



FINAL

Addendum

to the

1999 McClellan Air Force Base

**Basewide Volatile Organic Compound Feasibility Study
(VOC FS)**

June 2004

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CONTENTS

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| List of Acronyms and Terms | v |
| 1.0 Introduction | 1 |
| 1.1 Purpose | 1 |
| 1.2 Background Information | 1 |
| 1.3 Organization of this Report | 2 |
| 2.0 Scope and Role of the VOC Groundwater Remedy | 3 |
| 2.1 Breakup of the Original VOC ROD into Multiple RODs | 3 |
| 2.1.1 Change in ROD Strategy | 3 |
| 2.1.2 Scope of Each of the New Multiple RODs | 4 |
| 2.1.3 SVE Termination Linkage Between Groundwater and Shallow Soil Gas RODs | 4 |
| 2.2 Other Groundwater RODs | 5 |
| 2.2.1 1995 Interim Groundwater ROD | 5 |
| 2.2.2 Non-VOC Groundwater ROD | 6 |
| 2.3 Other RODs at McClellan | 6 |
| 2.4 VOC Sites Identified in this FS Addendum | 7 |
| 2.4.1 Basewide Remedy | 7 |
| 2.4.2 VOC Sites | 7 |
| 2.4.3 VOC Sites that Impact Groundwater | 7 |
| 2.4.3.1 Summary | 7 |
| 2.4.3.2 Discussion | 7 |
| 2.4.3.3 Conclusion | 8 |
| 3.0 Conceptual Model for Plume Behavior in the Next 30 Years | 11 |
| 3.1 Water Table Stabilization Analysis | 11 |
| 3.2 Time and Cost to Complete Under a Stabilized Water Table Scenario | 12 |
| 3.3 Water Table Level Remains Uncertain | 12 |
| 3.4 Changes in the Number of Wells Needed for Alternatives Described in the 1999 FS | 13 |
| 4.0 Update of Applicable or Relevant and Appropriate Requirements (ARARs) Analysis | 15 |
| 4.1 Dispute Resolution Agreement | 15 |
| 4.1.1 VOC Groundwater Cleanup Level | 15 |
| 4.1.2 SVE Turn-on (Start) and Turn-off (Stop) and How They Impact Groundwater Decisions for VOC s | 16 |
| 4.1.3 FFA Parties' Interpretation What the Dispute Resolution Means .. | 16 |
| 4.1.3.1 Air Force Interpretation | 16 |
| 4.1.3.2 Environmental Protection Agency Interpretation | 17 |

| | | |
|------------|--|-----------|
| | 4.1.3.3 State Interpretation | 18 |
| | 4.1.3.4 Agree to Disagree Language | 19 |
| 4.2 | Updated ARAR Analysis | 20 |
| 4.3 | State's Substantive NPDES Requirements for the McClellan Groundwater Treatment Plant | 22 |
| 4.4 | Sacramento County Well Ordinance 2002 | 23 |
| | 4.4.1 Section 6.28.000 G Consultation Zone | 23 |
| | 4.4.2 Section 6.28.025 Former McClellan Air Force Base Prohibition Area | 23 |
| 5.0 | Preliminary Cleanup Goals and Unrestricted Use Goals | 25 |
| 5.1 | Cleanup Goals for Groundwater | 25 |
| 5.2 | Cumulative Risk for Groundwater and for Parcels | 25 |
| 5.3 | Cleanup Goal for Unrestricted Use of Groundwater (VOC Contamination) | 25 |
| 5.4 | Groundwater Use Restrictions: Compliance Boundaries | 25 |
| | 5.4.1 Consultation Zone | 26 |
| | 5.4.2 Former McClellan Air Force Base Prohibition Area | 27 |
| 5.5 | Groundwater Treatment Plant Requirements | 28 |
| 5.6 | Air Emission Requirements | 28 |
| 6.0 | Institutional Controls for Groundwater and SVE Alternatives | 29 |
| 6.1 | Institutional Control Objectives and Descriptions | 29 |
| | 6.1.1 Institutional Control and Land Use Control Terminology | 29 |
| | 6.1.2 Institutional Control Objectives for McClellan Groundwater and SVE Alternatives | 30 |
| | 6.1.3 Description of Individual Institutional Controls | 33 |
| | 6.1.3.1 Part A - Institutional Controls Implemented by AFRPA | 34 |
| | 6.1.3.2 Part B - Institutional Controls Implemented by Sacramento County | 35 |
| | 6.1.3.3 Part C - Institutional Controls Implemented by the State | 36 |
| | 6.1.3.4 Monitoring and Enforcement | 36 |
| 6.2 | Detailed Analysis of Institutional Controls and Alternatives for Implementation | 37 |
| | 6.2.1 Overall Protection of Human Health and the Environment | 37 |
| | 6.2.2 Compliance with ARARs | 38 |
| | 6.2.3 Long-Term Effectiveness and Permanence | 38 |
| | 6.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment | 40 |
| | 6.2.5 Short-Term Effectiveness | 40 |
| | 6.2.6 Implementability | 41 |
| | 6.2.7 Cost | 42 |
| | 6.2.8 State/Support Agency Acceptance | 44 |
| | 6.2.9 Local Government and Community Acceptance | 44 |
| 7.0 | References | 45 |

APPENDICES

| | |
|---|-----|
| Appendix A | A-1 |
| TEXT OF DISPUTE RESOLUTION & ISSUE DOCUMENTS AND CUMULATIVE RISK LETTERS | |

Tab 1: Dispute Resolution Documents

| | |
|--|------|
| a. DTSC Letter, Undated. Subject: Initiation of Dispute, McClellan Air Force Base (AFB) | A-3 |
| b. Description of the Five Disputed Issues, 8 October 2000. McClellan Air Force Base Volatile Organic Compound Proposed Plan Alternative Dispute Resolution (Level 2) Issues Statement | A-7 |
| c. Level 3 Consensus Statement for Issues 4 and 5 of VOC ROD Dispute, March 2001 . . . | A-11 |
| d. Level 3 Consensus Statement for SVE TURN-ON (START) CRITERIA for Case #1, 4 December 2000. VOC Contamination in the Vadose Zone Over Groundwater Contaminated with the Same VOC COCs | A-17 |
| e. Level 3 Consensus Statement for SVE TURN-OFF (STOP) CRITERIA for Case #1, 4 December 2000. VOC Contamination in the Vadose Zone Over Groundwater Contaminated with the Same VOC COCs | A-23 |
| f. Level 3 Consensus Statement for SVE TURN-ON (START) CRITERIA for Case #2, 4 December 2000. VOC Contamination in the Vadose Zone Over Clean Groundwater . . | A-29 |
| g. Level 3 Consensus Statement for SVE TURN-OFF (STOP) CRITERIA for Case #2, 4 December 2000. VOC Contamination in the Vadose Zone Over Clean Groundwater . . | A-35 |
| h. Level 3 Consensus Statement for SVE TURN-ON (START) CRITERIA for Case #3, 4 December 2000. Some or All VOC Contamination in the Vadose Zone Over Groundwater Contaminated with Different COCs | A-41 |
| i. Level 3 Consensus Statement for SVE TURN-OFF (STOP) CRITERIA for Case #3, 4 December 2000. Some or All VOC Contamination in the Vadose Zone Over Groundwater Contaminated with Different COCs | A-49 |
| j. EPA Region IX Letter, 16 July 2001. Subject: Invoke Formal Dispute on the Proposed Plan for the VOC Operable Unit, McClellan Air Force Base | A-57 |
| k. EPA Region IX Letter, 5 December 2001. Subject: Resolution of Formal Dispute on the Proposed Plan for the VOC Operable Unit, McClellan Air Force Base | A-59 |

Tab 2: Issue Documents

| | |
|---|------|
| a. AFBCA/DD Letter, 19 June 2002. Subject: McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels | A-63 |
| b. EPA Region IX Letter, 16 July 2002. Subject: EPA Review Comments on the June 19, 2002 memorandum titled “McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels” | A-71 |
| c. EPA Region IX Letter, 19 July 2002. Re: EPA Acceptance of the June 19, 2002 memorandum titled “McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels” | A-75 |
| d. DTSC Letter, 27 May 2003. Re: DTSC Acceptance of the June 19, 2002 memorandum titled “McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels | A-77 |

| | |
|--|------|
| Appendix B | B-1 |
| INSTITUTIONAL CONTROL COST ESTIMATES | |
| Appendix C | C-1 |
| LIST OF SITES TO BE ADDRESSED BY VOC GROUNDWATER ROD | |
| Tab 1: Sites where VOCs were Detected at Measurable Levels (100 foot Buffer Zone) . . . | C-3 |
| Tab 2: Sites where VOCs were Detected at Levels Exceeding their Equivalent MCL Concentrations (100 foot Buffer) | C-9 |
| Appendix D | D-1 |
| UNITED STATES DEPARTMENT OF THE AIR FORCE, FORMER McCLELLAN AIR FORCE BASE, GROUNDWATER EXTRACTION AND TREATMENT SYSTEM, SUBSTANTIVE REQUIREMENTS FROM O&M MANUAL | |
| Appendix E | |
| AFRPA RESPONSES TO REGULATOR COMMENTS ON THE DRAFT | E-1 |
| BASEWIDE VOC FS ADDENDUM | |
| Tab 1: Response to EPA Comments | E-3 |
| Tab 2: Response to DTSC Comments | E-53 |
| Tab 3: Response to RWQCB Comments | E-87 |
| FIGURES and TABLES | |
| Figure 1 (Section 3.1): Groundwater Elevations (McClellan AFB), 1912-2002 | 12 |
| Figure 2 (Section 5.4.1): Approximate Location of 2000 ft. Buffer Zone, Sacramento County Code, Chapter 6.28.000 G | 26 |
| Figure 3 (Section 5.4.2): McClellan Prohibition Area, Sacramento County Code, Chapter 6.28.025 & City of Sacramento City Ordinance 86-080 . . . | 27 |
| Figure 4 (Section 6.1.2): Institutional Controls Matrix | 32 |
| Table 1 (Section 6.2.7): Summary of Estimated Costs for Groundwater Institutional Controls | 43 |

LIST OF ACRONYMS and TERMS

| | |
|--------|---|
| AFB | Air Force Base |
| AFRPA | Air Force Real Property Agency |
| ARAR | applicable or relevant and appropriate requirement |
| BACT | Best Available Control Technology |
| bgs | below ground surface |
| CEQA | California Environmental Quality Act |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| COC | Contaminant of Concern |
| CS | Confirmed Site |
| DSMOA | Defense State Memorandum of Agreement |
| DTSC | Department of Toxic Substances Control |
| EPA | Environmental Protection Agency |
| FFA | Federal Facility Agreement |
| FOSET | Finding of Suitability for Early Transfer |
| FOST | Finding of Suitability to Transfer |
| FS | Feasibility Study |
| GIS | Geographic Information System |
| GW | groundwater |
| GWTP | Groundwater Treatment Plant |
| IAIP | Indoor Air Inhalation Pathway |
| IC | Institutional Control |
| IROD | Interim Record of Decision |
| IRP | Installation Restoration Program |
| LRA | Local Redevelopment Authority |
| LUC/IC | Land Use Control/Institutional Control |
| LUCIP | Land Use Control Implementation Plan |
| MCL | Maximum Contaminant Level |
| MSL | mean sea level |
| NCP | National Contingency Plan |
| NPDES | National Pollutant Discharge Elimination System |

| | |
|-------|--------------------------------------|
| O&M | Operation and Maintenance |
| OPS | Operating Properly and Successfully |
| OU | Operable Unit |
| PCB | polychlorinated biphenyl |
| ppb | parts per billion |
| RAB | Restoration Advisory Board |
| RACR | Remedial Action Completion Report |
| RAO | Remedial Action Objective |
| RAWP | Remedial Action Work Plan |
| RI | Remedial Investigation |
| ROD | Record of Decision |
| RWQCB | Regional Water Quality Control Board |
| SC | Site Control |
| SEC | Senior Executive Committee |
| SLUC | State Land Use Covenant |
| SSG | Shallow Soil Gas |
| SVE | Soil Vapor Extraction |
| TBC | to-be-considered |
| TCE | trichloroethylene |
| TCRA | Time Critical Removal Action |
| TEF | technical and economic feasibility |
| USA | Underground Service Alert |
| USC | United States Code |
| VOC | Volatile Organic Compound |
| WDR | Waste Discharge Requirements |
| WQL | Water Quality Limit |

Section 1.0

INTRODUCTION

1.1 Purpose

Many things have changed since the completion of the 1999 McClellan Air Force Base Basewide Volatile Organic Compound (VOC) Feasibility Study (FS). The purpose of this addendum is to explain the changes, provide some additional detailed analysis for some of the 1999 Basewide VOC FS topics, and support a Record of Decision (ROD) that addresses subsurface VOC contamination residing in or threatening groundwater.

1.2 Background Information

During the 5 years that have passed since the completion of the 1999 Basewide VOC FS, the Air Force made significant progress resolving some key issues that affect the analysis in the Basewide VOC FS. Alternative dispute resolution and formal dispute resolution resulted in agreement on acceptable VOC groundwater (GW) cleanup levels for McClellan. It also clarified the process for initiating and terminating soil vapor extraction (SVE) systems based on groundwater cleanup levels agreeable to all the Federal Facility Agreement (FFA) parties, and have agreed to acceptable VOC groundwater cleanup levels for McClellan. The parties have also reached informal resolution of how to address cumulative risk for all media and contaminants combined.

However, some other issues have arrived and need resolution before final cleanup decisions can be made. Complicated issues concerning the behavior and potential risks associated with shallow soil gas caused the Air Force to change their ROD strategy by splitting the Indoor Air Inhalation Pathway (IAIP) out of the VOC ROD and into the Parcel (Soil) RODs. There is also planned to be a Shallow Soil Gas (SSG) two-site Breakout ROD to facilitate this split. Additionally, increased national focus on institutional control issues resulted in new Environmental Protection Agency (EPA) guidance, Air Force policies, and a new State regulation.

The Air Force has collected more data from ongoing operation and maintenance of existing extraction systems during the past 4 years. Some of these data supports significantly different interpretations of the VOC conceptual site model for time and cost estimates based on the number of wells needed for containment and the behavior of the groundwater table than the one portrayed in the 1999 Basewide VOC FS. Also, the presence of some non-VOC contaminants in treated groundwater effluent complicates the overall groundwater conceptual model and the treatment systems described in 1999.

1.3 Organization of this Report

This update closely follows the report format of the original Final Basewide VOC Feasibility Study, December 1999. This update brings the original report up-to-date; but it must be used in conjunction with the original FS in order for the reader to understand the analysis that was done.

Five new appendices were created; Appendix A – Text of Dispute Resolution and Issue Documents, and Cumulative Risk Letters; Appendix B – Institutional Control Cost Estimates; Appendix C – List of Sites to be Addressed by VOC Groundwater ROD; Appendix D – United States Department of the Air Force, former McClellan Air Force Base, Groundwater Extraction and Treatment System, Substantive Requirements from O&M Manual; Appendix E – AFRPA Responses to Regulator Comments on the Draft Basewide VOC FS Addendum.

Section 2.0

SCOPE AND ROLE OF THE VOC GROUNDWATER REMEDY

2.1 Breakup of the Original VOC ROD into Multiple RODs

At the time of the 1999 Basewide VOC FS, the Air Force planned for a single VOC ROD that would address VOC contamination residing in the subsurface. Thus, the FS evaluated alternatives that would cleanup VOC contamination in groundwater and the vadose zone. Because some of the VOC contamination in the vadose zone is located close enough to the surface to pose a risk for surface exposure (e.g., indoor air), the 1999 Basewide VOC FS also evaluated alternatives for shallow soil gas. However, the 1999 Basewide VOC FS did not completely discuss potential land use restrictions. It also did not discuss unrestricted use goals for the shallow soil gas vapor intrusion migration pathway into indoor air (referred to as Shallow Soil Gas Pathway in the remaining portions of this document).

2.1.1 Change in ROD Strategy

In 2003, the Air Force decided to separate the groundwater remedy from the shallow soil gas remedy, because complicated technical issues concerning shallow soil gas appeared likely to hold up the VOC ROD for an additional 2 to 3 years. In contrast, the groundwater pathway remedy will be ready for a Proposed Plan once this Addendum to the 1999 Basewide VOC FS is completed.

By separating the two pathway decisions (i.e., groundwater pathway threat and surface pathway threat), the Air Force believes that a VOC groundwater remedy can be selected in 2004 instead of 2006 or 2007. This would result in an earlier determination of Operating Properly and Successfully (OPS) for the VOC groundwater remedy.

The significant issues to be addressed for a groundwater pathway ROD involve institutional control analysis and implementation; and the identification, and implementation of applicable or relevant and appropriate requirements (ARARs). While these same issues also would exist for the shallow soil gas pathway, they are expected to be much more complicated and difficult to resolve for soil gas. By breaking out a separate decision for the groundwater pathway, a groundwater ROD would more quickly bring the potential institutional control (IC) issues to the decision makers. Sooner resolution of these IC issues by a ROD will strengthen the case for Finding of Suitability for Early Transfers (FOSETs) and property transfer of parcels that do not contain a shallow soil gas problem.

In 2002, the Air Force had planned for the Initial Parcel ROD to serve in the strategic role of resolving IC issues. However, detailed analysis in the Initial Parcel FS clearly indicated that cleanup to unrestricted use would likely be the strong preference of the Air Force. IC issues were no longer expected to arise for the first Initial Parcel ROD. Thus, another ROD was needed for this role and a groundwater breakout ROD would provide the next soonest possibility for addressing some of the key IC issues.

2.1.2 Scope of Each of the New-Multiple RODs

In July 2003 and January 2004, the Air Force proposed revisions to the McClellan FFA that split the proposed VOC ROD into separate documents. The VOC ROD became the Basewide VOC Groundwater ROD, supported by the original Basewide VOC FS and this Addendum. The Indoor Air Pathway was split out of the Basewide VOC ROD and will be dealt with in subsequent Parcel RODs and a Shallow Soil Gas two-site Breakout ROD. The Air Force expects these revisions to accelerate some of the final decisions and to facilitate the resolution of technical and policy issues that directly affect property transfer. The Initial Parcel ROD Group #2 and the Shallow Soil Gas Breakout ROD are upcoming RODs that will help resolve possible Institutional Control issues.

The first ROD will be known as the Basewide VOC Groundwater ROD and is anticipated for completion in 2004. This ROD will address VOC contamination in the groundwater and VOC contamination in the vadose zone that threatens to migrate to the groundwater. It will be supported by the 1999 Basewide VOC FS and this addendum to the 1999 Basewide VOC FS.

The second ROD will be known as the Breakout Shallow Soil Gas VOC ROD and is anticipated for completion in 2005. This ROD will address VOC contamination in shallow soil that threatens to migrate to surface exposure points, particularly indoor air. This ROD will limit its scope to the shallow soils located at a single Installation Restoration Program (IRP) site or a small group of related sites at which necessary data has already been collected. This ROD will act as a pilot ROD for resolving issues, which would also affect the numerous other shallow soil gas sites that will be addressed in separate Parcel RODs described next. This breakout ROD will be supported by a separate FS.

The Parcel RODs have been modified to now include the Indoor Air Inhalation Pathway as part of the FS analysis. Shallow Soil Gas (0-15 feet below ground) will be dealt with in parcel FS and ROD documents.

2.1.3 SVE Termination Linkage Between Groundwater and Shallow Soil Gas RODs

SVE is a presumptive remedy at McClellan and is directed at VOC contamination in the vadose zone. It has proven to be effective at removing VOCs from the vadose zone at McClellan. While it is primarily designed to minimize VOC migration to groundwater, it likely also affects the potential for shallow VOCs to migrate to the surface. Thus, it is a remedy component for both the groundwater pathway and the shallow soil gas pathway. SVE initiation and termination will be described in all future McClellan RODs that deal with VOCs.

Recent alternative and formal dispute resolutions determined prescribed processes for initiating and terminating SVE systems. These processes are known as the START and STOP processes, and the FFA parties agreed to the text that is provided in Appendix A of this Addendum.

Because most of the SVE systems are already installed and operating as part of a SVE removal action program, these same systems will often be subject to multiple RODs that deal with VOCs. Termination of a SVE system is linked to these RODs by the language in a STOP document. The STOP language requires that termination of the SVE system must involve satisfying the

requirements of the termination for the shallow soil gas pathway (i.e., meeting the cleanup standard developed in the Breakout Shallow Soil Gas ROD) and the requirements of termination for VOCs reaching groundwater. The STOP process is a series of steps for determining whether the residual vadose zone mass is no longer a concern and also if it could be addressed in a more timely or cost effective manner by groundwater extraction alone.

Because of the way the STOP language is written, there is no situation in which a SVE system could be terminated under one ROD at the same time that it is required for further operation under another ROD. However, it is quite possible that the extraction well configuration and depth could be optimized to address only the remaining threatened pathway in the event that the other pathway is no longer threatened. In such an event, a Remedial Action Completion Report (RACR) could be prepared to close out the remedy for the ROD, whose pathway remediation has met that RODs' requirements. The SVE system would then continue to operate solely under the authority of the other ROD.

2.2 Other Groundwater RODs

The Basewide Groundwater VOC ROD will not be the only ROD addressing groundwater for McClellan. It will supersede a previous Interim ROD (IROD) that addressed groundwater containment in 1995. A ROD addressing non-VOC contamination in groundwater is planned for 2011 and could result in other measures to remediate groundwater (e.g., additional extraction wells and a non-VOC treatment train integrated into the current VOC treatment train).

2.2.1 1995 Interim Groundwater ROD

The May 1995 Basewide Groundwater Operable Unit Interim Record of Decision (IROD) addresses groundwater contaminated with trichloroethylene (TCE) and other VOC solvents. This IROD requires the Air Force to construct a groundwater containment system in three phases and maintain this extraction and treatment system until a final groundwater remedy is selected. The containment goals are the individual Maximum Contaminant Levels (MCLs) for the VOCs. McClellan is currently installing Phase III wells, while operating the Phase I/II system. The Phase III design anticipates the likely remedy to be selected by the Basewide VOC Groundwater ROD described in Section 2.1.2. The Phase III system will not only complete the containment of basewide VOC plumes on and off base, but it will also extract groundwater to achieve a MCL cleanup level in a timely and cost-effective manner. Thus, Phase III will likely meet the anticipated requirements for groundwater cleanup that will be determined in the 2004 Basewide VOC Groundwater ROD.

During the course of implementing the 1995 Groundwater IROD, the Air Force has learned more about the nature and extent of groundwater contamination. Some of this new information, gathered since the 1999 Basewide VOC FS was completed, changes some of the assumptions that were made in the 1999 Basewide VOC FS. Section 3 in this Addendum discusses these changes and their consequences for time and cost to complete.

2.2.2 Non-VOC Groundwater ROD

The detection of elevated levels of hexavalent chromium and 1,4-dioxane in some extraction wells at McClellan and increased California concerns about the possible presence of “emerging chemicals” (e.g., perchlorate, 1,4-dioxane, hexavalent chromium) have caused the Air Force to begin a comprehensive investigation of non-VOC contamination in groundwater at McClellan. To date, non-VOC contaminant sampling indicates problem areas are within the VOC plume volumes already targeted for capture under the 1995 Interim Groundwater ROD. However, more sensitive analytical methods combined with evolving changes in risk assessment and preliminary remediation goals and health advisories will be considered in the non-VOC groundwater investigations planned for the next several years. The Non-VOC Groundwater ROD is not planned for completion until 2011.

It is very likely that the Non-VOC Groundwater ROD will address hexavalent chromium. At this time, it is not certain what other contaminants will be addressed in the Non-VOC Groundwater ROD. A treatment system for this contaminant of concern is already in place and operating as part of a Time Critical Removal Action (TCRA). This was necessary to meet the National Pollutant Discharge Elimination System (NPDES) discharge requirement for hexavalent chromium for the treated groundwater effluent currently being discharged to Magpie Creek under the 1995 Groundwater IROD. A portion of the VOC extracted GW is contaminated with elevated levels of 1,4-dioxane. The Groundwater Treatment Plant (GWTP) is currently treating these elevated 1,4-dioxane levels prior to discharge to Magpie Creek. The planned 2004 Basewide VOC Groundwater ROD is expected to require the continued operation of the hexavalent chromium treatment system.

2.3 Other RODs at McClellan

One other IROD has been completed for polychlorinated biphenyl (PCB)-contaminated soil at Operable Unit (OU) B1; was signed in 1993. Two RODs have been completed:

- Six Site No Action ROD was signed in 2003
- Seven Site Local Redevelopment Authority (LRA) Initial Parcel Non VOC Group #1 ROD signed in 2004

Eight additional RODs are currently planned for completion over the next 8 years. All these RODs focus on soil contamination. Additional studies planned for these RODs are not anticipated to find new sources of groundwater contamination, although they will all consider this possibility. In the event that additional groundwater concerns are uncovered, they will be addressed in the Non-VOC Groundwater ROD or by an amendment to the Basewide VOC Groundwater ROD.

- Two of these RODs address sites in the LRA Initial Parcel.
- A Breakout ROD will address shallow soil gas.
- Two other RODs will focus on particularly troublesome sites, Confirmed Site (CS) 10 and Building 252.
- The final three RODs will focus on small volume sites, large volume strategic sites (e.g., large disposal pit areas), and ecological areas.

2.4 VOC Sites Identified in this FS Addendum

2.4.1 Basewide Remedy

The Remedy and proposed cleanup levels are to be applied basewide. To date, it has been nearly impossible to identify which VOC sites created specific plumes of VOC groundwater contamination. An exception is the OU D groundwater plume.

2.4.2 VOC Sites

Appendix C, Tab 1, provides a list of McClellan IRP Sites that have detectable VOC contamination within a 100-foot buffer around the site somewhere in the vadose zone between ground surface and groundwater. These sites are considered VOC Sites. Additional shallow soil gas characterization work is currently underway at McClellan, which may identify additional VOC sites

2.4.3 VOC Sites that Impact Groundwater

Appendix C, Tab 2, provides a list of sites derived from sites shown in Appendix C, Tab 1 that could impact groundwater. The criterion used for screening sites is outlined below.

2.4.3.1 Summary

The VOC cleanup levels for the groundwater are based on MCLs for individual contaminants. Cleanup levels for the vadose zone are based on the potential for VOCs in the vadose zone to leach into the groundwater resulting in groundwater concentrations above MCL. The discharge of interstitial water (leachate) from the vadose zone can only increase the groundwater's contaminant concentration above the MCL if the leachate contaminant concentration exceeds the MCL. Therefore, if the maximum soil column contaminant concentration in interstitial water is less than the groundwater cleanup level (MCL), the vadose zone has met its cleanup standard and no further analysis is required. By using the Henry's law coefficient to convert chemical specific MCLs to their MCL equivalent soil gas concentration, the vadose zone sites can be segregated into those that have at least one sample result that exceeds its equivalent MCL from those that have none. Those sites with at least one result greater than the equivalent MCL require further analysis. Those with no results greater than the equivalent MCL need no further consideration for VOC contribution to groundwater.

2.4.3.2 Discussion

Almost all soil concentrations of volatile organic hydrocarbons at McClellan are calculated from measured soil gas concentrations using the equilibrium equation in the McClellan Basewide General Framework Document. Consistent with the conceptual model presented in the SVE RAWP (Removal Action Work Plan), this equation partitions the total contaminant mass into compartments of soil, comprising inorganic soil minerals and organic detritus, interstitial water, and soil gas. Two of the three compartments, soil gas and interstitial water (leachate) are mobile while the carbon is fixed. Concentrations in each compartment are determined by chemical

specific constants like Henry's Law and Carbon adsorption coefficient. Relative mass in each compartment is determined by its volume. As a contaminant migrates through the soil column, toward the groundwater, the ratio of soil gas concentration to the concentration in the other two compartments remains essentially unchanged although the mass in each may change because different soil types have different amounts of void space, water filled porosity and organic carbon.

There are no mechanisms in the conceptual vadose zone transport model that allow soil gas concentration to increase above the maximum in the soil column. All mechanisms serve to dilute the maximum concentration. Contaminant mass can be transported between layers by soil gas diffusion or by percolating water. For a more detailed discussion of the subsurface environment, the reader is directed to the SVE RAWP.

Contaminant transport by diffusion is caused by the random motion of individual molecules in soil gas, which results in a net migration from greater concentration areas to lesser concentration areas. The transfer continues until equilibrium is attained and the two concentrations are equal. After equilibrium is attained, the resulting concentration in the original greater area is reduced, the concentration in the original lesser area is increased, and both are less than the original greater.

Similar to diffusion, interstitial water can migrate in all directions. However, because water is applied to the surface as infiltrating rainwater the net direction is downward, moving contaminants to the groundwater. As water moves from an area of greater contamination to an area of less contamination (lower in the soil column), the concentration in the lower soil area is increased but can never exceed the original concentration in the upper soil area. The resulting concentration is necessarily lower due to dilution by the lesser-contaminated water. The converse is also true. If water moves from a lesser concentration area to a higher concentration area, the resulting concentration is less than the previous greater area and greater than the previous lesser area. In either case, a maximum column concentration will be reduced.

The Henry's law coefficient characterizes the ratio of contaminant concentration in the interstitial water to that in soil gas. It can be used to convert chemical specific MCLs to their MCL equivalent soil gas concentration for comparison to the soil gas data. Areas where no sample results exceed their MCL equivalent cannot increase the groundwater concentration above MCLs since these concentrations will only decrease during the transport process.

2.4.3.3 Conclusion

The above discussion of the transport physics was used as a preliminary screening tool for all sites where VOCs were detected during soil gas sampling. Any site where no soil gas sample exceeds its MCL equivalent was removed from consideration for further VOC cleanup to protect groundwater. This procedure ignores the dilution by either gaseous diffusion or rainfall infiltration and percolation, which would allow more sites to be removed. Sites with at least one contaminant in a single sample above its MCL equivalent will require further investigation. This procedure will not exclude any sites that may have a groundwater impact. However, it will include some sites that upon further analysis will require no VOC cleanup action to protect

groundwater. Consequently, it is conservative and protective of human health.

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Section 3.0

CONCEPTUAL MODEL FOR PLUME BEHAVIOR IN THE NEXT 30 YEARS

Ongoing quarterly monitoring of the VOC contaminant plumes at McClellan and Groundwater IROD Phase III data gap studies have provided some new information that significantly affects the conceptual model and alternative described in the 1999 Basewide VOC FS. The most dramatic change is that the anticipated groundwater drop of one foot per year will most likely not occur over the next 30 years. As a result, the time to remediate groundwater will likely be much longer than previously predicted in the 1999 Basewide VOC FS.

3.1 Water Table Stabilization Analysis

At the time of the 1999 Basewide VOC FS, the conceptual model for groundwater assumed that the water table would continue to drop about 1 foot per year for the next 30 years before it stabilized at about 130 feet below ground surface (bgs). Because most of the contaminant target volumes are currently present between 100 and 130 feet bgs, groundwater extraction would no longer be practical and VOC remediation would be best achieved by the much faster soil vapor extraction method. Some of the 1999 Basewide VOC FS alternatives employed strategically located dual-phase wells to accomplish this shift.

However, regional and McClellan-specific groundwater monitoring results during the past 8 to 10 years have indicated a major change from the previous long-term trend of a relatively static water table. Figure 1 (Section 3.1) presents the results of recent analysis by the California State Department of Toxic Substances Control (DTSC) that shows the water table has stabilized and slightly rising. Based on this new information, it is no longer reasonable to assume that the water table will drop another 30 feet any time soon. Part of the reason for the GW stabilization is because water districts in the vicinity of McClellan have opted to utilize their surface water rights in order to reduce the usage of groundwater resources.

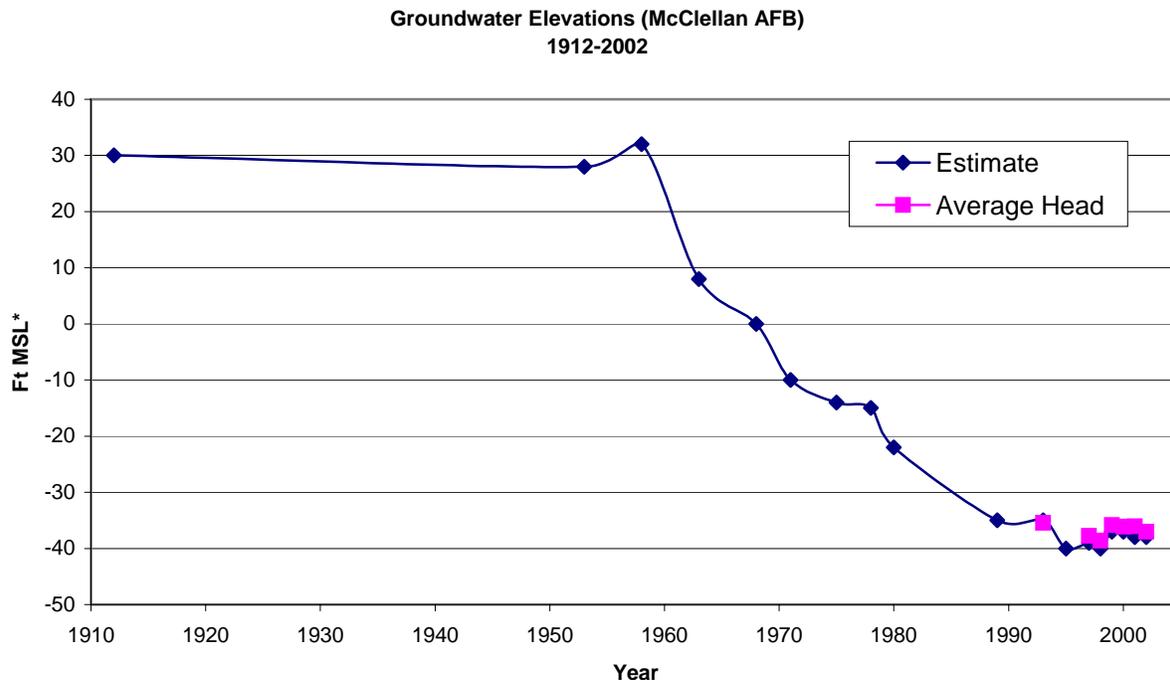


Figure 1 (Section 3.1)

*MSL = Mean Sea Level. McClellan ground surface is relatively flat. The ground surface at McClellan ranges from 60 to 70 feet above MSL.

3.2 Time and Cost to Complete Under a Stabilized Water Table Scenario

Section 6.8 of the 1999 Basewide VOC FS presents a sensitivity analysis that has already considered the possibility of an earlier stabilization of the groundwater table at McClellan. Using those assumptions, which are consistent with what is shown on Figure 1 (Section 3.1), the time to achieve cleanup goals for Alternative 2b would increase from 147 years with a falling water table to approximately 500 years using the updated conceptual model of this Addendum. Similarly, the lifetime cost (using the original 1997 cost data) to achieve cleanup goals for Alternative 2b would increase from \$152 million with a falling water table to approximately \$500 million lifetime cost using the updated conceptual model in this Addendum.

