitoring of Catalytic Oxidation Units, FT-001 | Hanusiak, Lisa<br>EPA Region IX | 1938<br>CD 10 |

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|---|---|---|---|
| 14 Dec 99 | RPM Meeting Minutes, 14 Dec 99 | Gutierrez-Palmenberg, Inc. | 1909 CD 9 |
| Jan 00 | Long-Term Groundwater Sampling Program, 99 Annual Report | Jacobs Engineering Group, Inc. | 1912 CD 9 |
| 04 Jan 00 | CDTSC Letter to Base Concerning Comments on Draft Proposed Plan, SCOU 2 | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 1939 CD 10 |
| 12 Jan 00 | CDTSC Letter to Base Concerning Comments on Draft Action Memorandum, SS-051 | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 1940 CD 10 |
| 26 Jan 00 | RPM Meeting Minutes, 26 Jan 00 | Gutierrez-Palmenberg, Inc. | 1911 CD 9 |
| 26 Jan 00 | Consensus Statement, Bldg 54 Metals Data Gap Resolution | Base Closure Team | 1941 CD 10 |
| 26 Jan 00 | RPM Meeting Minutes, 26 Jan 00 | Gutierrez-Palmenberg, Inc. | 1942 CD 10 |
| 26 Jan 00 | SVE Turn-On Criteria Report, SCOU | RPM Members | 1943 CD 10 |
| Feb 00 | Fact Sheet, Enviro Progress Newsletter, Edition 31 | Hunt, Julie Gutierrez-Palmenberg, Inc. | 1916 CD 9 |
| 18 Feb 00 | EPA Letter to Base Concerning Review of Draft Closure Report, LF-004, LF-006, SS-104 | Seid, Raymond EPA Region IX | 1913 CD 9 |
| 22 Feb 00 | RAB Meeting Minutes, 22 Feb 00 | Gutierrez-Palmenberg, Inc. | 1914 CD 9 |

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|---|---|---|---|
| 23 Feb 00 | RPM Meeting Minutes, 23 Feb 00 | Gutierrez-Palmenberg, Inc. | 1945 CD 10 |
| Mar 00 | Fact Sheet, Enviro Fact Sheet, Edition 27 | Hunt, Julie<br>Gutierrez-Palmenberg, Inc. | 1915 CD 9 |
| 06 Mar 00 | EPA Letter to Base Concerning Comments on SVE Decision Study Work Plan, SCOU | Seid, Raymond<br>EPA Region IX | 1946 CD 10 |
| 09 Mar 00 | CRWQCB Letter to Base Concerning Response to Comments on Closure Plan Update, LF-007, LF-008 | Russell, John<br>California Regional Water Quality Control Board | 1917 CD 9 |
| 13 Mar 00 | CRWQCB Letter to Base Concerning Review of Closure Report, LF-004, LF-006, SS-104 | Russell, John<br>California Regional Water Quality Control Board | 1918 CD 9 |
| 14 Mar 00 | CRWQCB Letter to Base Concerning Review of Draft Action Memorandum for Removal Action, Bldg 54 Group | Russell, John<br>California Regional Water Quality Control Board | 1919 CD 9 |
| 15 Mar 00 | CDTSC Letter to Base Concerning Results of Confirmation Samples at Bldg 1521 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1920 CD 9 |
| 28 Mar 00 | RPM Meeting Minutes, 28 Mar 00 | Gutierrez-Palmenberg, Inc. | 1947 CD 10 |
| 03 Apr 00 | EPA Letter to Base Concerning Review of Draft Action Memorandum for Removal Action, Bldg 54 Group | Seid, Raymond<br>EPA Region IX | 1921 CD 9 |
| 05 Apr 00 | CRWQCB Letter to Base Concerning Review of Excavation Site Draft Documents | Russell, John<br>California Regional Water Quality Control Board | 1922 CD 9 |

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|---|---|---|---|
| 19 Apr 00 | CDTSC Letter to Base Concerning Comments on Draft Action Memorandum for Excavation Sites and RA, Project Activities Work Plan, SCOU | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1949<br>CD 10 |
| 20 Apr 00 | CRWQCB Letter to Base Concerning Comments on Draft SVE Decision Study Work Plan | Russell, John<br>California Regional Water Quality Control Board | 1950<br>CD 10 |
| 25 Apr 00 | EPA Letter to Base Concerning Comments on the Draft Action Memorandum | Seid, Raymond<br>EPA Region IX | 1951<br>CD 10 |
| 28 Apr 00 | CRWQCB Letter to Base Concerning Comments on Action Memorandum | Russell, John<br>California Regional Water Quality Control Board | 1952<br>CD 10 |
| May 00 | Final Action Memorandum | Montgomery Watson Americas, Inc | 1953<br>CD 10 |
| 01 May 00 | EPA Letter to Base Concerning Comments on RA, Project Activities Work Plan and Quality Program Plan Addenda, SCOU | Seid, Raymond<br>EPA Region IX | 1954<br>CD 10 |
| 05 May 00 | CDTSC Letter to Base Concerning Comments on Draft SVE Decision Study Work Plan | California Department of Toxic Substances Control | 1955<br>CD 10 |
| 08 May 00 | EPA Letter to Base Concerning Comments on Work Plan and Quality Program Plan | Seid, Raymond<br>EPA Region IX | 1956<br>CD 10 |
| 22 May 00 | CDTSC Letter to Base Concerning Comments on Draft Final Action Memorandum | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1957<br>CD 10 |

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|---|---|---|---|
| 22 May 00 | CDTSC Letter to Base Concerning Comments on Draft Work Plan and Quality Program Plan | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1958<br>CD 10 |
| 22 May 00 | RPM Meeting Minutes, 22 May 00 | Gutierrez-Palmenberg, Inc. | 1959<br>CD 10 |
| 23 May 00 | RAB Meeting Minutes, 23 May 00 | Gutierrez-Palmenberg, Inc. | 1962<br>CD 10 |
| 24 May 00 | EPA Letter to Base Concerning Comments on Action Memorandum | Seid, Raymond<br>EPA Region IX | 1963<br>CD 10 |
| 05 Jun 00 | Ecological Risk Assessment Disposition Meeting Minutes, 09 Oct 97 | Jacobs Engineering Group, Inc. | 2118<br>CD 11 |
| 12 Jun 00 | EPA Letter to Base Concerning Comments on Action Memorandum For Excavation of Contaminated Soils at Four Sites | Meer, Daniel A<br>EPA Region IX | 1964<br>CD 10 |
| 15 Jun 00 | EPA Letter to Base Concerning Comments on Draft Closure Report, LF-034 | Seid, Raymond<br>EPA Region IX | 1965<br>CD 10 |
| 21 Jun 00 | RPM Meeting Minutes, 21 Jun 00 | Gutierrez-Palmenberg, Inc. | 1966<br>CD 10 |
| 22 Jun 00 | EPA Letter to Base Concerning Comments on RA, Project Activities Work Plan, SCOU and Quality Program Plan Addenda, Vol 1, Change 3 to Final | Seid, Raymond<br>EPA Region IX | 1967<br>CD 10 |
| 28 Jun 00 | EPA Letter to Base Concerning Comments on Removal Action Completion Report, LF-004, LF-006, SS-104 | Seid, Raymond<br>EPA Region IX | 1968<br>CD 10 |

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|---|---|---|---|
| 29 Jun 00 | EPA Letter to Base Concerning Comments on Work Plan and Quality Program Plan for Removal Actions for Six Sites | Seid, Raymond<br>EPA Region IX | 1969<br>CD 10 |
| 30 Jun 00 | CDTSC Letter to Base Concerning Comments on Removal Action, FT-001 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1970<br>CD 10 |
| Jul 00 | RA, Final Project Activities Work Plan for Petroleum Hydrocarbon Contaminated Sites, SCOU | Jacobs Engineering Group, Inc. | 1960<br>CD 10 |
| Jul 00 | Final Action Memorandum for CERCLA Excavation Sites | Jacobs Engineering Group, Inc. | 1961<br>CD 10 |
| Jul 00 | Final Data Evaluation Report, FT-001 | Praxis Environmental Technologies, Inc | 1971<br>CD 10 |
| Jul 00 | Final Data Evaluation Report, SD-012 | Praxis Environmental Technologies, Inc | 1972<br>CD 10 |
| Jul 00 | Long Term Groundwater Sampling Program, 00 Semiannual Report | Versar, Inc. | 1973<br>CD 10 |
| Jul 00 | Closure and Post Closure Maintenance Plan Update, LF-007, LF-008 | Jacobs Engineering Group, Inc. | 1974<br>CD 10 |
| Jul 00 | Final Closure Report, LF-034 | Jacobs Engineering Group, Inc. | 1986<br>CD 10 |
| Jul 00 | Ecological Assessment Report, Landfill 5 | Louis Berger & Associates, Inc. | 2119<br>CD 11 |

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|---|---|---|---|
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Draft Final Excavation Documents | Russell, John<br>California Regional Water Quality Control Board | 1975<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Draft Final Closure and Post Closure Maintenance Plan Update, LF-007, LF-008 | Russell, John<br>California Regional Water Quality Control Board | 1976<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Draft Final Removal Action Completion Report, LF-004, LF-006, SS-104 | Russell, John<br>California Regional Water Quality Control Board | 1977<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Draft Closure Report, LF-034 | Russell, John<br>California Regional Water Quality Control Board | 1978<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Final Action Memorandum and Draft Final Work Plan and Quality Program Plan | Russell, John<br>California Regional Water Quality Control Board | 1979<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Draft Final Closure Report, SS-017 | Russell, John<br>California Regional Water Quality Control Board | 1980<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Intrinsic Remediation Documents | Russell, John<br>California Regional Water Quality Control Board | 1981<br>CD 10 |
| 11 Jul 00 | CRWQCB Letter to Base Concerning Comments on Draft Final SVE Decision Study Work Plan | Russell, John<br>California Regional Water Quality Control Board | 1982<br>CD 10 |
| 18 Jul 00 | RPM Meeting Minutes, 18 Jul 00 | Gutierrez-Palmenberg, Inc. | 1983<br>CD 10 |

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|---|---|---|---|
| 24 Jul 00 | CDTSC Letter to Base Concerning Comments on Draft Memorandums for Excavation Sites | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1984<br>CD 10 |
| 24 Jul 00 | CDTSC Letter to Base Concerning Comments on Draft Closure Report, LF-034 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1985<br>CD 10 |
| Aug 00 | Fact Sheet, Enviro Progress Newsletter, Edition 34 | AFBCA/DD Castle | 1987<br>CD 10 |
| Aug 00 | Final Work Plan and Quality Program Plan for Bldg 54 Group Removal Action Project | Montgomery Watson Americas, Inc | 1988<br>CD 10 |
| Aug 00 | Removal Action Completion Report, LF-004, LF-006, SS-104 | Jacobs Engineering Group, Inc. | 1989<br>CD 10 |
| 02 Aug 00 | CDTSC Letter to Base Concerning Comments on Draft Removal Action Completion Report, LF-004, LF-006, SS-104 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1990<br>CD 10 |
| 02 Aug 00 | CDTSC Letter to Base Concerning Comments on Draft Final Closure and Post Closure Maintenance Plan Update, LF-007, LF-008 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1991<br>CD 10 |
| 03 Aug 00 | Base Letter to Regulators Concerning Comments on BCT Meeting Minutes, 17 Jul 00 | Lanning, Todd<br>AFBCA/DD Castle | 1992<br>CD 10 |
| 09 Aug 00 | CRWQCB Letter to Base Concerning Comments on Draft Closure Report, SD-016, WP-041 | Russell, John<br>California Regional Water Quality Control Board | 1993<br>CD 10 |

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|---|---|---|---|
| 18 Aug 00 | EPA Letter to Base Concerning Comments on Draft Final SVE Decision Study Work Plan, SCOU | Seid, Raymond<br>EPA Region IX | 1994<br>CD 10 |
| 23 Aug 00 | RPM Meeting Minutes, 23 Aug 00 | Gutierrez-Palmenberg, Inc. | 1996<br>CD 10 |
| 24 Aug 00 | EPA Letter to Base Concerning Comments on Final Closure Report, LF-034 | Seid, Raymond<br>EPA Region IX | 1995<br>CD 10 |
| 28 Aug 00 | CDTSC Letter to Base Concerning Comments on Draft Final SVE Decision Study Work Plan | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1997<br>CD 10 |
| 31 Aug 00 | CDTSC Letter to Base Concerning Comments on Draft Final Work Plan and Quality Program Plan, SS-054 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 1998<br>CD 10 |
| Sep 00 | Final SVE Decision Study Work Plan, SCOU | Earth Tech, Inc | 1999<br>CD 10 |
| Sep 00 | Final Closure Report, LF-034 | Jacobs Engineering Group, Inc. | 2000<br>CD 10 |
| 06 Sep 00 | CDTSC Letter to Base Concerning Comments on Final Closure Report, LF-034 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2001<br>CD 10 |
| 06 Sep 00 | CDTSC Letter to Base Concerning Comments on CERCLA Draft Closure Report for VOC Contamination, SD-016, WP-041 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2002<br>CD 10 |
| 26 Sep 00 | CRWQCB Letter to Base Concerning Comments on CERCLA Closure Report for VOC Contamination, SD-016, WP-041 | Austin, Duncan<br>California Regional Water Quality Control Board | 2003<br>CD 10 |

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|---|---|---|---|
| Oct 00 | Fact Sheet, Enviro Progress Newsletter, Edition 35 | AFBCA/DD Castle | 2004 CD 10 |
| Oct 00 | Earth Tech Response to CRWQCB Comments on Revised Draft Proposed Plan, SCOU | Earth Tech, Inc | 2005 CD 10 |
| Oct 00 | Earth Tech Response to CDTSC Comments on Revised Draft Proposed Plan, SCOU | Earth Tech, Inc | 2006 CD 10 |
| Oct 00 | Earth Tech Response to EPA Comments on Revised Draft Proposed Plan, SCOU | Earth Tech, Inc | 2007 CD 10 |
| 10 Oct 00 | CRWQCB Letter to Base Concerning Comments on Work Plan for Collecting Additional Soil Samples, SD-199, SD-200, SD-206 | Austin, Duncan California Regional Water Quality Control Board | 2008 CD 10 |
| 11 Oct 00 | Pulsing Assessment Report, FT-001 | Jacobs Engineering Group, Inc. | 2009 CD 10 |
| 13 Oct 00 | Project Note 164, Implementation of SVE Report, Bldg 325 | Jacobs Engineering Group, Inc. | 2120 CD 11 |
| 17 Oct 00 | CDTSC Letter to San Joaquin Valley APCD Concerning Comments on Request for ARAR's, SCOU | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2010 CD 10 |
| 23 Oct 00 | CRWQCB Letter to Base Concerning Comments on Request for Authorization to Close Excavation, FT-003 | Austin, Duncan California Regional Water Quality Control Board | 2011 CD 10 |
| 25 Oct 00 | CIWMB Letter to CDTSC Concerning Comments on Request for ARAR's, SCOU | Graber, Jacques California Integrated Waste Management Board | 2012 CD 10 |

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|---|---|---|---|
| 25 Oct 00 | CDTSC Letter to Base Concerning Comments on Draft Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation/Disposal Sites | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2013<br>CD 10 |
| 30 Oct 00 | CRWQCB Letter to Base Concerning Comments on Draft Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation/Disposal Sites | Austin, Duncan<br>California Regional Water Quality Control Board | 2014<br>CD 10 |
| 30 Oct 00 | CRWQCB Letter to CDTSC Concerning Comments on Request for ARAR, SCOU | Austin, Duncan<br>California Regional Water Quality Control Board | 2015<br>CD 10 |
| Nov 00 | SVE Decision Study for Data Report, SCOU | Earth Tech, Inc | 2016<br>CD 10 |
| 01 Nov 00 | Base Letter to Regulators Concerning Comments on TWG Meeting Minutes, 26 Sep 00 | Lanning, Todd<br>AFBCA/DD Castle | 2017<br>CD 10 |
| 07 Nov 00 | EPA Letter to Base Concerning Comments on Draft Closure Report for CERCLA and Petroleum Hydrocarbon-Contaminated Excavation/Disposal Sites | Seid, Raymond<br>EPA Region IX | 2018<br>CD 10 |
| 07 Nov 00 | Base Letter to CDBEO Concerning Comments on Site Selected Alternative Map, SCOU | Lanning, Todd<br>AFBCA/DD Castle | 2021<br>CD 10 |
| 09 Nov 00 | San Joaquin Valley APCD Letter to CDTSC Concerning Comments on Air Quality Requirements for RA | Sadredin, Seyed<br>San Joaquin Valley Air Pollution Control District | 2019<br>CD 10 |

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|---|---|---|---|
| 13 Nov 00 | EPA Letter to Base Concerning Comments on Draft Technical Memorandum for Re-evaluation of Risk Assessment, SD-045 | Seid, Raymond<br>EPA Region IX | 2020<br>CD 10 |
| 14 Nov 00 | EPA Letter to Base Concerning Comments on SVE, SS-064 | Seid, Raymond<br>EPA Region IX | 2022<br>CD 10 |
| 20 Nov 00 | EPA Letter to Base Concerning Comments on CERCLA Closure Report for VOC Contamination, SD-016, WP-041 | Seid, Raymond<br>EPA Region IX | 2023<br>CD 10 |
| 20 Nov 00 | Requisition and Invoice/Shipping Document | AFBCA/DD Castle | 2024<br>CD 10 |
| 27 Nov 00 | CDTSC Letter to Base Concerning Comments on Draft Final CERCLA Closure Report for VOC Contamination, SD-016, WP-041 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2025<br>CD 10 |
| 28 Nov 00 | RAB Meeting Minutes, 28 Nov 00 | Gutierrez-Palmenberg, Inc. | 2026<br>CD 10 |
| 29 Nov 00 | RPM Meeting Minutes, 29 Nov 00 | Gutierrez-Palmenberg, Inc. | 2027<br>CD 10 |
| 30 Nov 00 | Technical Memorandum Report, Re-evaluation of Risk Assessment, SD-045 | AFBCA/DD Castle | 2030<br>CD 10 |
| Dec 00 | Final Closure Report, CERCLA and Petroleum Hydrocarbon-Contaminated Excavation Sites | Jacobs Engineering Group, Inc. | 1944<br>CD 10 |
| Dec 00 | Final Closure Report, SS-017 | Jacobs Engineering Group, Inc. | 2028<br>CD 10 |

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|---|---|---|---|
| Dec 00 | Final CERCLA Closure Report for VOC Contamination, SD-016, WP-041 | Jacobs Engineering Group, Inc. | 2029 CD 10 |
| 11 Dec 00 | CRWQCB Letter to Base Concerning Comments on Draft Revised Proposed Plan, SCOU | Austin, Duncan California Regional Water Quality Control Board | 2031 CD 10 |
| 12 Dec 00 | EPA Letter to Base Concerning Comments on Draft Proposed Plan, SCOU | Seid, Raymond EPA Region IX | 2032 CD 10 |
| 22 Dec 00 | CRWQCB Letter to Base Concerning Comments on SVE, SS-064 | Austin, Duncan California Regional Water Quality Control Board | 2033 CD 10 |
| 08 Jan 01 | CRWQCB Letter to Base Concerning Comments on Draft Action Memorandum | Austin, Duncan California Regional Water Quality Control Board | 2034 CD 10 |
| 10 Jan 01 | RPM Meeting Minutes, 10 Jan 01 | Gutierrez-Palmenberg, Inc. | 2035 CD 10 |
| 22 Jan 01 | CDTSC Letter to Base Concerning Comments on Request for Extension on ROD, Draft Final Part 1, SCOU | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2036 CD 10 |
| 22 Jan 01 | EPA Letter to Base and CDTSC Concerning Comments on ROD, Part 1, SCOU | Seid, Raymond EPA Region IX | 2037 CD 10 |
| 24 Jan 01 | TWG Meeting Minutes, 09 Jan 01 | Jacobs Engineering Group, Inc. | 2044 CD 10 |
| 29 Jan 01 | CDTSC Letter to Base Concerning Comments on Phase II/III, RA, Draft Interim Report | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2038 CD 10 |

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| DOC. DATE | SUBJECT OR TITLE | AUTHOR or CORP. AUTHOR | FILE/CD NUMBER |
|---|---|---|---|
| Feb 01 | Fact Sheet, Enviro Fact Sheet, Edition 29 | AFBCA/DD Castle | 2039 CD 10 |
| Feb 01 | Long Term Groundwater Sampling Program, 00 Annual Report | Versar, Inc. | 2040 CD 10 |
| Feb 01 | Revised Proposed Plan, SCOU | AFBCA/DD Castle | 2042 CD 10 |
| 05 Feb 01 | EPA Letter to Base Concerning Comments on Draft Action Memorandum | Seid, Raymond EPA Region IX | 2041 CD 10 |
| 06 Feb 01 | EPA Letter to Base Concerning Comments on Draft Action Memorandum, SS-086, SD-013 | Seid, Raymond EPA Region IX | 2043 CD 10 |
| 06 Feb 01 | Base Letter to Regulators Concerning Comments on Disposition of ERA Sites | Lanning, Todd AFBCA/DD Castle | 2045 CD 10 |
| 12 Feb 01 | EPA Letter to Base Concerning Comments on ROD, Part 1, SCOU | Seid, Raymond EPA Region IX | 2046 CD 10 |
| 13 Feb 01 | CRWQCB Letter to Base Concerning Comments on ROD, Draft Final Part 1, SCOU | Austin, Duncan California Regional Water Quality Control Board | 2047 CD 10 |
| 13 Feb 01 | CDTSC Letter to Base Concerning Comments on ROD, Part 1, SCOU | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2048 CD 10 |
| 27 Feb 01 | RAB Meeting Minutes, 27 Feb 01 | Gutierrez-Palmenberg, Inc. | 2121 CD 11 |
| 05 Mar 01 | EPA Letter to Base Concerning Comments on Ecological Work Plan | Seid, Raymond EPA Region IX | 2049 CD 10 |

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|---|---|---|---|
| 07 Mar 01 | USFWS Letter to Base Concerning Comments on Amendment to Biological Opinion, Remediation Project, SS-189 | Goude, Cay C<br>US Fish and Wildlife Service | 2050<br>CD 10 |
| 13 Mar 01 | CRWQCB Letter to Base Concerning Comments on Draft Action Memorandum, SD-013, SS-086 | Austin, Duncan<br>California Regional Water Quality Control Board | 2051<br>CD 10 |
| 13 Mar 01 | CRWQCB Letter to Base Concerning Comments on Revised Draft Letter Work Plan, SS-112, Revised Draft Final Letter Work Plan, SS-089 and Letter Excavation Work Plan, SS-069 | Austin, Duncan<br>California Regional Water Quality Control Board | 2052<br>CD 10 |
| 13 Mar 01 | Regulators Letter to Base Concerning Comments on State's Position on Proposed Remedy, LF-034 | Tatoian Cain, Carolyn V<br>Austin, Duncan<br>California Department of Toxic Substances Control<br>California Regional Water Quality Control Board | 2053<br>CD 10 |
| 14 Mar 01 | CDTSC Letter to Base Concerning Comments on Final Revised Proposed Plan, SCOU 2 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2054<br>CD 10 |
| 15 Mar 01 | CDTSC Letter to Base Concerning Comments on Draft Ecological Work Plan | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2055<br>CD 10 |
| 20 Mar 01 | Mitretek Systems Letter to Base Concerning Comments on TWG and BCT Meeting Minutes, 27 Feb 01 | Casagrande, Daniel J<br>Mitretek Systems | 2056<br>CD 10 |
| 27 Mar 01 | CDTSC Letter to Base Concerning Comments on Draft Action Memorandum, SD-013, SS-086 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2057<br>CD 10 |

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|---|---|---|---|
| Apr 01 | Evaluation of Changes Affecting the SCOU Baseline Human Health Risk Assessment Study, Selected Remedies and RA Objectives | Jacobs Engineering Group, Inc. | 2072 CD 10 |
| 03 Apr 01 | CDTSC Letter to Base Concerning Comments on Draft Final Action Memorandum | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2058 CD 10 |
| 03 Apr 01 | Ecological Work Plan | Jacobs Engineering Group, Inc. | 2059 CD 10 |
| 09 Apr 01 | CRWQCB Letter to Base Concerning Comments on Draft Final Action Memorandum | Austin, Duncan California Regional Water Quality Control Board | 2060 CD 10 |
| 16 Apr 01 | Base Letter to Regulators Concerning Comments on ROD, Part 1, SCOU | Lanning, Todd AFBCA/DD Castle | 2061 CD 10 |
| 17 Apr 01 | EPA Letter to Base Concerning Comments on Draft Work Plan and Design Basis Report | Seid, Raymond EPA Region IX | 2062 CD 10 |
| 18 Apr 01 | EPA Letter to Base Concerning Comments on Phase II/III, RA, Interim Report for Groundwater Extraction and Treatment Systems | Seid, Raymond EPA Region IX | 2063 CD 10 |
| 24 Apr 01 | Base Letter to CRWQCB Concerning Comments on Conversion of SVE System to Bioventing, SS-187 | Lanning, Todd AFBCA/DD Castle | 2064 CD 10 |
| 25 Apr 01 | Letter Work Plan, Soil Vapor Monitoring/Extraction Well Installation, JP-7 | Montgomery Watson | 2065 CD 10 |
| 26 Apr 01 | EPA Letter to Base Concerning Comments on Draft Final Action Memorandum for Removal Action Project | Meer, Daniel A EPA Region IX | 2066 CD 10 |

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|---|---|---|---|
| 30 Apr 01 | CDTSC Letter to Base Concerning Comments on Revised Draft Final Action Memorandum | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2067<br>CD 10 |
| May 01 | Final Action Memorandum | Montgomery Watson Americas, Inc | 2068<br>CD 10 |
| 01 May 01 | CDTSC Letter to Base Concerning Comments on Supplemental EBS and FOSL | Phillippe, Stanley R<br>California Department of Toxic Substances Control | 2069<br>CD 10 |
| 03 May 01 | EPA Letter to Base Concerning Comments on Draft Final Action Memorandum, SD-013, SS-086 | Seid, Raymond<br>EPA Region IX | 2070<br>CD 10 |
| 04 May 01 | CRWQCB Letter to Base Concerning Comments on Draft Work Plan and Design Basis Report | Austin, Duncan<br>California Regional Water Quality Control Board | 2071<br>CD 10 |
| 09 May 01 | Base Letter to San Joaquin Valley APCD Concerning Comments on SVE | Lanning, Todd<br>AFBCA/DD Castle | 2073<br>CD 10 |
| 09 May 01 | EPA Letter to Base Concerning Comments on Draft Work Plan and Design Basis Report, SD-013, SS-086 | Seid, Raymond<br>EPA Region IX | 2074<br>CD 10 |
| 14 May 01 | San Joaquin Valley APCD Letter to Base Concerning Comments on Air Quality Requirements for RAs | Swaney, Jim<br>San Joaquin Valley Air Pollution Control District | 2075<br>CD 10 |
| 14 May 01 | CRWQCB Letter to Base Concerning Comments on Draft Final Action Memorandum, SD-013, SS-086 | Austin, Duncan<br>California Regional Water Quality Control Board | 2076<br>CD 10 |

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|---|---|---|---|
| 15 May 01 | EPA Letter to Base Concerning Comments on Draft Final Action Memorandum, SD-013, SS-086 | Meer, Daniel A<br>EPA Region IX | 2077<br>CD 10 |
| 21 May 01 | Base Letter to Regulators Concerning Request for Schedule Extension on ROD, Part 1, SCOU | Lanning, Todd<br>AFBCA/DD Castle | 2078<br>CD 10 |
| 22 May 01 | Certificate of Clearance Report | 93 CES/CEV | 2122<br>CD 11 |
| 25 May 01 | Base Letter to Regulators Concerning Comments on Revised Proposed Plan Responsiveness Summary, SCOU | Lanning, Todd<br>AFBCA/DD Castle | 2079<br>CD 10 |
| 30 May 01 | Final Wetlands Work Plan | Earth Tech, Inc | 2080<br>CD 10 |
| 31 May 01 | CRWQCB Letter to Base Concerning Comments on Draft Work Plan and Design Basis Report, SD-013, SS-086 | Austin, Duncan<br>California Regional Water Quality Control Board | 1948<br>CD 10 |
| 07 Jun 01 | Base Letter to Regulators Concerning Conversion of SVE System From Catalytic Oxidation to Granular Activated Carbon Treatment, FTA-1 | Lanning, Todd<br>AFBCA/DD Castle | 2123<br>CD 11 |
| 08 Jun 01 | BCT Meeting Minutes, 28 Mar 01 | AFBCA/DD Castle | 2124<br>CD 11 |
| 15 Jun 01 | CDTSC Letter to Base Concerning Draft Final Action Memorandum, Removal Action, Bldg 1350, Bldg 1762 and DA-5 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2125<br>CD 11 |
| 20 Jun 01 | EPA Letter to Base Concerning Project Note 165, SVE at Bldg 551 | Seid, Raymond<br>EPA Region IX | 2126<br>CD 11 |

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|---|---|---|---|
| 20 Jun 01 | USFWS Letter to Base Concerning Evaluation of Wetlands Final Work Plan | Knight, Jan C<br>US Fish and Wildlife Service | 2127<br>CD 11 |
| 21 Jun 01 | EPA Letter to Base Concerning Project Note 166, SVE at FTA-3 | Seid, Raymond<br>EPA Region IX | 2128<br>CD 11 |
| 21 Jun 01 | CDTSC Letter to Base Concerning Draft Work Plans and Design Basis Reports | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2129<br>CD 11 |
| 25 Jun 01 | RAB Meeting Minutes, 22 May 01 | Montgomery Watson | 2130<br>CD 11 |
| 25 Jun 01 | EPA Letter to Base Concerning Letter Work Plan for Installing SV Monitoring/Extraction Well, JP-7 | Seid, Raymond<br>EPA Region IX | 2131<br>CD 11 |
| 26 Jun 01 | CDTSC Letter to Base Concerning Final Closure Report for CERCLA and Petroleum Hydrocarbon Contaminated Excavation/Disposal Sites | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2132<br>CD 11 |
| 02 Jul 01 | CDTSC Letter to Base Concerning Final Wetlands Work Plan | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2133<br>CD 11 |
| 09 Jul 01 | CRWQCB Letter to Base Concerning Revised Letter Work Plan for Soil Vapor Monitoring/Extraction Well Installation | Austin, Duncan<br>California Regional Water Quality Control Board | 2134<br>CD 11 |
| 17 Jul 01 | Base Letter to Regulators Concerning Response to Comments on the Letter Work Plan for SV Monitoring/Extraction Well, JP-7 | Lanning, Todd<br>AFBCA/DD Castle | 2136<br>CD 11 |

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|---|---|---|---|
| 18 Jul 01 | Base Letter to FBP Concerning Wetlands and Vernal Pool Coordination/Support | Lanning, Todd<br>AFBCA/DD Castle | 2137<br>CD 11 |
| 23 Jul 01 | RPM Meeting Minutes, 23 May 01 | Montgomery Watson | 2135<br>CD 11 |
| 23 Jul 01 | CDTSC Letter to Base Concerning Draft FFS, Final Remedy for Non-VOC Contamination, Vol 1, FTA-1 | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2138<br>CD 11 |
| Aug 01 | Long-Term Groundwater Sampling Program, Semiannual Report 01 | Jacobs Engineering Group, Inc. | 2139<br>CD 11 |
| 01 Aug 01 | Final RPM Meeting Minutes, 28 Jun 01 | Montgomery Watson Harza | 2140<br>CD 11 |
| 13 Aug 01 | CRWQCB Letter to Base Concerning FFS, FTA-1 | Austin, Duncan<br>California Regional Water Quality Control Board | 2141<br>CD 11 |
| Oct 01 | RPM Meeting Minutes, Pre-Draft Summary, 24 Oct 01 | Montgomery Watson Harza | 2142<br>CD 11 |
| Oct 01 | Long-Term Groundwater Sampling Program, Irrigation, Municipal and Production Well Monitoring Report, Third Quarter 01 | Jacobs Engineering Group, Inc. | 2143<br>CD 11 |
| 31 Oct 01 | CDTSC Letter to Base Concerning Final ROD, Part 1, SCOU | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2144<br>CD 11 |
| 13 Nov 01 | MWH Letter to Base Concerning Air Quality Requirements, DA-5 | Arroyo, Shari L<br>Montgomery Watson Harza | 2145<br>CD 11 |

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|---|---|---|---|
| 13 Nov 01 | MWH Letter to Base Concerning Criteria for a Permit to Operate SVE System, DA-5 | Arroyo, Shari L<br>Montgomery Watson Harza | 2146<br>CD 11 |
| 13 Nov 01 | MWH Letter to Base Concerning Criteria for a Permit to Operate SVE System, Bldg 1350 | Arroyo, Shari L<br>Montgomery Watson Harza | 2147<br>CD 11 |
| 13 Nov 01 | MWH Letter to Base Concerning Air Quality Requirements, Bldg 1350 | Arroyo, Shari L<br>Montgomery Watson Harza | 2148<br>CD 11 |
| Dec 01 | Fact Sheet, Enviro Fact Sheet, Public Comment Period | AFBCA/DD Castle | 2153<br>CD 11 |
| 11 Dec 01 | CDTSC Letter to Agencies Concerning Request for Time Extension on Draft Comprehensive Basewide RI/FS, Part Two | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2149<br>CD 11 |
| 27 Dec 01 | CRWQCB Letter to Base Concerning Comprehensive Basewide RI/FS, Part Two | Austin, Duncan<br>California Regional Water Quality Control Board | 2150<br>CD 11 |
| 28 Dec 01 | RPM Meeting Minutes, 26 Nov 01 | Montgomery Watson Harza | 2151<br>CD 11 |
| 31 Dec 01 | EPA Letter to Base Concerning FFS, Final Remedy for Non-VOC Contamination, FTA-1 | Seid, Raymond<br>EPA Region IX | 2152<br>CD 11 |
| 04 Jan 02 | MWH Letter to Base Concerning Criteria For Permit to Operate SVE System, Bldg 1762 | Arroyo, Shari L<br>Montgomery Watson Harza | 2154<br>CD 11 |
| 07 Jan 02 | RAB Meeting Minutes, 27 Nov 01 | Montgomery Watson Harza | 2160<br>CD 11 |

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|---|---|---|---|
| Feb 02 | Long-Term Groundwater Sampling Program, Annual Report 01 | Jacobs Engineering Group, Inc. | 2155 CD 11 |
| 04 Feb 02 | Base Letter to Residents Concerning Water Sampling Results | LaFreniere, Steve AFBCA/DD Castle | 2156 CD 11 |
| 04 Feb 02 | TWG Meeting Minutes, 30 Jan 02 | Jacobs Engineering Group, Inc. | 2157 CD 11 |
| 07 Feb 02 | CRWQCB Letter to Base Concerning Draft Final FFS, Final Remedy for Non-VOC Contamination, Vol I, FTA-01 | Austin, Duncan California Regional Water Quality Control Board | 2161 CD 11 |
| 08 Feb 02 | RPM Meeting Minutes, 16 Jan 02 | Montgomery Watson Harza | 2162 CD 11 |
| 15 Feb 02 | CDTSC Letter to Base Concerning Draft Final FFS, Final Remedy For Non-VOC Contamination, FTA-1 | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2163 CD 11 |
| 19 Feb 02 | CRWQCB Letter to TWG Members Concerning TWG Meeting, 30 Jan 02 | Austin, Duncan California Regional Water Quality Control Board | 2158 CD 11 |
| 21 Feb 02 | Base Letter to Regulators Concerning Request for Schedule Extension for ROD, Part Two, SCOU | LaFreniere, Steve AFBCA/DD Castle | 2159 CD 11 |
| 25 Feb 02 | Project Note 3, Data Results of Soil Vapor Sampling, JP-7 | Montgomery Watson Harza | 2164 CD 11 |
| 27 Feb 02 | RPM Meeting Minutes, 27 Feb 02 | Montgomery Watson Harza | 2185 CD 11 |

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|---|---|---|---|
| Mar 02 | Final Year End Monitoring Report, PFFA | Parsons Engineering Science, Inc. | 2165 CD 11 |
| 12 Mar 02 | Base Response to EPA and CDTSC Comments on Draft Comprehensive Basewide RI/FS Part Two | AFBCA/DD Castle | 2166 CD 11 |
| 21 Mar 02 | RAB Meeting Minutes, 26 Feb 02 | AFBCA/DD Castle | 2167 CD 11 |
| Apr 02 | FFS, FTA-1 | Jacobs Engineering Group, Inc. | 2168 CD 11 |
| Apr 02 | Final Work Plan Addendum, PFFA | Parsons Engineering Science, Inc. | 2169 CD 11 |
| Apr 02 | Evaluation of Wetlands Technical Report | Earth Tech, Inc | 2170 CD 11 |
| 02 Apr 02 | Base Letter to Regulators Concerning Transmittal of Proposed Actions Report, City of Atwater Municipal Water Supply Well AM18 | LaFreniere, Steve AFBCA/DD Castle | 2171 CD 11 |
| 02 Apr 02 | Base Letter to Regulators Concerning Transmittal of Recommendation for Shutdown of EW15, EW17 and EW24 Report | LaFreniere, Steve AFBCA/DD Castle | 2172 CD 11 |
| 02 Apr 02 | Base Letter to Regulators Concerning Transmittal of Work Plan for Wellhead Treatment at MW824 and MW883/MW933 | LaFreniere, Steve AFBCA/DD Castle | 2173 CD 11 |
| 02 Apr 02 | Proposed Actions Report, City of Atwater Municipal Water Supply Well AM18 | Jacobs Engineering Group, Inc. | 2188 CD 11 |

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|---|---|---|---|
| 02 Apr 02 | Recommendation for Shutdown of EW15, EW17 and EW24 Report | Jacobs Engineering Group, Inc. | 2189 CD 11 |
| 02 Apr 02 | Work Plan for Wellhead Treatment at MW824 and MW883/MW933 | Jacobs Engineering Group, Inc. | 2190 CD 11 |
| 09 Apr 02 | Base Letter to Regulators Concerning Transmittal of Removal of Inorganic Constituents From Groundwater, Cost Analysis and Request for Waiver Report | LaFreniere, Steve AFBCA/DD Castle | 2174 CD 11 |
| 09 Apr 02 | RI/FS, Comprehensive Basewide Part Two Meeting Minutes, 09 Apr 02 | Jacobs Engineering Group, Inc. | 2175 CD 11 |
| 09 Apr 02 | RPM Meeting Minutes, 09-10 Apr 02 | Montgomery Watson Harza | 2177 CD 11 |
| 09 Apr 02 | Removal of Calcium, Chloride, TDS and Other Inorganic Constituents From Groundwater Report | Jacobs Engineering Group, Inc. | 2191 CD 11 |
| 26 Apr 02 | CRWQCB Letter to Base Concerning Work Plan for Environmental Remediation and Construction, PFFA | Austin, Duncan California Regional Water Quality Control Board | 2176 CD 11 |
| May 02 | ROD, Final Part One, SCOU | WPI, Inc | 2178 CD 11 |
| 06 May 02 | Base Comments on Draft Site Closure Request Letter, DA-6 | AFBCA/DD Castle | 2179 CD 11 |
| 20 May 02 | CDTSC Letter to Base Concerning Long-Term Groundwater Sampling Program, Annual Report 01 | Tatoian Cain, Carolyn V California Department of Toxic Substances Control | 2180 CD 11 |

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|---|---|---|---|
| 22 May 02 | Base Letter to Regulators Concerning CCR Title 27 and CFR Title 40, Notification of Exceeding Groundwater Criteria | LaFreniere, Steve<br>AFBCA/DD Castle | 2181<br>CD 11 |
| 28 May 02 | CDTSC Letter to Base Concerning Evaluation of Wetlands, Final Technical Report | Tatoian Cain, Carolyn V<br>California Department of Toxic Substances Control | 2182<br>CD 11 |
| 30 May 02 | EPA Letter to Base Concerning Proposed Actions, City of Atwater Municipal Water Supply Well AM18 | Seid, Raymond<br>EPA Region IX | 2183<br>CD 11 |
| 30 May 02 | EPA Letter to Base Concerning Long-Term Groundwater Sampling Program, Annual Report 01 | Seid, Raymond<br>EPA Region IX | 2184<br>CD 11 |
| Jun 02 | Final Work Plan for Environmental Remediation and Construction, PFFA | Parsons Engineering Science, Inc. | 2106<br>CD 11 |
| 12 Jun 02 | CRWQCB Letter to Base Concerning Draft Landfill 4 and Landfill 5 Closure Report | Austin, Duncan<br>California Regional Water Quality Control Board | 2101<br>CD 11 |
| 12 Jun 02 | CRWQCB Letter to Base Concerning Draft O & M Manual, Underground Fuel Leak 2, SVE System | Austin, Duncan<br>California Regional Water Quality Control Board | 2114<br>CD 11 |
| 27 Sep 02 | Administrative Record File Index | LABAT-ANDERSON INCORPORATED | 01<br>CD 1 |
| Multiple Dates | 7 Audio Tapes, 1 VHS Tape Concerning TRC Meetings | 93 BW/PA | 894<br>CD 5 |

# Appendix C

## SVE Termination or Optimization Process (STOP)

# SVE TURN-OFF CRITERIA

## SVE Termination or Optimization Process
## Castle AFB

### Introduction

The cleanup goal for the sites to be remediated using soil vapor extraction (SVE) is the lowest cleanup level technically and economically achievable to protect human health and the environment, including groundwater quality. The sites to be evaluated at Castle AFB overlie contaminated groundwater which is addressed in the final Comprehensive Base wide Part 1 Record of Decision, signed in 1997. The need to continue operation of an SVE system shall be evaluated at each site or group of sites. This evaluation will be called an SVE Termination or Optimization Process (STOP) and will be considered a primary document under the Federal Facilities Agreement and it may formally document site closure.