3.3 Water Table Level Remains Uncertain

In discussions with Water Districts, the Air Force has found that the water districts in the vicinity of McClellan have reduced GW pumping in an effort to create an underground water reserve that can be used in drought years. Thus, it is possible that the groundwater table might even raise and impact operating SVE wells. This would tend to further increase the costs and time to complete because of the additional extraction wells necessary to contain the plumes and clean the re-contaminated shallower zones. However, the trend towards increasing urbanization of previously agricultural or sparsely populated areas could cause an increase in domestic and commercial use of groundwater that might slow down or reverse the trend towards a stabilized or

rising groundwater table. The GW & SVE quarterly monitoring programs will be checking the water levels and will be able to recommend needed changes in the time to prevent remedy breakage.

3.4 Changes in the Number of Wells Needed for Alternatives Described in the 1999 FS

Changes to the required number of extraction and monitoring wells have been identified after the 1999 Basewide VOC FS was completed. These changes are due to the work involved with completing the implementation of the Basewide Groundwater IROD, particularly Phase III. The IROD Phase III extraction well design took into account the now static water table. Shown below is a comparison of wells for the preferred Alternative 2b:

| | <u>Alternative 2b</u> <u>Original Basewide VOC FS</u> | <u>Phase III (currently under design)*</u> |
|------------------|--|---|
| Extraction Wells | 46 | 69* |
| Monitoring Wells | 38 | 70* |

***numbers may change some when design is final.**

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Section 4.0

UPDATE OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) ANALYSIS

The Final Basewide VOC FS (December 1999) provided significant discussions among the parties (State, EPA, and Air Force). A major difference in the parties' proposed VOC groundwater cleanup levels caused the State to dispute the Air Force Proposed Plan. During dispute resolution, agreement was reached by all parties on the VOC groundwater cleanup level for McClellan and the process to initiate and terminate soil vapor extraction (SVE) systems based on groundwater cleanup levels. The positions taken by all parties, and items agreed to, are presented in Appendix A. The final decision is shown in Section 4.1.1 below.

Complicated issues concerning the behavior and potential risks associated with shallow soil gas have caused the Air Force to change their Basewide VOC ROD into a Basewide VOC Groundwater ROD, which includes vadose zone contamination that threatens GW. VOC Shallow Soil gas issues will be dealt with by future RODs.

Increased national focus on institutional control issues resulted in new Environmental Protection Agency (EPA) guidance, Air Force policies, and a new State regulation requiring a covenant.

4.1 Dispute Resolution Agreement

4.1.1 VOC Groundwater Cleanup Level

Provided below is the groundwater cleanup agreement for VOCs, which is quoted from the December 2001 Senior Executive Committee (SEC) decision document (see Appendix A Tab1 k):

“In the matter of the formal dispute before the Senior Executive Committee (SEC) regarding the McClellan Air Force Base Proposed Plan for the VOC Operable Unit, the SEC issues this written decision in accordance with Section 12.6 of the Amended Federal Facility Agreement for McClellan Air Force Base dated May 5, 1990. This decision incorporates the agreement reached by the Air Force, the State of California, and the Environmental Protection Agency in settlement of the dispute brought by the State of California regarding the Air Force's Proposed Plan dated March 2000 for cleanup of volatile organic compounds in soil and groundwater at McClellan Air Force Base.

The issues in dispute are: (1) Are State Board Resolution 92-49 and the Central Valley Water Board's Basin Plan (in whole or in part) considered to be Applicable or Relevant and Appropriate Requirements (ARARs) in setting cleanup levels in groundwater? (2) If State Board Resolution 92-49 and the Basin Plan are considered to be Applicable or Relevant and Appropriate Requirements, how should they be interpreted to set groundwater cleanup levels? (3) What are appropriate remedial action objectives for cleanup of groundwater? The “Dispute Resolution Committee Consensus Statement of McClellan Air Force Base VOC Proposed Plan Dispute” contains a more detailed summary of the issues in dispute. The individual position papers submitted to the SEC by the parties contain the facts and arguments that were presented

to the SEC concerning the issues in dispute.

The SEC has reached unanimous agreement as follows:

(1) The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as ARARs for the McClellan VOC Record of Decision.

(2) Under the currently available specific facts at McClellan, the Air Force and EPA believe that both ARARs result in a cleanup standard of 5 parts per billion (ppb) TCE, based primarily on economic feasibility. The State believes that application of both ARARs results in a cleanup standard of 2.3 ppb TCE. The Record of Decision will state 5 parts per billion as the cleanup standard for TCE. The parties agree to proceed with the cleanup as proposed by the Air Force until such time as 5 ppb is achieved in each plume, as defined by the BRAC Cleanup Team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, agrees within 60 days to complete an analysis and prepare a report (using agreed upon models), which evaluates the technical and economic feasibility of continuing remediation until plume levels reach 2.3 ppb TCE. After the report is complete, the parties will have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facility Agreement.

(3) The parties agree to not include either of the disputed remedial action objectives in the VOC Record of Decision.”

4.1.2 SVE Turn-on (Start) and Turn-off (Stop) and How They Impact Groundwater Decisions for VOCs

Using alternative dispute resolution, the FFA parties agreed to use the Start/Stop process described in Appendix A as the criteria for determining at which sites, SVE operations should commence, and once operational, when those operations should terminate.

4.1.3 FFA Parties' Interpretation What the Dispute Resolution Means

4.1.3.1 Air Force Interpretation

To the Air Force, incorporation of the VOC Proposed Plan dispute decision into the VOC FS Addendum means the following:

a. The McClellan VOC Proposed Plan was resolved by consensus of the Senior Executive Committee. The parties acknowledged in the consensus statement that Section III.G of State Water Resources Control Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Basin Plan [relevant and appropriate] ARARs for the McClellan VOC Record of Decision. The Air Force has recognized Section III.G of Resolution 92-49 as a potential ARAR for cleanups at other former Air Force bases in California and AFRPA expects to do so in the future.

b. The Air Force has not, in other instances, recognized the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR, and AFRPA considers the recognition of it in the McClellan VOC Proposed Plan consensus statement to be limited to that dispute and resolution. In the case of McClellan VOC plumes, it does not require anything more than is required by Resolution 92-49. Its inclusion in the consensus statement was unnecessary, but in that instance, harmless. In other situations, as to other contaminants, it may not be accepted as a potential ARAR.

c. In the case of the McClellan VOC plumes, AFRPA determined that the federal MCL for TCE (5 ppb) met the requirements of Resolution 92-49 and the Basin Plan's narrative toxicity objective. EPA agreed with that determination.

d. As a compromise, the parties agreed that in the case of the McClellan VOC plumes, the Air Force will proceed with cleanup until the plumes reach 5 ppb TCE, and then will complete a report that evaluates the technological and economic feasibility of continuing remediation until plume levels reach 2.3 ppb. The Air Force considers that agreement to be specific to the McClellan cleanup. Consideration of the technological and economic feasibility of cleaning up to a level lower than MCLs at any other site would be, as it was at McClellan, a site-specific decision based on the lead agency's discretionary determination, in consultation with the regulatory agencies, of the cleanup levels that meet the requirements of Resolution 92-49 and other ARARs, if any.

4.1.3.2 Environmental Protection Agency Interpretation

EPA agrees with the 2001 SEC statement, "The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as ARARs for the McClellan VOC Record of Decision." Because this discussion took place several years ago and ARARs are not set until a ROD is signed, EPA would recognize a continuation of that discussion during the FS and Proposed Plan stages and during the preparation of the draft ROD. Certainly, at the time of an FS and prior to a Proposed Plan, portions of both 92-49 and the Basin Plan could be considered 'Potential ARARs' since no final decisions have been made. An FS does not force the selection of specific ARARs.

EPA not only still believes that both potential ARARs result in a 5 ppb cleanup for TCE, but also believes that the ARARs would likely result in MCLs for all contaminants of concern because of the new information about the water table that is presented in the VOC FS Addendum. EPA sees no problem with continuing to support the 2001 dispute resolution not only for TCE, but also for the other contaminants as well. EPA believes the FS Addendum should provide that the FFA parties could agree to proceed with cleanup to MCLs until such time as the MCL for all contaminants has been achieved in each plume as defined by the BRAC Cleanup Team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, would agree within 60 days to complete an analysis and prepare a report (using agreed upon models), which evaluates the technical and economic feasibility (TEF) of continuing remediation until plume levels reach 2.3 ppb TCE or other 1×10^{-6} levels for other contaminants. After the report,

the parties would have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facility Agreement. For the purposes of the FS Addendum, EPA sees no reason to modify the language of the 2001 dispute resolution, although an expansion of the concept to include the other contaminants makes sense to EPA.

EPA fully supports the START and STOP text that was worked out over many years and was agreed to during the 2000 Alternative Dispute Resolution process by the McClellan FFA parties. EPA sees no reason to tinker with such language prior to the ROD, because the main question that drives the decision of when to start or stop SVE systems will remain the same (i.e., is it cheaper or quicker to rely solely on groundwater extraction and treatment to remove targeted VOC mass from the subsurface?).

4.1.3.3 State Interpretation

The McClellan VOC Proposed Plan dispute was resolved by consensus of the Senior Executive Committee (SEC). The consensus statement states that, *“The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as Applicable or Relevant and Appropriate Requirements (ARARs) for the McClellan VOC Record of Decision.”* Board staff strongly disagrees with the Air Force’s interpretation for incorporating the VOC Proposed Plan dispute decision into the VOC FS Addendum. The Air Force interpretation states that, *“The Air Force has not recognized the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR...”*. Board staff believes that the dispute resolution language is clear and unambiguous and states precisely that the narrative toxicity objective in Chapter III of the Basin Plan is an ARAR for the McClellan VOC ROD. The dispute resolution was a compromise between the Air Force, U.S. Environmental Protection Agency (EPA), and the Regional Board to resolve the nearly two-year long dispute. The Air Force’s interpretation of the dispute resolution is clearly contrary to the dispute resolution language and serves to undermine the dispute resolution process, the spirit of compromise, and good faith efforts of the SEC. Therefore, Board staff requests that the VOC FS Addendum be revised to recognize the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR for the McClellan VOC ROD.

The Air Force interpretation states that, *“In other situations, as to other contaminants, it (the narrative toxicity objective in Chapter III of the Basin Plan) may not be accepted as a potential ARAR.”* The SEC parties recognized Section III.G of State Board Resolution 92-49 and the narrative toxicity objective in Chapter III of the Basin Plan as ARARs for the McClellan VOC ROD. As to other contaminants, Board staff believes that based on the dispute resolution agreement and applying these ARARs to the other groundwater VOC contaminants of concern (COCs), the Air Force must evaluate the technical and economic feasibility of achieving Water Quality Limits (WQLs) that are more stringent than maximum contaminant levels (MCLs) for each VOC COC. Then based on the results of this evaluation, the appropriate cleanup level can be selected. Since the cleanup of groundwater contaminated with TCE will most likely drive the cleanup of other groundwater VOC COCs (with the exception of carbon tetrachloride), the final cleanup levels for the other VOC COCs will not likely drive the decision on when to terminate

the groundwater remedy. Therefore, consistent with the dispute resolution, Board staff could accept MCLs as the cleanup level for other VOC COCs in the VOC Groundwater ROD under the same conditions as described in the dispute resolution for TCE.

Specifically, the dispute resolution states in agreement Number 2: *“Under the currently available specific facts at McClellan, the Air Force and EPA believe that both ARARs result in a cleanup standard of 5 parts per billion (ppb) TCE, based primarily on economic feasibility. The State believes that application of both ARARs results in a cleanup standard of 2.3 ppb TCE. The Record of Decision will state 5 ppb as the cleanup standard for TCE. The parties agree to proceed with the cleanup as proposed by the Air Force until such time as 5 ppb is achieved in each plume, as defined by the BRAC Cleanup Team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, agrees within 60 days to complete an analysis and prepare a report (using agreed upon models) which evaluates the technical and economic feasibility of continuing remediation until plume levels reach 2.3 ppb TCE. After the report is complete, the parties will have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facilities Agreement.”* Therefore, for VOC COCs other than TCE, the groundwater cleanup would proceed as proposed by the Air Force until such time as the MCL for a particular VOC COC is achieved in each plume. The same process for evaluating the technical and economic feasibility of achieving cleanup levels at the WQLs would be followed, including the preparation of an analysis report (using agreed upon models) within 60 days of the Air Force notifying the parties that the MCL has been achieved in a particular plume and that subsequent extraction well shut down is proposed.

4.1.3.4 Agree to Disagree Language

The FFA parties agree that the issues presented in Sections 4.1.3.1, 4.1.3.2, and 4.1.3.3 will not be disputed at this time and will be dealt with in the VOC Basewide Groundwater ROD.

4.2 Updated ARAR Analysis

The ARAR Analysis identified in the original FS is adequate to precede to the ROD, with the following additions to Table B-1 and Table B-4:

Addition to Table B-1
Potential Chemical Specific ARARs
VOC Feasibility Study

| <u>Requirement</u> | <u>Description of Requirement</u> |
|----------------------------------|--|
| California National Toxics Rule* | |
| 40 CFR Part 131 | Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants. Based on this federal requirement, the State of California has adopted California Toxics Rule and has promulgated numeric aquatic and human health criteria for priority toxic pollutants and a compliance schedule provision which authorizes the State to issue schedules of compliance for new or revised National Pollution Discharge Elimination System permit limits based on the federal criteria when certain conditions are met. Applies to the discharge of treated groundwater from the groundwater treatment plant into surface waters, in this case, Magpie and Don Julio Creeks. |

*only substantive requirements are considered ARARs

Addition to Table B-4
 Potential Action-Specific ARARs
 VOC Feasibility Study

State ARARs

| Action | Requirement | Description | ARAR Determination | Comments |
|---|-----------------------------------|--|--------------------------|---|
| Deed Restrictions and State Land Use Covenant | 22 CCR 67391.1(a) | Requires imposition of appropriate limitation on land use by recorded land use covenant when hazardous substances remain on the property at levels that are not suitable for unrestricted use of the land. | Relevant and Appropriate | Identical restrictions (ICs) will be included in the federal deed and a State Land Use Covenant. The decision document will include a description of enforcement and implementation measures. |
| | (b) | Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations. | | |
| | (d) | Requires that the land use covenant be recorded in the county where the land is located. | | |
| | (i) | Definitions. | | |
| | CA Civil Code Sect. 1471(a) & (b) | Specifies requirements for land use covenants to apply to successors in the title to the land. | | |

4.3 State's Substantive NPDES Requirements for the McClellan Groundwater Treatment Plant

California Regional Water Quality Control Board (RWQCB), Central Valley Region adopted Waste Discharge Requirements (WDR) Order No. R5-2003-0052 on 24 April 2003. AFRPA has incorporated the substantive requirements of the Waste Discharge Requirements into the Groundwater Treatment Plant (GWTP) Operations and Maintenance (O&M) Manual Addendum. Refer to Appendix D for the substantive requirements.

AFRPA did not apply for the California Regional Water Quality Control Board, Central Valley Region, NPDES Permit Number CA0081850, Order Number R5-2003-0052, Waste Discharge Requirements. By law, regulation, and agreement with the State of California, AFRPA is exempt from any permit requirement for onsite activities conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. Section 9621(e)(1), 40 CFR. Section 300.400 (e)(1), McClellan Federal Facility Agreement (FFA) Section 19.1). The cited federal statute provides that no federal, state, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite..."

The primary congressional intent behind the CERCLA permit exclusion was to avoid delays to CERCLA responses inherent in obtaining permits or similar approvals, because CERCLA ensures the environmental protection that would otherwise be provided by a permit. CERCLA, the National Contingency Plan (NCP) at 40 Code of Federal Regulation (CFR) Part 300, and further implementing EPA directives and guidance provide detailed procedures and participation opportunities for federal, state, and local regulators to identify substantive requirements that would otherwise be included in permits. AFRPA is conducting environmental restoration activities pursuant to CERCLA and Executive Order 12580 authorities and therefore, the permit exclusion applies.

The RWQCB's position is documented in Finding No. 8 of the NPDES Permit Order No. R5-2003-0052 as follows: "The Discharger did not submit a Report of Waste Discharge to revise Order No. 99-067, but did submit information necessary for permit renewal in several other documents. The Discharger has stated that they are not required to obtain a permit as CERCLA allows for an exemption from the necessity of obtaining a permit for onsite remedial response activities. However, one of the requirements that allows the exemption is that all substantive requirements that would be contained in the permit must be in the CERCLA decision document that governs the activity that would be permitted. An Interim Record of Decision (IROD) was signed in the summer of 1995 which does not contain all the substantive requirements contained in the NPDES permit. The substantive requirements are also known as Applicable, Relevant, and Appropriate Requirements (ARARs). Since the appropriate decision document, the IROD, does not contain all of the necessary ARARs, the NPDES permit is necessary to regulate the discharge.

Typically, the State issues new permit requirements every 5 years and the steps above are repeated. The next regular update would be in 2008; however, the State plans on updating the permit in the next one to two years when Phase III of the Groundwater IROD expanded groundwater extraction and treatment system is finished. At this time the GWTP O&M Manual will be updated for substantive requirements.

4.4 Sacramento County Well Ordinance 2002

The following sections are excerpts from the County Ordinance, which pertain to groundwater well construction in the vicinity of McClellan. These restrictions are in place and are part of the ongoing corrective action at McClellan.

4.4.1 Section 6.28.000 G Consultation Zone

Any application for a well permit within 2000 feet of a known groundwater contaminant plume is subject to a special review by appropriate regulatory agencies, including but not limited to the Sacramento County Environmental Management Department and the California Regional Water Quality Control Board, Central Valley Region, to evaluate potential impacts to public health and groundwater quality.

4.4.2 Section 6.28.025 Former McClellan Air Force Base Prohibition Area

This section shall apply to, and the term “prohibition area” as used in this section shall mean, that portions of the unincorporated territory of the County bounded on the east and south by the boundary of former McClellan Air Force Base, on the south by the Sacramento City limits, on the west by Dry Creek Road, and on the north by I Street.

- New Wells Prohibited. No permit shall be issued for and no person shall dig or drill a new water well within the prohibition area.
- Exemptions. This section shall apply to exploratory borings, groundwater extraction wells, soil vapor extraction wells, or test wells operated by the United States Government or public agency.

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Section 5.0

PRELIMINARY CLEANUP GOALS AND UNRESTRICTED USE GOALS

The Final Basewide VOC FS discusses Preliminary Cleanup Goals in great detail. This addendum provides updates to the previous discussion.

5.1 Cleanup Goals for Groundwater

The cleanup goals for VOC contaminants in groundwater are the Federal and/or State MCLs, whichever is more stringent. The Dispute Resolution did set up a process for plume cleanup to potentially go to a lower concentration than MCLs in the future event that a technical and economic feasibility analysis of continuing the remedy to 2.3 ppb TCE convinced the FFA parties to do so. The Air Force believes that the Dispute Resolution only applies to TCE and that only the State and Federal MCLs are applicable to other VOCs. The State does not agree with this interpretation (See Section 4.0). Also, Refer to Appendix A Tab 1k (page A-60 in particular) for Dispute Resolution Agreement.

The U.S. EPA is currently undergoing a review of the toxicity evaluation for TCE and has produced a 2001 draft assessment. EPA is responding to public comments on the draft assessment. The outcome of this evaluation could affect the basis of the current MCL and may cause a change. Any changes in the MCL will be addressed in the 5 -year review processes and will not be addressed in this FS addendum.

5.2 Cumulative Risk for Groundwater and for Parcels

Section 2.3 of the 1999 Basewide VOC FS discusses the residual human health risk that would likely exist in wells that would meet the MCL cleanup goals. Some parcels of property have additional contamination in the soil posing a human health risk from exposure at the surface. Risk-based cleanup goals for the soil contamination will be developed independent from estimated residual human health risk of groundwater that meets MCL cleanup goals. Thus, the Air Force does not expect to change groundwater cleanup goals in the future to help achieve a prescribed total risk value (e.g., 10^{-6}) for a parcel, all media and contaminants combined. Appendix A, Tab 2, provides the agreed to approach on how cumulative risk will be done at McClellan.

5.3 Cleanup Goal for Unrestricted Use of Groundwater (VOC Contamination)

The VOC cleanup goals for unrestricted use of groundwater are the State and Federal MCLs. Refer to Section 5.1 above.

5.4 Groundwater Use Restrictions: Compliance Boundaries

Groundwater use restrictions are adequately described in the Final Basewide VOC FS. There are two groundwater use restricted areas of particular interest that are described in Sacramento County Well Ordinance (Sections 6.28.000G, and 6.28.025), and City of Sacramento Ordinance 86-080 (C) and (D). Also shown on Figure 2 (Section 5.4.1) is the current location of the

groundwater plume (above and below MCL). The Air Force has installed a network of monitoring wells within and outside of the plume area to ensure the plume is contained. In the future, if needed, additional monitoring wells, or sampling activity could be implemented to ensure groundwater cleanup is completed.

5.4.1 Consultation Zone

Section 6.28.000G says “Consultation Zone. Any application for a well permit within 2000 feet of a known groundwater contaminant plume is subject to special review by appropriate regulatory agencies, including but not limited to the Sacramento County environmental Management Department and the California Water Quality Control Board, Central Valley Region, to evaluate potential impacts to public health and groundwater quality.” Figure 2 (Section 5.4.1) below shows approximate location of the 2000-foot buffer zone. The edge of the contaminated plume is based on State Water Quality Objectives.

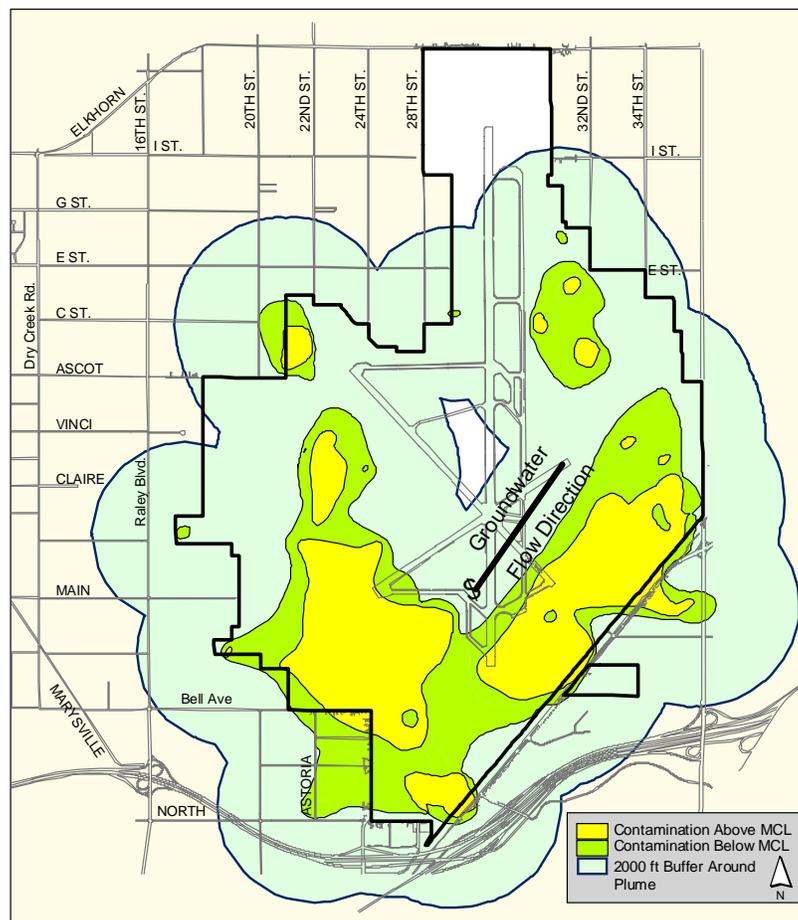


Figure 2 (Section 5.4.1): Approximate Location of 2000 ft. Buffer Zone, Sacramento County Code, Chapter 6.28.000G

5.4.2 Former McClellan Air Force Base Prohibition Area

This Prohibition Area was created in the mid 1980s. The area represents a very conservative estimate of how far the McClellan contamination plume could have moved away from McClellan. Groundwater monitoring has shown that the plume is within this prohibition area.

Section 6.28.025 says: “FORMER MCCLELLAN AIR FORCE BASE PROHIBITION AREA. This section shall apply to, and the term “prohibition area” as used in this section shall mean, that portion of the unincorporated territory of the County bounded on the east and south by the boundary of former McClellan Air Force Base, on the south by the Sacramento City limits, on the west by Dry Creek Road, and on the north by I street.”

City of Sacramento City Ordinance 86-080 says: “(C) PROHIBITION AREA. This Chapter shall apply to, and the term “prohibition area” as used in this Chapter shall mean, that portion of the City from McClellan Air Force Base west along Ascot Avenue, south on Dry Creek Road, southeast along Marysville Boulevard, east on Bell Avenue, then south on Raley Boulevard to Interstate 80 and east to McClellan. (D) NEW WELLS PROHIBITED. From and after such time as water from the City of Sacramento is made available for domestic, industrial, and irrigation purposes within the prohibition area no permit shall be issued for and no person shall dig or drill a new water well within the prohibition area.”

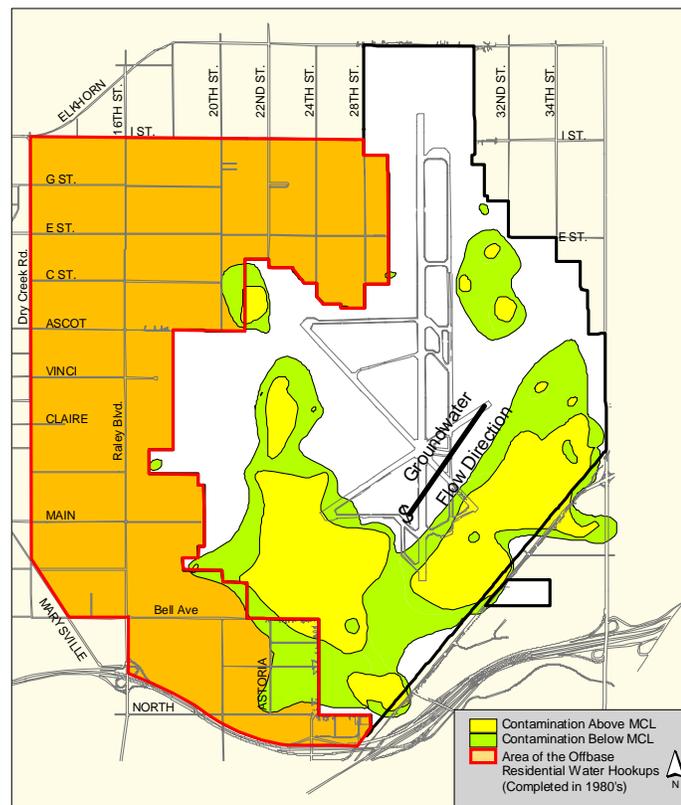


Figure 3 (Section 5.4.2): McClellan Prohibition Area, Sacramento County Code, Chapter 6.28.025 & City of Sacramento City Ordinance 86-080
5.5 Groundwater Treatment Plant Requirements

The groundwater treatment plant requirements are contained in the McClellan Operations and Maintenance (O&M) Manual and Addendum. The substantive requirements are provided in Appendix D. These requirements are reviewed periodically by the State, EPA, and Air Force and updated accordingly. An investigation to determine the extent of 1,4-dioxane contamination is currently ongoing using a phased approach. Generally, the wells with the 1,4-dioxane concentrations greater than Federal Preliminary Health Advisory Goal of 6.1 µg/L have been located within or close to a TCE plume. Currently, results do not suggest that 1,4-dioxane has generally migrated down gradient of the TCE target areas. The treatment processes currently in place at the GWTP reduce effluent discharge levels below the 6.1 µg/L level.

5.6 Air Emission Requirements

Periodic source testing is performed at all SVE and groundwater treatment systems to ensure compliance with the New Source standards contained in Section 301 of the Sacramento Metropolitan Air Quality Management District's Rule 202. It specifies that new sources must apply Best Available Control Technology (BACT). BACT is defined in Section 301.1 as any system capable of achieving specific effluent limits for contaminants including reactive organic compounds, nitrogen oxide, sulfur oxide, PM10 and carbon monoxide. Each of these compounds is monitored at each treatment system and totaled across the base. McClellan AFB has consistently met the BACT requirement on a base wide basis.

Section 6.0

INSTITUTIONAL CONTROLS FOR GROUNDWATER AND SVE ALTERNATIVES

The 1999 Basewide VOC FS focused on cleanup alternatives and associated cleanup goals. That FS provided only general descriptions of ICs that would accompany all the cleanup alternatives, and it provided no detailed analysis of ICs under the required Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) nine criteria. Current EPA guidance on IC analysis (EPA, 2000) recommends a full detailed analysis of the IC components of remedial alternatives.

6.1 Institutional Control Objectives and Descriptions

This section provides additional details on IC terminology, objectives, and descriptions. This information sets the stage for the detailed analysis presented in Section 6.2. The organization of this additional information will help focus the subsequent detailed analysis on issues among the FFA parties as to which party is responsible for implementing which ICs using what financial resources.

6.1.1 Institutional Control and Land Use Control Terminology

A major focus of this addendum to the 1999 Basewide VOC FS involves the land use controls and institutional controls related to groundwater contaminated with VOCs, the extraction of VOCs from groundwater and soil, and the subsequent treatment and discharge of groundwater and soil gas. The Air Force, State, and EPA sometimes use slightly different terminology to describe various aspects of land use controls and institutional controls. Following is a comparison of these different terms and the definitions used by the Air Force in this report and in the 1999 Basewide VOC FS.

Land use controls limit or control the use of land features such as soil or groundwater. Two main types of land use controls are **site controls** and **institutional controls**. Site controls are physical structures located at the site (e.g., engineered systems or physical structures). Site controls such as engineered barriers are physical structures or equipment that prevent or inhibit access or use of land features present at defined site locations. These barriers can be complex structures (e.g., multi-layered caps) or simple devices (e.g., alarms or fences). Guards or security patrols are other types of site controls that can support land use restrictions or assist in maintaining the integrity of engineered systems. Site controls are typically described in detail in O&M Plans. Institutional Controls are generally non-engineered instruments such as administrative and/or legal controls (e.g., zoning permits and deed covenants) used to prevent (or control) exposure to contaminants by limiting land use or resource (e.g., groundwater) use. They are used to supplement and complement the engineering and/or technical process controls. Institutional controls are information based and generally do not involve engineered equipment or devices as mentioned previously.

However, some information processes rely on computers that store and update data, possibly using a network of different computer locations. Institutional controls are not typically described in detail in O&M Plans. However, there is no reason they could not be included in such plans as a special section. The State of California, pursuant to California Code of Regulations, Title 22, section 67391.1, requires that any response action decision document include, among other things, an implementation and enforcement plan. This plan may be in the form of a Land Use Control Implementation Plan (LUCIP), which would at least describe the implementation of ICs, including establishment, maintenance and administrative monitoring and reporting requirements.

6.1.2 Institutional Control Objectives for McClellan Groundwater and SVE Alternatives

The 1999 Basewide VOC FS provided a list of general and specific remedial action objectives. Since then, the FFA parties met and organized the specific IC objectives into a chart (Figure 4; Section 6.1.2) showing the type of ICs available to address each objective. This chart has evolved over the last year and was revised as a result of Air Force comments/input during the preparation of the AFRPA Land Use Control/Institutional Control (LUC/IC) Management Plan. The resulting Figure 4 chart is different from the July 30, 2003 version presented to the BCT regulators, and the changes were presented to the BCT at the November 5, 2003 BCT Meeting. The rationale for the changes is as follows:

(1) “Provide information to stakeholders” and “Ensure long-term IC monitoring is performed” were removed as objectives because these are not LUC/IC goals or objectives, but rather are processes used to ensure that the goals and objectives (prevent exposure to contamination and disturbance of systems) are met. These processes are included in the LUC/IC Management Plan. For example, the Communications Plan (Appendix A of the LUC/IC Management Plan) talks extensively about providing information to stakeholders, and Section 5 of the LUC/IC Management Plan describes LUC/IC Monitoring. LUC/IC monitoring will also be discussed in the ROD as was done for the March AFB ROD.

(2) The “Rights of Access” objectives were also removed because these items are more appropriately classified as LUC/IC layers that should be identified as controls for other LUC/IC Objective/Goals. These are in fact included as “Reservation of Access” clauses in the deed. Figure 4 annotates this under the deed covenant IC type. The “Rights of Access” are also included as site controls in the AFRPA LUC/IC Management Plan for some of the objectives listed in Figure 4.

(3) “Prohibit installation of private wells” is a use restriction that is put in place to achieve the LUC/IC goals and objectives (e.g., preventing exposure, preventing migration of contamination) and, therefore, was removed as an LUC/IC objective.

(4) “Prevent migration of contaminated groundwater” was added as an LUC/IC objective because the Air Force feels that this was not covered under any of the other objectives, which focus on exposure to contamination and disturbance of systems. The use restriction that prevents installation of private wells (deed covenant) as mentioned in item 3 above is one IC type used to achieve this objective.

The following describes the IC objectives listed in Figure 4. A full description of the individual IC types associated with these objectives is provided in the next section 6.1.3. Engineered land use controls and monitoring are described and analyzed under the remedial alternatives in the 1999 Basewide VOC FS.

Protect and Control Surface Covers: Maintaining adequate surface cover (existing asphalt, concrete, soil, grass, etc.) helps to prevent intrusion of surface and rainwater, which could contribute to additional contaminants reaching the groundwater table from the vadose zone source areas. A use restriction on digging/excavation activities (in deed covenant and SLUC) above and around source areas serves to achieve this IC objective.

Prevent Migration of Contaminated Groundwater: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that prohibits installation of private wells (contained in a deed covenant and SLUC) serves to achieve this IC objective. Operation of existing wells (extraction and domestic) is closely monitored by the Air Force to ensure that plume containment is maintained.

Prevent or Reduce Exposure to Contaminated Groundwater: The intent of this objective is to ensure that contaminated groundwater is not used for human consumption or introduced into the environment that could be a detriment to sensitive ecological habitat. The use restriction that prohibits installation of private wells (deed covenant) serves to achieve this IC objective. Operation of an existing domestic well (Base Well 10) is closely monitored by the Air Force to ensure that plume containment is maintained and contaminants are not drawn towards this well, which is used as a drinking water source.