The STOP should be conducted after all the parties agree that:

- The site has been adequately characterized;
- The site does not pose an unacceptable risk to human health;
- The SVE system has been optimally designed;
- Performance monitoring indicates that the site conceptual model is accurate;
- Contaminant removal rates have stabilized and approached asymptotic levels, following one or more temporary shutdown periods; and
- The SVE system has been optimized to the greatest extent possible.

The decision to continue operation for an SVE system will depend upon the analysis of the three criteria listed below. It is always technically possible to remove more mass, but eventually whether to continued operations requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the remaining contaminant mass in the vadose zone will not reach the groundwater, additional remediation will not be warranted. If the contaminant concentration in the leachate entering the aquifer from the vadose zone is below the aquifer cleanup level (MCLs), the aquifer will not be unacceptably degraded further. Lower cleanup levels may be achievable, but the additional cleanup required to reach them would likely not be justified. Several lines of evidence must be used to make this professional judgment since measuring actual leachate concentrations may be technically impractical and predicting leachate concentrations via modeling might be inaccurate.

This process represents a compromise of the various parties' policies and should be used as a guide in preparing the SCOU Part 2 Record of Decision.

## Decision Criteria

The decision to continue SVE will be based on scientific, economic, and engineering judgment using the following criteria in sequence. The Air Force and the regulatory agencies acknowledge that there is uncertainty inherent in all of the elements used in the STOP, and that consensus is necessary to determine the levels of uncertainty that are acceptable in each of the elements.

I. Will the residual mass in the vadose zone reach the groundwater?

To answer this question, STOP elements "a" through "f" must be addressed.

- If the answer is "no", then proceed with site closure.
- If the answer is "yes" or "unknown", then proceed to criterion II.

II. Will the residual mass in the vadose zone cause the contaminant concentrations in the leachate to exceed the aquifer cleanup level?

To answer this question, STOP elements "a" through "g" must be addressed.

- If the answer is "no", then proceed with site closure.
- If the answer is "yes", or "unknown", then proceed to criterion III which requires a complete STOP.

III. Based on an evaluation of all of the elements, is it appropriate to permanently shut-off the SVE System?

To answer this question, all STOP elements must be addressed.

- If the answer is "yes", then shut off the SVE system and proceed with site closure.
- If the answer is "no" continue SVE operation or develop alternate remedial strategy.

## Elements of the STOP

The following elements should be applied to evaluate the criteria listed above.

a. What is the estimated residual contaminant mass and areal and vertical extent of the remaining vadose zone contaminant plume? Include contaminant isoconcentration maps

and plume cross-sections to illustrate the contaminant concentrations and distribution in the subsurface.

b. Do the data indicate migration towards the groundwater? Qualitative answers to this question may be either "yes", "no" or "unable to make a determination". Evidence for migration towards groundwater may include such lines of evidence as: 1) increasing contaminant concentrations in onsite monitoring wells; 2) pre-remediation soil gas profiles from nested wells to estimate the contaminant's propensity for migration; and 3) post-remediation time-series profiles of soil gas concentrations in nested wells.

c. What is the lithology of areas that do and do not demonstrate rebounds in soil gas concentration? Use site-specific information, and include as much information as possible, such as porosity, moisture content and carbon content of soil, etc.

d. What are the actual site specific infiltration and percolation rates? If site specific data are not available, what are the predicted rates?

e. Are there sufficient historical groundwater monitoring data for wells at or adjacent to the site to determine whether the vadose zone plume has or has not impacted the groundwater? (This determination may not be possible due to active groundwater extraction in the area.)

f. Are there any other site specific factors that should be considered in the evaluation such as site history and physical characteristics (e.g. organic carbon, biodegradation)? Factors to consider for this element include: 1) the nature of the release (for example: one-time spill or continued release over time?; how long ago the release occurred or ceased?; was the release to surface soil, or through a conduit to the subsurface such as a French drain, dry well, or leaking sewer line?, etc.) and 2) any site-specific physical characteristics that may enhance or retard the contaminants subsurface migration (such as unusual presence or absence of low permeability layers, high carbon content of soil, etc.).

g. What is the actual or predicted concentration and mass flux rate of leachate leaving the vadose zone?

h. What was the mass removal rate prior to SVE shutdown?

i. What are the VOC concentration and cumulative mass removed expressed as a function of time?

j. How much money has been spent to date on the site's remediation?

k. Are further enhancements to the SVE systems predicted to be technically- or cost-effective?

l. What are the locations and capture zones of operating groundwater extraction wells relative to the vadose zone contaminant plume? Will the existing wells effectively capture the contaminants from the site? If not, what are the additional costs to add groundwater wells?

m. What is the incremental cost over time of vadose zone remediation compared to the incremental cost over time for groundwater remediation provided that the underlying contamination has not reached aquifer cleanup levels? In other words, will the residual mass in the vadose zone significantly prolong the time and increase the cost to attain the aquifer cleanup level?

To implement this element, the following costs need to be calculated:

- The cost to reach the aquifer cleanup level *without* the additional impact from the site ($GW_0$);
- The cost to reach the aquifer cleanup level *with* the additional impact from the site ($GW_1$);
- The cost to reach the aquifer cleanup level *with* the additional impact from the site after an additional period of SVE operation ($GW_2$); and
- The cost of the additional SVE operation ($SVE_1$).

These costs can be calculated following the steps outlined below:

1. Estimate the predicted time required for the groundwater extraction system to reach aquifer cleanup level(s) in the vicinity of the site *without* additional impact from the site.
2. Estimate the monthly cost to continue operation of the groundwater extraction system in the area impacted by the site?
3. Calculate the cost to reach the aquifer cleanup level ($GW_0$) in the vicinity of the site *without* the additional impact from the site by multiplying the results of step 1 above by the results of step 2 above. ($GW_0$ = step 1 x step 2).
4. Using the measured residual soil gas concentrations at the site, calculate the mass of the residual contaminant in the vadose zone (same as element "a").
5. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
6. Estimate the time to reach the groundwater aquifer cleanup level using the modeling results obtained in step 5 above.
7. Estimate the monthly cost to continue operation of the groundwater extraction system in the area impacted by the site?
8. Calculate the cost to reach the aquifer cleanup level *with* the additional impact from the site ($GW_1$) by multiplying the results of step 6 by the results of step 7. ($GW_1$ = step 6 x step 7).
9. Estimate the monthly cost of continuing to operate the SVE system based on historical costs (including operation and shutdown periods for the site).

10. Estimate the cost to run SVE system for an agreed-upon length of time that is based on site-specific conditions, such as 6 months ($SVE_1$), by multiplying the agreed upon length of time by the results of step 9. ($SVE_1$ = length of time x step 9).
11. Estimate what the predicted residual soil gas concentrations would be if the SVE system was operated for the additional agreed-upon length of time.
12. Estimate the impact to groundwater from the site based on the results of step 11. This estimation can be conducted similarly to step 5 above.
13. Estimate the predicted time required for groundwater extraction system to reach aquifer cleanup level *with* the additional impact from the site after operation of the SVE system for an additional period of time.
14. Calculate the cost to reach the aquifer cleanup level ($GW_2$) *with* the additional impact from the site after operation of the SVE system for an additional period of time. This cost is calculated by multiplying the results of step 13 by the results of step 2. ($GW_2$ = step 13 x step 2).
15. Compare the costs of groundwater extraction *without* additional SVE at the site to the costs of groundwater extraction *with* additional SVE at the site. Is the cost of groundwater extraction without additional SVE at the site greater than or equal to the cost of groundwater extraction with SVE at the site plus the additional SVE costs.? Is this cost savings to the GW system worth the expense of continued SVE for an additional amount of time? Mathematically, this can be expressed as:

$$\text{Is } (GW_1 - GW_0) \leq (SVE_1) + (GW_2 - GW_0)?$$

**Implementation**

The Air Force will operate the SVE system until it demonstrates that the cleanup goal set forth above has been met. The Air Force, the USEPA, and the State (DTSC and the RWQCB) will jointly decide based on the STOP evaluation whether the SVE system may be permanently shut off. The STOP should be implemented in a phased approach, with the less complex criteria (criteria I and II described above) being evaluated first. Evaluation of these two criteria may indicate that the SVE system can be shut off, without having to perform a complete STOP (criterion III).

There are several potential outcomes of the STOP evaluation. Ideally, the STOP would indicate that the SVE system could be permanently turned off, and all parties agree that the site could be closed. Another potential outcome is that the STOP would indicate that the SVE system could be permanently shut off, but that the site may not yet be suitable for closure, based on remaining threats to the environment or water quality. In this case, additional discussion between the parties is necessary to determine what course of action is warranted, such as alternate remedial measures or long-term monitoring. The STOP may also indicate that additional SVE is warranted at the site prior to permanent system shut off.

Due to the reliance of the STOP on professional judgment, another outcome of the STOP is that the parties may not agree on whether the SVE system can be shut off or not. If the parties cannot reach a joint resolution, any party may invoke dispute resolution.

US EPA: RPM _____
Lisa Hanusiak

AFBCA: RPM _____
Steve LaFreniere

CA DTSC: RPM _____
Rizgar Ghazi

CVRWQCB: RPM _____
John Russell

# Appendix D
# Response to Agency Comments

# Response to EPA Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 16 August 2004—Follow-Up to June Comments)

For convenience, this response repeats EPA's original comment in standard type, followed by the Air Force response in **bold**. Please note that all page and paragraph references in the responses are based on the draft final document; the revised material may occur on a different page and/or in a different section or paragraph in the final document.

## Comments

1. **EPA General Comment #1:** EPA fully concurs with RB's response regarding AF's RTC on the selection of a final remedy for Landfills 4 & 5 (also see EPA email dated August 10, 2004). In addition, in the 4th complete paragraph of the RTC: The text states that groundwater monitoring will continue until the SVE/Bioventing remedy components of the FTA-1 remedy are completed. However, according to Section 2.8.6.5 of the ROD, concentrations of arsenic, lead, manganese, and zinc in soil all exceeded RAOs established for the protection of groundwater quality. As the maintenance of the existing Class 3 cap at FTA-1 is a component of the selected remedy, and SVE/Bioventing is not expected to be effective at reducing concentrations of metals in soil, groundwater monitoring at FTA-1 should continue even after the SVE/Bioventing is completed, as a measure of the performance of the cap.

   **The selected remedy for LF-4 and LF-5 will be cap maintenance and monitoring and institutional controls. Groundwater monitoring for the landfills is considered to be part of the cap maintenance and monitoring component of the remedy and does not need to be separately specified but is described in Section 2.8 and references have been added to the Declaration (Section 1) and Section 2.12 Selected Remedy. The Air Force also considers the monitoring of ICs as a component of the IC remedy, similar to notice, annual evaluations, response to violations and enforcement. Identification of monitoring of ICs as a separate remedy is therefore not necessary.**

   **Cap maintenance and monitoring has been added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class III type cap was installed at the site. The FTA-1 cap is currently maintained and monitored using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, portions of California's Title 27 landfill regulations pertaining to cap maintenance and monitoring have been identified as relevant and appropriate for FTA-1. A revised version of the ARARs table for FTA-1 (Table 2-21 in the updated document), which incorporates the relevant and appropriate portions of Title 27, Subchapters 3 and 5, has been provided to the regulatory agencies.**

   **The complete revised text for Section 2.12.5, FTA-1 Selected Remedy follows:**

### 2.12.5 Fire Training Area 1

The selected remedy for FTA-1 is SVE and bioventing, cap maintenance and monitoring, excavation and disposal, long-term ecological monitoring and ICs. An SVE removal action was implemented at FTA-1 in 1996 and continues. Locations where the TVPH/TEPH RAO was exceeded prior to SVE will be resampled after SVE has attained VOC RAOs and the rate of TVPH removal has dropped to low and stable levels. Bioventing will be implemented, in consultation with the BCT, only if TPH RAOs are still exceeded upon completion of SVE and only to the extent necessary to attain the TPH RAOs. Completion of bioventing will be based on soil sampling to confirm TPH RAOs have been achieved. Capping, the preferred alternative for non-VOC contamination, was undertaken as part of the SVE removal action. Long-term cap maintenance and monitoring was implemented following construction and has been conducted in accordance with cap maintenance and monitoring procedures in the CPCMP for LF-5 (Jacobs, 1998c). Within 180 days of the signing of this ROD, the Air Force will submit a revised CPCMP to include cap maintenance and monitoring at FTA-1. This revised plan will establish the same cap maintenance and monitoring procedures now used for LF-4 and LF-5 for the FTA-1 cap. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to cessation of groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to support the demonstration that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone pose a threat to water quality as specified in 27 CCR, Subchapters 3 and 5 (Appendix D). If the results demonstrate that water quality limits will not be exceeded, groundwater monitoring will be discontinued.

The estimated cost for the SVE/bioventing action (in operation since 1996) was $2,600,000. The estimated cost for cap maintenance and monitoring and groundwater monitoring at FTA-1 is assumed to be less than $10,000 per year. The estimated cost for excavation and disposal at FTA-1 is $50,000. The estimated cost for long-term ecological monitoring at FTA-1 is $3,000 every five years. The estimated cost for ICs for FTA-1 is $15,000 per year. Approximate areas affected by the various remedy components are shown on Figure 2-15 and Figure 2-16 (excavation areas only).

The FTA-1 FFS established that the existing cap meets criteria (design, location and dimensions) for the capping alternative, with the exception of approximately 150 cubic yards of soil that exceeds ecological risk assessment RAOs. The cap in place at FTA-1 is equivalent to the Class II/III cap installed at Castle AFB consolidation landfills (LF-4 and LF-5) and, in conjunction with the other elements of the selected remedy, will provide effective protection of groundwater and eliminate exposure and migration routes. As noted above, within 180 days of the signing of this ROD, the Air Force will submit a revision to the LF-5 CPCMP to include similar cap maintenance and monitoring at FTA-1. This plan will establish the cap maintenance and monitoring procedures now used for LF-5 for the FTA-1 cap.

**Excavation and disposal will address three areas identified in the FTA-1 FFS where contaminated soil exceeding ERA RAOs for cadmium and nickel lie outside the existing cap. These areas are shown on Figure 2-16. As shown, two of these areas overlap the southern boundary of the existing cap, and the third overlaps the cap's boundary with the Building 1888 compound. To address potential ecological threats, the selected remedy includes excavation of these areas and off-site disposal of the contaminated soil (approximately 150 cubic yards).**

**Long-term ecological monitoring at FTA-1 will consist of wetlands invertebrate and plant surveys every 5 years for a period of up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will be dependent upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives. If, after 30 years, no impact is observed according to the three factors, monitoring will be discontinued. Monitoring may be discontinued earlier than 30 years by mutual agreement of the Air Force, EPA and DTSC.**

**FTA-1 and its associated wetlands are located within the BoP United States Penitentiary, Atwater complex, and public access, including residential use, is prohibited. ICs are currently in place and fully implemented as follows (1) the AF/BoP MOU precludes site alterations that would interfere with IAG or IRP activities without notification and approval of the Air Force (the Air Force will obtain EPA and State of California approval of any requested alterations prior to issuing an approval notification to the BoP), (2) the AF/BoP MOU establishes that BoP may use groundwater underlying the BoP parcel if and to the extent that such use conforms to and complies with all applicable laws and regulations, (3) the AF/BoP MOU establishes access for the Air Force and the BCT and (4) elements of prison security (e.g., patrolled security fencing) restrict the potential for human exposure to site contamination. In addition, implementation of the selected remedy will not threaten sensitive ecological habitats. ICs will be maintained at FTA-1 until soils are at levels that allow for unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval.**

2. **General Comment #5 and Specific Comment 14b:** Section 2.6 remains a general discussion of overall risk assessment methodology rather than a discussion of risk assessment results for each of the sites in this ROD. A simple reference to Table 2-4 doesn't fix that. Site-specific risk assessment results are presented in various subsections of 2.8, listed as "Site Characteristics" in the contents. If the reader was to look for site-specific risk assessment information in the table of contents, he/she will not find it, as the specific subsections describing the site-specific risk assessment results are not listed there. The ROD should rename Section 2.6, and consider referring to subsections 2.8.1.4 (LF-4), 2.8.2.4, (LF-5), 2.8.3.4 (DP-9), 2.8.4.4, (ETC-8), 2.8.5.4 (ETC-10), and 2.8.6.4 (FTA-1) as

the locations to find summaries of site risks.

**The title of Section 2.6 has been changed to "Assessment of Site Risks." The section is intended to be a general discussion of overall risk assessment methodology as indicated by guidance and presented in the previous two Final SCOU RODs. The introduction to Section 2.6 currently indicates that site-specific results for risk assessments are presented in Section 2.8. The introduction to Section 2.6 and Section 1.6 (ROD Data Certification Checklist) has been revised to call out Sections 2.8.1.4 (LF-4), 2.8.2.4, (LF-5), 2.8.3.4 (DP-9), 2.8.4.4, (ETC-8), 2.8.5.4 (ETC-10) and 2.8.6.4 (FTA-1) as the locations to find site-specific risk information. This information has been added to the response to EPA General Comment #5 and Specific Comment #14b.**

3. **Specific Comment 24a:** EPA believes the statement that there are no COCs identified at the landfills can be misleading. The statements in the section should reflect the fact that rather than focusing on identifying COCs, the RI/FS focused on the consolidation of Castle landfill wastes and evaluation of the resumptive remedy of landfill capping. The fact that some chemicals have been previously detected in the groundwater monitoring underneath the landfills may very well indicate that the sources of these chemicals are in the landfills. Also, please note that whether a landfill is classified as a hazardous landfill or not does not indicate the presence nor absence of COCs in the landfill.

   **The response to Specific Comment 24a was revised based on discussion in the July RPM meeting where it was agreed to indicate that there were "no identified COCs" at the landfills. The original Draft Final text indicated only that there were "no COCs" at the landfills. One of the purposes of the RI sampling at the landfills was to characterize the nature and extent of contamination, including identification of COCs; sampling was not focused on waste consolidation or the presumptive remedy of capping. RI sampling focused on trench boundaries because of the difficulties and physical hazards associated with drilling into landfill waste. The Air Force acknowledges that hazardous substances have been detected in soil, soil gas and groundwater at the landfill sites, however, sampling to date, including sampling of large volumes of consolidated waste excavated from trenches, has not indicated such substances at concentrations that pose an adverse risk to human health or the environment.**

   **Therefore, the statement that there are no "identified" COCs at the landfills remains appropriate. In addition, the following statement has been added to Sections 2.8.1.6 and 2.8.2.7: "As reported in Section 2.8.1.2 (Section 2.8.2.2) Site Characterization, hazardous substances were detected within the vadose zone at LF-4 (LF-5) but not at concentrations determined to be an adverse risk to human health and the environment."**

4. **Specific Comment 25:** The RAO of 4.4 mg/kg for cadmium in soil represents a risk-based value; background has been established as the method detection limit (0.5 mg/kg). Hence, while a risk management decision not to remediate cadmium based on a single detection in soil of 4.6 mg/kg may be appropriate, the AF can't make the conclusion that because only one single reported concentration an order of magnitude greater than background and therefore, it does not indicate contamination. The fact that cadmium in soil only marginally exceeds the risk-

based RAO, and appears to be limited in extend, should be used as rationale that further excavation is not warranted, not that this concentration is consistent with natural background levels. Please revise the text.

**The response to Specific Comment #25 has been modified to read:**

**The phrase has been deleted. The sentence in question now reads: "The single cadmium result only marginally exceeded the RAO (4.63 mg/kg vs. 4.4 mg/kg) and indicated a very limited area of contamination that did not justify additional excavation."**

5. **Specific Comment 37:** The last paragraph of the response notes that the ROD states that five-year reviews are submitted to the regulatory agencies for "review and comment." However, the text in the ROD actually says "review and concurrence." Please reconcile this discrepancy.

   **The response to Specific Comment #37 indicates that the text has been changed to "review and comment." This change will be reflected in the final version of the SCOU ROD Part 3.**

6. The phrase "regulator approval" should be replaced with "regulatory agency" approval.

   **The responses to all regulatory agency comments and the text of the draft final SCOU ROD Part 3 have been reviewed and all uses of the phrase "regulator approval" replaced with the term "regulatory agency approval."**

# Response to EPA Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 9 June 2004)

For convenience, this response repeats EPA's original comment in standard type, followed by the Air Force response in **bold**. Please note that all page and paragraph references in the responses are based on the draft final document; the revised material may occur on a different page and/or in a different section or paragraph in the final document.

## General Comments

1. Long Term Monitoring Program at Landfill 4, 5 and at FTA-1: Landfill covers at Landfills 4 & 5 were installed as removal actions in 1999 and post-closure cap and groundwater monitoring programs were initiated and have been on-going since 1999. While the construction of the landfill covers were completed as removal actions and do not need to be part of the final remedies in the ROD, the long term post-closure monitoring programs are ongoing and should be components of the selected remedies, along with institutional control measures, in the SCOU ROD Part 3.

   Therefore, the SCOU ROD Part 3 should list the selected remedies for Landfills 4 & 5 to be:

   - Institutional controls
   - Long-term IC monitoring
   - Long-term groundwater monitoring
   - Long-term cap operation and maintenance

   As for FTA-1, the SCOU ROD Part 3 should list the selected remedy to be:

   - Soil vapor extraction
   - Bioventing
   - Excavation and offsite disposal
   - Institutional Controls
   - Long-term IC monitoring
   - Long-term ecological monitoring
   - Long-term groundwater monitoring
   - Long-term cap operation and maintenance

   EPA recommends using the above bullet format to list the selected remedies for all the sites addressed in this ROD in Section 1.0 Declaration.

   **The selected remedy for LF-4 and LF-5 will be cap maintenance and monitoring and institutional controls. Groundwater monitoring for the landfills is considered to be part of the cap maintenance and monitoring component of the remedy and does not need to be separately specified but is described in Section 2.8 and references have been added to the Declaration (Section 1) and Section 2.12 Selected Remedy.**

   **Cap maintenance and monitoring has been added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class III type cap**

**was installed at the site. The FTA-1 cap is currently maintained and monitored using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, portions of California's Title 27 landfill regulations pertaining to cap maintenance and monitoring have been identified as relevant and appropriate for FTA-1. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to ceasing groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to confirm that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone then exceed such limits in groundwater. This approach to groundwater monitoring, implemented as part of cap maintenance and monitoring, is now described in Section 2.12, Selected Remedy. A revised version of the ARARs table for FTA-1 (Table 2-21 in the updated document), which incorporates the relevant and appropriate portions of Title 27, Subchapters 3 and 5, has been provided to the regulatory agencies.**

**The Air Force considers the monitoring of ICs as a component of the IC remedy, similar to notice, annual evaluations, response to violations and enforcement. Identification of monitoring of ICs as a separate remedy is therefore not necessary.**

**The bullets listing the selected remedies in Section 1.4 Description of Selected Remedies have been simplified (list remedy only – no description of remedy).**

2. Remedy Cost Estimates: According the EPA=s A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Document, Section 6.3.12, the ROD should include estimated costs of the selected remedies in the ROD. Please revise the ROD to include the cost estimates for the selected remedies.

**Estimated costs for the each of the selected remedies have been added to Section 2.12 Selected Remedy. The estimated costs are as follows:**

a) **ICs (LF-4, LF-5, ETC-10 and FTA-1) – $15,000 per site per year**

b) **Long-term ecological monitoring (LF-3, LF-5, ETC-10, ETC-12 and FTA-1 – $3,000 per site every five years for up to 30 years**

c) **Excavation and disposal (ETC-8) – $700,000**

d) **Excavation and disposal (FTA-1) – $50,000**

e) **SVE and bioventing (FTA-1) – $2,600,000**

f) **Cap maintenance and monitoring and groundwater monitoring associated with SVE and bioventing (FTA-1) – assume less than $10,000 per year**

g) **No further action (DP-9) – no cost**

h) **No further ecological action (225 SCOU sites) – no cost**

**The next to last bullet item in Section 1.6 (ROD Data Certification Check List) has been revised to indicate that cost information is provided in Section 2.12.**

3. Institutional Controls for Groundwater Use Restriction: It is our understanding that all groundwater use restrictions at Castle Airport including Landfill 4, Landfill 5 and FTA-1 will be detailed in the upcoming Comprehensive Basewide Part 2 ROD. Please include this clarification in this ROD since the two landfills and FTA-1 are included in this ROD without the detailed groundwater use restrictions.

   **The CB ROD – Part 2 will address groundwater restrictions for the existing Castle AFB plumes that exceed MCLs. The CB ROD – Part 2 does not establish groundwater use restrictions for specific sites such as LF-4, LF-5 and FTA-1. However, the Draft Final SCOU ROD Part 3 selected remedy for LF-4 and LF-5 includes groundwater restrictions as specified in Section 2.12.1. Landfill regulations do not apply to the FTA-1 site but the AF/BoP MOU establishes that the BoP may not use groundwater underlying the BoP parcel unless such use conforms to and complies with all applicable laws and regulations. This existing restriction for FTA-1 will be included in Section 2.12.5 in the paragraph that describes how ICs are currently implemented at FTA-1.**

4. The Institutional Controls at Bureau of Prisons: The ROD states that the Air Force has a Memorandum of Understanding with the Bureau of Prisons(BoP) whereby BoP agrees to abide by the Institutional Controls identified in this ROD for ETC-10 and Landfill 5. The ROD also states that these institutional controls will be in place as long as BoP owns the property. The institutional control measures are components of the final remedy selected to protect the human health and the environment, regardless of the ownership of the subject property. In the event that BoP transfers the property -either to another federal agency or a private party, there needs to be assurances in this ROD that these institutional control measures will remain in place as long as they are necessary. In addition,

   **In Section 2.12.1, it is stated that ICs for LF-4 and LF-5 will be added to the ongoing post-closure maintenance and monitoring programs under the existing Closure and Post-Closure Maintenance plans. As noted in Sections 2.8.1.3 and 2.8.2.3, activities under these plans will be maintained in accordance with State landfill regulations. For clarity, a statement that ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations has been added to Section 2.12.1.**

   **The following text has been added to the end of the last paragraph of Section 2.12.4 – "ICs will be maintained at ETC-10 until soil and groundwater contaminants are at levels that allow for unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval." A similar sentence has also been added to Section 2.12.5 for FTA-1.**

5. Organization of the Sections in the ROD: This ROD places Site Characterization in a later section than the EPA guidance recommends. After reading the sections, EPA presumes that the intent is to present the general discussions on current and potential future site and resources uses, risk assessments, and remedial action objectives before providing site specific characterization. However, if the readerwas to find, for example, site risks, such information would not be found in *Section 2.6: Summary of Site Risks.*Rather, the information would only be later found under subsections under *Section 2.8 Site Characterization*. While we understand that many sites in this ROD contain similar information and a summarized discussion is much preferred over repeating in the individual site discussions, we recommend placing such general discussion before presenting site specific discussion.

   **The title of Section 2.6 has been changed to "Assessment of Site Risks." The section is intended to be a general discussion of overall risk assessment methodology as indicated by guidance and presented in the previous two Final SCOU RODs. The introduction to Section 2.6 currently indicates that site-specific results for risk assessments are presented in Section 2.8. The introduction to Section 2.6 and Section 1.6 (ROD Data Certification Checklist) has been revised to call out Sections 2.8.1.4 (LF-4), 2.8.2.4, (LF-5), 2.8.3.4 (DP-9), 2.8.4.4, (ETC-8), 2.8.5.4 (ETC-10) and 2.8.6.4 (FTA-1) as the locations to find site-specific risk information.**

   **Site risks specific to the SCOU ROD Part 3 sites are also provided in Table 2-4, which first appears in Section 2.6.1.4 Risk Characterization. We believe this summary presentation in Section 2.6.1.4, along with the later details provided by site, is best for the reader and we have retained the original organization.**

6. Consistent Use of the Phrases:

   a. "human health and the environment": Throughout the document, the phrases "human health and groundwater quality" or "human health, groundwater quality and the environment" are often used instead of the standard phrase "human health and the environment". Please replace these phrases with the standard phrase for consistency.

      **The document has been checked to confirm consistent usage of the noted phrases. The phrase "human health and the environment" is used in reference to the general risk assessment process and in all cases where the reference is intended to include the HHRA, WQSA and the ERA. The phrase "human health and groundwater quality" is used in cases where the reference includes the BHHRA and WQSA but not the ERA.**

      **In addition, the term "hit" has been replaced throughout the document with the term "detection" or "single detection" as appropriate.**

   b. Please revise the phrase "remedies for ecological risk" to "the selected remedies to address ecological risks ...."

      **The listed phrase has been revised as requested.**

c. Please replace the phrase "produce pathway" with "ingestion of homegrown produce" throughout the ROD

**The requested change has been made throughout the text and in the tables where the phrase was used.**

7. Text Simplification: While this ROD provides the necessary site information in accordance with EPA guidance, the document also includes information that is neither essential nor necessary in a ROD. As detailed in the specific comments below, EPA strongly recommends either deleting such information or simply referencing the source of the information. In addition, please minimize the use of acronyms as the ROD is a public friendly document rather than a technical report. For example, it is not necessary to shorten No Further Action into NFA or excavation and disposal into E&D.

**The use of acronyms has been reduced (common acronyms remain) and non-essential information identified in EPA specific comments has been eliminated (referenced where appropriate) from selected sections of the document.**

## Specific Comments

1. Section 1.2. Statement of Basis and Purpose, Page 1-1: Please revise the second last sentence to read: "EPA, the Air Force and the State of California have selected the remedies have selected the remedies in the SCOU ROD Part 3".

**By statute (CERCLA), EPA and the Air Force jointly select remedies and California concurs in that selection under the Federal Facilities Agreement. The second to last sentence in Section 1.2 has been revised to read as follows: "The Air Force and the EPA have jointly selected the remedies in the SCOU ROD Part 3; the State of California concurs."**

2. Section 1.3 Assessment of Sites:

a. Page 1-1: Please revise the first sentence to read: "The remedies selected in this ROD are necessary to protect the human health and the environment from actual or threatened releases of hazardous substances and pollutants or contaminants as defined in NCP Part 300.5".

**The first sentence in Section 1.3 Assessment of the Sites has been revised as requested.**

b. Page 1-2, bullets: Please remove the parenthesis as the site names are not for clarification but rather important subjects of the list. The list should read as follows:

- Landfills 4 & 5, Disposal Pit 5, 6, 8, 8A and Landfill 5 trenches where non-hazardous wastes (Table 2-2)
- ETC-8 and ETC-10 with polynuclear aromatic hydrocarbon (PAH) contamination from clay pigeons
- FTA-1 with volatile organic compound, semivolatile organic compound, metals, *dioxin and* fuel hydrocarbon contamination

- Disposal Pit 9 with no evidence of contamination
- To specifically address basewide ecological risks, all of the 233 SCOU sites are included in this ROD:
  - eight SCOU sites: ETC-10, ETC-12, FTA-1, LF-3, LF-5, DP-8, DP-8A and LF5 Trenches with metal contamination
  - the remaining 225 SCOU sites where contamination did not cause unacceptable ecological risks

**The bulleted list of sites at the end of Section 1.3 Assessment of the Sites has been revised as requested. The first bullet was edited as follows for clarity and accuracy: Landfill 4 (LF-4) with Disposal Pit 5 (DP-5) and DP-6 and LF-5 with DP-8, DP-8A and Landfill 5 Trenches, where municipal wastes (household, commercial and to a lesser extent industrial-type wastes) were historically disposed and non-hazardous/non-designated wastes from five Castle AFB landfills and other SCOU sites were consolidated and capped over pre-existing inactive landfill trenches. The last bullet was also edited slightly as follows: All 233 SCOU sites to address basewide ecological risks - Eight SCOU sites (ETC-10, ETC-12, FTA-1, LF-3, LF-5, DP-8, DP-8A and Landfill 5 Trenches) with metals contamination - 225 SCOU sites with no evidence of contamination, where contamination did not cause unacceptable ecological risk or where there was no suitable habitat and therefore no ecological receptors.**

3. Section 1.4 Description of Selected Remedies:

a. Page 1-2, first paragraph: Please delete the sentence about DP-7 and DP-10 as these two sites are not included in this ROD and such statement is not necessary in the Declaration.

**The sentence regarding DP-7 and DP-10 in the first paragraph of Section 1.4 Description of Selected Remedies has been deleted.**

b. Page 1-3: Please add a title to each bullet (see SCOU PROD Part 2) and also see general comment #1. In the Declaration, please simply list the elements of the selected remedies. The last paragraph in Section 1.4 is a sufficient clarification of the previous removal actions performed at the subject sites.

**Titles have been added to each of the selected remedy bullets in Section 1.4 Description of Selected Remedies.**

**As noted in the response to General Comment #1, the bullets listing the selected remedies in Section 1.4 have been simplified (list remedy only – no description of remedy).**

c. Page 1-3, second bullet: Please spell out NFA since No Further Action is not a long phrase.

**The acronym "NFA" has been eliminated from all text, tables and figures.**

4. Table 1-1, Table 2-18 and Table 2-1:

   a. Table 1-1should mention the 233 sites addressed in this ROD for ecological risks.

      **The remedy for ecological risk at all 233 SCOU sites is included in Table 1-1. Long-term ecological monitoring is identified as a selected remedy for LF-3, LF-5 (including DP-8, DP-8A and the Landfill 5 Trenches), ETC-10, ETC-12 and FTA-1; No further action is identified as the selected remedy for ecological risk at the remaining 225 SCOU sites.**

   b. Please revise Table 1-1 to include the additional remedy components (see general comment #1).

      **See response to General Comment #1. Revisions to Table 1-1 have been made accordingly.**

   c. It seems that Table 2-18 and Table 2-1 contain the same 233 SCOU site, only presented differently for different purposes. We recommend deleting Table 2-18.

      **Table 2-18 has been eliminated.**

   d. Please add ECT-8 to Section 2.14 Documentation of Significant Changes, since the preferred alternative in the recent Comprehensive Basewide Proposed Plan - Part 2 (December 2003) was institutional controls and the selected remedy in this ROD is excavation and disposal.

      **The preferred alternative for ETC-8 in the Comprehensive Basewide Proposed Plan – Part 2 was excavation and disposal. The preferred alternative and the selected remedy are the same and discussion of ETC-8 in Section 2.14 Documentation of Significant Changes is not necessary.**

      **The entry for the preferred alternative for ETC-8 in Table 1-1 has been corrected.**

5. Section 1.5 Statuary Determinations, last paragraph:

   a. Page 1-4, fourth line: the statement that the selected remedies are cost effective is not supported in this ROD as no cost estimates on the selected remedies are provided.

      **Estimated costs for each of the selected remedies have been added to Section 2.12 Selected Remedy. The next to last bullet item in Section 1.6 ROD Data Certification Check List has been revised to indicate that cost information is provided in Section 2.12. Note, however, that cost effectiveness is based on the comparative analysis of alternatives not the cost of the remedy. Costs for alternatives, where appropriate, are provided in Section 2.10. Since only one alternative satisfied the threshold criteria for LF-4, LF-5 and ETC-10, the one alternative is considered cost effective.**

   b. Please revise the last sentence to read: "The next five-year review for Castle Airport is scheduled for 2008".

**The last sentence in the final paragraph of Section 1.5 Statutory Determinations has been revised as requested.**

c. Please make sure the ROD uses the official name for Castle Airport as listed on the National Priority List.

**The NPL listing for Castle Airport is as "Castle Air Force Base." All references to Castle Airport, except in citations of documents, have been changed to "Castle AFB" or "former Castle AFB".**

6. Section 2.0 Decision Summary, bottom paragraph: If the Air Force incorporates EPA general comment #5, then the last paragraph is no longer necessary. Also, statements in the same paragraph indicating that details of the three proposed plans with the preferred alternatives at sites included in this ROD are provided in Section 2.3 Community Participation are not entirely accurate. Rather, the preferred alternatives are discussed in Section 2.9 Description of Alternatives and 2.10 Comparative Analysis of Alternatives. We recommend deleting the whole paragraph.

**As indicated in the response to General Comment #5, the order of sections will remain the same. Consequently, the first sentence of the last paragraph of Section 2.0 Decision Summary is retained. The remainder of the paragraph has been deleted.**

6. ***Note: Comment left as numbered by EPA.***

Section 2.1 Site Name, Location and Description: The second paragraph would be more appropriate for the enforcement activities discussion in the next section.