Prohibit Disturbance of Extraction, Treatment, and Monitoring Systems: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that prohibits development or land use that interferes with remedial operations (deed covenant) serves to achieve this IC objective.

| | Institutional Control Objectives | | | |
|--|---|---|--|--|
| Types of Institutional Controls | Protect and Control Surface Covers | Prevent Migration of Contaminated Groundwater | Prevent or Reduce Exposure to Contaminated Groundwater | Prohibit Disturbance of Extraction, Treatment and Monitoring Systems |
| Government | | | | |
| Zoning and Other Ordinances | | X | X | |
| Local Permits (e.g., bldg, grading, demo, well installation) | X | X | X | |
| Air Force Encroachment Permit | X | | X | X |
| Proprietary | | | | |
| Easements | | | | |
| Deed Covenants (includes Rights of Access) | X | X | X | X |
| State Land Use Covenant | X | X | X | X |
| Conservation Easements | | | | |
| Enforcement Tools | | | | |
| Administrative Order | | | | |
| Consent Decree | | | | |
| Federal Facilities Agreement | | | | |
| Information | | | | |
| Deed Notice | | | | |
| Advisories & Provide Information | X | X | X | X |

Figure 4 (Section 6.1.2): Institutional Controls Matrix

6.1.3 Description of Individual Institutional Controls

The 1999 Basewide VOC FS described ICs that would apply to each of the remediation alternatives. The following is a more detailed description of the ICs for the cleanup alternatives.

However, because the presumptive remedy of groundwater extraction and treatment with a cleanup goal of MCLs is most likely to continue to be the preferred alternative, the following description will be most compatible with Alternative 2B. Alternative 2B was a modification of the 1999 Basewide VOC FS Alternative 2 and was one of the focal points during the alternative dispute resolution and formal dispute resolution conducted by the FFA parties on the March 2000 draft final VOC Proposed Plan.

Under all VOC cleanup alternatives described in the 1999 Basewide VOC FS, institutional controls will be implemented as a remedy component to eliminate or limit exposure pathways to human and ecological receptors through non-engineering methods. Once the ICs are implemented, excavation and other site work could be allowed if environmental, work safety, and remediation equipment control measures were implemented.

The institutional control component has three distinct parts based on the responsible party for implementation. For this component, Air Force Real Property Agency (AFRPA), Sacramento County, and the State each have responsibilities for implementing specific institutional control process options as described below. In addition, all cleanup alternatives include monitoring and enforcement of the institutional controls by each of the three parties and the U.S. EPA as applicable. For example, the County could enforce against any zoning or ordinance violation, and the EPA could enforce against a deed covenant restricting use of contaminated groundwater. The State would not enforce against zoning or ordinance violations.

Part A – Institutional Controls Implemented by AFRPA

- Environmental encroachment permits
- Easements
- Deed covenants
- Deed notices
- Advisories

Part B – Institutional Controls Implemented by Sacramento County

- Zoning and other ordinances
- Local Permits
- Advisories

Part C – Institutional Controls Implemented by the State

- State Land Use Covenants (SLUCs)

The intent of including all of these institutional control process options as the IC component of all alternatives is to allow for development of costs and a comparison of the effectiveness of each part of the IC component. If this component is selected, some or all of the institutional control process options may be implemented, based on the outcome of the detailed analysis of alternatives using the nine CERCLA criteria (see Section 6.2). More detailed descriptions of the parts of institutional control implementation are provided in the following subsections.

6.1.3.1 Part A – Institutional Controls Implemented by AFRPA

Under Part A of the IC component, AFRPA may implement the following institutional controls:

Air Force Encroachment Permit. This requirement only applies to the Former McClellan Air Force Base. The AFRPA Environmental Encroachment/Work Permit (AFRPA Form 370) must be obtained before construction or soil disturbance activities are initiated on the former Base. The permit is intended to ensure that proper precautions have been incorporated into the activities to prevent impacts to human health, the environment, or remedial activities. (The specific objectives achieved by the encroachment permit are shown on Figure 4; Section 6.1.2.). For activities within parcels residing above contaminated groundwater or contaminated soil gas, the entity wanting to do the work must submit a site-specific work plan and a health and safety plan if soil, soil covers, vegetation, or other remediation structures may be disturbed. AFRPA provides review and approval of the permit request and performs site visits and oversight as necessary. Upon property transfer, use of the encroachment permit will be required of the new property owner by the deed covenant (see below). The encroachment permit process is integrated with Underground Service Alert (USA) to ensure the entities' compliance with environmental restrictions. Costs are included for AFRPA to manage the encroachment permits with one permit required for each site every 3 years.

Easements. Easements will be sought if access over privately owned property is needed. The cost associated with these easements would be included as part of the long-term O&M of the site.

Deed Covenants. Deed covenants (use restrictions) are implemented upon conveyance of the property, and can be used to achieve the same institutional control objectives as the encroachment permit and easements (see Figure 4; Section 6.1.2). Deed covenants run with the land. A major deed covenant is a use restriction that prohibits the installation of private wells, which serves to achieve two IC objectives as discussed in Section 6.1.2. The deed covenants will also include a reservation of rights to access the site so a separate easement will not be required. Costs for establishing the deed covenants (writing and recording) are not included in the IC costs because these costs must be incurred to transfer the property regardless of the environmental condition. However, costs to monitor and enforce the deed covenants are included as discussed in Section 6.2.7. Costs are also included to maintain a geographic information system (GIS) database to track the status of the property with environmental contamination.

Deed Notice. These are purely informational notices filed in public records to inform stakeholders of the presence of hazardous substances on the property. Costs for establishing the deed notices (writing and recording) are not included in the IC costs because these costs must be incurred to transfer the property regardless of the environmental condition.

Advisories. These warnings provide notice to potential users of the property of risks associated with the environmental contamination. The advisories also inform and remind key stakeholders of their role in maintaining the institutional controls. These efforts are guided by the AFRPA

Land Use Control Institutional Control Communication Plan. The advisories will be issued by AFRPA as part of the community relations program and costs to issue the advisories are included in the IC costs.

6.1.3.2 Part B – Institutional Controls Implemented by Sacramento County

Under Part B of the IC component, Sacramento County will implement the following institutional controls:

Zoning and Other Ordinances. Zoning is commonly applied to restrict or specify land uses, and would most commonly be used to prohibit residential use. The County has established zoning requirements for the former Base; therefore, only the incremental costs incurred by the County directly related to the environmental contamination are included in this IC component. For example, AFRPA will provide the County with an updated GIS database to track the status of the property with environmental contamination. Costs for an environmental technician to interpret and use the information in the database are included in the IC component. Because monitoring and enforcement are critical for success of the institutional controls, costs are also included for these activities. Existing County codes are in place to prevent exposure to contaminated groundwater and migration of contaminated groundwater; no additional zoning or ordinances are envisioned at this time. The following summarizes existing codes in place to prevent exposure to contaminated groundwater and migration of contaminated groundwater: Sacramento County Code, Chapter 6.28, Section 6.28.000.G (Consultation Zone) and Section 6.28.025 (Former McClellan Air Force Base Prohibition Area) apply as it relates to well restrictions. Section 6.28.000.G reads, “Consultation Zone. Any application for a well permit within two thousand (2000) feet of a known groundwater contaminant plume is subject to special review by appropriate regulatory agencies, including but not limited to the Sacramento County Environmental Management Department and the California Regional Water Quality Control Board, Central Valley Regional, to evaluate potential impacts to public health and groundwater quality”. Section 6.28.025 establishes a Prohibition Area west and southwest of the McClellan western base boundary. Operation of existing wells is not a concern as there has been no evidence of existing off-base wells impacting the groundwater contamination plume. In 1986 and 1987, McClellan negotiated with off-base residents that were on well water to supply them with municipal water supply. 550 off-base residences west of the base were given a municipal water supply connection to prevent possible exposure to contaminants (contaminants had been detected in 13 off-base wells). If it is necessary for the County to rewrite an ordinance or zoning code, an assessment may be required per the California Environmental Quality Act (CEQA).

Local Permits. Local permits for buildings, grading, demolition, and well construction can be used to protect the surface cover and prevent exposure to contaminated soil gas and groundwater. As with zoning, the County will be required to establish, if needed to supplement current requirements, and implement permitting procedures for the former Base regardless of the environmental contamination; therefore, only the incremental costs related to the environmental contamination are included. These costs are the same costs as described in the previous bullet.

Advisories. The Sacramento County Department of Environmental Management issues these advisories, and are similar to those issued by AFRPA.

6.1.3.3 Part C – Institutional Controls Implemented by the State

Before transfer of title to the property, the Air Force will execute and record a SLUC with the State that restricts property as necessary to protect human health and the environment, pursuant to State law, including California Code of Regulations, Title 22, Section 67391.1. The SLUC will include a legal description of the property restricted, a description of the contamination left in place, a brief summary of the health risk assessment and site history, and provisions for access and enforcement. The SLUC will be based upon the State model Covenant to Restrict Use of Property. The SLUC serves to achieve the same goals and objectives as the Air Force deed covenants.

6.1.3.4 Monitoring and Enforcement

Monitoring and enforcement of land use will be performed as part of the long-term Air Force O&M for the site and will be documented in a letter report each year and in the 5-year CERCLA review. This annual monitoring report, submitted to the regulatory agencies by the Air Force, will evaluate the status of all ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the use restrictions and controls references above were communicated in the deed(s), whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls.

Specific language will be included in the ROD regarding implementation, monitoring, and enforcement of selected ICs. Because restrictions and the means for implementing the restrictions will be detailed in the ROD, it will not be necessary for the Air Force to submit any new post-ROD IC implementation documents such as a Land Use Control Implementation Plan. During the time between adoption of the ROD associated with this FS and deeding of the property, equivalent restrictions are implemented by lease terms, which require compliance with the Encroachment Permit program. At the moment of deed transfer, the lease restrictions will be superseded by the restrictions to be included in the federal deed and the SLUC. For any property transferred to another federal agency, the transfer document will provide that the agency will incorporate the restrictions into its land use comprehensive plan and include the restrictions in any transfer to another federal agency or future deed to a non-federal entity.

To develop costs for the IC component, it was assumed that inspections will be performed quarterly by AFRPA and the County. It is further assumed that the Air Force, the County, and the State will respond to a violation of the institutional controls once every 10 years for each site, and dealt with as part of the Air Force O&M Plan. The response to the violations is assumed to include legal action to enforce zoning requirements, easements, deed covenants, and other ICs, and to take actions to prevent impacts to human health and the environment from contact with contaminants.

U.S. EPA will maintain an oversight role to ensure that institutional controls are being implemented as intended to protect human health and the environment. U.S. EPA will review reports and maintain a tracking database. For specific institutional controls, U.S. EPA will spot check enforcement activities of other agencies, and will provide oversight (inspections and

reporting) during response actions to correct breaches. In addition, as part of U.S. EPA's regulatory oversight under CERCLA, U.S. EPA will be involved in the 5-year review process (planning, inspections, and review). As required by Assembly Bill (AB) 871 and AB 2436, DTSC has developed and posted to its Web site, Deed Restricted Sites Lists to provide the public easy access to information on deed restrictions and affected sites. McClellan will be entered into this Sites Lists once the SLUC is signed. The State may also conduct inspections of the ICs.

In the event of a violation of the deed covenants, the Air Force encroachment permit process, easements, or interference with site controls (SCs), the Air Force will request enforcement by the Department of Justice. The Air Force will notify EPA and the State via e-mail or telephone as soon as practicable, but no later than two weeks 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. Remedies would be real estate and contract remedies, such as specific performance and monetary damages to compensate for mitigation or alternative performance undertaken by the Air Force as a result of the violation in order to maintain the same protectiveness of human health and the environment. If the violation of the deed covenants would result in impacts to human health and the environment and if the property owner was not immediately correcting the violation, the Air Force would respond to correct the violation.

6.2 Detailed Analysis of Institutional Controls and Alternatives for Implementation

This section provides the traditional detailed analysis under the first seven of the nine CERCLA criteria. In addition, because of the likelihood of the need for related IC issues resolutions among the FFA parties, this section provides some analysis of the last two CERCLA criteria (i.e., State Acceptance and Community Acceptance) in terms of key stakeholder participation in the implementation and funding of ICs. By providing this additional detailed analysis at the FS stage, the FFA parties are more likely to be able to resolve differences in a timely and effective manner during development of the ROD. For example, the extra detail provided in Section 6 of this Basewide VOC FS Addendum could help the State better understand the likely scope of a land use control implementation plan, which the State strongly desires to see at the time of the ROD.

6.2.1 Overall Protection of Human Health and the Environment

Protection of human health (from contaminated groundwater) and surface water is achieved and maintained by preventing exposure to contaminants. Access and land use restrictions are designed to prevent intrusion into contaminated materials. Assuming no breach occurs, exposure pathways are incomplete and no human health risks or threat to surface water are posed.

Ecological receptors could be impacted if the institutional controls were not effective and contaminated groundwater was released to a location with ecological habitat. Therefore, monitoring and enforcement of the institutional controls and engineered controls will be required to ensure the continued effectiveness of the IC component.

The institutional controls implemented under Part A are the most complete for those institutional control objectives most closely related to protection of human health and the environment:

protect and control surface covers, prohibit installation of private wells, prevent exposure to contaminated groundwater, and prohibit disturbance of extraction, treatment and monitoring systems. Parts A, B, and C are nearly equally as protective of human health and the environment.

6.2.2 Compliance with ARARs

The ICs as discussed in this FS addendum are in compliance with federal and State ARARs. The December 1999 Basewide VOC FS ARARs are applicable but were updated to reflect the state ARAR for the SLUC (see Section 4.2). The SLUC is discussed in Section 6.1.3.3 and other relevant criteria analyses in Section 6.2.

6.2.3 Long-Term Effectiveness and Permanence

ICs will provide continued protection of human health (from contaminated groundwater) and surface water as long as the institutional controls and engineered controls, particularly prohibiting installation of private wells, are monitored and enforced. Under CERCLA, 5-year reviews will be performed to determine if the remedy documented in the ROD is effective and is protective of human health and the environment. The 5-year reviews will provide an additional opportunity to review the monitoring and enforcement of the institutional controls and should serve to increase the likelihood that the institutional controls are effective over the long-term. However, because contaminants will remain in the groundwater above cleanup standards for many decades during the long-term operation of the cleanup remedy, the possibility of human exposure remains if the cleanup equipment is disturbed or private wells are installed.

Some institutional controls will “run with the land” for centuries, if necessary (e.g., deed covenants, SLUC). This is not that much different from ICs that would need to be in place in perpetuity. Each time the affected property is transferred, AFRPA, Sacramento County, and the State will be involved with the property transfer documents to ensure that the institutional controls are extended to the new owner and are correctly understood. Use of the AFRPA environmental encroachment permit will be required of the new owner by the deed covenant. The list of property owners and stakeholders in the tracking databases will be revised so that advisories can be distributed.

The Air Force would pay its portion of the institutional control costs through the current practice of programming projects annually. While it may be possible to establish a trust fund from which to pay the institutional control costs, the Air Force has not been successful in establishing a trust fund to maintain conservation easements. In addition, the long-term mission of AFRPA, which includes managing property at active installations, increases the likelihood of funding the institutional controls through the normal annual budget cycle. The Air Force will pay the State of California reasonable, nondiscriminatory costs associated with administration of the SLUC, subject to appropriation of funds through the Defense State Memorandum of Agreement (DSMOA) or some alternative payment mechanism. “Nondiscriminatory costs” means costs similar to those paid by other parties for such land use covenant administration.

As described in Section 6.2.1, Parts A, B, and C are nearly equally as protective of human health and the environment. Rights of access and prohibitions on disturbing treatment and monitoring systems can be implemented under Parts A and C, but not under Part B. Informational devices can be nearly equally implemented under Parts A and B. The types of institutional controls that can be implemented to achieve each institutional control objective are shown on Figure 4; Section 6.1.2. Implementation of deed covenants, which require the owner to attain an environmental encroachment permit, is arguably the most effective institutional control while the Air Force has a presence at McClellan for the institutional control objectives that prohibit or restrict activities at the site. The deed covenants coupled with the environmental encroachment permit are similar to the lease restrictions and environmental encroachment permits that are currently implemented. The Air Force is willing and able to implement, maintain, and enforce the institutional controls. However, at some point in the future when the Air Force presence decreases, the SLUC may become the most effective type of institutional control to attain many of the objectives. The deed covenants and the SLUC are equally effective for providing a right-of-access for the Air Force; however, the SLUC may be more effective for providing a right-of-access for regulatory agency inspections and for ensuring restriction of use to protect public health and the environment in perpetuity.

With the exception of restrictions on disposal of contaminated soil, the IC objectives can be achieved by layering two or more institutional control process options, thereby increasing the effectiveness of ICs through time should any one institutional control process option fail. The long-term effectiveness and permanence can be achieved through monitoring and enforcement of the institutional controls; however, failure of an institutional control process option can occur if the party responsible for implementation, monitoring, and enforcement does not perform these functions.

Difficulties and uncertainties in implementing long-term institutional controls are increased if funding is not sufficient or tenants are not aware of the institutional controls. In addition, the contamination left in place may result in the potential for increased insurance costs and other damages should the institutional controls fail. However, each of these factors can be mitigated by the proper implementation of institutional controls. For example, if each party implementing the institutional controls has a separate funding source, then the likelihood of all funding sources being insufficient at the same time is decreased. Because most of the institutional controls are layered (i.e., most institutional controls can be implemented by more than one party), the institutional controls will continue to be implemented. Similarly, updating databases that identify stakeholders can help ensure that advisories are received, and involving the parties when property is transferred will help ensure continuity in implementing the institutional controls.

Implementation of Parts A, B, and C enhance the long-term effectiveness and permanence of ICs. Parts A, B, and C further reinforce the implementation of institutional control objectives identified on Figure 4; Section 6.1.2, through several layers of protection by enabling the County, Air Force, State, and U.S. EPA to notify, monitor, control, and/or enforce against prohibited uses on the land.

6.2.4 Reduction of Toxicity, Mobility, or Volume through Treatment

The IC component results in no reduction in the intrinsic toxicity, mobility, or volume of contamination through treatment. Besides the reductions due to the engineered parts of the remedy as described in the 1999 Basewide VOC FS, additional permanent or significant reduction in toxicity and volume will occur only gradually as natural biological, chemical, or physical degradation occurs. These processes are inherently irreversible. The mobility of VOC contaminants is indirectly addressed by institutional controls restricting operation of private wells near the leading edges of the contaminant plumes and disturbance of surface covers that could affect soil gas extraction from the vadose zone. There are no distinctions between Parts A, B, and C for this criterion.

6.2.5 Short-Term Effectiveness

The Remedial Action Objectives (RAOs) for protection of human health (from contaminated groundwater) and surface water are achieved in the short-term because contaminants are not improperly disturbed under the IC component. No pathways for exposure are completed or created. Implementing and monitoring institutional controls poses only minor exposure risk to workers. The institutional controls would be implemented prior to or upon transfer of the property. There are no distinctions between Parts A, B, and C for this criterion.

As discussed in Section 6.2.3, if a breach of the institutional controls occurs (e.g., a private well is operated and contaminated groundwater is released), a residential or ecological receptor could be exposed to contaminants. However, AFRPA will have a right-of-access to quickly address the breach through engineering or site controls, such as well lock or a repaired conveyance line, to reduce the potential for exposure to contaminants.

Deed covenants will be implemented upon conveyance of the property and will be used to restrict disturbance to the surface cover and contaminated soil, and achieve other institutional control objectives. The deed covenants will also include a reservation of rights for AFRPA to access the site as necessary for monitoring, inspection, or remediation activities. The right-of-access will allow immediate access to the site if AFRPA must respond to an emergency or a breach of the institutional controls. However, such access will be more difficult for property outside the former Base boundaries. Should AFRPA need access to private property off the former base, the Air Force would use an easement or a right of entry (form of an easement).

The AFRPA institutional control tracking database will be operational at the time of property transfer to track the status of these sites, and AFRPA intends to share this database with Sacramento County. Although other databases to be maintained by the regulatory agencies may not be operational at the time of property transfer, this limitation should not impact oversight of the institutional controls in the short-term.

6.2.6 Implementability

The IC component is readily implementable on a technical basis. Materials, legal mechanisms, and services to implement the IC component are available. Because AFRPA will have a right-of-access in the deed covenant, AFRPA will be able to respond promptly to breaches of the institutional controls and will be able to implement future remedial actions (for some non-VOCs for example) if the IC component is implemented. Coordination with other remedial programs to address non-VOC contamination in soil and groundwater may be required at some sites. Also, AFRPA will need access for some sites with VOC-contaminated shallow soil gas. Such sites would already be at property affected by the VOC groundwater remedy.

Implementation of ICs will require coordination between the AFRPA, Sacramento County, and the State. Each of these entities is responsible for implementation, monitoring, and enforcement of specific parts of the IC component as described in Section 6.1.3. Each of these entities participated in developing the institutional control objectives matrix (Figure 4; Section 6.1.2), and each indicated a willingness to implement the institutional controls under Parts A, B, and C, respectively. The regulatory agencies also provided comments and suggestions on the draft of this document, which were considered and incorporated as applicable. However, the County has not decided whether they are willing to operate the encroachment permit process if the Air Force does not. No agreements have been completed specifying whether Sacramento County will pay for the institutional controls under Parts B and C, respectively, or the Air Force reimburses the entities.

Impacts to human health and the environment could occur if monitoring and enforcement of the institutional controls were not sufficient. For example, construction workers or tenants could be exposed to contaminated groundwater during a disturbance of groundwater conveyance lines. However, because of the chronic (as opposed to acute) nature of the health effects, the impacts on human health would likely be minimal if the exposure was significantly less than the one-year exposure period assumed for the human health risk calculations for construction workers.

To enhance the safety of human and ecological receptors, ICs can be applied to a parcel being transferred via a FOSET before the ROD for that parcel has been completed. For tenant-occupied facilities, deed restrictions would come into effect upon property transfer. The Air Force Encroachment Permit process has already been implemented under Part A, and the Air Force institutional control tracking database is operational. The Air Force will provide a copy of the database to the other entities as requested, but the other entities do not have operational institutional control tracking databases at this time. Deed covenants can be easily implemented upon property transfer. Advisories can be issued through the existing community relations program. Under Part B, Sacramento County would be required to include environmental issues in existing processes (e.g., issuing building and demolition permits). This would require technical knowledge to understand and apply available information from the IRP. For Part C, Air Force has agreed that the SLUC is between the State and the Air Force. AFRPA will pass the appropriate SLUC requirements onto the County via the deed.

Access to off-base property not owned by the Air Force will be more difficult. Should AFRPA need access to private property off the former base, the Air Force may use an easement or a right of entry (form of an easement).

6.2.7 Cost

To estimate the costs of groundwater institutional controls, it is helpful to first examine the likely incremental cost over implementation, monitoring and enforcement of soil ICs. A key IC necessary to prevent exposure of human and ecological receptors to contaminated groundwater is the deed covenant (use restriction) that prohibits water supply wells above or near contaminated plumes defined by the VOC Groundwater ROD. Cost for implementation of these controls is minimal, as measures to prevent the drilling of groundwater supply wells have already been adopted by the County of Sacramento (Sacramento County Code 6.28.000 G).

An additional layer of protection specific to McClellan is the Former McClellan Air Force Base Prohibition Area described in Sacramento County Code 6.28.025 (reference Section 5.4).

Costs for monitoring include the incremental cost of regulator review of drilling requests, Air Force, State and County deed covenant activities at property transfer, Air Force and County GIS maintenance, Air Force and County advisories, and County permit reviews/denials.

Costs for enforcement and for responding to breaches in the institutional controls are not included. The sole breach anticipated is the drilling of a water supply well, and this activity is difficult for an individual to perform with County zoning and ordinances in place. Therefore, it is considered unlikely and not considered for the purposes of this FS Addendum. For the same reason, the incremental cost of inspections is not estimated, as the Air Force feels that a drill rig would be visible at great distances (even off-site areas) to anyone inspecting and monitoring other ICs as well as during the routine monitoring of groundwater systems as part of the groundwater O&M. Actions such as damaging wells during routine construction are considered routine O&M costs, as the institutional control governs construction of new wells, and the O&M program already allows for periodic well replacement. While the task of drilling a water supply well could become more feasible in the future if the water table rose significantly, it will take more than five years and the implications of a rising water table and any necessary revisions to the groundwater institutional controls would be discussed in future Five-Year Reviews.

The estimated costs for implementation of ICs are summarized in Table 1; Section 6.2.7. The costs are computed for the entire Groundwater Operable Unit and surrounding areas because the institutional controls (prevention of water supply well drilling) do not change significantly with various contaminants or location relative to the plumes. The annual cost for the GW OU is \$7,800 and \$7,500 for Parts A and B, respectively, and \$2,600 for Part C. EPA's annual cost for oversight is estimates at \$500. Total costs and present-worth costs for 30 years are shown to allow comparisons between alternatives. However, annual costs for institutional controls will be incurred until cleanup goals are achieved.

For Parts A and B, costs are included for implementing and monitoring of the institutional controls. No capital costs are assumed because the institutional controls will be implemented through existing processes (e.g., Air Force Environmental Encroachment Permits under Part A and Local Permits under Part B) or processes that are required regardless of the environmental contamination (e.g., recording deeds). More detailed cost information and the assumptions used are provided in Appendix B.

| Table 1; Section 6.2.7 | | | | |
|---|------------|--------------------|----------------------------------|------------------------|
| Summary of Estimated Costs for Groundwater Institutional Controls | | | | |
| Start | End | Annual Cost | Total Cost (30 Years) | PW₃₀ |
| 2005 | 2035 | \$18,400 | \$552,000 | \$327,000 |

The average annual cost for each component of groundwater institutional controls is listed below. The cost of the Monitoring and Enforcement of ICs is covered in the Air Force O&M Plan (see Section 6.1.3.4).

Part A: Institutional Controls Implemented by AFRPA (\$7,800) – Air Force cost until the GW OU is finished.

- Encroachment Permits (\$248)
- Deed covenants (\$3,690)
- Advisories (\$2,530)
- Annual Report (\$1,300)

Part B: Institutional Controls Implemented by Sacramento County (\$7,500)

- Zoning and other ordinances (\$3,690) – Process already in place.
- Inspections (\$248) – Process already in place.
- Local Permits (\$1,000) – Process already in place.
- Advisories (\$2,530) – New; supplements the Air Force Advisories in Part A above.

Part C: Institutional Controls Implemented by the State : SLUCS (\$2,600) – Air Force pays via DSMOA (see Section 6.2.3).

EPA Oversight Costs: (\$500) – EPA FTE cost.

Annual costs for institutional controls will be incurred until cleanup goals are achieved. Cleanup is estimated at approximately 500 years based on the updated conceptual model presented in this Addendum. Because the level of effort required to implement and monitor institutional controls may vary through time, the cost estimates are uncertain. In addition, using present-worth calculations to quantify costs that occur over long periods is difficult because the discount rate will likely change through time and most governmental agencies fund projects for single fiscal years. However, to quantify the impact of long-term costs, the present-worth cost of groundwater institutional controls was calculated for periods ranging from 30 to 500 years. The present worth at various years are: 30 years - \$327,000; 100 years - \$473,000; 500 years - \$484,000. The present-worth cost is nearly constant after 100 years. The cost of ICs does not impact the selected remedy.

6.2.8 State/Support Agency Acceptance

Typically, this criterion is not evaluated until the ROD is being prepared following the comment period on the Proposed Plan. However, ICs are somewhat of a special case in that their implementability and long-term reliability are directly related to the amount of local and state support for implementing those portions of the ICs that are not under the domain of the Air Force.

Based on experiences with the groundwater extraction and treatment system that has been operating at McClellan since the mid 1980s, and based on recent discussions with DTSC and RWQCB, AFRPA believes that there is strong State support for an IC component to accompany the groundwater cleanup remedy. At the time of this Basewide VOC FS Addendum, AFRPA understands that the State wants to implement, monitor, and enforce a SLUC that will address all of the IC objectives. However, agreement between the State and Air Force on the details of how a SLUC will actually work and how State costs will be financed have not been reached.

6.2.9 Local Government and Community Acceptance

Typically, this criterion is not evaluated until the ROD is being prepared following the comment period on the Proposed Plan. ICs are somewhat of a special case in that their implementability and long-term reliability are directly related to the amount of local and state support for implementing those portions of the ICs that are not under the domain of the Air Force. CERCLA and the National Contingency Plan (NCP) do not specify a role for local governments in implementing the selected remedy. However, local government is often the only entity that has the legal authority to implement, monitor and enforce certain types of ICs (e.g., zoning ordinances).

Based on experiences with the groundwater extraction and treatment system that has been operating at McClellan since the mid 1980s, and based on recent discussions with the Restoration Advisory Board (RAB), Sacramento County's Local Redevelopment Authority (LRA), and their development partner, McClellan Park, AFRPA believes that there is general support for an IC component to accompany the groundwater cleanup remedy. Although the LRA has issued a reuse plan and the County created a zoning ordinance that prohibits installation of private wells in a 2000 foot buffer zone around contaminant plumes, AFRPA has not yet received any written statements of appropriate local agencies' and governments' willingness to implement, monitor and enforce ICs under their jurisdictions. AFRPA anticipates that financial support for local agency participation will be a big issue, especially if AFRPA is not providing funding for the local agencies to manage their IC programs at McClellan to the level of thoroughness required in the ROD.

Section 7.0
REFERENCES

AFBCA, July 2002. Action Memorandum for Groundwater Treatment Plant Hexavalent Chromium Discharges.

AFBCA/DR Letter, 30 July 2002. Land Use Control/Institutional Controls Management Guidance.

AFRPA, January 2003. Final Record of Decision for No Action for Soil at Six (6) Sites: PRL B-004, SA 064, SA 039, SA 050, PRL 035, and SA 017.

AFRPA, 11 July 2003 Letter. Proposed Revision to the McClellan Federal Facilities Agreement (FFA) Basewide Volatile Organic Compounds (VOC) Record of Decision (ROD) Strategy and Schedule.

AFRPA, December 2003. Land Use Control/Institutional Control Management Plan, Version 1.0.
(Note: This is a living document and is updated as conditions change. The document referenced here is the most recent.)

CH2MHill, June 1995. Final Basewide Groundwater Operable Unit Interim Record of Decision.

CH2MHill, December 1999. Final Basewide VOC Feasibility Study Report.

CH2MHill, February 2000. Draft Final VOC Proposed Plan.

CH2MHill, May 2002. Final GWOU Phase III Work Plan.

CH2MHill, August 2003. Final LRA Initial Parcel Feasibility Study #1 (7 Sites).

City of Sacramento Ordinance, Undated.

County of Sacramento, Undated. Sacramento County Well Ordinance.

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EDAW, July 2000. LRA McClellan AFB Final Reuse Plan.

McClellan AFB, April 1990. McClellan AFB Interagency Agreement, Amended Federal Facility Agreement.

MWH, June 2003. Final Technical Memorandum, Off Base GWOU Phase III VOC Data Gaps Investigation.

MWH, October 2003. GWOU Phase III Design - 60%.

Radian Corporation, July 1993. Final Operable Unit B1 Interim Record of Decision.

Radian Corporation, June 1997. Final Interim Basewide Remedial Investigation Report, Part 1, General Framework, Revision 1.

RWQCB, April 2003. Waste Discharge Requirements for United States Department of the Air Force former McClellan Air Force Base, Groundwater Extraction and Treatment System (GWTS), Sacramento County, Waste Discharge Requirements Order No. R5-2003-0052.

URS, May 2003. Time-Critical Removal Action Work Plan for Hexavalent Chromium.

URS, October 2003. Draft2 – Operations and Maintenance Manual, Groundwater Monitoring Program, Groundwater Treatment Plant.

URS, February 2004. Draft Final Time-Critical Removal Action Completion Report for Hexavalent Chromium.

URS Group-Laidlaw, 2001. Final Basewide Removal Action Work Plan for Soil Vapor Extraction, McClellan Air Force Base.

U.S. EPA, OSWER 9355.0-74FS-P, September 2000. U.S. EPA, Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups.

Appendix A

TEXT OF DISPUTE RESOLUTION & ISSUE DOCUMENTS AND CUMULATIVE RISK LETTERS

| <u>Tab 1: Dispute Resolution Documents</u> | <u>Page</u> |
|--|--------------------|
| a. DTSC Letter, Undated. Subject: Initiation of Dispute, McClellan Air Force Base (AFB) | A-3 |
| b. Description of the Five Disputed Issues, 8 October 2000. McClellan Air Force Base Volatile Organic Compound Proposed Plan Alternative Dispute Resolution (Level 2) Issues Statement | A-7 |
| c. Level 3 Consensus Statement for Issues 4 and 5 of VOC ROD Dispute, March 2001 | A-11 |
| d. Level 3 Consensus Statement for SVE TURN-ON (START) CRITERIA for Case #1, 4 December 2000. VOC Contamination in the Vadose Zone Over Groundwater Contaminated with the Same VOC COCs | A-17 |
| e. Level 3 Consensus Statement for SVE TURN-OFF (STOP) CRITERIA for Case #1, 4 December 2000. VOC Contamination in the Vadose Zone Over Groundwater Contaminated with the Same VOC COCs | A-23 |
| f. Level 3 Consensus Statement for SVE TURN-ON (START) CRITERIA for Case #2, 4 December 2000. VOC Contamination in the Vadose Zone Over Clean Groundwater | A-29 |
| g. Level 3 Consensus Statement for SVE TURN-OFF (STOP) CRITERIA for Case #2, 4 December 2000. VOC Contamination in the Vadose Zone Over Clean Groundwater | A-35 |
| h. Level 3 Consensus Statement for SVE TURN-ON (START) CRITERIA for Case #3, 4 December 2000. Some or All VOC Contamination in the Vadose Zone Over Groundwater Contaminated with Different COCs | A-41 |
| i. Level 3 Consensus Statement for SVE TURN-OFF (STOP) CRITERIA for Case #3, 4 December 2000. Some or All VOC Contamination in the Vadose Zone Over Groundwater Contaminated with Different COCs | A-49 |
| j. EPA Region IX Letter, 16 July 2001. Subject: Invoke Formal Dispute on the Proposed Plan for the VOC Operable Unit, McClellan Air Force Base. | A-57 |
| k. EPA Region IX Letter, 5 December 2001. Subject: Resolution of Formal Dispute on the Proposed Plan for the VOC Operable Unit, McClellan Air Force Base | A-59 |

Tab 2: Issue Documents

Page

- a. AFBCA/DD Letter, 19 June 2002. Subject: McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels A-63
- b. EPA Region IX Letter, 16 July 2002. Subject: EPA Review Comments on the June 19, 2002 memorandum titled “McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels” A-71
- c. EPA Region IX Letter, 19 July 2002. Re: EPA Acceptance of the June 19, 2002 memorandum titled “McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels” A-75
- d. DTSC Letter, 27 May 2003. Re: DTSC Acceptance of the June 19, 2002 memorandum titled “McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels A-77



Winston H. Hickox
Secretary for
Environmental
Protection

Department of Toxic Substances Control

Edwin F. Lowry, Director
10151 Croydon Way, Suite 3
Sacramento, California 95827-2106



Gray Davis
Governor

SM-ALC/EMR
Attention: Mr. Paul Brunner
5050 Dudley Blvd, Suite 3
McClellan AFB, California 95652-1389

INITIATION OF DISPUTE, MCCLELLAN AIR FORCE BASE (AFB)

Dear Mr. Brunner:

By this letter the Department of Toxic Substances Control, on behalf the California Regional Water Quality Control Board, Central Valley Region, invokes dispute consistent with the provisions of Section 12 of the May 2, 1990 McClellan AFB Interagency Agreement. Enclosed is the statement of dispute which describes the nature of the dispute, the work affected, and the Regional Water Quality Control Board's position.

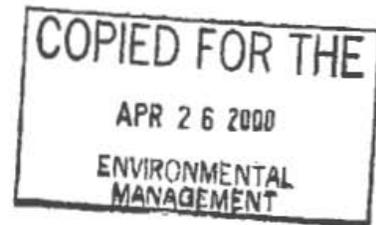
If you have any questions regarding this matter, please contact Mr. Dan Ward at (916) 255-3676.

Sincerely,

Anthony J. Landis, P.E.
Chief
Northern California Operations
Office of Military Facilities

Enclosure

cc: See next page



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Winston H. Hickox
Secretary for
Environmental
Protection

California Regional Water Quality Control Board Central Valley Region

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20 April 2000

Mr. Anthony Landis, P.E.
Chief, Office of Military Facilities
Northern California Operations
Department of Toxic Substances Control
10151 Croydon Way, Suite 3
Sacramento, CA 95827-2106

REQUEST TO INVOKE DISPUTE ON VOC PROPOSED PLAN, MC CLELLAN AIR FORCE BASE

On 22 March 2000 the Air Force submitted a Proposed Plan for cleanup of volatile organic contaminants from the groundwater and vadose zone at McClellan AFB. Board staff has provided significant comments on several versions of the feasibility study leading to the Proposed Plan, and on three separate previous versions of the Proposed Plan. We continue to disagree with the Air Force on several issues, and in an 11 April 2000 letter, the Air Force has stated that they are unwilling to make several changes to the Proposed Plan to address our concerns. We believe these changes are essential in order for us to concur with the Proposed Plan.

The Regional Board is in disagreement with the Air Force in the following three critical areas :

1. Regional Board staff disagrees with the selection of Alternative 2B, contained in the latest version of the Proposed Plan, as the "selected" remedial alternative. The Air Force has not demonstrated that the selected alternative complies with State ARARs, specifically State Board Resolution 92-49, and our Region's Basin Plan. Neither the Air Force position nor our position on this issue has changed since the draft version of the feasibility study.
2. Board staff disagrees with the listing in the Proposed Plan of Remedial Action Objectives (RAOs) for the groundwater cleanup. The list of RAOs for groundwater must also include the following:
 - a. Reduce concentrations in groundwater to the greatest possible extent that is technically and economically achievable.
 - b. Restore the aquifer to beneficial uses in a cost-effective and timely manner.

California Environmental Protection Agency

With Reserved Power

3. Board staff disagrees with the listing in the Proposed Plan of RAOs for the vadose zone cleanup. One of the RAOs for the vadose zone cleanup must be to protect water quality. The existing RAOs dealing with the vadose zone and impacts on water quality only discuss continued contamination of the groundwater from the contaminants in the vadose zone. Furthermore, the text discussing this RAO is limiting by including the phrase "...that significantly prolongs the pump and treat remedy".

The proposed RAO, including the limiting text describing it, calls for remediation of vadose zone contamination only to the extent that *not* remediating it prolongs the cost and/or time to cleanup the groundwater. The proposed RAO does nothing for preventing the degradation of clean water and allows concentrations up to the cleanup standard in the mixing zone before any potential remedial action is to occur. The proposed RAO demonstrates that the Air Force has not recognized the Regional Board's authority to require cleanup in the vadose zone to protect water quality.

To resolve these issues, we request that the Department of Toxic Substances Control invoke the dispute process pursuant to the Federal Facilities Agreement (FFA) for McClellan Air Force Base.

The Air Force has recently spent considerable time and effort developing an Alternate Dispute Resolution (ADR) process to augment and improve the dispute process contained in the FFA. This ADR process was developed in close cooperation with both State and federal regulatory agencies. We are in complete agreement with the Air Force that this recently formulated ADR process should be used in the resolution of this dispute. Use of the ADR process should save both time and resources, provide a more structured and informed basis for decision-making at higher management levels, should that become necessary, and facilitate a more timely resolution of these issues.

If you have any questions regarding this matter, please call Alexander MacDonald at (916) 255-3025 or James Taylor at 255-3069.



GARY M. CARLTON
Executive Officer

cc: Mr. Joseph Healy, United States Environmental Protection Agency, San Francisco
Ms. Frances McChesney, OCC, State Water Resources Control Board, Sacramento
Mr. Bill Kilgore, Department of Toxic Substances Control, Sacramento
Mr. Paul Bruner, Environmental Management, McClellan AFB
Mr. Rod Whitten, AFBCA/EVS, San Francisco
Captain George Joyce, Environmental Management, McClellan AFB
Mr. Jim Caliguri, Environmental Management, McClellan AFB

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**McCLELLAN AIR FORCE BASE VOLATILE ORGANIC COMPOUND PROPOSED
PLANALTERNATIVE DISPUTE RESOLUTION ISSUES STATEMENT**

Issue 1

Are specific State requirements, including State Board Resolution 92-49, the Water Quality Control Plan (Basin Plan), Central Valley Region, Sacramento and San Joaquin River Basins, Fourth Edition (1998), and Water Code Section 13304 [in whole or in part] Applicable or Relevant and Appropriate Requirements (ARARs) in setting cleanup levels in groundwater? If these State requirements are determined to not be Applicable, are there portions of these requirements that are Relevant and Appropriate?

Issue 2

Depending on the answer to Issue 1, how are Resolution 92-49, the Basin Plan, and Water Code Section 13304, or those portions of these requirements determined to be Applicable or Relevant and Appropriate, interpreted to develop groundwater cleanup levels for VOCs?

The following information is provided the McClellan AFB VOC Fesibility Study (FS):

Table 1. Comparison of Alternatives 2B, 3A, and 3B

| | Alternative 2B | Alternative 3A | Alternative 3B |
|--|--|--|--|
| Cleanup Level for Trichloroethylene (TCE)* | 5 ppb | 2.3 ppb/5 ppb** | 2.3 ppb |
| Number of New Wells | 46 | 60 | 60 |
| Costs | Total: \$152M Capital: \$15.7M Net Present Worth: \$71M Annual O&M*: \$4.5M | Total: \$166M Capital: \$18.4M Net Present Worth: \$76M Annual O&M*: \$4.6M | Total: \$175M Capital: \$18.4M Net Present Worth: \$76M Annual O&M*: \$4.6M |
| Time to Complete | 147 years | 195 years | 249 years |
| Time to Complete | 147 years | 195 years | 249 years |

*TCE is the most prevalent contaminant and in many places defines the outer boundary of the groundwater plumes. However, it is not the only contaminant of concern.

**The groundwater extraction wells would continue to operate until the 2.3 ppb TCE cleanup level is reached. However, at the end of the cleanup, when the last remaining well reaches MCL (5 ppb TCE), the cleanup standard converts from 2.3 ppb to 5 ppb TCE. At that point any operating wells, even if they have not attained the 2.3 ppb level, could be shut down, and the groundwater cleanup would be complete.

***The annual O&M cost is for the first year of implementation. Afterward, the annual costs decrease through time.

1. Which of the Alternatives in the FS substantively comply with State ARARs?
 - A. Given the uncertainties of modeling time to clean up that exceeds 30 years, are the time differentials among the three alternatives under consideration significant?
 - B. Given the uncertainties in the time to clean up, are the total cost (capital cost plus annual O&M) differentials among the three alternatives under consideration significant?
2. Based on the results of the analysis of Issue 2A and B, above, what is the cleanup standard for groundwater? Is the appropriate cleanup level background, Maximum Contaminant Level (MCL) (which is currently 5 ppb for TCE), 2.3 ppb TCE, or some other value?

The VOC FS and Proposed Plan discuss this as a difference between MCLs and Water Quality Objectives (WQOs). The Basin Plan, quoting the Porter-Cologne Water Quality Control Act defines WQOs as "... the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area [Water Code Section 13050(h)]." The State has published numeric WQOs for a variety of individual chemicals, but also considers additive risks using the following relationship:

$$\sum_{i=1}^n [\text{concentration of constituent}] / [\text{toxicologic limit in water}] < 1.0$$

The "toxicologic limits" are the published single contaminant WQOs. The FS defined the WQO plume boundary using this relationship for five contaminants: TCE, trichloroethene (PCE), carbon tetrachloride (CTCL), chloroform, and 1,2 dichloroethane (1,2-DCA).

For TCE, the WQO and the proposed cleanup level in Alternatives 3A and 3B are no longer the same numerical value, even though the Proposed Plan refers to a generic cleanup level of WQOs. At the general time of the FS preparation, the WQO for TCE was 2.3 ppb. The FS evaluated several alternatives using this 2.3 value as a cleanup level. Subsequently, the WQO for TCE was reduced to 0.8 ppb. The State agrees with the Air Force that cleanup to the new TCE WQO level of 0.8 ppb is not technically or economically feasible, based on the evaluation of cleanup to background (0.5 ppb) presented in the FS. Therefore, the cleanup level for TCE under consideration in Alternatives 3A and 3B (2.3 ppb) is no longer a WQO, but is a value based on the technical and economic feasibility criteria evaluated in the FS.

Issue 3

What are the Remedial Action Objectives (RAOs) for groundwater cleanup?

Depending on the resolution of Issue 1, are "reduction of concentrations in groundwater to the greatest possible extent that is technically and economically achievable" and "restoring the aquifer to the beneficial uses in a cost-effective and timely manner" RAOs for groundwater cleanup?

Issue 4

Are specific State requirements, including State Board Resolution 92-49, the Basin Plan, and Water Code Section 13304 ARARs in setting cleanup levels in soil for VOCs? If these State requirements are determined to not be Applicable, are there portions of these requirements that are Relevant and Appropriate?

Issue 5:

How are State Board Resolution 92-49, Basin Plan and Water Code Section 13304, or those portions of these requirements determined to be ARARs, interpreted to develop soil cleanup levels for VOCs?

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**DISPUTE ON MCCLELLAN AIR FORCE BASE VOLATILE ORGANIC
COMPOUND PROPOSED PLAN**

LEVEL 3 CONSENSUS STATEMENT TO RESOLVE ISSUES NO. 4 AND 5

On April 24, 2000, the Department of Toxic Substances Control (DTSC), the lead agency for the State, invoked formal dispute resolution on behalf of the Central Valley Regional Water Quality Control Board (Regional Board), on the Proposed Plan for cleanup of volatile organic contaminants (VOCs) from the groundwater and vadose zone at McClellan AFB. On May 19, 2000, the Dispute Resolution Committee (DRC) postponed the start of the formal dispute resolution period to allow the parties to use the Alternate Dispute Resolution (ADR) process to attempt to resolve the dispute. As part of the ADR process, Level 1 and Level 2 personnel (the Remedial Project Managers and their respective supervisors from each of the agencies) formulated issue statements clarifying the issues of dispute. The Level 2 Joint Issues Statement described 5 issues of the dispute. Issues 1 through 3 were primarily related to groundwater cleanup, while Issues 4 and 5 were related to soil cleanup.

Level 3 unanimously agrees to the following resolution of Issues 4 and 5 of the Level 2 Joint Issue Statement as described below.

ISSUE 4

Issue 4 was described in the Level 2 Joint Issue Statement as:

“Are specific State requirements, including State Board Resolution 92-49, the Basin Plan, and Water Code Section 13304 ARARs in setting cleanup levels in soil for VOCs? If these State requirements are determined to not be Applicable, are there portions of these requirements that are Relevant and Appropriate?”

Level 3 agrees to resolve this issue through the use of “agree to disagree” language on the ARAR status of State requirements in the VOC Record of Decision. Attachment “A” to this consensus statement includes the “agree to disagree” language that will be used in the ROD. Each party agrees to provide sections of the ROD language.

ISSUE 5

Issue 5 was described in the Level 2 Joint Issue Statement as:

“How are State Board Resolution 92-49, Basin Plan and Water Code Section 13304, or those portions of these requirements determined to be ARARs, interpreted to develop soil cleanup levels.”

Level 3 Consensus Statement
Issues 4 and 5 of VOC ROD Dispute

Page 1

3/8/2001

Level 3 agrees to resolve Issue 5 through the use of various agreements resulting from an informal dispute at Castle AFB on the same issue. These agreements include the following concepts that will be incorporated into any proposed plans and/or decision documents issued by the Air Force in connection with the VOC Record of Decision:

- The cleanup process for VOCs in the vadose zone will result in levels that are economically and technically achievable as determined by the McClellan START/STOP processes. No numerical limits will be used, beyond screening levels. This consensus statement does not establish cleanup standards for the vadose zone.
- Use of the McClellan START and STOP processes to determine when to turn-on and when to shut-off SVE systems, respectively. The McClellan RPMs (Level 1) have revised the Castle START and STOP processes to adapt them to the specific geologic, programmatic, and contaminant distribution aspects of McClellan AFB. The McClellan START and STOP processes are included with this consensus statement in Attachment "B".
- No mention of an arbitrarily-defined mixing zone as an end point or a point of compliance in the ROD.
- Use of best available site characterization data to support the START and STOP analyses.
- The McClellan RPMs have drafted START/STOP processes for three different contaminant distribution scenarios that are likely to occur at McClellan. For these scenarios, the Regional Board acknowledges that at sites subject to these SVE START and STOP criteria, some degradation of the groundwater may occur. The process for the application of the criteria is intended to result in reasonable protection of the beneficial uses of waters of the State. The State's portion of Attachment "A" contains an explanation to be documented in the *Final McClellan Basewide VOC ROD* as to why this potential degradation is acceptable.

Attachment "A"
"Agree to Disagree" ROD Language

Air Force Position

It is the position of the Air Force that California State Water Resources Control Board Resolutions 68-18 and 92-49 and Basin Plan policies do not meet the National Contingency Plan (NCP) criteria for potential applicable or relevant and appropriate requirements (ARARs) and thus are not ARARs for establishing groundwater cleanup standards for McClellan AFB. The State has not demonstrated that these resolutions and policies, as defined by the State in the context of this cleanup, meet the NCP criteria of enforceability and general applicability. In the alternative, if some or all of the resolutions and policies were redefined by the State to meet the NCP criteria of enforceability and general applicability, they would be satisfied by the selection by the Air Force of maximum contaminant levels (MCLs) as groundwater cleanup standards. The position of the Air Force regarding the State's failure to demonstrate that the resolutions and policies are enforceable and of generally applicable is described in more detail in dispute documents provided by the Air Force.

State Position

The State has identified State Water Resources Control Board Resolutions 68-16 and 92-49 and the "Policy for Investigation and Cleanup of Contaminated Sites" contained in the Central Valley Regional Water Quality Control Board's Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as proposed Applicable or Relevant and Appropriate Requirements (ARARs) for determining cleanup levels for VOCs in the vadose zone at McClellan AFB. The USAF and State disagree about whether those state requirements are ARARs for this cleanup.

With respect to Resolution 68-16, the State asserts that discharges subject to the Resolution include the continuing migration of in-situ contamination from the vadose zone to groundwater. Under Resolution 68-16 some degradation may be allowed so long as the cleanup action applies best practicable treatment or control to prevent further migration of waste to waters of the state at levels that exceed the water quality objectives or impact beneficial uses. With respect to Resolution 92-49, the State asserts that the Resolution is an applicable requirement for remedial actions of the vadose zone where the waste either discharges to or threatens to discharge to waters of the State. In such a case, Resolution 92-49 requires remediation of the vadose zone to the lowest concentration levels of constituents technically and economically feasible, which must at least protect the beneficial uses of groundwater and surface water, but need not be more stringent than is necessary to achieve background levels of the constituents in surface

water and groundwater. With respect to the Basin Plan, the Regional Water Board asserts that the Cleanup Policy applies to determining the appropriate cleanup level in the vadose zone that will comply with Resolution 68-16 and Resolution 92-49 and will meet the water quality objectives in the Basin Plan and protect the beneficial uses. The position of the State with respect to those requirements is described in greater detail in the dispute documents provided by the State.

The State agrees that application of the McClellan AFB START/STOP criteria, as proposed, will provide substantive compliance with Resolution 68-16, Resolution 92-49, and the Basin Plan and, therefore, will not object if the Air Force does not identify those requirements as ARARs in the ROD. The response actions are in the best interests of the people of the State. The criteria are intended to result in cleanup to the lowest level that is economically and technically feasible and that will protect the beneficial uses of the waters of the state.

Attachment "B"
McClellan START and STOP Papers

Included in this attachment are the START and STOP papers that detail how to conduct the START and STOP analyses for three different contaminant distribution scenarios reasonably expected to occur at McClellan Air Force Base. These three contaminant distribution scenarios are:

1. VOC contamination in the vadose zone over water contaminated by the same contaminant(s) of concern.
2. VOC contamination in the vadose zone over clean groundwater.
3. VOC contamination in the vadose zone over groundwater contaminated by different VOC's.

A separate START and STOP paper has been prepared, and agreed to, by the McClellan RPMs for each of these scenarios.

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McClellan AFB

SVE TURN-ON (START) CRITERIA Criteria for Case #1

VOC Contamination in the Vadose Zone Over Groundwater Contaminated with the Same VOC COCs

Introduction

There are a number of factors that can influence the decision to install and operate soil vapor extraction (SVE) at a site where contaminant levels exceed human health or water quality screening threshold criteria. The McClellan AFB SVE start/stop criteria focuses on the analysis of soil vapor extraction (SVE) systems for the remediation of volatile organic compound (VOC) contamination in the vadose zone as it relates to groundwater cleanup and protection. For the protection of groundwater quality the issue becomes: is it technically and economically feasible to install and operate an SVE system to remediate the site?

In addition to the impact on groundwater, under CERCLA there are a number of factors that must be evaluated to arrive at the decision to install and operate an SVE system. These factors are brought out when the feasibility study and the conceptual site model are developed for the site. To ensure that all the factors are considered in the decision to initiate, continue or stop an SVE system, the conceptual site model should be included as an integral tool to be used in the decision-making process.

A typical potential route of exposure, that is present when the vadose zone is contaminated with VOCs, is direct inhalation and contact by humans and biota at or near the ground surface. A site-specific analysis should be conducted to determine whether SVE system operation or other remedial action should be taken or continued to protect receptors from this type of exposure.

Any VOCs remaining in the vadose zone after a decision is made to stop or not start an SVE system must be managed to the degree necessary in relation to its significance. Where the cleanup does not meet unrestricted reuse cleanup standards, management measures, such as institutional controls should be evaluated and implemented if necessary.

In addition to the methods and criteria for analysis presented in these Start/Stop procedures, a separate analysis that addresses other routes of exposure identified in the conceptual site model needs to be conducted and considered in making the decision to begin or continue SVE.

For protection of groundwater quality at McClellan, there are three cases to be considered:

Case #1 - Volatile Organic Compounds (VOC) contamination in the vadose zone over groundwater contaminated with the same VOC contaminant(s) of concern (COCs).

Case #2 - VOC contamination in the vadose zone over clean groundwater.

Revised 4 December 2000
McClellCase1START-rev11rh.doc
Page 1

Case #3 -- Some or all VOC contamination in the vadose zone over groundwater contaminated with different COCs.

The SVE turn-on criteria presented below are for Case #1 to determine if SVE should be implemented. For SVE turn-on criteria for the other cases, see documents:

SVE TURN-ON (START) CRITERIA – Criteria for Case #2; and
SVE TURN-ON (START) CRITERIA – Criteria for Case #3

The *McClellan Basewide Feasibility Study Report* (December 1999, FS) identified SVE as the preferred remedial technology for these sites. However the FS used a conservative screening analysis for the remedy selection that did not fully evaluate the practicality of SVE implementation on a site-by-site basis. The criteria below were developed to determine the technical and economical feasibility of SVE for Case #1. The criteria below will be used to determine whether SVE should be implemented for Case #1 at a particular site. This evaluation will be called a "START" and will be a primary document under the Federal Facilities Agreement (FFA).

This analysis applies to sites at McClellan AFB that meet the conditions for Case #1 that are addressed in the *Final McClellan Basewide VOC Record of Decision* (VOC ROD).

The START should be conducted after all the parties agree that:

- The site has been adequately characterized;
- The risk assessment indicates that site contaminants pose a potential threat to either human health and/or the environment, including water quality.
- The FS indicated that SVE is the remedy most suited to remediate the site.

The decision to install and operate an SVE system will depend upon the analysis of the three criteria listed below. It is always technically possible to remove mass, but installing and operating an SVE system requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the contaminant mass in the vadose zone is predicted to not reach the groundwater, 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 selected in the VOC ROD, the aquifer will not be unacceptably degraded further, and remediation will not be warranted. Even if the leachate concentration is above the aquifer cleanup levels selected in the VOC ROD, remediation may or may not be warranted. 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.

Decision Criteria

The decision to install and operate 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 START, and that consensus is necessary to determine the levels of uncertainty that are acceptable in each of the elements.

Revised 4 December 2000
McClellCase1START-rev11rb.doc
Page 2

- I. Will the contaminant mass in the vadose zone reach the groundwater, based on either a screening level or site-specific evaluation?

To answer this question, START 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 II.

- II. Will the contaminant mass in the vadose zone cause the contaminant concentrations in the leachate to exceed the aquifer cleanup level?

To answer this question, START elements "A" through "II" 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 START.

- III. Based on an evaluation of all of the elements, is it appropriate to install and operate an SVE system at the site?

To answer this question, all START elements must be addressed.

- If the answer is "yes", then proceed with SVE system installation and operation.
- If the answer is "no" proceed with site closure negotiations.

Elements of the START

The following elements should be applied to evaluate the criteria listed above.

- A. Are there any time- or land use-critical re-use issues with the site, and if so, what are they? These types of issues may preclude the need for further analysis, if SVE is required to address these concerns.
- B. What is the estimated contaminant mass and areal and vertical extent of the vadose zone contaminant plume? Include contaminant isoconcentration maps and plume cross-sections to illustrate the contaminant concentrations and distribution in the subsurface.
- C. Do the data indicate contaminant 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) soil gas profiles from nested wells to estimate the contaminant's propensity for migration; and 3) time-series profiles of soil gas concentrations in nested wells.
- D. What is the lithology of areas that demonstrate significant soil gas concentrations of contaminants? Use site-specific information, and include as much information as possible, such as porosity, moisture content and carbon content of soil, etc.

- E. What are the actual site-specific infiltration and percolation rates? If site-specific data are not available, what are the predicted rates?
- F. 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.)
- G. 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 contaminant's subsurface migration (such as unusual presence or absence of low permeability layers, high carbon content of soil, etc.).
- H. What is the actual or predicted concentration and mass flux rate of leachate leaving the vadose zone? What is the predicted concentration trend of leachate over time based on modeling?
- I. Qualitatively, what is the estimated SVE effectiveness of a system, based on known information and experience from similar sites?
- J. How much money, if any, has been spent to date on the site's remediation?
- K. What is the estimated cost to install an SVE system?
- L. What are the locations and capture zones of operating groundwater extraction wells relative to the vadose zone contaminant plume? Will the existing groundwater wells effectively (i.e., technically and economically) capture the contaminants from the site? If not, what are the additional costs to add groundwater extraction wells?
- M. What is the cost of vadose zone remediation compared to the incremental cost for additional groundwater remediation due to impacts from the site 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 element "M" the following costs need to be calculated:

- The cost (GW_1) to reach the aquifer cleanup level *with* the additional impact from the site (assume SVE will not be implemented);
- The cost (GW_2) to reach the aquifer cleanup level *with* the additional impact from the site after a period of SVE operation; and
- The cost (SVE_1) of SVE installation and operation.

These costs can be calculated following the steps outlined below:

1. Using the measured soil gas concentrations at the site, calculate the mass of the contaminant in the vadose zone (same as element "B").
2. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
3. Estimate the time to reach the groundwater aquifer cleanup level using the modeling results obtained in step 2 above.
4. Estimate the monthly cost to continue operation of the groundwater extraction system in the area impacted by the site.
5. Calculate the cost to reach the aquifer cleanup level *with* the additional impact from the site (GW_1), because SVE will not be installed and operated. ($GW_1 = (\text{step 3} \times \text{step 4}) + \text{element L}$).
6. Estimate the monthly cost to operate the SVE system based on historical costs from similar sites (including all costs relating to operation and shutdown).
7. Estimate the cost to install an SVE system and operate for an estimated length of time that is based on site-specific conditions, such as 24 months. ($SVE_1 = \text{length of time} \times \text{step 6} + \text{cost to install SVE}$, i.e., element K)
8. Estimate what the predicted residual soil gas concentrations would be if the SVE system were operated for the estimated length of time.
9. Estimate the impact to groundwater from the site based on the results of step 8. This estimation can be conducted similarly to step 2 above.
10. Estimate the predicted time required for groundwater extraction system to reach aquifer cleanup level *with* the additional impact from the site assuming operation of the SVE system for the period of time estimated in step 7.
11. Calculate the cost to reach the aquifer cleanup level (GW_2) *with* the additional impact from the site assuming operation of the SVE system for the estimated period of time. This cost is calculated by multiplying the results of step 10 by the results of step 4. ($GW_2 = \text{step 10} \times \text{step 4}$)
12. Compare the costs to reach the aquifer cleanup level *with* the additional impact from the site to the costs of installing and operating an SVE system plus the cost to reach the aquifer cleanup level *with* the additional impact from the site after operation of the SVE system for an estimated period of time. Mathematically this can be expressed as:

$$\text{Is } GW_1 > SVE_1 + GW_2 ?$$

If GW_1 is greater than $(SVE_1 + GW_2)$, installation and operation of an SVE system should be strongly considered.

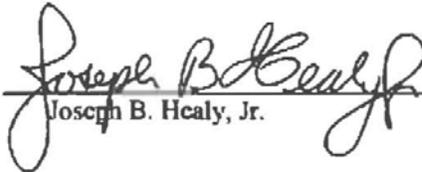
Implementation

The Air Force, the USEPA, and the State (DTSC and the RWQCB) will jointly decide, based on the START evaluation, whether the SVE system should or should not be installed at the site. The START 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 is not necessary, without having to perform a complete START (criterion III).

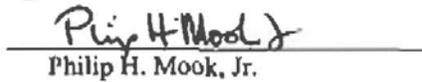
There are several potential outcomes of the START evaluation. Ideally, the START would indicate unequivocally that either the SVE system would not be necessary, and all parties agree that the site could be closed, or that SVE is warranted at the site and should be installed and operated. Another potential outcome is that the START would indicate that the SVE system is not economically or technically justified, 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.

Due to the reliance of the START on professional judgment, another outcome of the START is that the parties may not agree on whether the SVE system should be installed or not. If the parties cannot reach a joint resolution, any party may invoke dispute resolution.

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SVE TURN-OFF (STOP) CRITERIA Criteria for Case #1

VOC Contamination in the Vadose Zone Over Groundwater Contaminated with the Same VOC COCs

Introduction

There are a number of factors that can influence the decision to continue to operate soil vapor extraction (SVE) at a site where contaminant levels exceed human health or water quality screening threshold criteria. The McClellan AFB SVE start/stop criteria focuses on the analysis of soil vapor extraction (SVE) systems for the remediation of volatile organic compound (VOC) contamination in the vadose zone as it relates to groundwater cleanup and protection. For the protection of groundwater quality the issue becomes: is it technically and economically feasible to continue to operate an SVE system to remediate the site?

In addition to the impact on groundwater, under CERCLA there are a number of factors that must be evaluated to arrive at the decision to install and operate an SVE system. These factors are brought out when the feasibility study and the conceptual site model are developed for the site. To ensure that all the factors are considered in the decision to initiate, continue or stop an SVE system, the conceptual site model should be included as an integral tool to be used in the decision-making process.

A typical potential route of exposure, that is present when the vadose zone is contaminated with VOCs, is direct inhalation and contact by humans and biota at or near the ground surface. A site-specific analysis should be conducted to determine whether SVE system operation or other remedial action should be taken or continued to protect receptors from this type of exposure.

Any VOCs remaining in the vadose zone after a decision is made to stop or not start an SVE system must be managed to the degree necessary in relation to its significance. Where the cleanup does not meet unrestricted reuse cleanup standards, management measures, such as institutional controls should be evaluated and implemented if necessary.

In addition to the methods and criteria for analysis presented in these Start/Stop procedures, a separate analysis that addresses other routes of exposure identified in the conceptual site model needs to be conducted and considered in making the decision to begin or continue SVE.

For protection of groundwater quality at McClellan, there are three cases to be considered:

- Case #1 - Volatile Organic Compounds (VOC) contamination in the vadose zone over groundwater contaminated with the same VOC contaminant(s) of concern (COCs)
- Case #2 - VOC contamination in the vadose zone over clean groundwater

Revised 4 December 2000
McClellCase1STOP-rev11rb.doc
Page 1

Case #3 - Some or all VOC contamination in the vadose zone over groundwater contaminated with different COCs.

The SVE turn-off criteria presented below are for Case #1 to determine if SVE should be continued or terminated. For SVE turn-off criteria for the other cases, see documents:

SVE TURN-OFF (STOP) CRITERIA – Criteria for Case #2; and
SVE TURN-OFF (STOP) CRITERIA – Criteria for Case #3

This analysis applies to sites at McClellan AFB that meet the conditions for Case #1 that are addressed in the *Final McClellan Basewide VOC Record of Decision (VOC ROD)*. 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 continue operations requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the remaining contaminant mass in the vadose zone is predicted to 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 selected in the VOC ROD, 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.

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.

Revised 4 December 2001
McClellan Case STOP-rev11rb.doc
Page 2

- 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 an 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 contaminant's 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? What is the concentration trend of leachate over time based on field data and modeling?
- 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 groundwater wells effectively (i.e., technically and economically) 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 continued vadose zone remediation compared to the incremental cost over time for additional 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 element "M" the following costs need to be calculated:

- The cost (GW_1) to reach the aquifer cleanup level *with* the additional impact from the site (assume SVE will not be continued);
- The cost (GW_2) to reach the aquifer cleanup level *with* the additional impact from the site after an additional period of SVE operation; and
- The cost (SVE_1) of the additional SVE operation.

These costs can be calculated following the steps outlined below:

1. 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").
2. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
3. Estimate the time to reach the groundwater aquifer cleanup level using the modeling results obtained in step 2 above.
4. Estimate the monthly cost to continue operation of the groundwater extraction system in the area impacted by the site.

5. Calculate the cost to reach aquifer cleanup level *with* the additional impact from the site (GW_1), because SVE will not continue to be operated. ($GW_1 =$ (step 3 x step 4) plus element L)
6. Estimate the monthly cost of continuing to operate the SVE system based on historical costs (including operation and shutdown periods for the site).
7. Estimate the cost to operate the SVE system for an agreed-upon additional 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 6. ($SVE_1 =$ length of time x step 6).
8. Estimate what the predicted residual soil gas concentrations would be if the SVE system were operated for the additional agreed-upon length of time.
9. Estimate the impact to groundwater from the site based on the results of step 8. This estimation can be conducted similarly to step 2 above.
10. Estimate the predicted time required for groundwater extraction system to reach aquifer cleanup level *with* the additional impact from the site assuming operation of the SVE system for the additional period of time agreed upon in step 7.
11. Calculate the cost to reach the aquifer cleanup level (GW_2) *with* the additional impact from the site assuming operation of the SVE system for an additional period of time. This cost is calculated by multiplying the results of step 10 by the results of step 4. ($GW_2 =$ step 10 x step 4).
12. Compare the costs to reach the aquifer cleanup level *with* the additional impact from the site to the costs of continuing to operate a SVE system plus the cost to reach the aquifer cleanup level *with* the additional impact from the site after operation of the SVE system for an additional period of time. Mathematically this can be expressed as:

$$\text{Is } GW_1 > SVE_1 + GW_2 ?$$

If GW_1 is greater than ($SVE_1 + GW_2$), additional operation of the SVE system should be strongly considered.

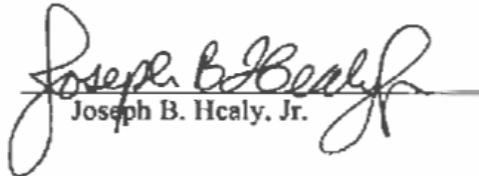
Implementation

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).

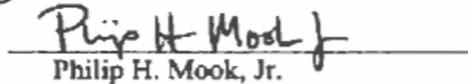
There are several potential outcomes of the STOP evaluation. Ideally, the STOP would indicate that the SVE system could be permanently turned off, and all parties agree that the site could be closed. Another potential outcome is that the STOP would indicate that the SVE system could be permanently shut 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.

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SVE TURN-ON (START) CRITERIA Criteria for Case #2

VOC Contamination in the Vadose Zone Over Clean Groundwater

Introduction

There are a number of factors that can influence the decision to install and operate soil vapor extraction (SVE) at a site where contaminant levels exceed human health or water quality screening threshold criteria. The McClellan AFB SVE start/stop criteria focuses on the analysis of soil vapor extraction (SVE) systems for the remediation of volatile organic compound (VOC) contamination in the vadose zone as it relates to groundwater cleanup and protection. For the protection of groundwater quality the issue becomes: is it technically and economically feasible to install and operate an SVE system to remediate the site?

In addition to the impact on groundwater, under CERCLA there are a number of factors that must be evaluated to arrive at the decision to install and operate an SVE system. These factors are brought out when the feasibility study and the conceptual site model are developed for the site. To ensure that all the factors are considered in the decision to initiate, continue or stop an SVE system, the conceptual site model should be included as an integral tool to be used in the decision-making process.

A typical potential route of exposure, that is present when the vadose zone is contaminated with VOCs, is direct inhalation and contact by humans and biota at or near the ground surface. A site-specific analysis should be conducted to determine whether SVE system operation or other remedial action should be taken or continued to protect receptors from this type of exposure.

Any VOCs remaining in the vadose zone after a decision is made to stop or not start an SVE system must be managed to the degree necessary in relation to its significance. Where the cleanup does not meet unrestricted reuse cleanup standards, management measures, such as institutional controls should be evaluated and implemented if necessary.

In addition to the methods and criteria for analysis presented in these Start/Stop procedures, a separate analysis that addresses other routes of exposure identified in the conceptual site model needs to be conducted and considered in making the decision to begin or continue SVE.