**The second paragraph in Section 2.1 Site Name, Location and Description has been moved to Section 2.2.1 Site History and Enforcement Activities – Castle Airport.**

7. Section 2.2 Site History and Enforcement Activities:

a. Please add a discussion about the 233 sites included in this ROD to address the ecological risks.

**A new heading has been added to Section 2.2 (Section 2.2.8 Ecological Risk Assessment). Text briefly describes the ecological screening performed for all 233 SCOU sites.**

b. Please add a statement about whether the subject sites were included in the previous five-year reviews as part of the site history.

**Text has been added to the last paragraph of Section 2.2.1 as follows: "The first five-year review for Castle Airport (Jacobs, 1998a) included a summary overview of all SCOU sites. The second five-year review for Castle Airport (Jacobs, 2004a) provided a detailed evaluation of ongoing SCOU removal or remedial actions, including the SCOU ROD Part 3 sites LF-4, LF-5, ETC-10 and FTA-1".**

8. Section 2.2.3. Landfill 5 (including Disposal Pits 8, 8A, 9 and Landfill 5 Trenches): In the Declaration, Disposal Pit 9 is listed as an individual site and not included in the Landfill 5 group. For consistency, please continue to do so throughout the document.

   **A separate discussion for DP-9 has been added to Section 2.2 (Section 2.2.4 Disposal Pit 9) and to Section 2.9 (Section 2.9.3 Description of Alternatives for Disposal Pit 9). All other major sections already include a separate discussion for DP-9.**

9. Section 2.2.4 Earth Technology Corporation 8: We recommend deleting the second sentence as the information is not useful.

   **The second sentence in Section (former) 2.2.4 Earth Technology Corporation 8 has been deleted.**

10. Section 2.2.5, Earth Technology Corporation 10 (ETC-10): Please replace E&D with excavation and disposal since the phrase is not a long one (see general comment #7). Also, please delete the second sentence.

    **The acronym "E&D" has been eliminated from all text, tables and figures. The second sentence in (former) Section 2.2.5 Earth Technology Corporation 10 has been deleted.**

11. Section 2.2.6, Fire Training Area: Please include the capping at FTA-1 as part of the removal action discussion. Also, revise the last sentence to read: "A focused feasibility study (April 2002)evaluated the remediation alternatives to address metals and dioxin contamination."

    **A brief overview of the capping action has been added to the removal action discussion in (former) Section 2.2.6 Fire Training Area 1. The last sentence in the section has been deleted since it is not consistent with the content of the other site subsections (i.e., text for the other sites does not address Feasibility Study evaluations).**

12. Section 2.4 Castle Operable Units:

    a. After the first sentence, please revise the text to read: "There are three operable units at Castle Airport: OU 1, OU2 and the Source Control Operable Unit (SCOU). OU 1 and OU 2 pertain to groundwater contamination and the SCOU pertains to surface and/or subsurface soil contamination. The following chart indicates how the operable units are incorporated into the Records of Decisions at Castle Airport"

       **The text after the first sentence in Section 2.4.1 Castle Operable Units has been revised for accuracy and to accommodate changes to the section resulting from Specific Comments 12b and 12c.**

    b. Please include the operable unit and ROD flow chart from the CB Proposed Plan – Part 2(December 2003).

       **The operable unit and ROD flowchart from the Comprehensive Basewide Proposed Plan – Part 2 (ROD Consolidation Flow Chart) has been added to**

**Section 2.4 and replaces the in-text flow chart previously provided in Section 2.4.3 Comprehensive Basewide Program.**

c. Since the flow chart is simple and self explanatory, it is no longer necessary to include the text in Section 2.4.2, 2.4.3. Please delete them.

**Sections 2.4.2 and 2.4.3 have been eliminated. The former Figure 2-2 is also eliminated as it duplicates the information provided on the ROD Consolidation Flow Chart from the CB Proposed Plan – Part 2.**

13. Section 2.5 Current and Potential Future Site and Resources Uses:

a. Please move the second and third paragraphsto the first and second since they discuss the general aerial land and groundwater use at Castle Airport.

**The second and third paragraphs have been moved to the lead position in Section 2.5 Current and Potential Future Site and Resource Uses.**

b. The current first paragraph is difficult to follow. For example the discussion of Landfill 4 current and future land uses are scattered throughout the paragraph among statements about other site land uses. We recommend using a table to illustrate the current and future land uses for each site.

**The current first paragraph has been revised and now incorporates a bullet list format to clearly identify current and future land uses by site.**

14. Section 2.6 Summary of Site Risks:

a. Overall, the detail discussion on the risk assessment protocols are not necessary in the ROD and can be greatly shortened and summarized.

**The discussion of the risk assessment protocols has been streamlined to the extent practical while retaining all current figures and tables and information referenced later in the document.**

b. The title of the section seems to indicate it contains site specific risk assessment information (also see general comment #6). Please revise.

**The title of Section 2.6 has been changed to "Assessment of Site Risks." The section is intended to be a general discussion of overall risk assessment methodology as indicated by guidance and presented in the previous two Final SCOU RODs. The introduction to Section 2.6 currently indicates that site-specific results for risk assessments are presented in Section 2.8. The introduction to Section 2.6 and Section 1.6 (ROD Data Certification Checklist) has been revised to call out Sections 2.8.1.4 (LF-4), 2.8.2.4, (LF-5), 2.8.3.4 (DP-9), 2.8.4.4, (ETC-8), 2.8.5.4 (ETC-10) and 2.8.6.4 (FTA-1) as the locations to find site-specific risk information.**

**Table 2-4, which is first called out in Section 2.6.1.4 Risk Characterization, also provides site-specific risk assessment results.**

c. Please revise the text on page 2-12 to clarify that as part of the SCOU RI/FS process, ecological risks were assessed, in addition to assessing risks to human health and groundwater quality.

**Mention of the ecological risk assessment process has been added to the introductory text for Section 2.6 (now "Assessment of Site Risks").**

15. Section 2.6.1, Human Health Risk Assessment: Please revise the second sentence to read "it provides a basis for taking action.." since other reasons such as a treat of groundwater impact or unacceptable ecological risks can also become the basis for taking action. Also, Table 2-4 summarizes the human health risks for the relevant sites in this ROD, please make a reference in this section.

**The second sentence in Section 2.6.1 Human Health Risk Assessment has been revised as requested. Table 2-4 is currently called out in Section 2.6.1.4 Risk Characterization. The initial callouts for all of the human health risk assessment tables (2-2, 2-3 and 2-4) have been moved to the second paragraph of Section 2.6.1.**

16. Section 2.6.1.2 Exposure Assessment: Please spell out the acronym "ADD" since it only appears in a very limited discussion. In addition, this acronym is commonly known to be used for a mental condition.

**The acronym "ADD" has been eliminated from all text, tables and figures.**

17. Section 2.6.1.3, Section Toxicity Assessment, page 2-17:

a. Please clarify that oral toxicity values were adjusted from an administered dose to and absorbed dose by accounting for absorption efficiency of the chemical *through the skin* rather than gastrointestinal absorption.

**The clarification regarding oral toxicity values has been added to Section 2.6.1.3 Toxicity Assessment as requested.**

b. In the last paragraph, please note that only cancer slope factors were also obtained from DTSC=s Office of Environmental Health Hazard Assessment.

**The clarification that only revised cancer slope factors were obtained from the DTSC has been added to the last paragraph of Section 2.6.1.3 Toxicity Assessment.**

18. Section 2.6.2.1, Site Background Levels, page 2-21: Please revise the statement in the first paragraph to state that because the organic analytes are not naturally occurring, the MDL are used as background levels because they are the lowest level detectable.

**The requested clarification regarding MDLs and background levels has been added to the first paragraph of Section 2.6.2.1 Site Background Levels. The phrase "lowest level detectable" was deleted since it is not necessarily accurate. The revised sentence is: "Therefore, the method detection limits for approved analytical methods were established as the background levels." In accordance with the overall request for document simplification**

**(General Comment #7) the acronym "MDL" has been eliminated from all text, tables and figures.**

19. Section 2.7. Remedial Action Objectives

a. This section discusses the development of RAOs for various contaminant groups to address the human health risks, the groundwater quality and the ecological risks. It also makes reference to the quantitative and qualitative RAOs. However, little of this information seems to be applicable to the individual sites since Section 2.8 Site Characterization establishes the site specific RAOs. We recommend deleting most of the section, except the general introduction of the site specific RAOs and the first three sentences in the second paragraph.

**The purpose of the section is to present the basis and development of the RAOs for Castle AFB. The general RAO approach is applicable to all sites. Individual site RAOs are presented in Section 2.8. Pursuant to the comment, Section 2.7 Remedial Action Objectives has been streamlined. The types of RAOs are introduced and described and the RAO tables are retained.**

b. First Paragraph: The second sentence sounds misleading. Please clarify that the RAOs are used at all sites to determine whether remediation is necessary.

**RAOs are not used to determine whether remediation is necessary, rather, RAOs are protective levels that selected remedies must achieve. However, the second sentence in the first paragraph of Section 2.7 Remedial Action Objectives has been deleted.**

c. First Paragraph: Please revise the third sentence to read: "In all cases, the human health RAOs and the groundwater protective RAOs must be attained, whichever are lower."

**The third sentence in the first paragraph of Section 2.7 Remedial Action Objectives has been revised to: "In all cases, the lowest RAO applicable must be attained." This revision allows that human health, WQSA and ecological RAOs must be considered.**

20. Section 2.8.1.3.1 Waste Consolidation: Please include a summary table of the confirmation sampling results. This comment also applies to Landfill 5 waste consolidation discussion. Also see specific comment # 25 below.

**See response to Specific Comment #23.**

21 Section 2.8.1.3.3, Post-Closure Monitoring and Section 2.8.1.3.4 Reporting Requirements: Please refer to general comment #1 and provide a short summary of the monitoring program initiated in the section. This comment applies to Landfill 5 discussion.

**Section 2.8.1.3.3 Post-Closure Monitoring (LF-4) and Section 2.8.2.3.3 Post-Closure Monitoring (LF-5) have been streamlined. The modified sections retain information necessary to support subsequent discussions. Section 2.8.1.3.4 Reporting Requirements (LF-4) and Section 2.8.2.3.4 Reporting Requirements (LF-5) are already very brief and have not been modified.**

22. Section 2.8.1.4 Humane Health Risk Assessment and Section 2.8.1.5 Water Quality Site Assessment, second paragraphs: As with any risk assessment, there are always uncertainties due to the nature of contamination in our environment. The ROD has an uncertainty analysis discussion in Section 2.6.1.5. So it is not necessary to make these statements under each individual site discussion. Please delete the second paragraphs under sections. In addition, please make reference to Table 2-4 as it summarizes the human health risks for the sites in this ROD. This comment also applies to Landfill 5 discussion.

    **Section 2.8.1.4 (LF-4) and Section 2.8.2.4 (LF-5) have been revised. In the third sentence of the first paragraph, the phrase "residual risk" has been replaced by "exposure". The following sentence has been added as the new third sentence of the first paragraph: "Although there may be adverse risk associated with waste under the cap, the installed cap eliminates the potential exposure routes." The second paragraph has been deleted. Reference to Table 2-4 has been added to all site human health risk assessment discussions.**

23. Table 2-11 through Table 2-17 Confirmation Sample Results: As with the summarized RI information, these confirmation sample results should be summarized as it is unnecessary to provide such detail information in the ROD. Please delete the tables.

    **Tables 2-11 through 2-17 have been deleted and replaced by appropriate summary discussions in text. References to documents containing confirmation sampling results have been included in the text discussions.**

24. Section 2.8.1.6, Site Contaminants of Concern and Remedial Action Objectives:

    a. First paragraph:The statement that there are no COCs for Landfill 4, DP-5 and 6 is not true. While the removal action eliminated the human exposure pathways, the COCs remain in place because the waste has not been removed. This comment also applies to Landfill 5 discussion.

    **At the July RPM meeting, it was agreed to indicate that there were "no identified COCs" at the landfills. The original Draft Final text indicated only that there were "no COCs" at the landfills. One of the purposes of the RI sampling at the landfills was to characterize the nature and extent of contamination, including identification of COCs; sampling was not focused on waste consolidation or the presumptive remedy of capping. RI sampling focused on trench boundaries because of the difficulties and physical hazards associated with drilling into landfill waste. The Air Force acknowledges that hazardous substances have been detected in soil, soil gas and groundwater at the landfill sites, however, sampling to date, including sampling of large volumes of consolidated waste excavated from trenches, has not indicated such substances at concentrations that pose an adverse risk to human health or the environment.**

    **Therefore, the statement that there are no "identified" COCs at the landfills remains appropriate. The first sentences of Section 2.8.1.6 and Section 2.8.2.7 have been revised to read as follows: "Based on post-removal action conditions, there are no identified human health or WQSA COCs. . .**

**In addition, the following statement has been added to Sections 2.8.1.6 and 2.8.2.7: "As reported in Section 2.8.1.2 (Section 2.8.2.2) Site Characterization, hazardous substances were detected within the vadose zone at LF-4 (LF-5) but not at concentrations determined to be an adverse risk to human health and the environment."**

b. Second paragraph: The purpose of the land use restrictions on Landfill 4 is not because the landfill had not been fully characterized. Rather, the purpose is to meet the identified qualitative RAOs listed. Please delete the paragraph. This comment also applies to Landfill 5 discussion.

**The second paragraphs of Section 2.8.1.6 and Section 2.8.2.7 have been deleted.**

25. Section 2.8.2.3.1 Landfill 5 Waste Consolidation, second paragraph: Please clarify the phrase "an expression of natural variation".

**The phrase has been deleted. The sentence in question now reads: "The single cadmium result only marginally exceeded the RAO (4.63 mg/kg vs. 4.4 mg/kg) and indicated a very limited area of contamination that did not justify additional excavation."**

26. Section 2.8.2.3.3 Post-Closure Monitoring, second paragraph, page 2-49: The statement that methane concentrations at Landfill 5 have stabilized and remained low should be revised to note the results of compliance samples collected in March 2004 with concentrations of 5.4 percent methane, which is greater than 100 percent of the lower explosive limit of 5.0 percent methane.

**Section 2.8.2.3.3 Post-Closure Monitoring has been revised to reflect recent landfill monitoring data.**

27. Section 2.8. 4.2. Site Characterization, first and second paragraphs: Please delete the first paragraph and the first sentence in the second paragraph. The discussion should start with "ETC-8 was first investigated as part of the SCOU Data Gap investigation in 1997".

**The first paragraph and the first sentence of the second paragraph of Section 2.8.4.2 Site Characterization have been deleted.**

28. Section 2.8.4.3 Removal Action: Please indicate the total volume of soil excavated at ETC-8 during the removal action.

**The total volume of soil excavated during the ETC-8 removal action (approximately 2,210 cubic yards) has been added to the removal action discussion in Section 2.8.4.3 Removal Action.**

29. Section 2.8.5.2 Site Characterization: Please delete the first sentence as it is not relevant.

**The first sentence of the first paragraph of Section 2.8.5.2 Site Characterization has been deleted.**

30. Section 2.8.6 Site Summary for FTA-1: There seems to be missing a discussion on the cap monitoring maintenance. Please clarify.

**A brief discussion of cap monitoring and maintenance, conducted in accordance with the LF-5 CPCMP, has been added to Section 2.8.6.3 Removal Action.**

31. Section 2.8.6.4 Human Health Risk Assessment: Please include the blood-lead estimates for both surface and subsurface soil instead of stating that the estimates are below 10 ug/dL.

**The blood-lead estimates for both surface and subsurface soil (4.1 µg/dL and 2.8 µg/dL, respectively) have been added to the discussion in Section 2.8.6.4 Human Health Risk Assessment.**

32 Section 2.8.6.5. Water Quality Site Assessment, second, third and fourth paragraphs:It would be much easier for the reader if the information is presented in a table format.

**The information on analytes exceeding WQSA thresholds and RAOs in Section 2.8.6.5 Water Quality Site Assessment has been converted to a bullet format.**

33. Section 2.8.6.7 Site Contaminants of Concern and Remedial Acton Objectives: The qualitative RAOs for FTA-1 should be the same as established for Landfills 4 and 5. Also, the first and second sentences in the top paragraph on page 2-80 are identical and please delete one.

**The third and fourth qualitative RAOs listed for the landfills (protect remedial system from damage and protect the integrity of the cap and associated system; prohibit activities that would limit access to any equipment and systems associated with monitoring and maintenance) have been added as qualitative RAOs for FTA-1 in Section 2.8.6.7 Site Contaminants of Concern and Remedial Action Objectives. The first and second qualitative RAOs listed for the landfills (prevent contact with landfill waste and gasses; prevent or minimize migration of landfill contents to the vadose zone and groundwater) are landfill specific and are not appropriate for FTA-1. The current qualitative RAO for FTA-1 is retained.**

**The first and second sentences at the top of page 2-80 are not identical (one refers to soil and the other to soil gas contaminants) and have been retained.**

34. Section 2.8.9 Ecological No Further Action Sites: The information presented here is redundant with Section 2.6.3. Please revise to simply state that as discussion in Section 2.6.3, no further action is required at the 225 SCOU sites based on the ecological risk assessment evaluation.

**The duplicate information in Section 2.8.9 Ecological No Further Action Sites has been deleted.**

35. Section 2.9.1 Institutional Control Alternative:

a. Please revise the title of the section to Institutional Controls.

**The title of Section 2.9.1 has been changed to "Institutional Controls."**

b. 1st paragraph: Please revise the paragraph to read: "In order to meet the qualitative RAOs identified in previous sections for Landfill 4, DP-5, DP-6, Landfill 5, DP-8, DP-8A, Landfill 5 Trenches, ETC-10 and FTA-1, ICs are a component of the selected remedies at these sites".

**Given that Section 2.9.1 Institutional Controls is a description of ICs as an alternative and not a description of a selected remedy, the first sentence of the first paragraph has been modified to read: "In order to meet the qualitative RAOs identified in previous sections for LF-4, DP-5, DP-6, LF-5, DP-8, DP-8A, Landfill 5 Trenches, ETC-10 and FTA-1, ICs were evaluated as an alternative at these sites."**

c. 2nd paragraph, page 2-86:Please delete the third sentence and revise the fourth sentence to read "Within 120 days of the signing of this ROD, the Air Force will submit to EPA and DTSC for review and approval the revised closure and lost-closure maintenance plans for LF-4, DP-5, DP-6, LF-5, DP-8, DP-8A, Landfill 5 Trenches, to include the restrictions as well as the implementation, monitoring, reporting and enforcement measures described in this section."

**The third sentence of the second paragraph of Section 2.9.1 Institutional Controls is retained. The text of the fourth sentence has been revised as requested with the term "within 180 days" replacing "within 120 days" to be consistent with the NCP and the term "State of California" replacing "DTSC".**

d. 2nd paragraph, page 2-86: Please delete the last two sentences and replace them with the following "Within 120 says of signing of this ROD, the Air Force will submit to EPA and DTSC for review and approval an IC implementation plan to include the restrictions as well as the implementation, monitoring, reporting and enforcement measures described in this section."

**The Air Force has previously submitted an internal IC management plan to the EPA and the State of California for review and comment purposes only. The Air Force believes that the details provided in this ROD sufficiently outline Air Force obligations as to ICs; these same obligations will be incorporated (as noted) in updated CPCMPs or O&M plans. Therefore, the Air Force does not plan to submit a separate IC plan for "approval". IC details will be identified in the CPCMPs or O&M plans. The existing text is retained.**

e. 3rd paragraph, last sentence, page 2-86: Please revise the sentence to read "Any grantee of property constrained by ICs imposed on their transfer document may submit requests to the Air Force proposing modification or termination of the ICs. Such request must first be approved by the Air Force prior to seeking approval from EPA and DTSC." This comment also applied to Section 2.9.1.6 Approval of Land Use Modification on page 2-90.