For protection of groundwater quality at McClellan, there are three cases to be considered:

Case #1 - Volatile Organic Compounds (VOC) contamination in the vadose zone over groundwater contaminated with the same VOC contaminant(s) of concern (COCs).

Case #2 - VOC contamination in the vadose zone over clean groundwater.

Case #3 - Some or all VOC contamination in the vadose zone over groundwater contaminated with different COCs.

Revised 4 December 2000
McClellanCase2START-rev11rb.doc
Page 1

- The SVE turn-on criteria presented below are for Case #2 to determine if SVE should be implemented. For SVE turn-on criteria for the other cases, see documents:

SVE TURN-ON (START) CRITERIA – Criteria for Case #1; and
SVE TURN-ON (START) CRITERIA – Criteria for Case #3

The *McClellan Basewide Feasibility Study Report* (December 1999, FS) identified SVE as the preferred remedial technology for these sites. However the FS used a conservative screening analysis for the remedy selection that did not fully evaluate the practicality of SVE implementation on a site-by-site basis. The criteria below were developed to determine the technical and economical feasibility of SVE for Case #2. The criteria below will be used to determine whether SVE should be implemented for Case #2 at a particular site. This evaluation will be called a "START" and will be a primary document under the Federal Facilities Agreement (FFA).

This analysis applies to sites at McClellan AFB that meet the conditions for Case #2 that are addressed in the *Final McClellan Basewide VOC Record of Decision* (VOC ROD).

The START should be conducted after all the parties agree that:

- The site has been adequately characterized;
- The risk assessment indicates that site contaminants pose a potential threat to either human health and/or the environment, including water quality.
- The FS indicated that SVE is the remedy most suited to remediate the site.

The decision to install and operate an SVE system will depend upon the analysis of the three criteria listed below. It is always technically possible to remove mass, but installing and operating an SVE system requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the contaminant mass in the vadose zone is predicted to not reach the groundwater, remediation will not be warranted.

If the contaminant concentration in the leachate entering the aquifer from the vadose zone is greater than non-detectable concentrations (i.e., is detectable based on laboratory practical quantitation limits), but below the aquifer cleanup level selected in the VOC ROD, the aquifer may be unacceptably degraded, and remediation may be warranted. If the leachate concentration is above the aquifer cleanup levels selected in the VOC ROD, remediation may be warranted. 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.

The Regional Board acknowledges that at sites subject to these SVE turn-on (START) criteria, some degradation of the groundwater may occur. The process for the application of the criteria is intended to result in reasonable protection of the beneficial uses of waters of the State as further described in the *Final McClellan Basewide VOC ROD*.

- Case #2 addresses VOC contamination in the vadose zone over clean groundwater and assumes that groundwater treatment has not been implemented at the site. To complete the START process the Air

Revised 4 December 2000
McClellanCase2START1-rev11rb.doc
Page 2

Force and regulatory agencies must evaluate the cost to construct and operate a groundwater treatment system. The groundwater treatment system would capture groundwater contaminated above the aquifer clean-up level selected in the VOC ROD caused by the vadose zone contamination.

Decision Criteria

The decision to install and operate 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 START, and that consensus is necessary to determine the levels of uncertainty that are acceptable in each of the elements.

- I. Will the contaminant mass in the vadose zone reach the groundwater, based on either a screening level or site-specific evaluation?

To answer this question, START 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 II.

- II. Will the contaminant mass in the vadose zone cause the contaminant concentrations in the leachate to exceed *non-detectable concentrations* (i.e., is detectable based on laboratory practical quantitation limits)?

To answer this question, START elements "A" through "H" 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 START.

- III. Based on an evaluation of all of the elements, is it appropriate to install and operate an SVE system at the site?

To answer this question, all START elements must be addressed.

- If the answer is "yes", then proceed with SVE system installation and operation.
- If the answer is "no" proceed with site closure negotiations.

Elements of the START

The following elements should be applied to evaluate the criteria listed above.

- A. Are there any time- or land use-critical re-use issues with the site, and if so, what are they? These types of issues may preclude the need for further analysis, if SVE is required to address these concerns.
- B. What is the estimated contaminant mass and areal and vertical extent of the vadose zone contaminant plume? Include contaminant isoconcentration maps and plume cross-sections to illustrate the contaminant concentrations and distribution in the subsurface.

- C. Do the data indicate contaminant 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) soil gas profiles from nested wells to estimate the contaminant's propensity for migration; and 3) time-series profiles of soil gas concentrations in nested wells.
- D. What is the lithology of areas that demonstrate significant soil gas concentrations of contaminants? Use site-specific information, and include as much information as possible, such as porosity, moisture content and carbon content of soil, etc.
- E. What are the actual site-specific infiltration and percolation rates? If site-specific data are not available, what are the predicted rates?
- F. 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.)
- G. 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 contaminant's subsurface migration (such as unusual presence or absence of low permeability layers, high carbon content of soil, etc.).
- H. What is the actual or predicted concentration and mass flux rate of leachate leaving the vadose zone? What is the predicted concentration trend of leachate over time based on modeling?
- I. Qualitatively, what is the estimated SVE effectiveness of a system, based on known information and experience from similar sites?
- J. How much money, if any, has been spent to date on the site's remediation?
- K. What is the estimated cost to install an SVE system?
- L. What are the locations and capture zones of operating groundwater extraction wells relative to the vadose zone contaminant plume? Will the existing groundwater wells effectively (i.e., technically and economically) capture the contaminants from the site? If not, what are the additional costs to add groundwater extraction wells and a treatment system, if necessary?
- M. What is the cost of vadose zone remediation compared to the cost for groundwater remediation due to impacts from the site.

To implement element "M" the following costs need to be calculated:

- The cost (GW_1) to reach the aquifer cleanup level *with* the additional impact from the site; (assume SVE will not be implemented).
- The cost (SVE_1) of SVE installation and operation.

These costs can be calculated following the steps outlined below:

1. Using the measured soil gas concentrations at the site, calculate the mass of the contaminant in the vadose zone (same as element "B").
2. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
3. Estimate the time to reach the groundwater aquifer cleanup level using the modeling results obtained in step 2 above.
4. Estimate the monthly cost to operate a groundwater extraction system in the area impacted by the site?
5. Calculate the cost to reach the aquifer cleanup level *with* the additional impact from the site (GW_1), because SVE will not be installed and operated. ($GW_1 = (\text{step 3} \times \text{step 4}) \text{ plus element L}$).
6. Estimate the monthly cost to operate the SVE system based on historical costs from similar sites (including all costs relating to operation and shutdown).
7. Estimate the cost to install an SVE system and operate for an estimated length of time that is based on site-specific conditions, to achieve site cleanup. ($SVE_1 = \text{length of time} \times \text{step 6 plus cost to install SVE, i.e., element K}$)
8. Compare the costs of groundwater extraction *without* SVE at the site to the costs of SVE at the site. Mathematically, this can be expressed as:

$$\text{Is } (GW_1) > (SVE_1) ?$$

If (GW_1) is greater than (SVE_1), installation and operation of an SVE system should be strongly considered.

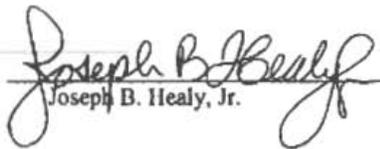
Implementation

The Air Force, the USEPA, and the State (DTSC and the RWQCB) will jointly decide, based on the START evaluation, whether the SVE system should or should not be installed at the site. The START 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 is not necessary, without having to perform a complete START (criterion III).

There are several potential outcomes of the START evaluation. Ideally, the START would indicate unequivocally that either the SVE system would not be necessary, and all parties agree that the site could be closed, or that SVE is warranted at the site and should be installed and operated. Another potential outcome is that the START would indicate that the SVE system is not economically or technically justified, 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.

Due to the reliance of the START on professional judgment, another outcome of the START is that the parties may not agree on whether the SVE system should be installed or not. If the parties cannot reach a joint resolution, any party may invoke dispute resolution.

US EPA: RPM


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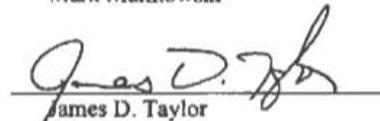
AFBCA: RPM


Philip H. Mook, Jr.

CA DTSC: RPM


Mark Malinowski

CVRWQCB: RPM


James D. Taylor

Revised 4 December 2000
McClellCase2START-rev11rb.doc
Page 6

McClellan AFB

SVE TURN-OFF (STOP) CRITERIA Criteria for Case #2

VOC Contamination in the Vadose Zone Over Clean Groundwater

Introduction

There are a number of factors that can influence the decision to continue to operate soil vapor extraction (SVE) at a site where contaminant levels exceed human health or water quality screening threshold criteria. The McClellan AFB SVE start/stop criteria focuses on the analysis of soil vapor extraction (SVE) systems for the remediation of volatile organic compound (VOC) contamination in the vadose zone as it relates to groundwater cleanup and protection. For the protection of groundwater quality the issue becomes: is it technically and economically feasible to continue to operate an SVE system to remediate the site?

In addition to the impact on groundwater, under CERCLA there are a number of factors that must be evaluated to arrive at the decision to install and operate an SVE system. These factors are brought out when the feasibility study and the conceptual site model are developed for the site. To ensure that all the factors are considered in the decision to initiate, continue or stop an SVE system, the conceptual site model should be included as an integral tool to be used in the decision-making process.

A typical potential route of exposure, that is present when the vadose zone is contaminated with VOCs, is direct inhalation and contact by humans and biota at or near the ground surface. A site-specific analysis should be conducted to determine whether SVE system operation or other remedial action should be taken or continued to protect receptors from this type of exposure.

Any VOCs remaining in the vadose zone after a decision is made to stop or not start an SVE system must be managed to the degree necessary in relation to its significance. Where the cleanup does not meet unrestricted reuse cleanup standards, management measures, such as institutional controls should be evaluated and implemented if necessary.

In addition to the methods and criteria for analysis presented in these Start/Stop procedures, a separate analysis that addresses other routes of exposure identified in the conceptual site model needs to be conducted and considered in making the decision to begin or continue SVE.

For protection of groundwater quality at McClellan, there are three cases to be considered:

- Case #1 - Volatile Organic Compounds (VOC) contamination in the vadose zone over groundwater contaminated with the same VOC contaminant(s) of concern (COCs)
- Case #2 - VOC contamination in the vadose zone over clean groundwater
- Case #3 - Some or all VOC contamination in the vadose zone over groundwater contaminated with different COCs.

Revised 4 December 2000
McClellCase2SVE-OP-rev11rb.doc
Page 1

The SVE turn-off criteria presented below are for Case #2 to determine if SVE should be continued or terminated. For SVE turn-off criteria for the other cases, see documents:

SVE TURN-OFF (STOP) CRITERIA – Criteria for Case #1; and
SVE TURN-OFF (STOP) CRITERIA – Criteria for Case #3

This analysis applies to sites at McClellan AFB that meet the conditions for Case #2 that are addressed in the *Final McClellan Basewide VOC Record of Decision (VOC ROD)*. 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 continue operations requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the remaining contaminant mass in the vadose zone is predicted to 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 greater than non-detectable concentrations (i.e., is detectable based on laboratory practical quantitation limits), but below the aquifer cleanup level selected in the VOC ROD, the aquifer may be unacceptably degraded, and continued remediation may be warranted. If the leachate concentration is above the aquifer cleanup levels selected in the VOC ROD, continued remediation may be warranted. 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.

The Regional Board acknowledges that at sites subject to these SVE turn-off (STOP) criteria, some degradation of the groundwater may occur. The process for the application of the criteria is intended to result in reasonable protection of the beneficial uses of waters of the State as further described in the *Final McClellan Basewide VOC ROD*.

Case #2 addresses VOC contamination in the vadose zone over clean groundwater and assumes that groundwater treatment has not been implemented at the site. To complete the STOP process the Air Force and regulatory agencies must evaluate the cost to construct and operate a groundwater treatment system. The groundwater treatment system would capture groundwater contaminated above the aquifer clean-up level selected in the VOC ROD caused by the vadose zone contamination.

Revised 4 December 2000
McClellanCase2STOP-rev11rb.doc
Page 2

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 *non-detectable concentrations* (i.e., is detectable based on laboratory practical quantitation limits)?

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 an 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 contaminant's 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? What is the concentration trend of leachate over time based on field data and modeling?
- 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 groundwater wells effectively (i.e., technically and economically) capture the contaminants from the site? If not, what are the additional costs to add groundwater extraction wells and a treatment system, if necessary?
- M. What is the cost of vadose zone remediation compared to the cost for groundwater remediation due to impacts from the site.

To implement element "M" the following costs need to be calculated:

- The cost (GW₁) to reach the aquifer cleanup level *with* the additional impact from the site; (assume SVE will not be continued).
- The cost (SVE₁) of the additional SVE operation.

These costs can be calculated following the steps outlined below:

1. 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").
2. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
3. Estimate the time to reach the groundwater aquifer cleanup level using the modeling results obtained in step 2 above.
4. Estimate the monthly cost to operate a groundwater extraction system in the area impacted by the site?
5. Calculate the cost to reach aquifer cleanup level *with* the additional impact from the site (GW_1), because SVE will not continue to be operated. ($GW_1 = (\text{step 3} \times \text{step 4}) \text{ plus element L}$)
6. Estimate the monthly cost of continuing to operate the SVE system based on historical costs (including all costs relating to operation and shutdown).
7. Estimate the cost to operate the SVE system for an agreed-upon additional length of time to achieve site cleanup that is based on site-specific conditions. ($SVE_1 = \text{length of time} \times \text{step 6}$)
8. Compare the costs of groundwater extraction *without* additional SVE at the site to the costs of continuing SVE at the site. Mathematically, this can be expressed as:

$$\text{Is } (GW_1) > (SVE_1) ?$$

If (GW_1) is greater than (SVE_1), additional operation of the SVE system should be strongly considered.

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).

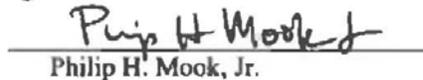
There are several potential outcomes of the STOP evaluation. Ideally, the STOP would indicate that the SVE system could be permanently turned off, and all parties agree that the site could be closed. Another potential outcome is that the STOP would indicate that the SVE system could be permanently shut 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


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SVE TURN-ON (START) CRITERIA Criteria for Case #3

Some or All VOC Contamination in the Vadose Zone Over Groundwater Contaminated with Different COCs

Introduction

There are a number of factors that can influence the decision to install and operate soil vapor extraction (SVE) at a site where contaminant levels exceed human health or water quality screening threshold criteria. The McClellan AFB SVE start/stop criteria focuses on the analysis of soil vapor extraction (SVE) systems for the remediation of volatile organic compound (VOC) contamination in the vadose zone as it relates to groundwater cleanup and protection. For the protection of groundwater quality the issue becomes: is it technically and economically feasible to install and operate an SVE system to remediate the site?

In addition to the impact on groundwater, under CERCLA there are a number of factors that must be evaluated to arrive at the decision to install and operate an SVE system. These factors are brought out when the feasibility study and the conceptual site model are developed for the site. To ensure that all the factors are considered in the decision to initiate, continue or stop an SVE system, the conceptual site model should be included as an integral tool to be used in the decision-making process.

A typical potential route of exposure, that is present when the vadose zone is contaminated with VOCs, is direct inhalation and contact by humans and biota at or near the ground surface. A site-specific analysis should be conducted to determine whether SVE system operation or other remedial action should be taken or continued to protect receptors from this type of exposure.

Any VOCs remaining in the vadose zone after a decision is made to stop or not start an SVE system must be managed to the degree necessary in relation to its significance. Where the cleanup does not meet unrestricted reuse cleanup standards, management measures, such as institutional controls should be evaluated and implemented if necessary.

In addition to the methods and criteria for analysis presented in these Start/Stop procedures, a separate analysis that addresses other routes of exposure identified in the conceptual site model needs to be conducted and considered in making the decision to begin or continue SVE.

For protection of groundwater quality at McClellan, there are three cases to be considered:

Case #1 - Volatile Organic Compounds (VOC) contamination in the vadose zone over groundwater contaminated with the same VOC contaminant(s) of concern (COCs)

Revised 4 December 2000
McClellanCase3START-rev11rb.doc
Page 1

- Case #2 - VOC contamination in the vadose zone over clean groundwater
- Case #3 - Some or all VOC contamination in the vadose zone over groundwater contaminated with different COCs.

The SVE turn-on criteria presented below are for Case #3 to determine if SVE should be implemented. For SVE turn-on criteria for the other cases, see documents:

SVE TURN-ON (START) CRITERIA - Criteria for Case #1; and
SVE TURN-ON (START) CRITERIA - Criteria for Case #2

The *McClellan Basewide Feasibility Study Report* (December 1999, FS) identified SVE as the preferred remedial technology for these sites. However the FS used a conservative screening analysis for the remedy selection that did not fully evaluate the practicality of SVE implementation on a site-by-site basis. The criteria below were developed to determine the technical and economical feasibility of SVE for Case #3. The criteria below will be used to determine whether SVE should be implemented for Case #3 at a particular site. This evaluation will be called a "START" and will be a primary document under the Federal Facilities Agreement (FFA).

This analysis applies to sites at McClellan AFB that meet the conditions for Case #3 that are addressed in the *Final McClellan Basewide VOC Record of Decision* (VOC ROD).

The START should be conducted after all the parties agree that:

- The site has been adequately characterized;
- The risk assessment indicates that site contaminants pose a potential threat to either human health and/or the environment, including water quality.
- The FS indicated that SVE is the remedy most suited to remediate the site.

The decision to install and operate an SVE system will depend upon the analysis of the three criteria listed below. It is always technically possible to remove mass, but installing and operating an SVE system requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the contaminant mass in the vadose zone is predicted to not reach the groundwater, remediation will not be warranted.

If the contaminant concentration in the leachate entering the aquifer from the vadose zone is greater than non-detectable concentrations (i.e., is detectable based on laboratory practical quantitation limits) for the COCs not already in the groundwater, but below the aquifer cleanup level selected in the VOC ROD, the aquifer may be unacceptably degraded, and remediation may be warranted. If the leachate concentration is above the aquifer cleanup levels selected in the VOC ROD, remediation may be warranted. 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.

The Regional Board acknowledges that at sites subject to these SVE turn-on (START) criteria, some degradation of the groundwater may occur. The process for the application of the criteria is intended to

result in reasonable protection of the beneficial uses of waters of the State as further described in the *Final McClellan Basewide VOC ROD*.

Case #3 addresses VOC contamination in the vadose zone over groundwater contaminated with different COCs. Case #3 is similar to Case #1. The difference is that in Case #3, further evaluation is required if the contaminant concentration in the leachate entering the aquifer from the vadose zone is greater than *non-detectable concentrations* (i.e., is detectable based on laboratory practical quantitation limits) for the COCs not already in the groundwater. In Case #1 no further evaluation is required if the contaminant concentration in the leachate entering the aquifer from the vadose zone is below the aquifer cleanup level selected in the ROD. This also applies to Case #3 for COCs already present in the groundwater.

Decision Criteria

The decision to install and operate 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 START, and that consensus is necessary to determine the levels of uncertainty that are acceptable in each of the elements.

- I. Will the contaminant mass in the vadose zone reach the groundwater, based on either a screening level or site-specific evaluation?

To answer this question, START 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 II.

- II. Will the contaminant mass in the vadose zone cause the contaminant concentrations in the leachate to exceed *non-detectable concentrations* (i.e., detection is based on laboratory practical quantitation limits) for the COCs not already in the groundwater, or the aquifer cleanup level for the COCs already in the groundwater?

To answer this question, START elements "A" through "H" 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 START.

- III. Based on an evaluation of all of the elements, is it appropriate to install and operate an SVE system at the site?

To answer this question, all START elements must be addressed.

- If the answer is "yes", then proceed with SVE system installation and operation.
- If the answer is "no" proceed with site closure negotiations.

Elements of the START

The following elements should be applied to evaluate the criteria listed above.

- A. Are there any time- or land use-critical re-use issues with the site, and if so, what are they? These types of issues may preclude the need for further analysis, if SVE is required to address these concerns.
- B. What is the estimated contaminant mass and areal and vertical extent of the vadose zone contaminant plume? Include contaminant isoconcentration maps and plume cross-sections to illustrate the contaminant concentrations and distribution in the subsurface.
- C. Do the data indicate contaminant 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) soil gas profiles from nested wells to estimate the contaminant's propensity for migration; and 3) time-series profiles of soil gas concentrations in nested wells.
- D. What is the lithology of areas that demonstrate significant soil gas concentrations of contaminants? Use site-specific information, and include as much information as possible, such as porosity, moisture content and carbon content of soil, etc.
- E. What are the actual site-specific infiltration and percolation rates? If site-specific data are not available, what are the predicted rates?
- F. 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.)
- G. 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 contaminant's subsurface migration (such as unusual presence or absence of low permeability layers, high carbon content of soil, etc.).
- H. What is the actual or predicted concentration and mass flux rate of leachate leaving the vadose zone? What is the predicted concentration trend of leachate over time based on modeling?
- I. Qualitatively, what is the estimated SVE effectiveness of a system, based on known information and experience from similar sites?
- J. How much money, if any, has been spent to date on the site's remediation?
- K. What is the estimated cost to install an SVE system?

- L. What are the locations and capture zones of operating groundwater extraction wells relative to the vadose zone contaminant plume? Will the existing groundwater wells effectively (i.e., technically and economically) capture the COC contaminants from the site? If not, what are the additional costs to add groundwater extraction wells?
- M. What is the cost of vadose zone remediation compared to the incremental cost for additional groundwater remediation due to impacts to the site from the vadose zone contamination. 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 element "M" the following costs need to be calculated:

- The cost (GW_1) to reach the aquifer clean-up level *with* the additional impact from the site; (assume SVE will not be implemented);
- The cost (GW_2) to reach the aquifer cleanup level *with* the additional impact from the site after a period of SVE operation; and
- The cost (SVE_1) of SVE installation and operation.

These costs can be calculated following the steps outlined below:

1. Using the measured soil gas concentrations at the site, calculate the mass of the contaminant in the vadose zone (same as element "B").
2. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
3. Estimate the time to reach the groundwater aquifer clean-up level using the modeling results obtained in step 2 above.
4. Estimate the monthly cost to continue operation of the groundwater extraction system in the area impacted by the site.
5. Calculate the cost to reach the aquifer clean-up level *with* the additional impact from the site (GW_1), because SVE will not be installed and operated. ($GW_1 = (\text{step 3} \times \text{step 4}) \text{ plus element I.}$)
6. Estimate the monthly cost to operate the SVE system based on historical costs from similar sites (including all costs relating to operation and shutdown).
7. Estimate the cost to install an SVE system and operate for an estimated length of time that is based on site-specific conditions, such as 24 months. ($SVE_1 = \text{length of time} \times \text{step 6 plus cost to install SVE, i.e., element K}$)
8. Estimate what the predicted residual soil gas concentrations would be if the SVE system were operated for the estimated length of time.

9. Estimate the impact to groundwater from the site based on the results of step 8. This estimation can be conducted similarly to step 2 above.
10. Estimate the predicted time required for groundwater extraction system to reach aquifer cleanup level *with* the additional impact from the site assuming operation of the SVE system for the period of time estimated in step 7.
11. Calculate the cost to reach the aquifer cleanup level (GW_2) *with* the additional impact from the site assuming operation of the SVE system for the estimated period of time. This cost is calculated by multiplying the results of step 10 by the results of step 4. ($GW_2 = \text{step 10} \times \text{step 4}$)
12. Compare the costs to reach the aquifer cleanup level *with* the additional impact from the site to the costs of installing and operating an SVE system plus the cost to reach the aquifer cleanup level *with* the additional impact from the site after operation of the SVE system for an estimated period of time. Mathematically this can be expressed as:

$$\text{Is } GW_1 > SVE_1 + GW_2 ?$$

If GW_1 is greater than $(SVE_1 + GW_2)$, installation and operation of an SVE system should be strongly considered.

Implementation

The Air Force, the USEPA, and the State (DTSC and the RWQCB) will jointly decide, based on the START evaluation, whether the SVE system should or should not be installed at the site. The START 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 is not necessary, without having to perform a complete START (criterion III).

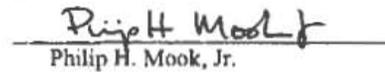
There are several potential outcomes of the START evaluation. Ideally, the START would indicate unequivocally that either the SVE system would not be necessary, and all parties agree that the site could be closed, or that SVE is warranted at the site and should be installed and operated. Another potential outcome is that the START would indicate that the SVE system is not economically or technically justified, 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.

Due to the reliance of the START on professional judgment, another outcome of the START is that the parties may not agree on whether the SVE system should be installed or not. If the parties cannot reach a joint resolution, any party may invoke dispute resolution.

US EPA: RPM


Joseph B. Healy, Jr.

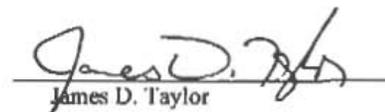
AFBCA: RPM


Philip H. Mook, Jr.

CA DTSC: RPM


Mark Malinowski

CVRWQCB: RPM


James D. Taylor

Revised 4 December 2000
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Page 7

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McClellan AFB

SVE TURN-OFF (STOP) CRITERIA Criteria for Case #3

Some or All VOC Contamination in the Vadose Zone Over Groundwater Contaminated with Different COCs

Introduction

There are a number of factors that can influence the decision to continue to operate soil vapor extraction (SVE) at a site where contaminant levels exceed human health or water quality screening threshold criteria. The McClellan AFB SVE start/stop criteria focuses on the analysis of soil vapor extraction (SVE) systems for the remediation of volatile organic compound (VOC) contamination in the vadose zone as it relates to groundwater cleanup and protection. For the protection of groundwater quality the issue becomes: is it technically and economically feasible to continue to operate an SVE system to remediate the site?

In addition to the impact on groundwater, under CERCLA there are a number of factors that must be evaluated to arrive at the decision to install and operate an SVE system. These factors are brought out when the feasibility study and the conceptual site model are developed for the site. To ensure that all the factors are considered in the decision to initiate, continue or stop an SVE system, the conceptual site model should be included as an integral tool to be used in the decision-making process.

A typical potential route of exposure, that is present when the vadose zone is contaminated with VOCs, is direct inhalation and contact by humans and biota at or near the ground surface. A site-specific analysis should be conducted to determine whether SVE system operation or other remedial action should be taken or continued to protect receptors from this type of exposure.

Any VOCs remaining in the vadose zone after a decision is made to stop or not start an SVE system must be managed to the degree necessary in relation to its significance. Where the cleanup does not meet unrestricted reuse cleanup standards, management measures, such as institutional controls should be evaluated and implemented if necessary.

In addition to the methods and criteria for analysis presented in these Start/Stop procedures, a separate analysis that addresses other routes of exposure identified in the conceptual site model needs to be conducted and considered in making the decision to begin or continue SVE.

For protection of groundwater quality at McClellan, there are three cases to be considered:

Case #1 - Volatile Organic Compounds (VOC) contamination in the vadose zone over groundwater contaminated with the same VOC contaminant(s) of concern (COCs)

Case #2 - VOC contamination in the vadose zone over clean groundwater

Revised 4 December 2000
McClellCase3STOP-rev11rb.doc
Page 1

Case #3 – Some or all VOC contamination in the vadose zone over groundwater contaminated with different COCs.

The SVE turn-off criteria presented below are for Case #3 to determine if SVE should be continued or terminated. For SVE turn-off criteria for the other cases, see documents:

SVE TURN-OFF (STOP) CRITERIA - Criteria for Case #1; and
SVE TURN-OFF (STOP) CRITERIA - Criteria for Case #2

This analysis applies to sites at McClellan AFB that meet the conditions for Case #3 that are addressed in the *Final McClellan Basewide VOC Record of Decision (VOC ROD)*. 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 continue operations requires evaluating the tradeoff between certain monetary expenditure and uncertain environmental benefit. If the remaining contaminant mass in the vadose zone is predicted to 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 greater than non-detectable concentrations (i.e., is detectable based on laboratory practical quantitation limits) for the COCs not already in the groundwater, but below the aquifer cleanup level selected in the VOC ROD, the aquifer may be unacceptably degraded, and continued remediation may be warranted. If the leachate concentration is above the aquifer cleanup levels selected in the VOC ROD, continued remediation may be warranted. 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.

The Regional Board acknowledges that at sites subject to these SVE turn-off (STOP) criteria, some degradation of the groundwater may occur. The process for the application of the criteria is intended to result in reasonable protection of the beneficial uses of waters of the State as further described in the *Final McClellan Basewide VOC ROD*.

Case #3 addresses VOC contamination in the vadose zone over groundwater contaminated with different COCs. Case #3 is similar to Case #1. The difference is that in Case #3, further evaluation is required if

Revised 4 December 2000
McClellanCase3STOP-rev11rb.doc
Page 2

the contaminant concentration in the leachate entering the aquifer from the vadose zone is greater than *non-detectable concentrations* (i.e., is detectable based on laboratory practical quantitation limits) for the COCs not already in the groundwater. In Case #1 no further evaluation is required if the contaminant concentration in the leachate entering the aquifer from the vadose zone is below the aquifer cleanup level selected in the ROD. This also applies to Case #3 for COCs already present in the groundwater.

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 *non-detectable concentrations* (i.e., is detectable based on laboratory practical quantitation limits) for the COCs not already in the groundwater, or the aquifer cleanup level for the COCs already in the groundwater?

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 an 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 contaminant's 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? What is the concentration trend of leachate over time based on field data and modeling?
- 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 groundwater wells effectively (i.e., technically and economically) capture the COC contaminants from the site? If not, what are the additional costs to add groundwater extraction wells?
- M. What is the incremental cost over time of continued vadose zone remediation compared to the incremental cost over time for additional groundwater remediation provided that the underlying contamination has not reached the aquifer clean-up level? In other words, will the residual mass in the vadose zone significantly prolong the time and increase the cost to attain the aquifer clean-up level?

To implement element "M", the following costs need to be calculated:

- The cost (GW_1) to reach the aquifer clean-up level *with* the additional impact from the site (assume SVE will not be continued);
- The cost (GW_2) to reach the aquifer clean-up level *with* the additional impact from the site after an additional period of SVE operation; and
- The cost (SVE_1) of the additional SVE operation.

These costs can be calculated following the steps outlined below:

1. 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").
2. Estimate the site's potential impact to groundwater using appropriate vadose zone and groundwater fate and transport models.
3. Estimate the time to reach the groundwater aquifer clean-up level using the modeling results obtained in step 2 above.
4. Estimate the monthly cost to continue operation of the groundwater extraction system in the area impacted by the site.
5. Calculate the cost to reach aquifer cleanup level *with* the additional impact from the site (GW_1), because SVE will not continue to be operated. ($GW_1 = (\text{step 3} \times \text{step 4})$ plus element I.)
6. Estimate the monthly cost of continuing to operate the SVE system based on historical costs (including operation and shutdown periods for the site).
7. Estimate the cost to operate the SVE system for an agreed-upon additional 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 6. ($SVE_1 = \text{length of time} \times \text{step 6}$).
8. Estimate what the predicted residual soil gas concentrations would be if the SVE system were operated for the additional agreed-upon length of time.
9. Estimate the impact to groundwater from the site based on the results of step 8. This estimation can be conducted similarly to step 2 above.
10. Estimate the predicted time required for groundwater extraction system to reach the aquifer clean-up level *with* the additional impact from the site assuming operation of the SVE system for the additional period of time agreed upon in step 7.

Revised 4 December 2000
McClellCase3S1OP-rev11rb.doc
Page 5

11. Calculate the cost to reach the aquifer clean-up level (GW_2) *with* the additional impact from the site assuming operation of the SVE system for an additional period of time. This cost is calculated by multiplying the results of step 10 by the results of step 4. ($GW_2 = \text{step 10} \times \text{step 4}$).

12. Compare the costs to reach the aquifer cleanup level *with* the additional impact from the site to the costs of continuing to operate a SVE system plus the cost to reach the aquifer cleanup level *with* the additional impact from the site after operation of the SVE system for an additional period of time. Mathematically this can be expressed as:

$$\text{Is } GW_1 > SVE_1 + GW_2 ?$$

If GW_1 is greater than $(SVE_1 + GW_2)$, additional operation of the SVE system should be strongly considered.

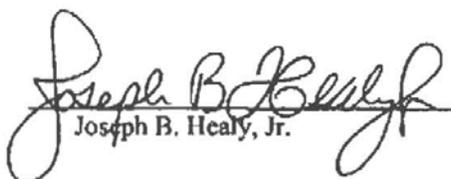
Implementation

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).

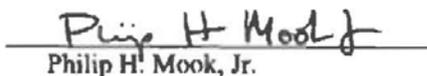
There are several potential outcomes of the STOP evaluation. Ideally, the STOP would indicate that the SVE system could be permanently turned off, and all parties agree that the site could be closed. Another potential outcome is that the STOP would indicate that the SVE system could be permanently shut 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.

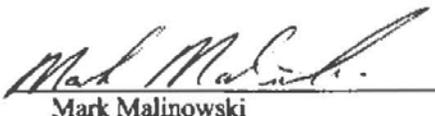
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Joseph B. Healy, Jr.

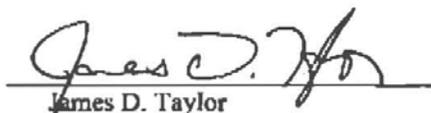
AFBCA: RPM


Philip H. Mook, Jr.

CA DTSC: RPM


Mark Malinowski

CVRWQCB: RPM


James D. Taylor

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 16, 2001

Anthony Landis
Department of Toxic Substances Control
Offices of Military Facilities
8800 Cal Center Drive
Sacramento, CA 95826

Thomas Kempster
Air Force Base Conversion Agency
3237 Peacekeeper Way, suite 13
McClellan Air Force Base, CA 95652-1056

Subject: Invoke Formal Dispute on the Proposed Plan for the VOC Operable Unit,
McClellan Air Force Base

Tom & Tom
Dear Sirs:

Attached is statement formally invoking dispute on the McClellan Air Force Base
Proposed Plan for the VOC Operable Unit. Please sign the original Statement and return it to me
for the record.

Sincerely,

Daniel A. Meert
Chief, Federal Facilities Cleanup Branch
Superfund Division

cc: Antonia Vorster
Central Valley Regional Water Quality Control Board
3443 Roulter Road, Suite A
Sacramento, CA 95827-3098

✓ Paul Brunner
AFBCA
~~5050 Dudley Blvd., Suite 3~~ 3411 Olson Street
~~Sacramento, CA 95827-5880~~ McClellan CA 95652

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AUG 15 2001

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AUG 07 2001

Consensus Statement of the Dispute Resolution Committee (DRC) Invoking Formal Dispute over the Proposed Plan for the VOC Operable Unit, McClellan Air Force Base

This consensus statement may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.

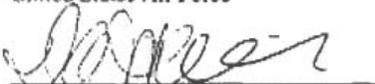
"In the matter of formal dispute before the Dispute Resolution committee (DRC) regarding the McClellan Air Force Base (McAFB) Proposed Plan for the VOC Operable Unit, the DRC began an effort to resolve the dispute on April 24, 2000, using an Alternative Dispute Resolution (ADR) process developed by the Air Force. The DRC was presented with five (5) issues and was able to resolve two (2) of them. The DRC was unable to resolve three (3) of the issues.

The DRC had previously agreed to postpone the start of formal dispute until July 20, 2001. Since the DRC was unable to resolve all of the issues, the DRC has decided to invoke formal dispute on the remaining three issues. To allow time to prepare the consensus statement and position papers, the DRC will hereby invoke formal dispute beginning on August 31, 2001.

 Anthony Landis
 State of California
 Department of Toxic Substances Control

 Date

 Tom Kempster
 Air Force Base Conversion Agency
 United States Air Force



 Daniel A. Meer
 United States Environmental Protection Agency

 Date

7/16/01

 Date



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

December 5, 2001

Gary Carlton
Executive Officer
Central Valley Regional Water Quality Control Board
3443 Routier Road, Suite A
Sacramento, CA 95827

Terry A. Yonkers
Acting Deputy Assistant Secretary of the Air Force
for Environment, Safety and Occupational Health
1600 Air Force Pentagon, 5C866
Washington, D.C. 20330-1660

Subject: Resolution of Formal Dispute on the Proposed Plan for the VOC Operable Unit,
McClellan Air Force Base

Dear Mr. Carlton and Mr. Yonkers:

Attached for your signature is a written decision of the Senior Executive Committee (SEC) resolving the formal dispute on the McClellan Air Force Base Proposed Plan for the VOC Operable Unit. The decision has been prepared in accordance with section 12.6 of the Amended Federal Facility Agreement for McClellan Air Force Base dated May 5, 1990. Please sign the decision where indicated and return it to me for distribution.

Thank you both for your personal efforts to resolve this matter.

Sincerely,

Keith Takata

Keith Takata
Director,
Superfund Division

cc: Antonia Vorster
Central Valley Regional Water Quality Control Board

Paul Brunner
AFBCA

Decision of the Senior Executive Committee (SEC) Resolving the Formal Dispute over the Proposed Plan for the VOC Operable Unit, McClellan Air Force Base

In the matter of the formal dispute before the Senior Executive Committee (SEC) regarding the McClellan Air Force Base (McAFB) Proposed Plan for the VOC Operable Unit, the SEC issues this written decision in accordance with Section 12.6 of the Amended Federal Facility Agreement for McClellan Air Force Base dated May 5, 1990. This decision incorporates the agreement reached by the Air Force, the State of California, and the Environmental Protection Agency in settlement of the dispute brought by the State of California regarding the Air Force's Proposed Plan dated March 2000 for cleanup of volatile organic compounds in soil and groundwater at McClellan Air Force Base.

The issues in dispute are: (1) Are State Board Resolution 92-49 and the Central Valley Water Board's Basin Plan (in whole or in part) considered to be Applicable or Relevant and Appropriate Requirements (ARARs) in setting cleanup levels in groundwater? (2) If State Board Resolution 92-49 and the Basin Plan are considered to be Applicable or Relevant and Appropriate Requirements, how should they be interpreted to set groundwater cleanup levels? (3) What are appropriate remedial action objectives for cleanup of groundwater? The "Dispute Resolution Committee Consensus Statement on McClellan Air Force Base VOC Proposed Plan Dispute" contains a more detailed summary of the issues in dispute. The individual position papers submitted to the SEC by the parties contain the facts and arguments that were presented to the SEC concerning the issues in dispute.

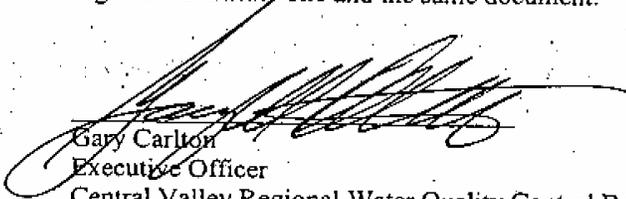
The SEC has reached unanimous agreement as follows:

(1) The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as ARARs for the McClellan VOC Record of Decision.

(2) Under the currently available specific facts at McClellan, the Air Force and EPA believe that both ARARs result in a cleanup standard of 5 parts per billion (ppb) TCE, based primarily on economic feasibility. The State believes that application of both ARARs results in a cleanup standard of 2.3 ppb TCE. The Record of Decision will state 5 parts per billion as the cleanup standard for TCE. The parties agree to proceed with the cleanup as proposed by the Air Force until such time as 5 ppb is achieved in each plume, as defined by the BRAC cleanup team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, agrees within 60 days to complete an analysis and prepare a report (using agreed upon models) which evaluates the technical and economic feasibility of continuing remediation until plume levels reach 2.3 ppb TCE. After the report is complete, the parties will have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facility Agreement.

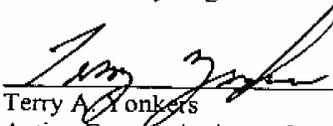
(3) The parties agree to not include either of the disputed remedial action objectives in the VOC Record of Decision.

This decision may be executed and delivered in any number of counterparts, each of which when executed and delivered shall be deemed to be an original, but such counterparts shall together constitute one and the same document.



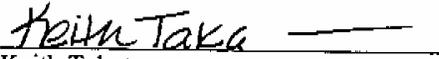
Gary Carlton
Executive Officer
Central Valley Regional Water Quality Control Board

12-27-01
Date



Terry A. Yonkers
Assistant ~~Acting~~ Deputy Assistant Secretary of the Air Force
for Environment, Safety and Occupational Health

10 Dec '01
Date



Keith Takata
Director, Superfund Division
Region 9
United States Environmental Protection Agency

12-5-01
Date

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DEPARTMENT OF THE AIR FORCE
AIR FORCE BASE CONVERSION AGENCY

JUN 19 2002

MEMORANDUM FOR BCT MEMBERS

FROM: AFBCA/DD-McClellan
3411 Olson Street
McClellan CA 95652-1003

SUBJECT: McClellan CERCLA Decisions, i.e. Cumulative Risk and ROD Cleanup Levels

1. On April 10, 2002, I met with representatives from DTSC to discuss what cumulative risk meant to each Agency and how it applied to ROD decision documents. The meeting was beneficial. The slides I used at the meeting are attached for your reference. Since the meeting, I have exchanged e-mails on this topic with DTSC, but have not quite closed each issue. We are at a point in our program where this issue needs to be resolved or else it will impact the schedule and cost of our documents (e.g. LRA Initial Parcel Feasibility Study). Based on the discussion I've had to date with DTSC, I've outlined below how the Air Force plans to proceed with our documents.

- The term Unrestricted Use means there are no institutional controls for a given media and class of contaminants.
- CERCLA risk range is 10^{-4} - 10^{-6} (not 1×10^{-4} - 1×10^{-6}).
- Cumulative risk sums the risk of contaminants and is applicable to human health. Radiological risk is not part of the cumulative risk and dealt with separately.
- The groundwater will be remediated to the levels designated in the VOC ROD as determined by the result of the completed dispute resolution.
- The State point of departure for alternative analysis is 1×10^{-6} cumulative risk for unrestricted use. For property located over contaminated groundwater, this alternative is not viable since the groundwater MCL cleanup level is already greater than 1×10^{-6} .
- Each Feasibility Study will analyze at least the following alternatives for a given media (e.g., soil or groundwater) and class of contaminants (e.g., VOCs or non-VOCs):
 - No Action.
 - Institutional Controls (ICs) Only option
 - Cleanup to Industrial PRG levels with the appropriate ICs
 - Unrestricted Use with no ICs. The value used in this Alternative analysis will be calculated using a McClellan modified (to address State input) PRG value
- The McClellan modified PRG values for soil will be calculated using the most current risk assessment procedures. For each individual contaminant, the selected value will be a soil concentration equivalent to the lesser of a carcinogenic risk of 1×10^{-6} or a non-carcinogenic hazard index of 1.0.

- Each IRP site or class of sites will have its own proposed cleanup levels in the Proposed Plan and ROD based on the selected alternative.
- Each ROD will establish the cleanup level for each chemical of concern. This cleanup level will not be revised unless the BCT or a subsequent five-year review indicates a change is needed. Should a revision be necessary the Air Force will make that revision.
- Since each site will most likely have more than one ROD, it is recognized that the sum of all the risks at the site will be greater than 1×10^{-6} , but within the CERCLA risk range.
- There will be no Final Base-wide ROD. Each ROD will stand on its own.
- Where appropriate, the Air Force will perform additional site-specific cumulative risk assessments for all chemicals of concern for each site prior to each five-year review. This will occur at sites where cleanup actions have begun.
- The Air Force will perform site-specific cumulative risk assessments for all chemicals of concern after all RODs pertaining to that site have been signed.

2. Please advise by 15 July 2002 if the above conditions are acceptable. If you have questions, please contact me at (916) 643-1250x200.


PAUL G. BRUNNER
BRAC Environmental Coordinator

Attachment:
Cumulative Risk Briefing Charts from
10 April 2002 Meeting with DTSC

DISTRIBUTION:
EPA Region IX (Joe Healy)
EPA Region IX (Glenn Kistner)
DTSC (Kevin Depies)
RWQCB (James Taylor)

Cumulative Risk

- CERCLA Risk Range = $10^{-4} - 10^{-6}$
(not $1 \times 10^{-4} - 1 \times 10^{-6}$)
- Cumulative Risk =
 - Individual Contaminant Risk Summed
 - Human Health
- Unrestricted Use = No Institutional Controls
- All Media Combined = All Contaminants
(does not include Radiological)

Cumulative Risk

- McClellan RICS Human Health Risk =
VOC + Non-VOC Risk
- State Point of Departure = 1×10^{-6}
Cumulative Risk for Unrestricted Use = No
Institutional Controls
- How Do You Apply?

Cumulative Risk

Media

| VOC ROD | Non-VOC ROD | Eco ROD | Rad ROD |
|--|--|----------|-------------------|
| <p>Human Health Risk</p> <p>Base-wide Approach</p> <ul style="list-style-type: none"> - Not Unrestricted - Has ICs - Established GW Cleanup Levels <p>Final ROD</p> | <p>Human Health Risk</p> <p>Site Specific Approach</p> <ul style="list-style-type: none"> - Doing Analysis for Cumulative Risk Unrestricted (1×10^{-6}) is not viable/possible in FS -- Contaminant Mix makes Risk Calculations hard to predict -- Current RI Information is not Sufficient to Allow Definition of 1×10^{-6} Cumulative Risk Volumes in FS -- Do not have all VOC Shallow Soil Gas Date) for Initial Parcel FS - All Sites over Contaminated GW will have ICs | Eco Risk | Human Health Risk |

Cumulative Risk

- Each Non-VOC ROD Set Cleanup Level
 - Calculate 1×10^{-6} Concentration for each Contaminant for Unrestricted Use for the ROD
 - Does not Deal with VOC Component, since VOC ROD will
 - Alternatives in FS
 - No Action
 - No Action Except ICs
 - Residential/Business with ICs
 - Unrestricted – No ICs
 - Each Site or Class of Sites will have its own Cleanup Level in the PP and ROD based on Alternative Selected

Cumulative Risk

- How Does it all Get Wrapped Up?
 - Cumulative Risk at Site after all RODs: GW and SG and Non-VOC + Rad > 1×10^{-6} ; but within CERCLA Risk Range most likely in 10^{-6} Range
 - Deal with all the Risks in the 5-Year Review: State/EPA take Action to Modify ROD(s), if needed

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Steve

July 16, 2002

AFBCA/DM
Attn: Paul Brunner
3411 Olson St.
McClellan, CA 95652-1071

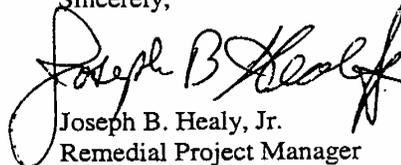
Re: EPA Review Comments on the June 19, 2002 memorandum titled "McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels"

Dear Paul:

Attached are my comments on the June 19, 2002 memorandum titled "McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels".

If you have any questions, please do not hesitate to call me at (415) 972-3269.

Sincerely,



Joseph B. Healy, Jr.
Remedial Project Manager

JBH/jbh

Attachment: Joe Healy's comments on subject document

cc: James Taylor, RWQCB Mark Malinowski, DTSC
Kevin Depies, DTSC Steve Mayer, McAFB

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July 18, 2002

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JUL 19 2002

Joe Healy's Comments

on the

June 19, 2002 memorandum titled "McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels"

SPECIFIC COMMENTS

1. p. 1, 3rd bullet: The two separate risk numbers should be reported in the same paragraph to allow for a reader to mentally add them together if it is important to that reader's perception of total risk.
2. p. 1, 4th bullet: In the same paragraph as described in the preceding comment, the residual risk number for groundwater should be included for a reader to mentally add risk numbers together if it is important to that reader's perception of total risk.
3. p. 1, 5th bullet: A distinction should be made for soil remedy ICs versus groundwater remedy ICs. This bullet could be interpreted to mean that the Air Force would not evaluate a no ICs alternative for the soil remedy if the soil contamination exists above contaminated groundwater. Although such property would have ICs related to groundwater, it would likely be much more valuable if there were no ICs or other restrictions related to soil use or other surface conditions. I strongly believe that soil remedies should always have a no soil IC alternative regardless of whether groundwater ICs will already be necessary.
4. p. 1, 7th bullet: For carcinogenic risk, the presence of multiple contaminants (e.g., five metal COCs) could likely result in residual total risks slightly greater than 1×10^{-6} . This should be acknowledged and justified when presenting the rationale for the individual PRG values.
5. p. 2, 1st bullet: This will be very messy in a multi-site ROD. It would be better to have basewide standards for industrial versus residential or unrestricted use cleanups.
6. p. 2, 2nd bullet: Insert the phrase "using a ROD Amendment" at the end of the sentence. You cannot change cleanup standards without a new proposed plan and public comment period.
7. p. 2, 3rd bullet: Being within the CERCLA risk range is not enough. You will need to justify where in the CERCLA risk range you will generally find yourself when following your cleanup standards.
8. p. 2, 4th bullet: To adequately explain its scope and role, each successive ROD always needs to refer to previous RODs and anticipated future RODs. The last ROD at McClellan will have a "Scope and Role" section that explains how this last ROD, combined with all previous RODs, completes the formal decision process. You need to state that by following all of these RODs, you expect the entire NPL site will be protective of human health and the environment without needing any further RODs, assuming no remedies fail or new information raises new concerns.

9. p. 2, 5th and 6th bullets: Generally, I would think only one risk assessment needs to be conducted after the ROD is signed. That would be the calculation of the residual risk at the time that cleanup is completed for the particular ROD remedy. As long as post-cleanup conditions do not change, I doubt that a new risk assessment would be needed, unless a new risk is identified and would place the site outside EPA's acceptable risk range.

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Burdley



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 19, 2002

AFBCA/DM
Attn: Paul Brunner
3411 Olson St.
McClellan, CA 95652-1071

Re: EPA Acceptance of the June 19, 2002 memorandum titled "McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels"

Dear Paul:

My July 16, 2002 letter contained EPA's comments on the June 19, 2002 memorandum titled "McClellan CERCLA Decisions, i.e., Cumulative Risk and ROD Cleanup Levels". As we discussed yesterday in the Regulatory Agency Meeting at McClellan, EPA agrees with the basic approach for cumulative risk and ROD cleanup levels that you outlined in your June 19th memo. The EPA comments point to aspects that EPA believes can be worked out during the development of the ROD documents.

If you have any questions, please do not hesitate to call me at (415) 972-3269.

Sincerely,

Joseph B. Healy, Jr.
Joseph B. Healy, Jr.
Remedial Project Manager

JBH/jbh

cc: James Taylor, RWQCB Steve Mayer, McAFB
Kevin Depies, DTSC

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July 19, 2002

*Received
25 Jul 02*

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Department of Toxic Substances Control



Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Edwin F. Lowry, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Gray Davis
Governor

May 27, 2003

AFRPA/DD-McClellan
Mr. Paul Brunner
3411 Olson Street
McClellan, California 95652-1071

Dear Mr. Brunner:

Over the past several months, we have been in discussion regarding the issue of cumulative risk and safe transfer of properties on the former McClellan Air Force Base. The main issue the Air Force wants to resolve is that of cumulative risk on individual installation restoration program (IRP) sites.

The Air Force has agreed to remediate individual chemicals at soil contamination sites using a cleanup goal of 1×10^{-6} cancer risk. The Department of Toxic Substances Control's (DTSC's) position is that, in most cases, remediated IRP sites where there are multiple chemicals cleaned up to 1×10^{-6} or less cancer risk will be acceptable for unrestricted use, even though the resultant total risk is greater than 1×10^{-6} . Further, if the groundwater exposure pathway is not completed, risk from groundwater contamination should not be included in these calculations.

We hope to continue productive discussions on the issue of safe transfer of parcels with the Air Force, United States Environmental Protection Agency and the Regional Water Quality Control Board. These remaining issues include evaluation of risk from radiation and petroleum, and evaluation of risk from contamination on adjacent and nearby parcels.

California Environmental Protection Agency
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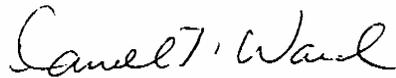
Mr. Paul Brunner

May 27, 2003

Page 2

If you have questions about these issues, please contact me at (916) 255-3676.

Sincerely,



Daniel T. Ward, P.E.
Chief
Base Closure Unit
Office of Military Facilities

cc: Ms. Michelle Schutz (SFD-1)
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

Mr. John Russell
Regional Water Quality Control Board
Central Valley Region V
3443 Routier Road
Sacramento, California 95827-3098

Appendix B

INSTITUTIONAL CONTROL COST ESTIMATES

The costs for ICs described in this Appendix are annual costs based on discussions as provided in Section 6.2.7 and Sections 6.1.3.1 through 6.1.3.4. A summary of the assumptions is included within the cost tables in this Appendix. Air Force (AF), Sacramento County (SC), the State Land Use Covenant (SLUC) overseen by DTSC, and EPA oversight costs are included in this Appendix. The cost associated with easements is not included here because these would be included as part of the long-term O&M of the site.

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Total IC Cost

| | | <u>Subtotals</u> |
|------------------------------|----------|------------------|
| Total AF Encroachment Permit | \$248 | |
| Total AF Deed Covenant | \$3,690 | |
| Total AF Inspections | \$0 | |
| Total AF Advisories | \$2,530 | |
| Total AF Deed Notices | \$0 | |
| Total Annual Report | \$1,300 | \$7,768 AF |
| Total SC Zoning | \$3,690 | |
| Total SC Inspections | \$248 | |
| Total SC Advisories | \$2,530 | |
| Total SC Permits | \$1,000 | \$7,468 SC |
| Total SLUC | \$2,638 | \$2, 638 State |
| Total EPA Oversight | \$536 | \$536 EPA |
| | | |
| Total GW ICs | \$18,410 | |

Air Force IC Cost

1. Encroachment Permit:

| Permit Processing | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|--|--------------|-------------|-------------|
| Technical Time (assumes 1 permit specific to groundwater every 3 years) | 4 | \$62 | \$248 |

Total AF Encroachment Permit **\$248**

2. Deed Covenant:

| Violations | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|---------------------|--------------|-------------|----------------------|
| Technical Time | 0 | \$62 | \$0 |
| Attorney Time | 0 | \$107 | \$0 |
| Cost per incident | | | \$0 |
| Cost per year | | | \$0 |
| | | | Costs covered in O&M |
| Removal Cost | | | \$0 |

Property Transfer

| | | | |
|-------------------|----|-------|--|
| Technical Time | 20 | \$62 | \$1,240 |
| Attorney Time | 20 | \$107 | \$2,140 |
| Cost per incident | | | \$3,380 |
| Cost per year | | | \$3,380 |
| | | | Assumes one Property Transfer every year |

GIS Maintenance

| | | | |
|----------------|---|------|-------|
| Technical Time | 5 | \$62 | \$310 |
|----------------|---|------|-------|

Total Deed Covenant **\$3,690**

3. Inspections:

| INSPECTIONS | Costs covered in O&M | | |
|-----------------------------|----------------------|-------------|-------------|
| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
| Technical Time | 0 | \$62 | \$0 |
| Attorney Time | 0 | \$107 | \$0 |
| Report | | | \$0 |
| Cost per year | | | \$0 |
| Total AF Inspections | | | \$0 |

4. Advisories:

ADVISORIES

| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|---|--------------|-------------|----------------|
| Technical Time (includes graphics generation) | 35 | \$62 | \$2,170 |
| Printing (assumes 100 advisories) | 5 | \$62 | \$310 |
| Postage (assumes 100 advisories) | | | \$50 |
| Total AF Advisories | | | \$2,530 |

5. Deed Notices:

DEED NOTICES

Total Deed Notices \$0

6. Annual Report

ANNUAL REPORT

| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|----------------------------|--------------|-------------|----------------|
| Preparation Time | 20 | \$62 | \$1240 |
| Distribution | | | \$60 |
| Total Annual Report | | | \$1,300 |

Sacramento County IC Cost

1. Zoning:

| Violations | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> | |
|-------------------|--------------|-------------|-------------|--------------------------------|
| Technical Time | 0 | \$62 | \$0 | |
| Attorney Time | 0 | \$107 | \$0 | |
| Cost per incident | | | \$0 | |
| Cost per year | | | \$0 | Unlikely, none figured in cost |

Property Transfer

| | | | | |
|-------------------|----|-------|---------|--|
| Technical Time | 20 | \$62 | \$1,240 | |
| Attorney Time | 20 | \$107 | \$2,140 | |
| Cost per incident | | | \$3,380 | |
| Cost per year | | | \$3,380 | Assumes one Property Transfer every year |

GIS Maintenance

| | | | | |
|----------------|---|------|-------|--|
| Technical Time | 5 | \$62 | \$310 | |
|----------------|---|------|-------|--|

Total SC Zoning **\$3,690**

2. Inspections:

INSPECTIONS

| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|---|--------------|-------------|-------------|
| Technical Time | 4 | \$62 | \$248 |
| Attorney Time | 0 | \$107 | \$0 |
| Report | | | \$0 |
| Cost per year (assumes County will perform quarterly inspections) | | | \$0 |

Total SC Inspections **\$0**

Sacramento County IC Cost (continued)

3. Advisories:

ADVISORIES

| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|---|--------------|-------------|----------------|
| Technical Time (includes graphics generation) | 35 | \$62 | \$2,170 |
| Printing (assumes 100 advisories) | 5 | \$62 | \$310 |
| Postage (assumes 100 advisories) | | | \$50 |
| Total AF Advisories | | | \$2,530 |

4. Permits:

PERMITS

| <u>Review/Denial</u> | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> |
|---------------------------|--------------|-------------|----------------|
| Technical Time (Engineer) | 10 | \$100 | \$1,000 |
| Total SC Permits | | | \$1,000 |
| Capital | | | \$0 |

State IC Cost

1. SLUC

STATE CONTROLS

| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> | |
|---|--------------|-------------|----------------|-----------------------------|
| Technical Time (Website Database Maintenance) | 2 | \$62 | \$124 | |
| Regulator (inspections) Cost per year | 8 | \$103 | \$824 \$948 | Assumes 2 hours per quarter |

| Violations | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> | |
|-------------------|--------------|-------------|-------------|-------------------------------------|
| Regulator | 0 | \$103 | \$0 | |
| Attorney Time | 0 | \$107 | \$0 | |
| Cost per incident | | | \$0 | |
| Cost per year | | | \$0 | Assumes one incident every 10 years |

SLUC Renegotiation

| | | | | |
|-------------------|----|-------|---------|--|
| Technical Time | 10 | \$62 | \$620 | |
| Attorney Time | 10 | \$107 | \$1,070 | |
| Cost per incident | | | \$1,690 | |
| Cost per year | | | \$1,690 | Assumes one Property Transfer per year |

Total SLUC **\$2,638**

EPA Oversight Costs

1. EPA Oversight

EPA Oversight

| | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> | |
|--|--------------|-------------|--------------|-------------------------------------|
| Technical Time (Tracking Database Maintenance) | 2 | \$62 | \$124 | |
| Regulator (inspections) | 4 | \$103 | \$412 | Assumes 1 hour per quarter |
| Cost per year | | | \$536 | |
| Violations | <u>Hours</u> | <u>Rate</u> | <u>Cost</u> | |
| Regulator | 0 | \$103 | \$0 | |
| Attorney Time | 0 | \$107 | \$0 | |
| Cost per incident | | | \$0 | |
| Cost per year | | | \$0 | Assumes one incident every 10 years |
| Total SLUC | | | \$536 | |

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Appendix C

LIST OF SITES TO BE ADDRESSED BY VOC GROUNDWATER ROD

| | <u>Page</u> |
|---|-------------|
| Tab 1 | C-3 |
| Provides the list of McClellan IRP Sites that have detectable VOC contamination somewhere within a 100-foot buffer around the site in the Vadose Zone between ground surface and eighty-feet (80) below ground surface. These Sites are considered VOC Sites. | |
| Tab 2 | C-9 |
| Provides the list of sites derived from sites shown in Appendix C Tab 1 that could impact groundwater. | |

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Appendix C – Tab 1

Sites where VOCs were Detected at Measurable Levels (100 foot Buffer Zone)

| WIMS_ES | IRPSITE | SITE_NAME |
|---------|---------|----------------------------|
| SD007 | CS 007 | Sludge/oil pit |
| LF008 | PRL 008 | Sludge refuse/landfill |
| LF009 | PRL 009 | Possible landfill |
| LF010 | CS 010 | Landfill |
| LF011 | CS 011 | Landfill |
| LF012 | CS 012 | Landfill |
| LF013 | CS 013 | Landfill |
| LF014 | CS 014 | Landfill |
| DP015 | PRL 015 | Sodium valve trench |
| DP016 | PRL 016 | Sodium valve trench |
| LF018 | PRL 018 | Landfill |
| DP020 | PRL 020 | Sludge/oil pit |
| DP021 | PRL 021 | Sludge/oil pit |
| LF022 | CS 022 | Burn pit/landfill |
| LF023 | CS 023 | Landfill |
| LF024 | CS 024 | Landfill |
| LF025 | PRL 025 | Landfill |
| DP028 | PRL 028 | Skimming basin |
| SS029 | PRL 029 | Landfill |
| DP030 | CS 030 | Surface spill area |
| SS031 | CS 031 | Incinerator ash burial pit |
| SS032 | PRL 032 | Rad./hazardous wastes |
| WP033 | PRL 033 | IWTP sludge landfarm |
| ST034 | CS 034 | Waste sol. storage tanks |
| DP035 | PRL 035 | Scrap metal burial pit |
| SS036 | CS 036 | Open storage area |
| LF037 | CS 037 | Landfill |
| LF038 | CS 038 | Engine Repair Shop |
| LF039 | PRL 039 | Landfill |
| WP040 | CS 040 | Indus. wastewater sludge |
| LF041 | PRL 041 | Landfill |
| LF042 | CS 042 | Oil storage/landfill |
| LF043 | CS 043 | Burn pit |
| SS045 | CS 047 | Abandoned plating shop |
| WP046 | CS 048 | Abandoned IWTP |
| LF047 | PRL 049 | Possible landfill |
| WP048 | PRL 050 | Settling pond |
| WP049 | PRL 051 | Holding pond |
| DP050 | CS 052 | Fill area |
| WP051 | PRL 053 | Settling pond |
| SS052 | PRL 054 | Storage area |

| WIMS_ES | IRPSITE | SITE_NAME |
|---------|--------------|--|
| SS053 | PRL 055 | Acid storage area/landfill |
| SS054 | PRL 056 | Storage area |
| WP056 | PRL 060 | Holding ponds |
| WP057 | PRL 061 | Chemical waste pit |
| WP058 | PRL 062 | Chemical waste pit |
| SD059 | PRL 063 | Unlined ditch |
| SD060 | PRL 064 | Unlined ditch |
| LF061 | PRL 065 | Landfill |
| WP062 | PRL 066A-D | Ditches and pond |
| WP063 | CS 067 | Landfill |
| WP064 | PRL 068 | Sludge ponds |
| DP065 | CS 069 | Burn pit |
| WP068 | GWTP | Groundwater treat. plant |
| LF069 | PRL B-001 | Landfill |
| LF071 | PRL B-003 | Landfill |
| WP072 | PRL B-004 | Sludge drying bed |
| LF073 | CS B-005 | Empty lot |
| LF074 | PRL B-006 | Waste stripping area |
| LF075 | PRL B-007 | Former spoil area |
| LF076 | PRL B-009 | Landfill |
| SD077 | PRL P-001 | Drainage ditch, former engine test pad |
| SD078 | PRL P-002 | Waste pond |
| WP079 | PRL P-003 | Oil pit |
| WP080 | PRL P-004 | Sump |
| SD081 | CS P-005 | Open Ditch |
| SD082 | CS P-006 | Open Ditch |
| SD083 | PRL P-007A-D | Unlined drainage ditch |
| WP084 | PRL P-008 | Acid and cyanide pit |
| SD085 | PRL P-009 | Open drainage ditch |
| SS086 | PRL S-001 | Plating Shop |
| SS087 | PRL S-002 | Chemical warehouse |
| SS088 | PRL S-003 | Acid storage Warehouse |
| SS089 | PRL S-004 | Treat. plant/sludge beds |
| WP090 | PRL S-005 | Abandoned IWTP |
| WP091 | PRL S-006 | IWTP #1 |
| WP092 | CS S-007 | IWTP #3 |
| SS093 | PRL S-008 | Electroplating shop, IWTP |
| SS094 | PRL S-009 | Asbestos Storage |
| SS095 | PRL S-010 | Rad storage area |
| SS096 | PRL S-011 | BCE/PCE storage |
| SS097 | PRL S-012 | PCB storage |
| SS098 | PRL S-013 | Open storage |
| SD099 | PRL S-014 | Paint shop/spray booths |
| SD100 | PRL S-015 | Aircraft repair, electrical/machine shops, foundry |
| SD101 | PRL S-016 | Sol./paint spray booths |
| SD102 | PRL S-017 | Repair shop/spray booths |
| SD103 | PRL S-018 | Repair shop/clean shop |

| WIMS_ES | IRPSITE | SITE_NAME |
|---------|-----------|--|
| SS104 | PRL S-019 | Entomology storage area |
| SD105 | PRL S-020 | Photo lab |
| SD106 | CS S-021 | Degreaser/spray booths |
| SD107 | PRL S-022 | Repair shop/spray booths |
| SD108 | PRL S-023 | Plating shop |
| SD109 | CS S-024 | Depaint washrack |
| SD110 | PRL S-025 | Transformer shop |
| SD111 | CS S-026 | Mainshop/spray booth |
| SD112 | CS S-027 | Solvent recovery stills |
| SS113 | PRL S-028 | Oil/paint storage |
| SS114 | PRL S-029 | Equipment repair |
| SD115 | PRL S-030 | Depaint washrack |
| SD116 | PRL S-031 | Aircraft paint hanger |
| SS117 | PRL S-032 | Paint storage area |
| SS118 | PRL S-033 | Hazardous mat. storage |
| SD119 | PRL S-034 | Degreaser/paint booth |
| SD120 | PRL S-035 | Solvent spray booth |
| SS121 | PRL S-036 | Oil drum storage |
| SS122 | PRL S-037 | Oil drum storage |
| SS123 | PRL S-038 | Drum storage |
| SS124 | PRL S-039 | Former aircraft maintenance area (Current museum site) |
| SD125 | PRL S-040 | Aircraft maintenance/engine testing area |
| SD126 | PRL S-041 | MAT K storage |
| SD127 | PRL S-042 | Auto/Hobby shop/washrack |
| SD128 | PRL S-043 | Aircraft washrack |
| SD129 | PRL S-044 | Aircraft maintenance area |
| SD130 | PRL S-045 | Aircraft maintenance area |
| ST131 | PRL T-006 | UST |
| ST132 | PRL T-007 | Sol pit/waste thinner tank |
| ST133 | PRL T-008 | Fuel tank |
| ST134 | PRL T-010 | Solvent tank |
| ST136 | CS T-012 | Waste oil/solvent tank |
| ST137 | PRL T-015 | Tank Farm 1 |
| ST138 | CS T-016 | Tank Farm 2 |
| ST139 | CS T-017 | Tank Farm 3W |
| ST140 | PRL T-018 | Tank Farm 4 |
| ST141 | PRL T-19 | Tank Farm 5 |
| ST142 | CS T-020 | Tank Farm 6 |
| ST143 | CS T-021 | UST |
| ST144 | CS T-030 | UST |
| ST146 | PRL T-032 | UST, Aircraft maintenance |
| ST147 | PRL T-033 | UST, Aircraft maintenance |
| ST148 | CS T-036 | UST |
| ST149 | CS T-037 | UST |
| ST150 | PRL T-044 | Firehouse, engine repair facility |
| SD154 | PRL T-045 | Oil/water separator |
| SD155 | PRL T-046 | Defuel Fac. Tanks |

| WIMS_ES | IRPSITE | SITE_NAME |
|---------|--------------|--------------------------------|
| SD156 | CS T-047 | Oil/water separator |
| SD157 | PRL T-048 | Oil/water separator UST |
| WL158 | PRL L-001A-C | Indus. wastewater line |
| WL159 | PRL L-002A-D | IWL |
| WL160 | PRL L-003A-B | IWL |
| WL161 | PRL L-004A-B | IWL |
| WL162 | PRL L-005A-G | Indus. wastewater line |
| WL163 | PRL L-006A-B | Indus. wastewater line |
| WL164 | PRL L-007A-D | Indus. wastewater line |
| SD165 | PRL P-010 | Magpie Creek |
| SS166 | PRL S-046 | Unknown |
| SS167 | PRL S-047 | Boiler Room, drainage trench |
| SS168 | PRL S-048 | Jet Engine Test Pad |
| WL169 | CS T-057 | IWL drain at Bldg. 431 |
| ST170 | CS T-059 | UST |
| ST171 | PRL T-060 | UST |
| DP178 | VZ | Vadose Zone |
| WP179 | SA 001 | Surface disposal |
| SS180 | SA 002 | Laboratory |
| SD181 | SA 003 | Washrack |
| SS182 | SA 004 | Paint shop |
| SS183 | SA 005 | Paint storage/boiler |
| SS184 | SA 006 | Gas station |
| SD185 | SA 007 | Washrack |
| ST186 | SA 008 | UST |
| SS187 | SA 009 | Hazardous mat. storage |
| SS188 | SA 010 | Entomology sumps |
| ST189 | SA 011 | UST |
| SS190 | SA 012A-D | Transformer oil area waste pit |
| SS191 | SA 013 | Chemical storage area |
| SD192 | SA 014 | Storm water drainage |
| SS193 | SA 015 | NW corner lot 10 spill |
| SD194 | SA 016 | Hangars/storage area |
| SS195 | SA 017 | Oil storage yard |
| SS196 | SA 018 | Oil storage yard |
| SD197 | SA 019 | Spray booth |
| ST198 | SA 035 | UST |
| SS199 | SA 037 | Motor pool |
| ST200 | SA 038 | UST |
| SS201 | SA 040 | Chemical storage area |
| SS202 | SA 041 | Metal fabrication |
| WP204 | SA 044 | Sump |
| SS205 | SA 045 | Soil contamination |
| ST206 | SA 046 | UST |
| SD207 | SA 047 | Washrack 254 |
| ST208 | SA 048 | Warehouse |
| ST209 | SA 049 | UST |