**Air Force agreement with EPA HQ in compromising on the order of approvals is not to identify the order since all members of the BCT must approve any modifications inconsistent with the ROD or IC termination. The Air Force believes it is preferable to identify the approval requirement without specifying the order of such approvals given that the Air Force is not going to approve IC termination or modification without knowing that regulators will approve it as well. The last sentence has been revised to: "Modification or termination of these ICs requires Air Force, EPA and State of California approval."**

f. 4th paragraph, 1st sentence, page 2-86:Please delete the later half of the sentence starting with "..of operations and maintenance activities and ICs at .."

**The first sentence in the fourth paragraph in Section 2.9.1 Institutional Controls has been revised to read: "The regulatory agencies may conduct inspections of CERCLA remedial response activities." Access is not open ended; for the purposes of the ROD, access is relevant to the CERCLA remedial response process.**

g. 1st complete sentence, page 2-87: Please add the word "equivalent" after "..superseded by".

**The fourth sentence in the fifth paragraph of Section 2.9.1 Institutional Controls has been revised to read: "...superceded by equivalent restrictions to be included ..."**

h. 1st full paragraph, 3rd sentence, page 2-87: Please add the phrase "and approval" after "notification". This comment also applied to the last paragraph on page 2-117, Section 2.12.4 Earth Technology Corporation 10 and Section 2.12.5 Fire Training Area 1.

**The existing AF/BoP MOU requires notification of the Air Force, EPA and the State of California regarding any planned alterations but only requires Air Force approval to proceed. Wording in the identified sections (2.9.1, 2.12.4 and 2.12.5) has been modified to indicate that the Air Force will obtain EPA and State of California approval of any requested alterations prior to issuing an approval notification to the BoP.**

i. 2nd full paragraph, page 2-87: Please delete the first sentence starting with "Meeting RAOs..."

**The first sentence of the eighth paragraph of Section 2.9.1 Institutional Controls will be retained. The language is part of the settlement language at Travis and March and has been accepted by EPA Headquarters.**

j. 2nd full paragraph, 2nd sentence, page 2-88: Please revise the sentence to read ALand Use Controls will be maintaineduntil contamination in the soil and groundwater are at such levels to allow for unrestricted use and exposure."

**The second and last sentences in the last paragraph of Section 2.9.1 Institutional Controls have been modified to read: "ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations. ICs will be**

**maintained at ETC-10 and FTA-1 until soil and groundwater contaminants are at levels that allow for unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval."**

k. Please include a figure in the ROD delineating the aerial boundaries of the ICs.

**The approximate area of ICs for LF-4, LF-5 and FTA-1 (capped areas) and ETC-10 (excavated area) are shown on Figure 2-5, Figure 2-8, Figure 2-15 and Figure 2-14, respectively. Mention of the areas covered by ICs and reference to the appropriate figures has been added to the appropriate subsections within Section 2.12 Selected Remedy.**

36. Section 2.9.1.1 Deed Restrictions and Reserv ation of Access, 1st paragraph, 1st sentence:Please add "Selected Remedy" after the citation to 2.12 to make it easier reading.

**The title for Section 2.12 (Selected Remedy) has been added to the first sentence in the first paragraph of Section 2.9.1.1 Deed Restrictions and Reservation of Access.**

37. Section 2.9.1.3 Annual Evaluation/Monitoring, 3rd sentence and last sentence: Please delete the third sentence as the statement is unnecessary. Also, delete the phrase "or eliminate" from the last sentence and add the following sentence in the section: "The annual evaluation will address whether ICs identified in this ROD were communicated in the deed, whether the owners and state and local agencies were notified of the ICs affecting the property and whether the use of property has conformed with such ICs."

**The third sentence of Section 2.9.1.3 has been deleted.**

**As to the request to delete "eliminate", it is appropriate to retain as a possible recommendation from the 5-Year Review—the Air Force acknowledges that any actual proposal to do so would require EPA and State approval.**

**The fourth sentence of the paragraph has been changed to read as follows (language recently coordinated with EPA Headquarters): "The annual evaluation will address whether the ICs in the ROD were communicated in the deed(s) if property was deeded during the period covered, whether the owners and State and local agencies were notified of the ICs affecting the property, and whether use of the property has conformed with such ICs".**

**In addition, the last sentence referencing five-year review reports notes that such reports "are submitted to the regulatory agencies for review and comment". This change is consistent with legal authorities and was part of the negotiated March language.**

38. Section 2.9.1.4 Response to Violations: Please delete the sentence that reads "This description is not subject to regulator review" and replace it with the following "Any violation/inconsistent activities with identified ICs in this ROD will be included in the annual monitoring reports described in Section 2.9.1.3."

**After discussing this language with Allison Abernathy and Sally Dalzell at EPA Headquarters, and in response to their concerns, the referenced sentence has been revised to read: "This description of corrective action is not subject to regulatory agency approval." The suggested additional language concerning the monitoring report was not added because it is redundant of the commitment to monitoring report contents that appears in Section 2.9.1.3 (confirmed with the same EPA Headquarters personnel).**

39. Section 2.9.2 Description of Alternatives for Landfill 4 and Landfill 5: Please include long term maintenance and monitoring of the landfills as components of the alternatives (see general comment #1). Also, DP-9 should be listed as an individual site for consistency in the ROD.

**See response to General Comment #1. The second paragraph of Section 2.9.2 Description of Alternatives for Landfill 4 (including DP-5 and DP-6) and Landfill 5 (including DP-8, DP-8A, DP-9 and Landfill 5 Trenches) identifies long-term maintenance and monitoring as an integral part of all capping alternatives. The text further states that capping was completed as a removal action and that long-term cap maintenance and monitoring is an ongoing activity in accordance with approved CPCMPs.**

**A separate subsection describing alternatives considered for DP-9 has been added (Section 2.9.3 Description of Alternatives for Disposal Pit 9).**

40. Section 2.9.2.2 Institutional Controls:

a. Page 2-93:Please replace the last sentence with the following "Land Use Controls will be maintaineduntil contamination in the soil and groundwater are at such levels to allow for unrestricted use and exposure."

**The last sentence in the first paragraph of Section 2.9.2.2 Institutional Controls (now Section 2.9.2.7) has been modified to read: "ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations. Modification or termination of ICs requires Air Force, EPA and State of California approval."**

b. Page 2-94, first bullet: The bullet should limit the land use at Landfills 4 and 5 to nonirrigated open space as described in Section 2.5 Current and Potential Future Site and Resources Uses.

**The first bullet has been modified to read: "Limit use of the property to nonirrigated open space unless otherwise approved in accordance with State landfill regulations."**

41. Section 2.9.4.2 Excavation and Disposal, page 2-98, 2nd paragraph: please clarify why this alternative could only meet most ARARs instead of all ARARs. The comment also applies to Section 2.9.5.6.1 Capping with ICs (for FTA-1) on page 2-107, Section 2.9.5.6.2 Excavation and Disposal (for FTA-1), Section 2.9.6.2 Alternative 2- Excavation and Restoration on Page 2-111.

**The word "most" has been deleted from the discussion in all of the listed sections.**

42. Section 2.9.4.3 Institutional Controls, 1st paragraph: Please delete the rest of the first paragraph except the first sentence and replace them with "Land Use Controls will remain in place until the contamination at the site is at such levels to allow for unrestricted use and exposure."

**The third sentence of the first paragraph of Section 2.9.4.3 Institutional Controls has been deleted. The second sentence has been modified as follows: "ICs for ETC-10 will remain in place until soil contaminants are at levels that allow for unrestricted use and exposure. Modification or termination of ICs requires Air Force, EPA and State of California approval."**

43. Section 2.9.5 Description of Alternatives for FTA-1 and Section 2.10 Comparative Analysis: Since FTA-1 already has a cap installed as a removal and SVE as an ongoing removal action, it seems mute to present such a detailed discussion of the alternatives considered either before or after the removal action in this ROD. We recommend reducing the lengthen of the discussion on the alternatives and deleting Tables 2-20, 2-21 and 2-22 as they offer little substantive value in this ROD.

**Section 2.9.5 Description of Alternatives for Fire Training Area 1 has been streamlined. However, the tables summarizing comparison of alternatives for FTA-1 in Section 2.10 Comparative Analysis of Alternatives are retained in accordance with the declaration checklist for ROD preparation (EPA guidance).**

44. Section 2.11.1 Landfill 4, DP-5 and DP-6, 2nd paragraph on page 2-114:2nd paragraph: Please delete the second sentence in the paragraph. Also, please replace the phrase "may be" with "are".

**The last sentence of the first paragraph of Section 2.11.1 has been revised to read: "The Air Force and the regulatory agencies agreed that the single detection of zinc did not pose an adverse risk. . . " The first sentence of the second paragraph is retained. The second sentence of the second paragraph has been revised to read: "However, the installed cap at LF-4 eliminates potential routes of exposure." The same change has been made to the second sentence of the second paragraph in Section 2.11.2 (LF-5).**

45. Section 2.12 Selected Remedy: Please see general comment #1 for including long term monitoring of groundwater and landfill cap maintenance as components of the selected remedy for Landfill 4, Landfill 5 and FTA-1.

**See response to General Comment #1.**

46. Section 2.12.1 Landfill 4 and 5:

a. First bullet, page 2-116:Please revise the statement to indicate that the land use at Landfills 4 and 5 I is limited to nonirrigated open space as described in Section 2.5 Current and Potential Future Site and Resources Uses.

**The first covenant in Section 2.12.1 Landfill 4 and Landfill 5 has been deleted since the last covenant provides appropriate restriction of land use.**

b. Please include a complete list of Land Use Covenant with the State of California in this ROD.

**The State Land Use Covenant will not be completed until after the SCOU ROD 3 is finalized and would not be executed until immediately prior to property transfer.**

c. 1st full paragraph, page 2-118: Please replace the phrase "regulatory approved documents" with "existing primary documents".

**The sentence preceding the third bullet list in Section 2.12.1 Landfill 4 and Landfill 5 has been revised as requested.**

d. 1st sentence following the bullets, page 2-118: Please delete the phrase "As necessary and appropriate" and replace it with "Within 120 days of the signing of this ROD, the Air Force will submit these updated document to include the ICs for review and approval by EPA and DTSC."

**The identified sentence has been revised to read: "Within 180 days of the signing of this ROD, the Air Force will submit updated versions of these documents to include the ICs as outlined in Section 2.9.1 of this ROD."**

47. Section 2.12.3, Earth Technology Corporation 8: Since the IC was the preferred alternative for ETC-8 and the selected remedy is excavation and disposal, please include a discussion of the rationale for the change in remedy in Section 2.14 Documentation of Significant Changes.

**The preferred alternative for ETC-8 in the Comprehensive Basewide Proposed Plan – Part 2 was excavation and disposal. Table 1-1 and the text in Section 2.12.3 have been corrected. The preferred alternative and the selected remedy are the same and discussion of ETC-8 in Section 2.14 Documentation of Significant Changes is not necessary.**

48. Section 2.13 Statutory Determination: The discussion for each site in the section should also explain the five-year review requirement for each Selected Remedy.

**Mention that selected remedies will be subject to five-year reviews has been added to the appropriate site subsections of Section 2.13 Statutory Determinations. The five-year review process will not apply to ETC-8, DP-9 or the 225 ecological no-further-action sites. Documentation of the five-year review process for SCOU ROD 3 sites is already included in Section 2.13.7 Five-Year Review.**

49. Section 2.14 Documentation of Significant Changes: Please revise the statements about elements of the selected remedy for Landfill 4, Landfill 5 and FTA -1 based on general comment #1.

**See response to General Comment #1.**

50. Appendix D ARARs for On-going Maintenance and Monitoring: Since the ongoing maintenance and monitoring should be components of the selected remedy for many sites include in this ROD, please incorporate these ARARs into Tables 2-25 and 2-28.

**See response to General Comment #1. Appendix D has been eliminated. Information in former Table D-1 has been incorporated into Table 2-18 (current ARARs table for LF-4 and LF-5) and the information in former Table D-2 has been incorporated into Table 2-21 (current ARARs table for FTA-1).**

The following comments were received from the EPA on 16July 2004

51. Description of Selected Remedies, Section 1.4, page 1-4: Revise the 7th (and final) bullet in this section to also note that for certain sites, the selected remedy to address risk to ecological receptors is NFA because of the lack of suitable habitat, regardless of the levels of contamination present.

**The bullet list in Section 1.4 has been streamlined and now lists only sites and their selected remedies. A statement regarding the lack of suitable habitat as a basis for ecological no further action has been added to the bullet list in Section 1.3 Assessment of the Sites.**

52. Source Control Operable Unit, Section 2.4.2, page 2-8: Clarify that the 32 sites are excluded from CERCLA due to being solely contaminated with petroleum hydrocarbons. Sites contaminated with both petroleum and hazardous wastes, even if predominately contaminated with petroleum, are not eligible for exclusion from CERCLA requirements.

**Per EPA Specific Comment #12c, Section 2.4.2 has been deleted. It is correct that the 32 sites were excluded due to their contamination solely, rather than predominantly, with petroleum hydrocarbons.**

53. Site Characteristics for Disposal Pit 9, Section 2.8.2.2, page 2-55: The Munsell Color System codes presented in this section should either be defined, or the references deleted.

**The references to Munsell codes in Section 2.8.3.2 have been deleted.**

54. Focused Feasibility Study for FTA-1 Non-VOC Contamination, Section 2.9.5.6: Clarify the text in this section to note that the that the Class III-equivalent cap was not evaluated in the SCOU FS as an alternative to non-VOC contamination at FTA-1, rather than "explicitly" evaluated as stated here. The fact that capping was not evaluated as an alternative for non-VOC contamination is attested to by the requirement to evaluate this alternative in the FTA-1 focused feasibility study, and by the fact that the cap as installed does not cover all areas where non-VOC contamination exceeds RAOs.

**The first bullet in Section 2.9.5.6 in the draft final document stated that the "Class III-equivalent cap that was placed over the site during the removal action was <u>not</u> explicitly evaluated in the SCOU FS." The word "explicitly' has been deleted from the bullet, now in Section 2.9.6.6.**

55. Fire Training Area 1, Section 2.12.5, page 2-120: The first two sentences of the second paragraph appear to contradict one another. The first sentence states that the dimensions of the existing FTA-1 cap meets criteria for the capping alternative, while the second sentence notes that 150 cubic yards of soil contamination that exceeds ecological RAOs are not addressed by the cap and must be excavated. Clearly, if soil outside the area of the existing cap must be excavated in order to achieve RAOs for this site, then the "design, location, and dimensions" of the cap meets "criteria" only in conjunction with other components of the selected remedy for FTA-1. Revise the text in this section to more clearly note that the existing FTA-1 cap will be protective only in conjunction with the other components of the selected remedy for this site.

**The second paragraph of Section 2.12.5 have been revised as follows: "The FTA-1 FFS established that the existing cap meets criteria (design, location and dimensions) for the capping alternative, with the exception of approximately 150 cubic yards of soil that exceeds ecological risk assessment RAOs. The cap in place at FTA-1 is equivalent to the Class II/III cap installed at Castle AFB consolidation landfills (LF-4 and LF-5) and, in conjunction with the other elements of the selected remedy, will provide effective protection of groundwater and eliminate exposure and migration routes."**

# Response to DTSC Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 17 August 2004—Follow-Up to June Comments)

For convenience, this response repeats DTSC's original comment in standard type, followed by the Air Force response in **bold**. Comments have been numbered for ease of reference.

## Comments

1. **RTC #8** – DTSC is not aware of a specific format for the annual report and there has been no discussion between DTSC, USEPA and the Air Force regarding what type of information will be provided these reports. Since the institutional controls (ICs) have not been incorporated into the post closure plans for the landfills and the operation and maintenance plans for the other sites. DTSC is not able to make a decision on what points the annual report should address. Additionally, the Air Force response is unclear as to how ICs violations would be addressed in the annual report. Therefore DTSC reserves the right to request changes in the format and contents of the annual reports. DTSC does not want to take an enforcement action in order to get changes made to the annual report format.

   **The anticipated content of the annual IC monitoring reports is outlined briefly in Section 2.9.1.3 of the updated document. Section 2.9.1.3 currently reads as follows:**

   **"The Air Force will conduct annual monitoring and undertake prompt action to address activity that is inconsistent with the IC objective or use restrictions or any action that may interfere with the effectiveness of the ICs. The Air Force will submit to the regulatory agencies annual monitoring reports on the status of ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the ICs in the ROD were communicated in the deed(s), if property was deeded during the period covered, whether the owners and State and local agencies were notified of the ICs affecting the property and whether use of the property has conformed to such ICs. Five-year review reports will make recommendations on the continuation, modification or elimination of annual reports and IC monitoring frequencies. Five-year review reports are submitted to the regulatory agencies for review and comment."**

   **The Air Force response to IC violations will be in accordance with Section 2.9.1.4 Response to Violations. The portion of the IC monitoring report that addresses whether property use has conformed to ICs will summarize such violations and associated corrective actions, taken or planned.**

2. **RTC #12** – DTSC project management staff were recently informed that August 3, 2004 conference call you cite in your response to our comments was canceled. We are aware that discussions regarding reimbursement of our oversight costs are ongoing between the agencies. Until a resolution is reached regarding this matter DTSC will not be able to sign SCOU ROD, part 3.

**The reference to an August 3, 2004 conference call that was originally included in the response to DTSC General Comment #12 has been removed.**

**Regarding future payment of state land use control oversight costs, the Air Force considers these as operating costs that can and will be negotiated outside any ROD(s). As in previous Castle RODs, resolution of such funding is not addressed in the SCOU ROD Part 3, but is being resolved independently between the Air Force and the State of California.**

# Response to DTSC Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 17 June 2004)

For convenience, this response repeats DTSC's original comment in standard type, followed by the Air Force response in **bold**. Comments have been numbered for ease of reference. Please note that all page and paragraph references in the responses are based on the draft final document; the revised material may occur on a different page and/or in a different section or paragraph in the final document.

## General Comments

1. Page 2-10, section 2.4.3; DTSC disagrees with the statement that part of the selected remedy for the North Base plume and the Landfill one and four plumes in the Comprehensive Basewide Record of Decision (CB ROD), part 1 was institutional controls (ICs) to prevent the installation of ***shallow*** water supply wells. The CB ROD actually states that ICs will be put in place to prevent the installation of groundwater wells on Castle Air Force Base (CAFB). Please revise the text in this ROD to actually reflect the text in the CB ROD, part 1. Additionally, a Land Use Covenant (LUC) that will be executed at the time of transfer will state that no wells are to be installed on CAFB or adjacent areas where groundwater contamination exists.

   **The comment is correct in that the CB ROD Part 1 groundwater use restriction for the North Base and LF-1/LF-4 plumes is not limited to shallow water supply wells and that a SLUC with groundwater restrictions will be executed at the time of transfer. However, per EPA Specific Comment #12c, Section 2.4.3 has been eliminated.**

2. Page 2-40, section 2.8.2.1; The text in this section should reflect the fact that the construction waste and demolition debris area that was located near Landfill 5 has been removed or buried under the supervision of the Merced County Environmental Health Department. DTSC is unaware of any existing enforcement order. This section should be rewritten to simply state that the waste was removed and that the action was not subject to Comprehensive Environmental Response, Compensation, and Liability Act.

   **The last three sentences of the first paragraph of Section 2.8.2.1 Site Description have been revised to read as follows: "A construction waste and demolition debris area was located immediately west of the LF-5 cap. The Merced County Department of Public Health issued a notice of violation for the area in April 2003. In June 2003, the EPA, DTSC and the Air Force issued a joint letter identifying the construction and demolition debris area as being the responsibility of the BoP and not subject to CERCLA requirements. BoP subsequently took action to address the noted violations. The Merced County Department of Public Health has since documented that the BoP has abated the construction and demolition debris area and that the area is now in compliance with State regulations."**

3. Pages 2-51 and 2-52, section 2.8.2.4; The last paragraph in this section is confusing. DTSC believes the paragraph should be moved and placed after the first sentence in this section. The first word of the new paragraph should be, ***"However"***.

   **Section 2.8.2.4 Human Health Risk Assessment has been revised. In the third sentence of the first paragraph, the phrase "residual risk" has been replaced by "exposure". The following sentence has been added as the new third sentence of the first paragraph: "Although there may be adverse risk associated with waste under the cap, the installed cap eliminates the potential exposure routes." The second paragraph has been deleted.**

4. Page 2.54, section 2.8.2.7; There is an error in the second sentence. This section describes conditions at Landfill 5. However, Landfill 4 is referenced in the second sentence. Please revise the sentence.

   **The reference in the second sentence has been corrected to LF-5.**

5. Page 2-86, section 2.9.1; The Air Force (AF), commits in this section to revise the Closure Post Closure Monitoring Plan to include restrictions as well as the implementation, monitoring, reporting and enforcement measures described in later sections of this ROD. However, there is no date cited for the plan completion. When will the Plan be completed and submitted to the agencies?

   **Text has been added to Section 2.9.1 Institutional Control Alternative indicating that revised CPCMPs will be submitted for EPA and State of California review and approval within 180 days of the signing of this ROD.**

6. Page 2-86, section 2.9.1; The text in this section states that the AF, United States Environmental Protection Agency, and the State of California must approve any modification or termination of ICs imposed in a transfer document. DTSC does not fully understand what this sentence means. Does the AF mean to say that DTSC must approve all modifications and termination that are submitted to us, or that all agencies must agree before any termination or a modification can be granted. Please rewrite this sentence to clearly state your intent.

   **The sentence has been revised to read: "Modification or termination of these ICs requires Air Force, EPA and State of California approval." The order of such approvals is left silent. The Air Force intent is that each entity must approve the modification or termination; it would be up to the applicant the most efficient way to seek such approvals.**

7. Page 2-88, section 2.9.1; The text in this section states that maintenance, monitoring and other controls as established in the revised Closure-Post Closure Maintenance Plan will continue until ICs are no longer necessary. What factors will be used to determine that ICs are no longer necessary and what procedure will be instituted to document that the ICs are no longer necessary? Please clarify your statement in the ROD to addresses these points.

**The second and last sentences in the last paragraph of Section 2.9.1 Institutional Controls have been modified to read: "ICs will be maintained for LF-4 and LF-5 as long as required by State landfill regulations. ICs will be maintained at ETC-10 and FTA-1 until soil and groundwater contaminants are at levels that allow for unrestricted use and exposure. Modification or termination of these land use controls requires Air Force, EPA and State of California approval."**

8. Page 2-89, section 2.9.1.3; DTSC has the authority and is obligated to enforce the LUC if in our opinion one or more of the restrictions cited within the LUC has been violated. The statement in this section of the ROD that reads as follows; *IC monitoring reports will not be subject to approval and/or revision by the regulatory agencies* should be revised to acknowledge DTSC authority.

   **Section 2.9.1.3 has been revised as follows:**

   **"The Air Force will conduct annual monitoring and undertake prompt action to address activity that is inconsistent with the IC objective or use restrictions or any action that may interfere with the effectiveness of the ICs. The Air Force will submit to the regulatory agencies annual monitoring reports on the status of ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual monitoring report will address whether the ICs in the ROD were communicated in the deed(s), if property was deeded during the period covered, whether the owners and State and local agencies were notified of the ICs affecting the property and whether use of the property has conformed to such ICs. Five-year review reports will make recommendations on the continuation, modification or elimination of annual reports and IC monitoring frequencies. Five-year review reports are submitted to the regulatory agencies for review and comment."**

   **The third sentence of Section 2.9.1.3 has been deleted.**

   **See also the response to DTSC's follow-up Comment #1 and EPA's Specific Comment #37.**

9. Page 2-90, section 2.9.1.4; The text states that the Air Force in response to a violation of the LUC will provide the regulatory agencies with a description of the corrective actions taken to be taken or planned to address any violation(s). The text goes on to state that the description of the corrective action is not subject to regulatory review. State statues allow DTSC to initiate an enforcement action if we believe the corrective action(s) taken or planned will not adequately address the violation(s) being described. This section should be revised to acknowledge DTSC authority.

**The Air Force agrees that the DTSC can take whatever action it deems necessary under its enforcement authority. However, Section 2.9.1.7 specifically addresses State Land Use Covenants and DTSC authority. In contrast, the referenced sentence is in regard to the Air Force reporting what corrective actions will or have been taken in response to a violation; it neither requires nor precludes DTSC action/authorities that are outlined elsewhere. In response to discussion with EPA Headquarters, the sentence has been revised to read: "This description of corrective action is not subject to regulatory agency approval."**

**(See also response to EPA Specific Comment #38)**

10. Page 2-85, section 2.9.1.6; The text at the end of the second paragraph should be modify to reflect the fact that USEPA will be a party to the LUCs and thus will not have the legal ability to make determinations on modifications or termination of the LUCs. This comment is based on servel conversations between DTSC and USEPA management and legal staffs.

    **The last sentence of the first paragraph of Section 2.9.1.7 State Land Use Covenants has been revised as follows: "Modification or termination of the State Land Use Covenant must be undertaken in accordance with State law." However, we note that although changes to the State Land Use Covenant are the domain of State law, Air Force understanding is that EPA is a party to terminations/modifications of the ICs themselves – that position is reflected elsewhere in the ROD.**

11. Page 2-91, section 2.9.1.7; There is an error in the first paragraph. The Installation Restoration Program (IRP) is not a factor when modifications or terminations of the LUC are considered. Please revise the text accordingly.

    **The term "IRP" has been deleted from the last sentence of the first paragraph of Section 2.9.1.7 State Land Use Covenants.**

12. Page 2-91, section 2.9.1.7; The text in the second paragraph that pertains to the state costs needs to be revised. The text should read as follows The Air Force will pay the State all cost associated with our oversight subject to appropriation of funds through the Defense State Memorandum of Agreement or some alternate payment mechanism. Our oversight would include activities that we deem necessary to perform under California Code of Regulations, title 22, section 67391.1 as well as the following tasks;

    - Quarterly SVE reports for sites still being remediated.
    - Closure reports for remaining SVE and PHO sites.
    - Annual and Semi-annual Groundwater Monitoring Reports.
    - Annual Landfill Monitoring Reports.
    - Annual Ecological Monitoring Reports.
    - Annual inspection/monitoring reports to ensure that the ICs are in place.
    - Periodic site inspections.
    - Five Year Review Reports.
    - Any ESD or ROD amendments that may be necessary.

**The Air Force understands the significance of the ongoing discussions with the State. Overall, the Air Force considers the reimbursement of State oversight costs, as they apply in this particular circumstance, as operating costs that can and will be negotiated and assigned in the transaction, much like a follow-on entity would have to maintain permits or licenses. The Air Force intends to account for such fees as part of the overall property transaction, just as it now does for permit fees or similar future ongoing expenses after the property transfers to private hands.**

13. Page 2-115, section 2.12; The ROD listed eight sites where part or all of the proposed remedy is long-term ecological monitoring. However, no specific information is given as to how the monitoring will be conducted and no date is provided as to when a monitoring plan may be written and submitted to the regulatory agencies. Please provide information in the ROD as to how the sampling will be done or when DTSC can expect to receive an Ecological Monitoring Plan.

    **A description of how long-term ecological monitoring will be conducted has been included in the applicable sections for the eight sites. Section 2.9.6.3 describes frequency, evaluation of survey results and criteria for when the monitoring can be discontinued or when alternatives need to be considered. This description is consistent with Air Force policy that requires the ROD to define essential actions and results rather than additional documents. Actions essential to the monitoring have been described in the ROD.**

14. Page 2-120, section 2.12.5; Groundwater monitoring should be a component of the remedy at site FTA-1. When the remedy was chosen for the East Base Plume the Remedial Investigation for Castle Air Force Base was incomplete. It was later determined that the source of the East Base Plume was FTA-1. In l996 a cap was placed over the site to enhance the soil vapor extraction system which is still operating. Recently it was determined that the cap would be part of the final remedy due to dioxins and lead above the remedy action objective (RAO) being left in place. Given the fact that waste is being left in place under the cap, and that volatile organic compounds and petroleum related contamination remains above the RAOs, it is appropriate to continue to monitor the groundwater downgradient of the site annually until a further evaluation can be made in the next Five Year Review in 2008.

    **Cap maintenance and monitoring has been added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class III type cap was installed at the site. The FTA-1 cap is currently maintained and monitored using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, portions of California's Title 27 landfill regulations pertaining to cap maintenance and monitoring have been identified as relevant and appropriate for FTA-1. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to ceasing groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to confirm that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone then exceed such limits in groundwater. This approach to groundwater monitoring, implemented as**

**part of cap maintenance and monitoring, is now described in Section 2.12, Selected Remedy. A revised version of the ARARs table for FTA-1 (Table 2-21 in the updated document), which incorporates the relevant and appropriate portions of Title 27, Subchapters 3 and 5, has been provided to the regulatory agencies.**

# Response to RWQCB Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 9 August 2004—Follow-Up to June Comments)

For convenience, this response repeats RWQCB's original comment in standard type, followed by the Air Force response in **bold**. Please note that all page and paragraph references in the responses are based on the draft final document; the revised material may occur on a different page and/or in a different section or paragraph in the final document.

## Comments

1. Remedial Actions Proposed for Landfills 4 and 5

For Landfills 4 and 5, the sole remedy proposed for selection in the draft final SCOU ROD 3 is institutional controls (ICs). This represents a major departure from the draft Landfill ROD[1] wherein consolidation and capping, long-term maintenance and monitoring and ICs were selected as the remedy for Landfills 4 and 5.

In the Regional Board's comment on the draft final SCOU ROD 3, the Regional Board stated:

> "The draft final SCOU ROD 3 proposes ICs for selection at LF-4 and LF-5 but does not include selection of the previously implemented removal actions. While capping is already implemented, the draft final ROD should select the current landfill caps as part of the selected final remedies. The ROD should also include long-term monitoring and maintenance of the capped landfills as part of the selected remedy".

The Air Force response is as follows:

> "The BCT agreed that completed removal actions (the consolidation and capping removal actions at LF-4 and LF-5) need not be a part of the selected remedies for LF-4 and LF-5 during review of the draft Landfill 4 and Landfill 5 ROD, the precursor to the current SCOU ROD Part 3. Post-closure cap maintenance and monitoring and groundwater monitoring at both former landfills are currently ongoing in accordance with approved CPCMPs per State landfill regulations.
>
> Please refer to the response to EPA General Comment #1."

The Air Force has incorrectly interpreted the BCT agreement regarding the incorporation of removal actions into the ROD remedy selection process. The Regional Board's comment regarding this matter, as set forth in our August 25, 2003 comment letter on the draft Landfill ROD is as follows:

> "We concur with the remedies proposed for selection for LF-4, LF-5 [capping, long-term maintenance and monitoring and ICs]. However, for a

[1] The draft Landfill ROD, Dated March 2003, was subsequently updated by the inclusion of the remaining source sites and remedy selection for the source sites based on ecological risk, the successor document to the Draft Landfill ROD was submitted as the draft final SCOU ROD 3, even though major portions of it were new and had not been reviewed by the regulatory agencies.

number of reasons, the ARARs section of the document is insufficient. The ARARs description does not include a list of the ARARs but, instead, refers to the ARARs listed in the Action Memoranda. However, the ARARs listed in the Action Memoranda for LF-4 reference the old California Code of Regulations (CCR) citations (Title 14 and Title 23) that have since been combined into Title 27. The ARARs listed in the Action Memoranda for LF-5 reference the Title 27 CCR sections but the groundwater-monitoring requirements are given as a general reference to Title 27, CCR Article 5 (and this citation is incorrect). The ARARs tables presented in the Action Memoranda contain dozens of ARARs that are not relevant to the LF ROD because they relate to landfill consolidation and capping activities, not long-term monitoring or maintenance activities. Thus, a new ARARs table should be created for this LF ROD that includes updated code citations and a specific list of ARARs specific to the remedy proposed for selection."

The Regional Board's comment, and the agreement reached by the BCT, related only to the need for incorporation of ARARS into the ROD which related to the waste consolidations and construction of the caps at the Landfills. The Regional Board did not agree, nor did EPA and DTSC agree, to wholesale removal of capping, monitoring and maintenance from the ROD for the landfills. Even if the inclusion of *completed* removal actions do not need to be part of a selected remedy, the Landfill 4 and 5 removal actions are not considered complete because of the ongoing requirement for monitoring and maintenance.

As to the Air Force's response that maintenance and monitoring is currently ongoing in accordance with "approved CPCMPs (Closure and Post-Closure Maintenance Plans) per State landfill regulations", we agree that maintenance and monitoring is currently ongoing in accordance with the CPCMPs, which were prepared in conjunction with the Landfill removal actions. However, this response does not address the issue of whether the ROD should select capping, maintenance and monitoring. We believe that the ROD should select a final remedy for these landfills. We also believe that the final remedy should be the same as the interim remedy identified during the removal action (namely, capping, long- term maintenance and monitoring) and ICs.

Lastly, the Air Force refers to its response to EPA comment #1. That response is as follows:

"The recent EPA Region 9, State of California, and Air Force finalization of the March OU-2 ROD (May 2004) established that ongoing actions started as a removal action or as a component of a removal action and being conducted in accordance with an existing approved plan (primary document) pursuant to State landfill requirements need not be a separate part of the final selected remedy for a site. The Air Force has also been unable to determine a rationale for identifying either groundwater or landfill gas monitoring as a separate remedy (see, e.g., OSWER Dir. No. 9355.0-49FS, Presumptive Remedy for CERCLA Municipal Landfill Sites, which notes that an active response is not required if contaminant concentrations are within the Agency's acceptable risk range). Accordingly, long-term cap maintenance and monitoring, which is ongoing at LF-4 and LF-5 in accordance with State landfill regulations (ARARs) and existing CPCMPs, is not separately defined as part of the

selected remedies for the landfills. These monitoring requirements are executed through the regulatory-approved O&M plan that is an enforceable document. Clarification that cap maintenance and monitoring is ongoing and will continue as long as mandated by State landfill regulations has been added to the last paragraph of Section 1.4 Description of Selected Remedies. The suggested language sent to us by Thelma Estrada via email on July 27 (other than the additional wording in the bullet list of selected remedies) has been added in Section 2.12 (p. 2-116) and 2-118.

Similarly, long-term groundwater monitoring for LF-4 and LF-5 is ongoing in accordance with the same plans and in accordance with state landfill regulations and also need not be identified as a separate remedy. Clarification that long-term groundwater monitoring is ongoing and will continue as long as required by State landfill regulations has been added to the last paragraph of Section 1.4 Description of Selected Remedies."

The Air Force's reference to the March AFB ROD is insufficient to justify the application of the same decision in the case of the former Castle AFB. We expect that the circumstances surrounding the situation at March AFB are quite different from those at Castle. At any rate, the Central Valley Regional Board, who was not a party to the March ROD, does not agree that the March ROD creates some sort of precedent to which it is bound to follow at Castle AFB. In fact, the precedent set at Castle AFB is that ongoing removal actions are included in the ROD (see SCOU ROD 2 where SVE was selected in the ROD at SCOU sites subject to ongoing SVE removal actions). That approach has been the norm at CERCLA sites where removal actions are, by their nature, interim measures. Where it is determined through the CERCLA process that the interim measure should be made final, a ROD is required. Otherwise, ongoing removal actions become de facto permanent without the requisite CERCLA process.

If the Air Force cannot find a basis for selecting maintenance and monitoring separately from a selecting a capping remedy, the solution is not to exclude maintenance and monitoring but to include capping as a part of the remedy selected.

We understand that the Air Force intends to continue to maintain and monitor the landfill caps. What is not clear is why the Air Force believes this stated intention is an adequate substitute for actual selection of those actions in a ROD. Nor is it clear why Air Force is unwilling to include such actions as a part of the remedy selected in the ROD when it intends to perform such work anyway.

In sum, the Central Valley Regional Water Quality Control Board disagrees with the Air Force's proposal in the draft final SCOU ROD 3 to select only ICs as the remedy for Landfill 4 and 5. In addition to ICs, the ROD should select long-term maintenance and monitoring of the cap

**The selected remedy for LF-4 and LF-5 will be cap maintenance and monitoring and institutional controls. Groundwater monitoring for the landfills is considered to be part of the cap maintenance and monitoring component of the remedy and does not need to be separately specified but is described in Section 2.8 Site Characteristics and references have been added to the Declaration (Section 1) and Section 2.12 Selected Remedy.**

2. Fire Training Area 1 (FTA-1)

The Regional Board noted in our comments on the Draft Final SCOU ROD 3 that waste was disposed at FTA-1. As such, the Board stated that the groundwater monitoring, closure and post-closure maintenance standards set forth in the California Code of Regulations, Title 27 Chapter 3, Subchapters 3 and 5 are applicable requirements to the remedy proposed for selection at FTA-1.

In response, the Air Force states:

> "Groundwater monitoring for FTA-1 will be added as a component of the SVE/bioventing elements of the selected remedy. The nature and frequency of the monitoring program will be developed by the BCT based on the results of historical groundwater monitoring and recent COC baseline sampling of wells in the vicinity of FTA-1. Groundwater monitoring will continue until the SVE/bioventing components of the FTA-1 selected remedy are completed.
>
> Cap monitoring and maintenance will be added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class 3 type cap was installed at the site. As opposed to the landfills, a cap monitoring and maintenance plan has not been completed and approved for FTA-1. The FTA-1 cap is currently monitored and maintained using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, California's Title 27 cap monitoring and maintenance regulations will be identified as relevant and appropriate for FTA-1.
>
> The Air Force does not agree that all groundwater monitoring, closure and post-closure maintenance standards set forth in California Code of Regulations, Title 27, Chapter 3, Subchapters 3 and 5 are applicable to FTA-1 and/or the selected remedies for FTA-1. The Air Force accepts that portions of referenced Subchapters 3 and 5 are relevant and appropriate for inclusion in an updated O&M plan."

The Regional Board concurs with the addition of groundwater monitoring to the SVE/Bioventing element of the selected remedy and the addition of cap maintenance and monitoring. The Regional Board is willing to "agree to disagree" regarding the applicability of the cited CCR sections. However, the Air Force needs to present which "portions of referenced Subchapters 3 and 5 are relevant and appropriate" for regulatory Agency review prior to our concurrence with this proposed revision to the SCOU ROD 3.

**Cap maintenance and monitoring has been added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class III type cap was installed at the site. The FTA-1 cap is currently maintained and monitored using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, portions of California's Title 27 landfill regulations pertaining to cap maintenance and monitoring have been identified as relevant and appropriate for FTA-1. A revised version of the ARARs table for FTA-1 (Table 2-21 in the updated document), which incorporates the relevant and appropriate portions of**

Title 27, Subchapters 3 and 5, has been provided to the regulatory agencies.

The complete revised text for Section 2.12.5, FTA-1 Selected Remedy follows:

2.12.5 Fire Training Area 1

The selected remedy for FTA-1 is SVE and bioventing, cap maintenance and monitoring, excavation and disposal, long-term ecological monitoring and ICs. An SVE removal action was implemented at FTA-1 in 1996 and continues. Locations where the TVPH/TEPH RAO was exceeded prior to SVE will be resampled after SVE has attained VOC RAOs and the rate of TVPH removal has dropped to low and stable levels. Bioventing will be implemented, in consultation with the BCT, only if TPH RAOs are still exceeded upon completion of SVE and only to the extent necessary to attain the TPH RAOs. Completion of bioventing will be based on soil sampling to confirm TPH RAOs have been achieved. Capping, the preferred alternative for non-VOC contamination, was undertaken as part of the SVE removal action. Long-term cap maintenance and monitoring was implemented following construction and has been conducted in accordance with cap maintenance and monitoring procedures in the CPCMP for LF-5 (Jacobs, 1998c). Within 180 days of the signing of this ROD, the Air Force will submit a revised CPCMP to include cap maintenance and monitoring at FTA-1. This revised plan will establish the same cap maintenance and monitoring procedures now used for LF-4 and LF-5 for the FTA-1 cap. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to cessation of groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to support the demonstration that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone pose a threat to water quality as specified in 27 CCR, Subchapters 3 and 5 (Appendix D). If the results demonstrate that water quality limits will not be exceeded, groundwater monitoring will be discontinued.

The estimated cost for the SVE/bioventing action (in operation since 1996) was $2,600,000. The estimated cost for cap maintenance and monitoring and groundwater monitoring at FTA-1 is assumed to be less than $10,000 per year. The estimated cost for excavation and disposal at FTA-1 is $50,000. The estimated cost for long-term ecological monitoring at FTA-1 is $3,000 every five years. The estimated cost for ICs for FTA-1 is $15,000 per year. Approximate areas affected by the various remedy components are shown on Figure 2-15 and Figure 2-16 (excavation areas only).

The FTA-1 FFS established that the existing cap meets criteria (design, location and dimensions) for the capping alternative, with the exception of approximately 150 cubic yards of soil that exceeds ecological risk assessment RAOs. The cap in place at FTA-1 is equivalent to the Class II/III cap installed at Castle AFB consolidation landfills (LF-4 and LF-5) and, in conjunction with the other elements of the selected remedy, will provide effective protection of groundwater and eliminate exposure and migration routes. As noted above, within 180 days of the signing of this ROD, the

Air Force will submit a revision to the LF-5 CPCMP to include similar cap maintenance and monitoring at FTA-1. This plan will establish the cap maintenance and monitoring procedures now used for LF-5 for the FTA-1 cap.

Excavation and disposal will address three areas identified in the FTA-1 FFS where contaminated soil exceeding ERA RAOs for cadmium and nickel lie outside the existing cap. These areas are shown on Figure 2-16. As shown, two of these areas overlap the southern boundary of the existing cap, and the third overlaps the cap's boundary with the Building 1888 compound. To address potential ecological threats, the selected remedy includes excavation of these areas and off-site disposal of the contaminated soil (approximately 150 cubic yards).

Long-term ecological monitoring at FTA-1 will consist of wetlands invertebrate and plant surveys every 5 years for a period of up to 30 years. In general, to ensure site contaminants have not impacted wetland habitats, plant and invertebrate surveys of contaminated and uncontaminated wetlands will be conducted. Evaluation of survey results will be dependent upon three measurements: plant abundance, plant diversity and invertebrate (fairy shrimp) abundance. If results show that these three factors are not statistically lower (at a 0.05 significance level) in the contaminated wetlands, then it will be concluded that there is no impact. If an impact is observed, then the Air Force (in consultation with EPA and DTSC) will evaluate potential remedial alternatives. If, after 30 years, no impact is observed according to the three factors, monitoring will be discontinued. Monitoring may be discontinued earlier than 30 years by mutual agreement of the Air Force, EPA and DTSC.

FTA-1 and its associated wetlands are located within the BoP United States Penitentiary, Atwater complex, and public access, including residential use, is prohibited. ICs are currently in place and fully implemented as follows (1) the AF/BoP MOU precludes site alterations that would interfere with IAG or IRP activities without notification and approval of the Air Force (the Air Force will obtain EPA and State of California approval of any requested alterations prior to issuing an approval notification to the BoP), (2) the AF/BoP MOU establishes that BoP may use groundwater underlying the BoP parcel if and to the extent that such use conforms to and complies with all applicable laws and regulations, (3) the AF/BoP MOU establishes access for the Air Force and the BCT and (4) elements of prison security (e.g., patrolled security fencing) restrict the potential for human exposure to site contamination. In addition, implementation of the selected remedy will not threaten sensitive ecological habitats. ICs will be maintained at FTA-1 until soils are at levels that allow for unrestricted use and exposure. Modification or termination of these ICs requires Air Force, EPA and State of California approval.

# Response to RWQCB Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 30 June 2004)

For convenience, this response repeats RWQCB's original comment in standard type, followed by the Air Force response in **bold**. Please note that all page and paragraph references in the responses are based on the draft final document; the revised material may occur on a different page and/or in a different section or paragraph in the final document.

## General Comments

1. Wastes were disposed at FTA-1. The wastes included waste solvents, waste volatile petroleum compounds and waste non-volatile petroleum compounds. These oily, ignitable and toxicity characteristic wastes also contained metals. In a regulatory sense, the practice of partially burning these materials for the purpose of fire abatement training does not alter the underlying basic activity, which is the disposal of waste materials. In fact, the partial burning of the waste created additional waste constituents in the form of PAHs, dioxins and others. Sites of this type are commonly referred to as "burn dumps". As discussed in the specific comments below, the remedy proposed for selection in the draft final SCOU ROD 3 does not properly account for the regulatory status of FTA-1 as a waste disposal facility. The groundwater monitoring, closure and post-closure maintenance standards set forth in the California Code of Regulations, Title 27 Chapter 3, Subchapters 3 and 5 are applicable requirements to the remedy proposed for selection at FTA-1.

   **Cap maintenance and monitoring has been added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class III type cap was installed at the site. The FTA-1 cap is currently maintained and monitored using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, portions of California's Title 27 landfill regulations pertaining to cap maintenance and monitoring have been identified as relevant and appropriate for FTA-1. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to ceasing groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to confirm that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone then exceed such limits. This approach to groundwater monitoring, implemented as part of cap maintenance and monitoring, is now described in Section 2.12, Selected Remedy. A revised version of the ARARs table for FTA-1 (Table 2-21 in the updated document), which incorporates the relevant and appropriate portions of Title 27, Subchapters 3 and 5, has been provided to the regulatory agencies.**

2. The draft final SCOU ROD 3 indicates that bioventing ***may*** be applied as part of the remedy proposed for FTA-1. The draft final ROD is not clear as to the criteria to be used in determining whether bioventing will be used nor is it clear as to the conditions under which bioventing would be terminated. The SCOU ROD 3 should

be revised to include additional discussions as to the applicability of bioventing at FTA-1.

**The text in Section 1.4 stating that bioventing "may" be used at FTA-1 has been deleted and the term is not used elsewhere in the document. The following information has been added to the first paragraph of Section 2.12.5 Fire Training Area 1: Locations where the TVPH/TEPH RAO was exceeded prior to SVE will be resampled after SVE has attained VOC RAOs and the rate of TVPH removal has dropped to low and stable levels. Bioventing will be implemented only if TPH RAOs are still exceeded upon completion of SVE, and in consultation with the BCT, to the extent necessary to attain the TPH RAOs. Completion of bioventing will be based on soil sampling to confirm TPH RAOs have been achieved.**

3. The draft final SCOU ROD 3 proposes ICs for selection at LF-4 and LF-5 but does not include selection of the previously implemented removal actions. While capping is already implemented, the draft final ROD should select the current landfill caps as part of the selected final remedies. The ROD should also include long-term monitoring and maintenance of the capped landfills as part of the selected remedy.

   **The selected remedy for LF-4 and LF-5 will be cap maintenance and monitoring and institutional controls. Groundwater monitoring for the landfills is considered to be part of the cap maintenance and monitoring component of the remedy and does not need to be separately specified but is described in Section 2.8 Site Characteristics and references have been added to the Declaration (Section 1) and Section 2.12 Selected Remedy.**

## Specific Comments

1. In Section 1.3, entitled "Assessment of the Sites", the first bullet of the paragraph describes LF-4 and LF-5 as "two closed landfills ... where non-hazardous waste from five Castle Airport landfills and other SCOU sites were consolidated...". This is misleading in that it creates the impression that LF-4 and LF-5 are comprised solely of the consolidated non-hazardous waste. The introductory sentence to the first bullet indicates that the descriptions will include the primary contaminants for the site but the LF-4 and LF-5 item does not contain such a list. This paragraph should be revised.

   **The first bullet in Section 1.3 has been revised to include the phrase: "... consolidated and capped over pre-existing inactive landfill trenches." The first bullet has also been revised to identify the nature of wastes disposed at LF-4 and LF-5, primarily municipal wastes (household, commercial and to a lesser extent industrial-type wastes).**

2. In Section 1.4, entitled "Description of Selected Remedies", the first paragraph refers to Table 1-1 which "provides a listing of the SCOU ROD Part 3 sites including their preferred alternative, removal action (if any), selected remedy and remedial status". Table 1-1 lists the selected remedy for LF-4 (and associated sites, DP-5 and DP-6) as "ICs" (meaning Institutional Controls) and the selected remedy for LF-5 (and associated sites DP-8, DP-8a the LF-5 trenches) as "ICs and long-term ecological monitoring". For LF-4 and LF-5, the remedies proposed for

selection should be 1) institutional controls, 2) capping and cap maintenance, and 3) long-term groundwater monitoring.

**Capping at both LF-4 and LF-5 has been completed as a removal action, and by EPA, State of California and Air Force (BCT) agreement, need not be a part of the selected remedy for the landfills. The selected remedy for LF-4 and LF-5 will be cap maintenance and monitoring and institutional controls. Groundwater monitoring for the landfills is considered to be part of the cap maintenance and monitoring component of the remedy and does not need to be separately specified but is described in Section 2.8 Site Characteristics and references have been added to the Declaration (Section 1) and Section 2.12 Selected Remedy.**

3. In Section 1.4, entitled "Description of Selected Remedies", the first paragraph refers to Table 1-1 which "provides a listing of the SCOU ROD Part 3 sites including their preferred alternative, removal action (if any), selected remedy and remedial status". Table 1-1 lists the selected remedy for FTA-1 as SVE, bioventing, ICs, long-term ecological monitoring and excavation and disposal. In addition to those listed, the remedies proposed for selection should include capping, cap maintenance and long-term groundwater monitoring.

   **Cap maintenance and monitoring has been added as a component of the FTA-1 selected remedy. Although FTA-1 is not a landfill, a Class III type cap was installed at the site. The FTA-1 cap is currently maintained and monitored using the same procedures and reporting as established in the approved landfill plans. Although not considered applicable, portions of California's Title 27 landfill regulations pertaining to cap maintenance and monitoring have been identified as relevant and appropriate for FTA-1. As part of cap maintenance and monitoring, groundwater monitoring for VOC and fuel COCs will be conducted until the RAOs for these COCs are attained by the SVE/bioventing components of the remedy. Prior to ceasing groundwater monitoring at FTA-1, a round of groundwater sampling will be conducted to confirm that no COCs (VOCs, fuels, metals) that originally exceeded water quality limits in the vadose zone then exceed such limits. This approach to groundwater monitoring, implemented as part of cap maintenance and monitoring, is now described in Section 2.12, Selected Remedy. A revised version of the ARARs table for FTA-1 (Table 2-21 in the updated document), which incorporates the relevant and appropriate portions of Title 27, Subchapters 3 and 5, has been provided to the regulatory agencies.**

4. In Section 1.4, entitled "Description of Selected Remedies", the bulletized paragraphs describing the selected remedies requires revisions to conform to the remedies proposed for selection. For instance, the remedy proposed for selection LF-4 is ICs and for LF-5, ICs and long-term ecological monitoring. The document indicates that long-term monitoring and maintenance of the capped landfills "was implemented as part of the removal action and continues under approved closure and post-closure maintenance plans". However, the ROD must include long-term monitoring and maintenance of the capped landfills as part of the selected remedy.

   **See responses to General Comment #3 and Specific Comment #2.**

5. Also, in Section 1.4, entitled "Description of Selected Remedies", the bulletized paragraph describing the selected remedies for FTA-1 requires revisions to conform to the remedies proposed for selection. The document indicates that long-term monitoring and maintenance of the cap "was implemented and will continue per requirements established in the LF-4 and LF-5 closure and post-closure maintenance plans exclusive of groundwater and landfill gas monitoring requirements". This ROD should include capping, cap maintenance and long-term groundwater monitoring as part of the selected remedy.

   **See responses to General Comment #1 and Specific Comment #3.**

6. Also, in Section 1.4, entitled "Description of Selected Remedies", the bulletized paragraph describing the selected remedies for FTA-1 indicates that bioventing "**may** be used upon termination of the SVE to further remediate nonvolatile fuel hydrocarbons in site soil" (emphasis added). This paragraph should be revised to indicate the conditions under which bioventing would be used upon termination of the SVE. Also, the document should discuss the conditions under which bioventing would be terminated and a description of how the Air Force intends to demonstrate that bioventing has successfully remediated the non-volatile hydrocarbon contamination. If the remediation of nonvolatile fuel hydrocarbons in site soil is achieved through bioventing, landfill gas monitoring requirements may not be necessary.

   **See response to General Comment #2. Text describing how bioventing will be implemented and terminated has been added to Section 2.12.5 Fire Training Area 1 (see response to General Comment #2).**

7. In Section 1.6, entitled "ROD Data Certification Check List", the eighth bulletized paragraph refers to "cost estimates for selected remedies" as being in Section 2.10 and Tables 2-20 and 2-21. The ninth bulletized item refers to "criteria for remedy selection as also being in Section 2.10. However the Section 2.10 (at page 2-113) contains no cost information and Tables 2-20 and 2-21 contain cost information for FTA-1 and ETC-8 only. Further, for LF-4 amd LF-5, Section 2.10, entitled "Comparative Analysis of Alternatives", states as follows:

   > "The remedial alternatives for LF-4 (including DP-5 and DP-6), and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches), ETC-8, ETC-10 and FTA-1 were compared using the EPA evaluation criteria. These comparisons served as the basis for selection of remedial alternatives for each site."

   Then, later in the same paragraph the document states:

   > "A comparative analysis summary is not provided for LF-4 (including DP-5 and DP-6), and LF-5 (including DP-8, DP-8A and Landfill 5 Trenches) and ETC-10 because only one alternative (ICs) satisfied both threshold criteria, and thus evaluation against balancing or modifying criteria was unnecessary."

   This paragraph needs to be rewritten so as to be internally consistent. Additional explanation as to how only one alternative satisfied the threshold criteria needs to be provided. For comparison purposes, couldn't the landfills be removed in

satisfaction of the threshold criteria?

**At EPA request, cost information has been added to Section 2.12 for all of the selected remedies. The eighth bullet in Section 1.6 has been revised accordingly.**

**The ninth bullet in Section 1.6 has been revised to refer to Section 2.9 Description of Alternatives and Section 2.10 Comparative Analysis of Alternatives. Criteria for remedy selection are discussed in both sections.**

**Sections 2.9 and 2.10 have been revised to more clearly present the alternatives and analysis of alternatives that resulted in the selected remedies for the SCOU ROD Part 3 sites. As part of this revision, the description and analysis of alternatives for FTA-1 has been streamlined (EPA comment) and a concise summary added of the FS alternatives and comparative analysis for the landfill sites.**

8. Section 2.9.2, which describes the alternatives for LF-4 and LF-5, needs to be revised in accordance with General Comment #3, above. A review of a comparison of removal of the Landfills vs. capping should be included as an alternative considered.

   **See response to General Comment #3 and Specific Comments #2 and #7. A concise summary of the FS alternatives and comparative analysis of alternatives for the landfill sites has been added to Sections 2.9 Description of Alternatives and Section 2.10 Comparative Analysis of Alternatives.**

9. Section 2.9.5, which describes the alternatives for FTA-1, does not include a description of the remedy proposed for selection. The document should be revised to include a description of the remedy proposed for selection and explain how the proposed remedy was derived.

   **The description of alternatives presented in Section 2.9.5 is presented as performed for the FTA-1 site. Text has been added to Section 2.9.5 to address the following points: 1) remedial alternatives for all contaminants at FTA-1 were evaluated in the SCOU FS. Due to reasons described in Section 2.9.5.6, an FTA-1 FFS provided further evaluation for non-VOC remedial alternatives; 2) Alternatives evaluated in the SCOU FS are presented in Sections 2.9.5.1-2.9.5.5; and 3) Alternatives evaluated in the FTA-1 FFS pursuant to issues identified by the regulatory agencies regarding the preferred alternative for non-VOCs are presented in Section 2.9.5.6.**

   **Per EPA comment, the detail provided for the SCOU FS alternatives has been reduced. A statement has been added to Section 2.10 indicating that the preferred alternative for FTA-1 is based on the SCOU FS for VOCs (SVE and bioventing) and the FTA-1 FFS for non-VOCs (capping and excavation and disposal).**

10. Sections 2.12.1 and 2.13.1, which describe the remedies proposed for selection at LF-4 and LF-5, should be revised in accordance with General Comment #3, above.

    **See response to General Comment #3.**

11. Sections 2.12.5, 2.13.5, and 2.14, which describe the remedies proposed for selection at FTA-1, should be revised in accordance with General Comments #1 and #2, above.

    **See responses to General Comments #1 and 2.**

12. ARARs Tables for LF-4, LF-5 and FTA-1 (Tables 2-25, 2-28 and D-2) should be revised to conform to the above comments.

    **The ARARs tables have been revised to include the relevant and appropriate portions of Title 27 in accordance with the responses to General Comments #1, #2 and #3.**

# Response to Merced County DPH Comments on the Draft Final Source Control Operable Unit Record of Decision Part 3 (Comments Dated 4 June 2004)

For convenience, this response repeats Merced County DPH's original comment in standard type, followed by the Air Force response in **bold**. Please note that all page and paragraph references in the responses are based on the draft final document; the revised material may occur on a different page and/or in a different section or paragraph in the final document.

## Comments

1. Page 1-3: First bullet: The Bureau of Prisons has abated the violations in the demolition portion of Landfill 5 and Landfill 5 and is now in compliance with State regulations.

   **The bullet list in Section 1.3 Description of Selected Remedies has been streamlined to present only the remedy and no supporting discussion; reference to the demolition and debris area has been removed. Other references to the demolition and debris area within the document have been revised to indicate that the area is in compliance with State regulations.**

2. Page 2-33: Section 2.8.1.3: The document states "that there was a strong desire for unrestricted use of as much land as possible at Castle Airport" during the public comment period. That statement is not entirely accurate. It was and is a strong desire of the community that all landfills be clean closed to maximize reuse of the property and lower costs of long-term monitoring. Although the Air Force agreed to consolidate landfills, it was always the desire by the Restoration Advisory Board and County that all landfills be clean closed.

   **To simplify the document, the first two sentences of Section 2.8.1.3 have been deleted. Sources of waste consolidated in LF-4 are documented in Section 2.8.1.3.1 and are listed in Table 2-10.**

3. The maps in Figures 2-8, 2-9, and 2-10 do not include Landfill 5 as defined by the State (the map should show both the CERCLA and the State Landfill).

   **The figures for LF-5 (Figures 2-8, 2-9 and 2-10) show the site boundaries (capped areas) relevant to the selected remedy (cap maintenance and monitoring and ICs) in the SCOU ROD Part 3. Please see the response to Merced County DPH Comment #1 on the Draft Landfill 4 and Landfill 5 ROD that was provided with the Draft Final SCOU ROD Part 3.**