| WIMS_ES | IRPSITE | SITE_NAME |
|---------|-----------|-----------------------------|
| ST210 | SA 052 | Blowdown Tanks |
| WP211 | SA 053 | Washrack |
| ST212 | SA 054 | Aboveground storage tank |
| SS213 | SA 055 | Laboratory |
| SD214 | SA 056 | Wastewater |
| SS215 | SA 058 | Chemical storage tank |
| ST216 | SA 059 | UST |
| WP217 | SA 060 | Industrial wastewater drain |
| SD218 | SA 061 | Solvent spray booth |
| SS219 | SA 064 | Chemical storage |
| WL220 | SA 065 | IWL |
| SS221 | SA 066 | Motor pool |
| SS222 | SA 067 | Soil contamination |
| SS223 | SA 068 | Aircraft maintenance |
| WP224 | SA 069 | Steam Fac./UST |
| WL225 | SA 070 | IWL |
| SS226 | SA 071 | Hazardous material storage |
| ST228 | SA 074 | AST, UST |
| OT229 | SA 075 | IWL |
| SS230 | SA 076 | Hazardous mat. storage |
| ST231 | SA 077 | Aboveground storage tank |
| SD232 | SA 078 | Locomotive washrack |
| ST233 | SA 079 | Fuel Test Fac. |
| SS234 | SA 080 | Contractor staging |
| ST235 | SA 081 | Fuel lines |
| SD236 | SA 084 | Spray booth |
| WP237 | SA 085 | Oil/Water Separator |
| WP238 | SA 086 | Engine Test/UST |
| ST239 | SA 087 | UST |
| SS240 | SA 088 | Soil contamination |
| SS241 | SA 089 | Open storage area |
| SS242 | SA 090 | Washrack |
| SS243 | SA 091 | Soil contamination |
| ST245 | SA 094 | Open storage area |
| ST246 | SA 095 | UST |
| WP247 | SA 096 | UST |
| SD248 | SA 097 | Tank farm |
| SS249 | SA 098 | Spray booths |
| ST250 | SA 099 | Sewage Treat/UST |
| ST251 | SA 100 | Doc. Destruct./UST |
| WP252 | SA 101 | Sump |
| SS253 | SA 103 | Soil contamination |
| SS254 | SA 105 | Laboratory |
| ST255 | SA 106 | Salvage Yard/UST |
| SS256 | SA 107 | Engine Test Stands |
| SD257 | SA 108 | Aircraft fluids |
| SD258 | SA 109A-E | Magpie Creek contamination |

| WIMS_ES | IRPSITE | SITE_NAME |
|---------|--------------------------|---|
| CF260 | AOC F-2 | Soil disposal area |
| SS261 | AOC F-3 | Runway |
| LF262 | AOC F-4 | Burial pit area |
| SI263 | AOC F-5 | Waste disposal area |
| LF265 | AOC G-1 | Landfill area & firing range |
| PL266 | AOC G-2 | Pol storage area |
| MY267 | AOC G-3 | Aircraft maintenance apron |
| MY268 | AOC G-4 | Aircraft maintenance metals/wood/auto shops |
| MY269 | AOC G-5 | Aircraft maintenance hangar |
| PL270 | AOC H-1 | Building 900 Gas Station |
| SS271 | AOC H-10 | Former aircraft apron |
| DP272 | AOC H-11 | Former burial pit, rad storage |
| SD273 | AOC H-12 | Weather squadron, shop, rad or depot |
| SS274 | AOC H-13 | Auto hobby shop |
| SI275 | AOC H-14 | Dry impoundment area |
| SS276 | AOC H-2 | Revetments |
| SS277 | AOC H-3 | Revetments |
| SS278 | AOC H-4 | Revetments |
| SS283 | AOC H-9 | Stains on taxiway, battery pit |
| SP284 | Bldg. 600 | Building 600 |
| SS285 | Bldg. 635 | AeroClub |
| MY287 | CS S-049 | Maintenance |
| WR288 | Dudley Rd | rad site |
| TA289 | Free Oil Tank | Free oil separation tank for IWTP |
| SD290 | Old Magpie Creek Channel | Former creek channel |
| TU291 | SA 029 | Calibration shop/UST |
| SS292 | SA 034 | Industrial electronics control |
| SS293 | SA 039 | Office and storage building |
| SS294 | SA 050 | Electrical equipment storage/warehouse |
| SS295 | SA 063 | Electronics maintenance |
| TU296 | SA 092 | UST/Laboratory |
| RW297 | SA 102 | Paint booth/washrack |
| SS298 | SA 104 | Maintenance/soil spray booth |
| FR299 | SAFR | Small arms firing range |
| SS300 | SSA 002 | Special Study Area |
| TU303 | Tank 701 | Former diesel UST - removed |
| TU305 | Tank 714 | Chemical and/or waste oil USTs |
| TU306 | Tank 737 | |
| DP310 | Wastepile | Waste pile |
| TU312 | AOC 312 | Gas Station |
| AT313 | AOC 313 | FTA |
| XU314 | AOC 314 | Former Ammo Storage Area |
| SD316 | AOC 316 | Drainage Ditch |

Appendix C – Tab 2

Sites where VOCs were Detected at Levels Exceeding their Equivalent MCL Concentrations (100 foot Buffer)

| WIMS ES | SITE ID | SITE DESCRIPTION |
|---------|---------|----------------------------|
| SD007 | CS 007 | Sludge/oil pit |
| LF008 | PRL 008 | Sludge refuse/landfill |
| LF009 | PRL 009 | Possible landfill |
| LF010 | CS 010 | Landfill |
| LF011 | CS 011 | Landfill |
| LF012 | CS 012 | Landfill |
| LF013 | CS 013 | Landfill |
| LF014 | CS 014 | Landfill |
| DP015 | PRL 015 | Sodium valve trench |
| DP016 | PRL 016 | Sodium valve trench |
| LF018 | PRL 018 | Landfill |
| LF022 | CS 022 | Burn pit/landfill |
| LF023 | CS 023B | Landfill |
| LF024 | CS 024 | Landfill |
| LF025 | PRL 025 | Landfill |
| DP028 | PRL 028 | Skimming basin |
| SS029 | PRL 029 | Landfill |
| DP030 | CS 030 | Surface spill area |
| SS031 | CS 031 | Incinerator ash burial pit |
| WP033 | PRL 033 | IWTP sludge landfarm |
| ST034 | CS 034 | Waste sol. storage tanks |
| DP035 | PRL 035 | Scrap metal burial pit |
| SS036 | CS 036 | Open storage area |
| LF037 | CS 037 | Landfill |
| LF038 | CS 038 | Engine Repair Shop |
| LF039 | PRL 039 | Landfill |
| WP040 | CS 040 | Indus. wastewater sludge |
| LF041 | PRL 041 | Landfill |
| LF042 | CS 042 | Oil storage/landfill |
| LF043 | CS 043 | Burnpit |
| SS045 | CS 047 | Abandoned plating shop |
| WP046 | CS 048 | Abandoned IWTP |
| LF047 | PRL 049 | Possible landfill |
| DP050 | CS 052 | Fill area |
| WP051 | PRL 053 | Settling pond |
| SS053 | PRL 055 | Acid storage area/landfill |
| WP056 | PRL 060 | Holding ponds |
| WP057 | PRL 061 | Chemical waste pit |
| WP058 | PRL 062 | Chemical waste pit |
| SD059 | PRL 063 | Unlined ditch |
| LF061 | PRL 065 | Landfill |

| WIMS ES | SITE ID | SITE DESCRIPTION |
|----------------|----------------|--|
| WP062 | PRL 066B | Ditches and pond |
| WP063 | CS 067 | Landfill |
| WP064 | PRL 068 | Sludge ponds |
| DP065 | CS 069 | Burn pit |
| CG066 | BW-18 | Base Well 18 |
| WP068 | GWTP | Groundwater treat. plant |
| LF069 | PRL B-001 | Landfill |
| LF071 | PRL B-003 | Landfill |
| WP072 | PRL B-004 | Sludge drying bed |
| LF073 | CS B-005 | Empty lot |
| LF075 | PRL B-007 | Former spoil area |
| LF076 | PRL B-009 | Landfill |
| SD077 | PRL P-001 | Drainage ditch, former engine test pad |
| SD078 | PRL P-002 | Waste pond |
| WP079 | PRL P-003 | Oil pit |
| WP080 | PRL P-004 | Sump |
| SD081 | CS P-005 | Open Ditch |
| SD082 | CS P-006 | Open Ditch |
| SD083 | PRL P-007A | Unlined drainage ditch |
| SD085 | PRL P-009 | Open drainage ditch |
| SS086 | PRL S-001 | Plating Shop |
| SS087 | PRL S-002 | Chemical warehouse |
| SS088 | PRL S-003 | Acid storage Warehouse |
| SS089 | PRL S-004 | Treat. plant/sludge beds |
| WP090 | PRL S-005 | Abandoned IWTP |
| WP091 | PRL S-006 | IWTP #1 |
| WP092 | CS S-007 | IWTP #3 |
| SS093 | PRL S-008 | Electroplating shop, IWTP |
| SS094 | PRL S-009 | Asbestos Storage |
| SS096 | PRL S-011 | BCE/PCE storage |
| SS097 | PRL S-012 | PCB storage |
| SS098 | PRL S-013B | Open storage |
| SD099 | PRL S-014 | Paint shop/spray booths |
| SD100 | PRL S-015 | Aircraft repair, electrical/machine shops, foundry |
| SD101 | PRL S-016 | Sol./paint spray booths |
| SD102 | PRL S-017 | Repair shop/spray booths |
| SD103 | PRL S-018 | Repair shop/clean shop |
| SS104 | PRL S-019 | Entomology storage area |
| SD105 | PRL S-020 | Photo lab |
| SD106 | CS S-021 | Degreaser/spray booths |
| SD107 | PRL S-022 | Repair shop/spray booths |
| SD108 | PRL S-023 | Plating shop |
| SD109 | CS S-024 | Depaint washrack |
| SD110 | PRL S-025 | Transformer shop |
| SD111 | CS S-026 | Mainshop/spray booth |
| SD112 | CS S-027 | Solvent recovery stills |
| SS113 | PRL S-028 | Oil/paint storage |

| WIMS ES | SITE ID | SITE DESCRIPTION |
|----------------|----------------|--|
| SS114 | PRL S-029 | Equipment repair |
| SD115 | PRL S-030 | Depaint washrack |
| SD116 | PRL S-031 | Aircraft paint hanger |
| SS117 | PRL S-032 | Paint storage area |
| SS118 | PRL S-033B | Hazardous mat. storage |
| SD119 | PRL S-034 | Degreaser/paint booth |
| SD120 | PRL S-035 | Solvent spray booth |
| SS121 | PRL S-036 | Oil drum storage |
| SS122 | PRL S-037 | Oil drum storage |
| SS123 | PRL S-038 | Drum storage |
| SS124 | PRL S-039 | Former aircraft maintenance area (Current museum site) |
| SD125 | PRL S-040 | Aircraft maintenance/engine testing area |
| SD126 | PRL S-041 | MAT K storage |
| SD128 | PRL S-043 | Aircraft washrack |
| SD129 | PRL S-044 | Aircraft maintenance area |
| SD130 | PRL S-045C | Aircraft maintenance area |
| ST131 | PRL T-006 | UST |
| ST132 | PRL T-007 | Sol pit/waste thinner tank |
| ST133 | PRL T-008 | Fuel tank |
| ST134 | PRL T-010 | Solvent tank |
| ST137 | PRL T-015 | Tank Farm 1 |
| ST138 | CS T-016 | Tank Farm 2 |
| ST139 | CS T-017 | Tank Farm 3W |
| ST140 | PRL T-018 | Tank Farm 4 |
| ST141 | PRL T-019 | Tank Farm 5 |
| ST142 | CS T-020 | Tank Farm 6 |
| ST144 | CS T-030 | UST |
| ST146 | PRL T-032 | UST, Aircraft maintenance |
| ST147 | PRL T-033 | UST, Aircraft maintenance |
| ST148 | CS T-036 | UST |
| ST149 | CS T-037 | UST |
| ST150 | PRL T-044 | Firehouse, engine repair facility |
| SD155 | PRL T-046 | Defuel Fac. Tanks |
| SD156 | CS T-047 | Oil/water separator |
| SD157 | PRL T-048 | Oil/water separator UST |
| WL158 | PRL L-001D | Indus. wastewater line |
| WL159 | PRL L-002A | IWL |
| WL160 | PRL L-003A | IWL |
| WL161 | PRL L-004A | IWL |
| WL162 | PRL L-005E | Indus. wastewater line |
| WL163 | PRL L-006A | Indus. wastewater line |
| WL164 | PRL L-007C | Indus. wastewater line |
| SD165 | MAGPIE CREEK | Magpie Creek |
| SS168 | PRL S-048 | Jet Engine Test Pad |
| WL169 | CS T-057 | IWL drain at Bldg. 431 |
| ST171 | PRL T-060 | UST |
| DP178 | VZ | Vadose Zone |

| WIMS ES | SITE ID | SITE DESCRIPTION |
|----------------|----------------|--------------------------------|
| WP179 | SA 001 | Surface disposal |
| SS180 | SA 002 | Laboratory |
| SD181 | SA 003 | Washrack |
| SS182 | SA 004B | Paint shop |
| SS183 | SA 005 | Paint storage/boiler |
| SS184 | SA 006 | Gas station |
| SD185 | SA 007 | Washrack |
| ST186 | SA 008 | UST |
| SS187 | SA 009 | Hazardous mat. storage |
| SS188 | SA 010 | Entomology sumps |
| ST189 | SA 011 | UST |
| SS190 | SA 012B | Transformer oil area waste pit |
| SS191 | SA 013 | Chemical storage area |
| SD192 | SA 014 | Storm water drainage |
| SS193 | SA 015B | NW corner lot 10 spill |
| SD194 | SA 016 | Hangars/storage area |
| SS195 | SA 017 | Oil storage yard |
| SS196 | SA 018 | Oil storage yard |
| SD197 | SA 019 | Spray booth |
| ST198 | SA 035 | UST |
| SS199 | SA 037 | Motor pool |
| ST200 | SA 038 | UST |
| SS201 | SA 040 | Chemical storage area |
| SS202 | SA 041 | Metal fabrication |
| WP204 | SA 044 | Sump |
| SS205 | SA 045 | Soil contamination |
| ST206 | SA 046 | UST |
| SD207 | SA 047 | Washrack 254 |
| ST208 | SA 048 | Warehouse |
| ST209 | SA 049 | UST |
| ST210 | SA 052 | Blowdown Tanks |
| WP211 | SA 053 | Washrack |
| ST212 | SA 054 | Aboveground storage tank |
| SS213 | SA 055 | Laboratory |
| SD214 | SA 056 | Wastewater |
| SS215 | SA 058 | Chemical storage tank |
| ST216 | SA 059 | UST |
| WP217 | SA 060 | Industrial wastewater drain |
| SD218 | SA 061 | Solvent spray booth |
| SS219 | SA 064 | Chemical storage |
| WL220 | SA 065 | IWL |
| SS221 | SA 066 | Motor pool |
| SS222 | SA 067 | Soil contamination |
| SS223 | SA 068 | Aircraft maintenance |
| WP224 | SA 069 | Steam Fac./UST |
| WL225 | SA 070 | IWL |
| SS226 | SA 071 | Hazardous material storage |

| WIMS ES | SITE ID | SITE DESCRIPTION |
|----------------|----------------|---|
| ST228 | SA 074 | AST, UST |
| OT229 | SA 075 | IWL |
| SS230 | SA 076 | Hazardous mat. storage |
| ST231 | SA 077 | Aboveground storage tank |
| ST233 | SA 079 | Fuel Test Fac. |
| SS234 | SA 080 | Contractor staging |
| ST235 | SA 081F | Fuel lines |
| SD236 | SA 084 | Spray booth |
| WP238 | SA 086 | Engine Test/UST |
| ST239 | SA 087 | UST |
| SS240 | SA 088 | Soil contamination |
| SS241 | SA 089 | Open storage area |
| SS242 | SA 090 | Washrack |
| SS243 | SA 091 | Soil contamination |
| ST245 | SA 094 | Open storage area |
| ST246 | SA 095 | UST |
| WP247 | SA 096 | UST |
| SD248 | SA 097 | Tank farm |
| SS249 | SA 098 | Spray booths |
| ST251 | SA 100 | Doc. Destruct./UST |
| WP252 | SA 101 | Sump |
| SS254 | SA 105 | Laboratory |
| ST255 | SA 106 | Salvage Yard/UST |
| SS256 | SA 107 | Engine Test Stands |
| SD258 | SA 109 | Magpie Creek contamination |
| LF262 | AOC F-4 | Burial pit area |
| SI263 | AOC F-5 | Waste disposal area |
| LF265 | AOC G-1 | Landfill area & firing range |
| PL266 | AOC G-2 | Pol storage area |
| MY267 | AOC G-3 | Aircraft maintenance apron |
| MY268 | AOC G-4 | Aircraft maintenance metals/wood/auto shops |
| MY269 | AOC G-5 | Aircraft maintenance hangar |
| PL270 | AOC H-1 | Building 900 Gas Station |
| SS271 | AOC H-10 | Former aircraft apron |
| SD273 | AOC H-12 | Weather squadron, shop, rad or depot |
| SS274 | AOC H-13 | Auto hobby shop |
| SI275 | AOC H-14 | Dry impoundment area |
| SS278 | AOC H-4 | Revetments |
| SS283 | AOC H-9 | Stains on taxiway, battery pit |
| SP284 | BLDG 600 | Building 600 |
| SS285 | BLDG 635 | AeroClub |
| MY287 | CS S-049 | Maintenance |
| TA289 | FREE OIL TANK | Free oil separation tank for IWTP |
| TU291 | SA 029 | Calibration shop/UST |
| SS292 | SA 034 | Industrial electronics control |
| SS293 | SA 039 | Office and storage building |
| SS294 | SA 050 | Electrical equipment storage/warehouse |

| WIMS ES | SITE ID | SITE DESCRIPTION |
|----------------|----------------|--------------------------------|
| SS295 | SA 063 | Electronics maintenance |
| RW297 | SA 102 | Paint booth/washrack |
| SS298 | SA 104 | Maintenance/soil spray booth |
| SS300 | SSA 002 | Special Study Area |
| TU303 | TANK 701 | Former diesel UST - removed |
| TU305 | TANK 714 | Chemical and/or waste oil USTs |
| TU306 | TANK 737 | |
| DP310 | WASTEPILE | Waste pile |
| TU312 | GAS STATION | Gas Station |
| AT313 | FIRE TRAIN | FTA |
| SD316 | DRAINAGE OU C | Drainage Ditch |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

APPENDIX D

UNITED STATES DEPARTMENT OF THE AIR FORCE
FORMER McCLELLAN AIR FORCE BASE
GROUNDWATER EXTRACTION and TREATMENT SYSTEM
Substantive Requirements from O&M Manual

The Air Force Real Property Agency (AFRPA) at McClellan did not apply for the California Regional Water Quality Control Board, Central Valley Region, NPDES Permit Number CA0081850, Order Number R5-2003-0052, Waste Discharge Requirements. By law, by regulation, and by agreement with the State of California, AFRPA is exempt from any permit requirement for onsite activities conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. Section 9621(e)(1), 40 CFR, Section 300.400 (e)(1), McClellan Federal Facility Agreement (FFA) Section 19.1). The cited federal statute provides that “(n)o Federal, State, or local permit shall be required for the portion of any removal or remedial action conducted entirely onsite...”

The primary congressional intent behind the CERCLA permit exclusion was to avoid delays to CERCLA responses inherent in obtaining permits or similar approvals, because CERCLA ensures the environmental protection that would otherwise be provided by a permit. CERCLA, the NCP at 40 CFR Part 300, and further implementing EPA directives and guidance provide detailed procedures and participation opportunities for federal, state, and local regulators to identify substantive requirements that would otherwise be included in permits. AFRPA is conducting environmental restoration activities pursuant to CERCLA and EO 12580 authorities and therefore, the permit exclusion applies. AFRPA is therefore incorporating the substantive requirements of the permit in this appendix to the Groundwater Treatment Plant (GWTP) Operations & Maintenance (O&M) Manual.

AFRPA did not submit a Report of Waste Discharge to revise the Previous NPDES Permit, Order No. 99-067, but did submit additional information to relevant regulatory agencies as necessary in several other documents. AFRPA will do the same for the current NPDES Permit Number CA0081850, Order Number R5-2003-0052.

A. Discharge Specifications, Discharge from Outfall 001 to Magpie Creek, and Discharge from Outfall 002 to Don Julio Creek via Beaver Pond:

1. The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board (RWQCB) have classified this discharge from the Groundwater Treatment System (GWTS) at McClellan as a minor discharge. AFRPA will perform monitoring and reporting consistent with the requirements for a minor industrial discharger.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

2. AFRPA may submit additional receiving water characterization to demonstrate the flow regime and pollutant assimilative capacity or GWTS modifications and ask the CERCLA Remedial Program Managers (RPMs) (Department of Toxic Substances Control (DTSC), RWQCB, USEPA and Air Force) to consider this new information per the FFA process. The RWQCB RPM will act as liaison between AFRPA and the Executive Officer of the Board.

3. The discharge is described as follows:

| | |
|----------------------|----------------------------|
| Average flow: | 2.12 mgd * |
| Design flow: | 2.16 mgd |
| Average temperature: | 72° F summer; 60° F winter |

| <u>Constituent</u> | <u>Units</u> |
|--------------------|------------------|
| Suspended Matter | < 5 mg/L (ppm)** |
| pH | 6.5 - 8.5 |

* million gallons per day

** milligrams/Liter (parts per million)

4. As part of this Plan, up to 2.16 mgd of treated groundwater may be discharged from the GWTS via Outfall 001 to **Magpie Creek**. When the Phase III wells become operational, the projected maximum discharge is expected to increase to 3.6 mgd. A portion of the 2.16 mgd currently discharged by the GWTS, up to 0.144 mgd, may be discharged via Outfall 002 to a wetlands area (Beaver Pond) which drains to adjacent **Don Julio Creek**, which is tributary to Magpie Creek east of the former McClellan AFB (Base) boundary and east of Raley Boulevard. According to documents provided by AFRPA (Installation Restoration Program (IRP) Creeks and Floodplains Conceptual Site Model, 4 June 2002), Magpie Creek originates to the east of the McClellan Base boundary, in the Foothill Farms area, flowing in general from east to west through the Base. The tributary land area of Magpie Creek is approximately 4 square miles. Magpie Creek carries flows onto the Base through a set of culverts under Roseville Road. Magpie Creek conveys water across the developed portions of the Base through a series of channels and underground pipes. Portions of the Magpie Creek channel have been modified, at various times since 1945, from their original course. Within much of the Base, Magpie Creek is lined with concrete, gunite, or corrugated steel half-pipe. Downstream of Outfall 001 at Lang Avenue, the modified creek channel connects with the old alignment of Magpie Creek. From this point west to Raley Boulevard, Magpie Creek follows its original course and has not been re-routed or channelized.

Don Julio Creek originates east of the Base, in the North Highlands area. Don Julio Creek also flows, in general, from east to west, entering the Base near James Way via two 60-inch diameter culverts. After entering the Base, flow in Don Julio Creek is conveyed underground, resurfacing on the west side of the Base. In addition, a pair of creeks or drainage ditches originating from the Building 772 and 774 areas also feed into Don Julio Creek. Don Julio Creek then exits the Base, flows through a residential area, and re-enters the Base near the northwest corner. From the northwest corner of the Base, Don Julio Creek continues as a gunite lined ditch and flows

Response to Comments

Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

south along Patrol Road, turning west near the center of the Base and exiting the Base near Raley Boulevard. Absent the discharge of treated groundwater from the GWTS, there are periods of limited or no flow in Magpie Creek and Don Julio Creek.

Off the Base and west of Raley Boulevard, Magpie Creek and Don Julio Creek flow into the Magpie Creek Diversion which empties into Robla (Rio Linda) Creek. This diversion was constructed in the 1950s to alleviate flooding along the lower reaches of Magpie Creek by diverting water to Robla Creek. Robla Creek, in turn, empties into the Natomas East Main Drainage Canal (NEMDC). From this point, the NEMDC flows south to the north side of the American River, then turns west, paralleling the American River before emptying into the Sacramento River just north of Discovery Park and upstream from the confluence with the American River.

5. USEPA adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to the McClellan GWTS. The State Water Resources Control Board (SWRCB) adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP), which establishes requirements for implementation of the NTR and the CTR. On 10 September 2001, the Executive Officer issued a letter, in conformance with Section 13267 of the California Water Code, requiring the AFRPA to prepare a technical report assessing effluent and receiving water quality. A copy of that letter, including its Attachments I through IV, are incorporated into CA Order No. R5-2003-0052. AFRPA has fulfilled the above requirement by submitting the monitoring data on 26 February 2003.

6. Volatile organic compounds (VOCs) have been detected in influent groundwater, prior to treatment. Trichloroethene (TCE), tetrachloroethene (PCE), 1,2-dichloroethane (1,2 DCA), cis-1,2-dichloroethene (cis-1,2 DCE), 1,1-dichloroethane (1,1 DCA), 1,1-dichloroethene (1,1 DCE), vinyl chloride, and 1,1,1 trichloroethane (1,1,1 TCA) have been detected in the GWTS influent during the past year (January 2001 through December 2001). Hereafter, these detected VOCs will be referred to as VOC constituents of concern (VOC CoCs).

B. Effluent Requirements, Discharge from Outfall 001 to Magpie Creek, and Discharge from Outfall 002 to Don Julio Creek via Beaver Pond:

1. The discharge shall not have a pH less than 6.5 nor greater than 8.5.
2. The daily average discharge flow from Outfall 001 will not exceed 2.16 mgd. The total combined daily average discharge flow from Outfall 001 and Outfall 002 will not exceed 2.16 mgd. The daily average discharge flow from Outfall 002 will not exceed 0.144 mgd.
3. An interim mass effluent limit for mercury will be established, if necessary, based on the report required by Provision E.3. The preliminary mass limitation (Effluent Requirements B.5.) will apply after collection of 12 months of data and will be applied per 12 months on a running average for the discharge to surface waters, subject to the conditions stated below:

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

a. In calculating for compliance, AFRPA will count all non-detect measures at one-half of the detection level and apply the monthly average flow from the sampled discharge. If compliance with the effluent limit is not attained due to the non-detect contribution, AFRPA will improve and implement available analytical capabilities and compliance will be evaluated with consideration of the detection limits.

b. After collecting the initial 12 months of data, 12-month mass loadings should be calculated for each calendar month. For monthly measures, calculate monthly loadings using average monthly flow and the average of all mercury analyses conducted that month. After collecting the initial 12 months of data, AFRPA will submit a cumulative total of mass loadings for the previous 12 months with each self-monitoring report. Compliance will be determined based on the previous 12-month moving averages over the previous 12 months of monitoring.

4. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay: 70%

Median for any three or more consecutive bioassays: 90%

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

5. Effluent from Outfall 001 or Outfall 002 shall not exceed the following limits:

| <u>Constituents</u> | <u>Units</u> | <u>Daily Maximum</u> | <u>Monthly Average</u> | <u>Monthly Median</u> |
|---|-----------------------|-----------------------|-------------------------|-----------------------|
| Volatile Organic Compound CoCs ¹ | µg/L (ppb) | 1.0 ³ | --- | ⁴ |
| | lbs/day | 0.018 ⁶ | --- | --- |
| | lbs/day | 0.0012 ⁷ | --- | --- |
| Pesticides ² | µg/L (ppb) | ⁵ | --- | --- |
| Hexavalent Chromium | µg/L (ppb) | 14.1 ⁹ | 10 ⁹ | --- |
| | lbs/day | 0.25 ^{6,9} | 0.18 ^{6,9} | --- |
| | lbs/day | 0.017 ^{7,9} | 0.012 ^{7,9} | --- |
| | µg/L (ppb) | 19.5 ¹⁰ | 16.5 ¹⁰ | --- |
| | lbs/day | 0.35 ^{6,10} | 0.30 ^{6,10,11} | --- |
| | lbs/day | 0.023 ^{7,10} | 0.02 ^{7,10,11} | --- |
| Selenium (Total) | µg/L (ppb) | 8.2 ⁹ | 4.1 ⁹ | --- |
| | lbs/day | 0.15 ^{6,9} | 0.074 ^{6,9} | --- |
| | lbs/day | 0.01 ^{7,9} | 0.005 ^{7,9} | --- |
| | µg/L (ppb) | 10 ¹⁰ | --- | --- |
| | lbs/day | 0.18 ^{6,10} | --- | --- |
| lbs/day | 0.012 ^{7,10} | --- | --- | |
| Mercury | µg/L (ppb) | --- | 0.012 ⁸ | --- |

¹ The VOC Contaminants of Concern are: 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, TCE, and Vinyl Chloride.

² Those pesticides identified in Table 2d of Appendix 4 to the SIP.

³ Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment.

⁴ Less than ML's identified in Table 2a of Appendix 4 to the SIP or Section 8 of the Basewide QAPP. For compliance determination purposes, use a USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment.

⁵ Less than ML's for those pesticides identified in Table 2d of Appendix 4 to the SIP or Section 8 of the Basewide QAPP. For compliance determination purposes, use a USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment.

⁶ Limit for Outfall 001, based upon maximum daily discharge limit of 2.16 mgd.

⁷ Limit for Outfall 002, based upon maximum daily discharge limit of 0.144 mgd.

⁸ Preliminary limitation until completion of Interim Mercury Mass Limitation Report of Provision E.3.

⁹ Final limits effective 25 June 2003, unless compliance schedule justification is submitted. Otherwise, these final limits become effective 1 March 2008.

¹⁰ Interim limits effective until 25 June 2003 unless compliance schedule justification is submitted. Otherwise, these interim limitations are effective until 1 March 2008.

¹¹ This average was changed to its current value as directed by the RWQCB, Central Valley Region, in the Draft 2 GWTP O&M Manual comments letter dated 2 February 2004.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

C. Carbon Disposal:

1. Spent carbon will be sent for regeneration at an approved facility. Spent carbon and any collected screenings or other solids removed from liquid wastes will be disposed of in a manner approved by the CERCLA RPMs and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.
2. Any proposed change in disposal practice from a previously approved practice will be approved by the CERCLA RPMs.

D. Receiving Water Requirements:

The discharge shall not cause the following in Magpie Creek or Don Julio Creek via Beaver Pond:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/L (ppm). The monthly median of the mean daily dissolved oxygen concentration at this location shall not fall below 85% of saturation in the main water mass, and the 95th percentile concentration shall not fall below 75% of saturation. If the dissolved oxygen is below 5.0 mg/L, AFRPA is not required to improve the naturally occurring level.
2. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.
3. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.
4. Esthetically undesirable discoloration.
5. Fungi, slimes, or other objectionable growths.
6. The turbidity to increase as follows:
 - a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.
 - b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
 - c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.
 - d. More than 10 percent where natural turbidity is greater than 100 NTUs.
7. The normal ambient pH to fall below 6.5 or exceed 8.5.
8. The normal ambient temperature to increase more than 5°F (3°C), or exceed 90°F (32.2°C).

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

9. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
10. Deposition of material that causes nuisance or adversely affects beneficial uses.
11. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.
12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
13. Taste or odor-producing substances to impart undesirable tastes or odors to water supplies, or to fish flesh or other edible products of aquatic origin; or to cause nuisance or adversely affect beneficial uses.

E. Provisions:

1. The treatment facility will be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency. The discharge point shall be firmly anchored and repaired promptly if damaged due to flooding or other causes.
2. **Hexavalent Chromium, Selenium Compliance Schedule:** This Plan contains a compliance schedule justification for hexavalent chromium and selenium. The compliance schedule justification includes all applicable items specified by the SIP Section 2.1, Paragraph 3 (items (a) through (d)). A technical memorandum describing the “road map” for implementation of non-VOC (i.e., metals, SVOCs, and radiological compounds) Record of Decision (ROD) for groundwater will be presented for review by the CERCLA RPMs by September 2003.

The Time Critical Removal Action for hexavalent chromium will have the Ion Exchange slip-stream system installed by 30 June 2003. There will be a 6-month period of Startup and Performance testing. The Remedial Action Closure Report will be Final by 30 April 2004. The Ion Exchange should also lower the selenium levels in the effluent. Once this Plan is final, the interim limits for hexavalent chromium and selenium will be in effect until **1 March 2008**. AFRPA will submit semi-annual progress reports on **15 January** and **15 July** each year until AFRPA achieves compliance with the final water quality based effluent limitations for hexavalent chromium and selenium.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

3. **Interim Mercury Mass Limitation Report:** AFRPA will submit within 18 months of adoption of RWCQB Order No. R5-2003-0052 an *Interim Mercury Mass Limitation Report* which summarizes the flow and effluent mercury data collected.

4. **Chronic Toxicity Testing:** AFRPA will conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, AFRPA will initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, AFRPA will submit a work plan to conduct a Toxicity Reduction Evaluation (TRE) and, after the CERCLA RPMs evaluation, conduct the TRE. This plan will be revised and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the SWRCB, this Plan may be revised and a limitation based on that objective included.

5. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, AFRPA will obtain approval from the CERCLA RPMs.

F. INFLUENT MONITORING

Representative influent groundwater samples will be collected from the GWTS prior to treatment. When feasible, the influent will be collected at approximately the same time as effluent samples.

| Constituents | Units | Type of Sample | Frequency |
|--|--------------------------------------|----------------|-----------|
| Volatile Organic Compound CoC's ¹ | μg/L ³ , ppb ⁴ | Grab | Annually |
| Pesticides ² | μg/L ³ , ppb ⁴ | Grab | Annually |
| Acetone | μg/L ³ , ppb ⁴ | Grab | Annually |
| Methyl Ethyl Ketone | μg/L ³ , ppb ⁴ | Grab | Annually |
| Methyl Isobutyl Ketone | μg/L ³ , ppb ⁴ | Grab | Annually |

¹ VOC Contaminants of Concern are: 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, TCE, and Vinyl Chloride, using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment, or Section 8 of the Basewide QAPP, Method SW8260B.

² Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment, or Section 8 of the Basewide QAPP, Method SW8081.

³ micrograms per Liter.

⁴ parts per billion.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

G. EFFLUENT MONITORING (Outfall 001 to Magpie Creek and Outfall 002 to Don Julio Creek via Beaver Pond)

Effluent samples will be collected downstream from the last connection through which wastes can be admitted into the outfall. Effluent samples will be representative of the volume and quality of the discharge, including batch releases from the GWTS. A sampling point may be selected which is representative of both Outfall 001 and Outfall 002. Time of collection of samples will be recorded. The effluent monitoring will include at least the following:

| <u>Constituents</u> | <u>Units</u> | <u>Type of Sample</u> | <u>Frequency</u> |
|---|------------------------|------------------------------|------------------|
| Flow | mgd | Meter | Continuous |
| pH ¹ | pH units | Grab | Weekly |
| Electrical Conductivity @25°C ¹ | µmhos/cm | Grab | Weekly |
| Temperature ¹ | °F | Grab | Weekly |
| Dissolved Oxygen ¹ | mg/L (ppm) | Grab | Weekly |
| Volatile Organic Compound CoC's ² | µg/L, (ppb) lbs/day | Grab | Monthly |
| Hexavalent Chromium ⁴ | µg/L, (ppb) lbs/day | Grab or 24-hour composite | Monthly |
| Selenium (Total) ^{4, 7} | µg/L, (ppb) lbs/day | Grab or 24-hour composite | Monthly |
| Hardness (as CaCO ₃) ⁵ | mg/L, (ppm) | Grab | Quarterly |
| Total Dissolved Solids | mg/L, (ppm) | Grab | Quarterly |
| Total Suspended Solids | mg/L, (ppm) | Grab | Quarterly |
| Turbidity | NTU | Grab or 24-hour composite | Quarterly |
| Mercury (Total) ⁶ | µg/L, (ppb) lbs/day | Grab or 24-hour composite | Monthly |
| Cadmium (Total) ⁴ | µg/L, (ppb) | Grab or 24-hour composite | Annually |
| Total Chromium ⁴ | µg/L, (ppb) | Grab or 24-hour composite | Annually |
| Copper (Total) ⁴ | µg/L, (ppb) | Grab or 24-hour composite | Annually |
| Lead (Total) ⁴ | µg/L, (ppb) | Grab or 24-hour composite | Annually |
| Zinc (Total) ⁴ | µg/L, (ppb) | Grab or 24-hour composite | Annually |
| Basin Plan Metals (Dissolved) ⁸ | µg/L, (ppb) | Grab or 24-hour composite | Annually |
| Nitrate ⁹ | mg/L, (ppm) | Grab or 24-hour composite | Annually |
| Pesticides ³ | µg/L, (ppb) | Grab | Annually |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| <u>Constituents</u> | <u>Units</u> | <u>Type of Sample</u> | <u>Frequency</u> |
|-------------------------------------|--------------|---------------------------|------------------|
| Acetone | µg/L, (ppb) | Grab | Annually |
| Methyl Ethyl Ketone | µg/L, (ppb) | Grab | Annually |
| Methyl Isobutyl Ketone | µg/L, (ppb) | Grab | Annually |
| 1,4- Dioxane | µg/L, (ppb) | Grab | Monthly |
| <u>Acute Toxicity</u> ¹⁰ | % Survival | Grab or 24-hour composite | Semi-Annually |

¹ Field Measurements.

² VOC CoC's are: 1,1-DCA, 1,2-DCA, 1,1-DCE, cis-1,2-DCE, PCE, 1,1,1-TCA, TCE, and Vinyl Chloride. Use USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment, or Section 8 of the Basewide QAPP, Method SW8260B. Report all detectable concentrations between the Method Detection Limit and Minimum Level.

³ Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment or Section 8 of the Basewide QAPP, Method SW8081. Report all detectable concentrations between the Method Detection Limit and Minimum Level.

⁴ At a minimum AFRPA will comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the SIP. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a ML below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP or Section 8 of the Basewide QAPP, Methods 6010B/6020/GFAA. AFRPA is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is AFRPA to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the USEPA test methods.

⁵ Concurrent with metals monitoring.

⁶ Use clean sample collection techniques and USEPA Test Method 1669 or 1631, or later amendment for Mercury.

⁷ Use USEPA Test Method 7742/6020, or later amendment for Selenium.

⁸ Dissolved Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, Zinc.

⁹ Total Nitrate (as N).

¹⁰ The acute bioassays samples will be analyzed using USEPA-821-R-02-012, Fifth Edition, or later amendment. Temperature and pH will be recorded at the time of bioassay sample collection. Test species will be fathead minnows (*Pimephales promelas*). Applicable acute toxicity data derived from the three species chronic toxicity testing will be considered if appropriate.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

H. RECEIVING WATER MONITORING (Magpie Creek and Beaver Pond)

All receiving water samples will be grab samples. Receiving water monitoring in Magpie Creek and Beaver Pond is required only during periods of effluent discharge and will include at least the following:

| <u>Station</u> | <u>Description</u> |
|----------------|--|
| R-1 | 100 feet upstream from the point of discharge to Outfall 001 |
| R-2 | 100 feet downstream from the point of discharge to Outfall 001 |
| R-3 | Within 100 feet from the point of discharge to Outfall 002 |

| <u>Constituents</u> | <u>Units</u> | <u>Station</u> | <u>Sampling Frequency</u> |
|---|--------------|----------------|---------------------------|
| Flow ¹ | cfs | R-1 | Daily |
| pH ² | pH Units | R-1, R-2, R-3 | Weekly |
| Electrical Conductivity @25°C ² | µmhos/cm | R-1, R-2, R-3 | Weekly |
| Dissolved Oxygen ² | mg/L, (ppm) | R-1, R-2, R-3 | Weekly |
| Temperature ² | °F | R-1, R-2, R-3 | Weekly |
| Hardness (as CaCO ₃) ⁴ | mg/L, (ppm) | R-1, R-2, R-3 | Quarterly |
| Total Suspended Solids | mg/L, (ppm) | R-1, R-2, R-3 | Quarterly |
| Total Organic Carbon | mg/L, (ppm) | R-1, R-2, R-3 | Quarterly |
| Total Dissolved Solids | mg/L, (ppm) | R-1, R-2, R-3 | Quarterly |
| Cadmium ³ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Hexavalent Chromium ³ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Copper (Total) ³ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Lead (Total) ³ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Mercury (Total) ⁵ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Selenium (Total) ^{3,7} | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Zinc (Total) ³ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Basin Plan Metals (Dissolved) ⁸ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
| Nitrate ⁹ | mg/L, (ppm) | R-1, R-2, R-3 | Annually |
| Turbidity | NTU | R-1, R-2, R-3 | Quarterly |
| Volatile Organic Compound CoC's ¹⁰ | µg/L, (ppb) | R-1, R-2, R-3 | Quarterly |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| | | | |
|---------------------------------|-------------|---------------|----------|
| <u>Pesticides</u> ¹¹ | µg/L, (ppb) | R-1, R-2, R-3 | Annually |
|---------------------------------|-------------|---------------|----------|

¹ Estimate of receiving water flow, recorded for each day of sample collection.

² Field measurements.

³ At a minimum AFRPA will comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the SIP or Section 8 of the QAPP. For each priority pollutant use an analytical method

from the SIP, Appendix 4 or Section 8 of the QAPP, with a ML below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP or Section 8 of the QAPP. AFRPA is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is AFRPA to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the USEPA test methods.

⁴ Concurrent with metals monitoring.

⁵ Use clean sample collection techniques and USEPA Test Method 1669 or 1631, or later amendment for Mercury.

⁶ Field measurements.

⁷ Use USEPA Test Method 7742/6020, or later amendment for Selenium.

⁸ Dissolved Arsenic, Barium, Copper, Cyanide, Iron, Manganese, Silver, Zinc.

⁹ Total Nitrate (as N).

¹⁰ Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2a, or later amendment or Section 8 of the QAPP. Report all detectable concentrations between the Method Detection Limit and Minimum Level.

¹¹ Using USEPA Test Method with ML's equal to or less than ML's specified by the SIP, Appendix 4, Table 2d, or later amendment or Section 8 of the QAPP. Report all detectable concentrations between the Method Detection Limit and Minimum Level.

In conducting the receiving water sampling, a log will be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2 on Magpie Creek, and R-3 in Beaver Pond. Attention will be given to the presence of:

- | | |
|---------------------------------|--|
| a. Floating or suspended matter | e. Visible films, sheens or coatings |
| b. Discoloration | f. Fungi, slimes, or objectionable growths |
| c. Bottom deposits | g. Potential nuisance conditions |
| d. Aquatic life | |

Notes on receiving water conditions will be summarized in the monitoring reports.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

I. THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring for both Magpie Creek and Don Julio Creek will be conducted to determine whether the effluent is contributing toxicity to Magpie Creek or Don Julio Creek. The testing will be conducted as specified in EPA-821-R-02-013, Fourth Edition, or later amendment. Chronic toxicity samples will be collected from the final GWTS effluent discharge prior to its entering Magpie Creek and Don Julio Creek. Grab samples will be representative of the volume and quality of the discharge. Time of collection samples will be recorded. The effluent tests must be conducted with concurrent reference toxicant tests. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then AFRPA must re-sample and re-test within 21 days. Chronic toxicity monitoring will include the following:

Species: *Pimephales promelas*, *Ceriodaphnia dubia*, and *Selenastrum capricornutum*
 Frequency: **Once within 12 months of Plan Adoption (before June 15, 2004).**

For Magpie Creek and Don Julio Creek, AFRPA will conduct the chronic toxicity testing using 100% effluent and 2 controls. If toxicity is found in any of the effluent tests, AFRPA must immediately retest using the full sampling protocol of 5 dilutions listed below.

| Dilution Series: | <u>Dilutions (%)</u> | | | | | <u>Controls</u> | |
|-------------------------|-----------------------------|-----------|-----------|-------------|-------------|--|----------------------|
| | | | | | | Magpie Creek/ Don Julio Creek Water | Lab Water |
| | <u>100</u> | <u>50</u> | <u>25</u> | <u>12.5</u> | <u>6.25</u> | | |
| % GWTS Effluent | 100 | 50 | 25 | 12.5 | 6.25 | 0 | 0 |
| % Dilution Water* | 0 | 50 | 75 | 87.5 | 93.75 | 100 | 0 |
| % Lab Water | 0 | 0 | 0 | 0 | 0 | 0 | 100 |

* Dilution water will be receiving water from Magpie Creek and Don Julio Creek taken upstream from the discharge point. If dilution water is not available in Don Julio Creek upstream from Outfall 002, use synthetic laboratory water. (Take sample East side of Lang Avenue at Don Julio Creek).

J. REPORTING

Monitoring reports will be submitted to the Regional Board, DTSC and USEPA by the **first day** of the second month following sample collection. Semi-annual and annual monitoring results will be submitted by the **first day of the second month following each calendar semi-annual period, and year**, respectively.

In reporting the monitoring data, AFRPA will arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data will be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and should be determined and recorded.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

If AFRPA monitors any pollutant at the locations designated herein more frequently than is required by this Plan, the results of such monitoring will be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency will be indicated on the discharge monitoring report form.

By 30 January of each year, AFRPA will submit a written report to the CERCLA RPMs containing the following:

- a. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
- b. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.
- c. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the groundwater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for accuracy.

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

Appendix E

**AFRPA RESPONSES TO REGULATOR COMMENTS ON THE
DRAFT BASEWIDE VOC FS ADDENDUM**

| | <u>Page</u> |
|--|--------------------|
| Tab 1: Response to EPA Comments | E-3 |
| Tab 2: Response to DTSC Comments | E-53 |
| Tab 3: Response to RWQCB Comments | E-87 |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

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Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (TechLaw, Inc.) | | |
|--|---|---|
| No. | Comment | Response |
| SPECIFIC COMMENTS | | |
| 1 | Section 2.1.1, Changes in ROD Strategy, Page 3: It is not likely that the strategy of separating the “groundwater pathway threat” and the “surface pathway threat” will result in an earlier determination of Remedial Actions Operating Property and Successfully (OPS), given that a Record of Decision (ROD) selecting remedies for non-VOC contaminants in groundwater is currently not scheduled for completion until 2011. As a determination of OPS for groundwater remedies cannot occur prior to remedy selection and implementation for non-VOC contaminants, the assertion that the current strategy will allow for the completion of a Finding of Suitability to Transfer (FOST) in the foreseeable future requires additional explanation. | Section 2.1.1 text modified. Agree, deleted the reference to earlier parcel transfer by FOST instead of FOSET. Modified text (Section 2.2.1, second paragraph) says: “By separating the two pathway decisions (i.e., groundwater pathway threat and surface pathway threat), the Air Force believes that a VOC groundwater remedy can be selected in 2004 instead of 2006 or 2007. This would result in an earlier determination of Operating Properly and Successfully (OPS) for the VOC groundwater remedy.” See Page 3 of the Draft Final Basewide VOC FS Addendum. |
| 2 | Section 2.4.3, VOC Sites that Impact Groundwater, Pages 7 and 8: The terminology for soil gas VOC concentrations that potentially impact groundwater would benefit from some clarification. Comparison of interstitial water (leachate) and groundwater VOC concentrations are made appropriately to maximum contaminant levels (MCLs). However, subsections 2.4.3.1 and 2.4.3.3 discuss soil gas sample results greater than the MCL, which should be called the “MCL equivalent” to be consistent with terminology used in the quarterly vadose zone reports. In addition, sections 2.4.3.2 and 2.4.3.3 use the term “equivalent MCL”, which might be changed to “MCL equivalent” for consistency. Please consider applying the term “MCL equivalent” in this section | Sections 2.4.3, 2.4.3.1, 2.4.3.2, and 2.4.3.3 text has been modified to consistently use the term MCL Equivalent. See Pages 7, 8 and 9 of the Draft Final Basewide VOC FS Addendum. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (TechLaw, Inc.) | | |
|--|---|---|
| No. | Comment | Response |
| | to soil gas concentrations that produce leachate with VOC concentrations greater than MCL. | |
| 3 | Section 3.3, Water Table Level Remains Uncertain, Page 10: The presentation of an updated conceptual model based on recently stabilized water table levels is an extremely important component on the VOC FS Addendum, so this section on uncertainty would benefit from further detail. In particular, it would be beneficial to include a summary of discussions with nearby water districts regarding their plans for future pumping of groundwater. In addition, it may be useful to consider potential responses (e.g., more aggressive extraction rates) should a rising water table threaten to inundate soil vapor extraction (SVE) wells. | Section 3.3 text was modified as follows: “In discussions with Water Districts, the Air Force has found that the water districts in the vicinity of McClellan have reduced GW pumping in an effort to create an underground water reserve that can be used in drought years. Thus, it is possible that the groundwater table might even raise and impact operating SVE wells. This would tend to further increase the costs and time to complete because of the additional extraction wells necessary to contain the plumes and clean the re-contaminated shallower zones. However, the trend towards increasing urbanization of previously agricultural or sparsely populated areas could cause an increase in domestic and commercial use of groundwater that might slow down or reverse the trend towards a stabilized or rising groundwater table. The GW & SVE quarterly monitoring programs will be checking the water levels and will be able to recommend needed changes in the time to prevent remedy breakage.” See Page 12 of the Draft Final Basewide VOC FS Addendum. |
| 4 | Section 6.2.3, Long-Term Effectiveness and Permanence, Page 25: It is not clear how the risks due to institutional control (IC) failure at selected sites would be estimated to range from 10^{-3} to 10^{-4} without knowing, at a minimum, the contaminant concentrations in groundwater at the time of IC failure. The risk associated with potential exposure to contaminated groundwater would be contingent on a number | Concur. The sentence on quantitative risk at the end of the first paragraph in Section 6.2.3 was deleted. See Page 38 of the Draft Final Basewide VOC FS Addendum. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (TechLaw, Inc.) | | |
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| No. | Comment | Response |
| | of factors, including contaminant concentrations, and the degree and duration of the exposure. The estimated risks calculated for residential receptors assume an exposure duration of 30 years. It is unlikely that an IC failure at McClellan would result in exposure to contaminated groundwater for such an extended period. Accordingly, it is recommended that the quantitative estimate of risk associated with potential IC failures be deleted or additional justification for the estimate be provided. | |
| 5 | Section 6.2.6, Implementability, Page 28: Given the relatively dilute VOC concentrations likely to be present in McClellan groundwater conveyance pipelines, the conclusion regarding minimal impacts to human health appears to be supportable, but the exposure period was misstated in the text. Human health risk assessments for construction workers, the receptors most likely to be exposed to VOC-contaminated water in groundwater conveyance piping, are generally performed using a one-year exposure period, not 30 years as listed in the text. Please revise the text to correct this misstatement. | The change was made as suggested, and the last sentence of the third paragraph of Section 6.2.6 now reads, “However, because of the chronic (as opposed to acute) nature of the health effects, the impacts on human health would likely be minimal if the exposure was significantly less than the one-year exposure period assumed for the human health risk calculations for construction workers.” See Page 41 of the Draft Final Basewide VOC FS Addendum. |
| 6 | Appendix C, Tab 1, Page 123: Potential Release Location (PRL) 020 is listed twice, and it appears that the second listing should be PRL 021 (DP021). Please change the second PRL 020 to PRL 021. | Second listing of PRL 020 changed to PRL 021. See Page C-3 (Appendix C) of the Draft Final Basewide VOC FS Addendum. |
| 7 | Appendix C, Tab 1, Page 124: Base Well 18 (BW-18, CG066) is listed, but the site has been removed administratively from the McClellan site list with regulatory concurrence. Please delete BW-18 from Appendix C or explain why it should be included. | Base Well 18 (CG066) deleted from the table in Tab 1, Appendix C. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (TechLaw, Inc.) | | |
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| No. | Comment | Response |
| 8 | Appendix C, Tab 1, Page 125: PRL T-011 (ST135) is not listed, but the site is shown in the October 2003 Final Base Realignment and Closure Cleanup Plan (BCP) as a site with low contamination. PRL T011 was reportedly an underground solvent storage tank near Building 1093 in Operable Unit (OU) D. Please explain why the site is not included in the list. | The Appendix C Tab 1 table is a list of McClellan IRP Sites that have detectable VOC contamination somewhere within a 100-foot buffer around the site in the Vadose Zone. No samples in the McClellan database in or near PRL T-011 fit this criterion. The site was recommended as a no further investigation site at the end of the Phase 1,OU A RICS. |
| 9 | Appendix C, Tab 1, Page 126: Study Area (SA) 073 (WP227) is not listed, but the site is shown in the BCP as a VOC-only site (color-coded blue). SA 073 was reportedly a sump in Investigation Cluster 30 in OU A. Please explain why the site is not included in the list. | The Appendix C Tab 1 table is a list of McClellan IRP Sites that have detectable VOC contamination somewhere within a 100-foot buffer around the site in the Vadose Zone. No samples in the McClellan database in or near SA 073 fit this criterion. The color-coded table in the current BCP will be amended in the BCP currently being drafted. |
| 10 | Appendix C, Tab 1, Page 124: The Dudley Road site (WR288) is listed, but the site is shown in the BCP as a non-VOC-only site (color-coded green). Dudley Road is a radiation site in OU A. Please explain why the site is included in the list. | The Appendix C Tab 1 table is a list of McClellan IRP Sites that have detectable VOC contamination somewhere within a 100-foot buffer around the site in the Vadose Zone. Samples in the McClellan database in or near the Dudley Road Site fit this criterion. However, they do not exceed their MCL equivalent and the site is not included in the Appendix C, Tab 1 table. |
| MINOR COMMENTS | | |
| 1 | Section 4.1.1, VOC Groundwater Cleanup Level, Pages 13-14: This section includes a quotation from the VOC dispute resolution, but it is not clear where the direct quotation ends because there is no closed quotation punctuation. Please add quotation marks to close the direct quotation. | Quotation mark inserted at the end of the quote in Section 4.1.1. See Page 16 of the Draft Final Basewide VOC FS Addendum. |
| 2 | Section 5.1, Cleanup Goals for Groundwater and Section 5.3, Cleanup Goals for Unrestricted Use of Groundwater, Page | Appendix C reference changed to Appendix A, Tab 1k (page A-60 in particular), in Section 5.1. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (TechLaw, Inc.) | | |
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| No. | Comment | Response |
| | 17: These sections refer the reader to Appendix C for the Dispute Resolution Agreement, but the correct reference is Appendix A, Tab 1. Please revise the reference. | See Page 25 of the Draft Final Basewide VOC FS Addendum. |
| 3 | Figure 2, Institutional Controls Matrix, Page 20: It appears that the second header row was centered instead of right justified, as the types of institutional controls in the second row do not line up with the corresponding IC mechanisms below. Please check the alignment in the table. In addition, it is not clear how ICs will “prevent migration of contaminated groundwater” (second objective) other than preventing construction of groundwater extraction wells that might affect contaminant plume migration. Please consider clarifying this IC objective. | <p>Figure 4 (previously Figure 2 in the draft version) in Section 6.1.2 has been corrected.</p> <p>See Page 32 of the Draft Final Basewide VOC FS Addendum.</p> <p>The IC objective was clarified in response to a Joe Healy comment. A description of the objective was added to Section 6.1.2, “Prevent Migration of Contaminated Groundwater: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that prohibits installation of private wells (deed covenant) serves to achieve this IC objective. Operation of existing wells (extraction and domestic) is closely monitored by the Air Force to ensure that plume containment is maintained.”</p> <p>See Page 31 of the Draft Final Basewide VOC FS Addendum.</p> |
| 4 | Section 6.2.7, Cost, Page 29: The second paragraph appears to repeat information summarized in the previous paragraph and provided in detail in Appendix E. It is recommended that the second paragraph be deleted and a reference to Appendix E be added to the end of the first paragraph of this section. | The first two paragraphs in Section 6.2.7 were clarified in response to another regulator comment. They both now read as follows, “To estimate the costs of groundwater institutional controls, it is helpful to first examine the likely incremental cost over implementation, monitoring and enforcement of soil ICs. A key IC necessary to prevent exposure of human and ecological receptors to contaminated |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (TechLaw, Inc.) | | |
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| No. | Comment | Response |
| | | <p>groundwater is the deed covenant (use restriction) that prohibits water supply wells above or near contaminated plumes defined by the VOC Groundwater ROD. Cost for implementation of these controls is minimal, as measures to prevent the drilling of groundwater supply wells have already been adopted by the County of Sacramento (Sacramento County Code 6.28.000 G).</p> <p>An additional layer of protection specific to McClellan is the Former McClellan Air Force Base Prohibition Area described in Sacramento County Code 6.28.025.”</p> <p>See Page 42 of the Draft Final Basewide VOC FS Addendum.</p> |
| 5 | Appendix D, Page 137: The test at the end of the first paragraph refers to the VOC ROD dispute, but the dispute involved the VOC Proposed Plan. Please revise the sentence. | Comment is correct; however, Appendix D has been deleted from the document. |
| 6 | As shallow soil gas does not possess any inherent risk, a global change to the statement “risk of shallow soil gas” to “potential risks associated with shallow soil gas” is suggested. | <p>Only two occurrences were found (Sections 1.2 and 4.0) and both were changed to the suggested text.</p> <p>See Pages 1 and 15 respectively, of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
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| No. | Comment | Response |
| 1 | <p>Provided below is descriptive language regarding ICs which was developed in the March AFB ROD. Where the FS addendum addresses these issues, the descriptive language would provide a basis for describing the current view of ICs at California closing bases and would improve the clarity of much of the existing language. Note that the March ROD incorporated specific descriptions of the restrictions and the implementation monitoring and enforcement mechanism rather than incorporating those features in a post-ROD document. EPA would like to discuss whether this approach is workable for the VOC ROD.</p> | <p>As suggested, additional language was incorporated into this FS Addendum to improve the clarity of the document (some language was already incorporated based on comments from other individuals). The Air Force feels that with this incorporated language, the FS contains sufficient detail to finalize the document. Additional detail not included is more appropriate for the ROD itself. The following text was added or modified to Section 6.1.3.1:</p> <p>Section 6.1.3.1: Deed Covenants. “Deed covenants (use restrictions) are implemented upon conveyance of the property, and can be used to achieve the same institutional control objectives as the encroachment permit and easements (see Figure 4; Section 6.1.2). Deed covenants run with the land. A major deed covenant is a use restriction that prohibits the installation of private wells, which serves to achieve two IC objectives as discussed in Section 6.1.2. The deed covenants will also include a reservation of rights to access the site so a separate easement will not be required. Costs for establishing the deed covenants (writing and recording) are not included in the IC costs because these costs must be incurred to transfer the property regardless of the environmental condition. However, costs to monitor and enforce the deed covenants are included as discussed in Section 6.2.7. Costs are also included to maintain a geographic information system (GIS) database to track the status of the property with environmental contamination.”</p> <p>A new paragraph was inserted after the first paragraph of</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|----------------|--|
| No. | Comment | Response |
| | | <p>Section 6.1.3.4: “Specific language will be included in the ROD regarding implementation, monitoring, and enforcement of selected ICs. Because restrictions and the means for implementing the restrictions will be detailed in the ROD, it will not be necessary for the Air Force to submit any new post-ROD IC implementation documents such as a Land Use Control Implementation Plan. During the time between adoption of the ROD associated with this FS and deeding of the property, equivalent restrictions are implemented by lease terms, which require compliance with the Encroachment Permit program. At the moment of deed transfer, the lease restrictions will be superseded by the restrictions to be included in the federal deed and the SLUC. For any property transferred to another federal agency, the transfer document will provide that the agency will incorporate the restrictions into its land use comprehensive plan and include the restrictions in any transfer to another federal agency or future deed to a non-federal entity.”</p> <p>A new sentence was inserted after the first sentence of the last paragraph of Section 6.1.3.4. The paragraph now reads, “In the event of a violation of the deed covenants, the Air Force encroachment permit process, easements, or interference with site controls (SCs), the Air Force will request enforcement by the Department of Justice. The Air Force will notify EPA and the State via e-mail or telephone as soon as practicable, but no later than two weeks 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. Remedies would be real</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|--|--|
| No. | Comment | Response |
| | | <p>estate and contract remedies, such as specific performance and monetary damages to compensate for mitigation or alternative performance undertaken by the Air Force as a result of the violation in order to maintain the same protectiveness of human health and the environment. If the violation of the deed covenants would result in impacts to human health and the environment and if the property owner was not immediately correcting the violation, the Air Force would respond to correct the violation.”</p> <p>See Pages 34, 36, and 37 respectively, of the Draft Final Basewide VOC FS Addendum.</p> |
| 2 | <p>The current version of the FS does not describe how ICs would address contamination which has migrated beyond the current property boundary or which could be influenced by actions of adjacent property owners. The FS should acknowledge that the Air Force may need to negotiate with the owners of private property to restrict the use of contaminated or potentially contaminated groundwater as well as restricting the extraction of groundwater within certain areas/zones which could impair the effectiveness of the groundwater containment system.</p> | <p>There is a mechanism in place to restrict installation of private wells at off base properties. An example of this is the Sacramento County Code for the Consultation Zone and Prohibition Area. Based on a previous comment, Section 6.1.3.2 (Zoning and Other Ordinances) was modified to include the following, which addresses this issue, “Existing County codes are in place to prevent exposure to contaminated groundwater and migration of contaminated groundwater; no additional zoning or ordinances are envisioned at this time. The following summarizes existing codes in place to prevent exposure to contaminated groundwater and migration of contaminated groundwater: Sacramento County Code, Chapter 6.28, Section 6.28.000.G (Consultation Zone) and Section 6.28.025 (Former McClellan Air Force Base Prohibition Area) apply as it relates to well restrictions. Section 6.28.000.G reads, “Consultation Zone. Any application for a well permit within two thousand (2000) feet of a known groundwater contaminant plume is subject to</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
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| No. | Comment | Response |
| | | <p>special review by appropriate regulatory agencies, including but not limited to the Sacramento County Environmental Management Department and the California Regional Water Quality Control Board, Central Valley Regional, to evaluate potential impacts to public health and groundwater quality”. Section 6.28.025 establishes a Prohibition Area west and southwest of the McClellan western base boundary.”</p> <p>This text was also added to 6.1.3.2, Zoning and Other Ordinances: “In 1986 and 1987, McClellan negotiated with off-base residents that were on well water to supply them with municipal water supply. 550 off-base residences west of the base were given a municipal water supply connection to prevent possible exposure to contaminants (contaminants had been detected in 13 off-base wells).”</p> <p>See Page 35 of the Draft Final Basewide VOC FS Addendum.</p> |
| 3 | The ARARs table has been updated to include the State LUC regulation; however, the narrative description is lacking in a number of respects: | <p>Section 4.2 was updated to reflect a more detailed description of the SLUC as it relates to the specific requirements. Appendix D was deleted from the document. The language used is consistent with the March OU2 ROD (April 2004) and reads as follows:</p> <p>For CCR, Title 22, Section 67391.1(a): Requires imposition of appropriate limitation on land use by recorded land use covenant when hazardous substances remain on the property at levels that are not suitable for unrestricted use of the land.</p> <p>For CCR, Title 22, Section 67391.1(b): Requires that the</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|---|---|
| No. | Comment | Response |
| | | <p>cleanup decision document contain an implementation and enforcement plan for land use limitations.</p> <p>For CCR, Title 22, Section 67391.1(d): Requires that the land use covenant be recorded in the county where the land is located.</p> <p>For CCR, Title 22, Section 67391.1(i): Definitions.</p> <p>For CA Civil Code Section 1471(a) & (b): Specifies requirements for land use covenants to apply to successors in the title to the land.</p> <p>See Pages 20 of the Draft Final Basewide VOC FS Addendum.</p> |
| 4 | The State has an IC tracking system, it may be unnecessary for EPA to establish an independent tracking system. | <p>As required by Assembly Bill (AB) 871 and AB 2436, DTSC has developed and posted to its Web site, Deed Restricted Sites Lists to provide the public easy access to information on deed restrictions and affected sites. It is the Air Force's understanding that EPA prefers to maintain its own tracking database. Therefore, the reference to the EPA tracking database in Section 6.1.3.4 was not deleted. Reference to the State Sites List is now incorporated into the fourth paragraph of Section 6.1.3.4. The paragraph now reads, "U.S. EPA will maintain an oversight role to ensure that institutional controls are being implemented as intended to protect human health and the environment. U.S. EPA will review reports and maintain a tracking database. For specific institutional controls, U.S. EPA will spot check enforcement activities of other agencies, and will provide oversight (inspections and reporting) during response actions to correct</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
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| No. | Comment | Response |
| | | <p>breaches. In addition, as part of U.S. EPA’s regulatory oversight under CERCLA, U.S. EPA will be involved in the 5-year review process (planning, inspections, and review). As required by Assembly Bill (AB) 871 and AB 2436, DTSC has developed and posted to its Web site Deed Restricted Sites Lists to provide the public easy access to information on deed restrictions and affected sites. McClellan will be entered into this Sites Lists once the SLUC is signed. The State may also conduct inspections of the ICs.”</p> <p>See Pages 36 and 37 of the Draft Final Basewide VOC FS Addendum.</p> |
| 5 | The section (6.1.3.3 C) describing the State’s role on IC implementation needs to be reworked to reflect their IC regulation. | <p>The first sentence of Section 6.1.3.3 was reworded. Section 6.1.3.3 now reads as follows: Before transfer of title to the property, the Air Force will execute and record a SLUC with the State that restricts property as necessary to protect human health and the environment, pursuant to State law, including California Code of Regulations, Title 22, Section 67391.1. The SLUC will include a legal description of the property restricted, a description of the contamination left in place, a brief summary of the health risk assessment and site history, and provisions for access and enforcement. The SLUC will be based upon the State model Covenant to Restrict Use of Property. The SLUC serves to achieve the same goals and objectives as the Air Force deed covenants.”</p> <p>See Page 36 of the Draft Final Basewide VOC FS Addendum.</p> |
| 6 | Language from the March ROD (modified to eliminate site | Appropriate language from the March ROD was incorporated |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|---|--|
| No. | Comment | Response |
| | <p>specific references, may contain some language which can be deferred to the ROD). That language for the ICs Alternative is as follows:</p> <p>Specific language will be included in the 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 and the means for implementing the restrictions will be detailed in the ROD, it will not be necessary for the Air Force to submit any new post-ROD, IC implementation documents, such as a Land Use Control Implementation Plan (LUCIP).</p> <p>As part of the NPL deletion process, EPA must make the determination that remedial action for all OUs have achieved their objectives. Where ICs are a component of the remedy, EPA's determination that the remedy achieved its protectiveness objectives will be made based on the IC annual monitoring reports, so long as adequate information is provided in the report.</p> <p>The ICs Alternatives include various enforceable use restrictions and land use controls on the use of the property and groundwater. The Air Force is responsible for implementing, maintaining, monitoring and reporting the remedial actions (including institutional controls) before and after property transfer. The Air Force will exercise this responsibility in accordance with CERCLA and the National Contingency Plan (NCP). Any grantee of property</p> | <p>into this FS. See Response to Bob Carr Comment 1.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|---|-----------------|
| No. | Comment | Response |
| | <p>constricted by ICs imposed in their deed may request modification or termination of the ICs. Any modification or termination must be approved by the Air Force, USEPA, and the State of California.</p> <p>The regulatory agencies may conduct inspections of operations and maintenance activities and ICs. The Air Force will continue to provide access to the property for those purposes, as required under the Federal Facilities Agreement, and any deed transferring the property will reserve a right of access to the property for those purposes for itself, USEPA, and the State of California.</p> <p>During the time between adoption of this ROD and deeding of the property, equivalent restrictions are implemented by lease terms which require compliance with the Encroachment Permit program. At the moment of deed transfer, the lease restrictions will be superseded by the restrictions to be included in the federal deed and the State Land Use Covenant. For any property transferred to another federal agency, the transfer document will provide that the agency will incorporate the restrictions into its land use comprehensive plan and include the restrictions in any transfer to another federal agency or future deed to a nonfederal entity.</p> <p>The Air Force may contractually arrange for third parties to perform any and all of the above actions, although the Air Force is ultimately responsible under CERCLA for the successful implementation of the ICs, including monitoring,</p> | |

**Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum**

| Review Comments by: EPA (Bob Carr) | | |
|---|--|-----------------|
| No. | Comment | Response |
| | <p>maintenance, review, and reporting of ICs. The above actions will be continued under the ICs are no longer necessary or are modified due to reduction in toxicity or exposure to the contamination. Approval by the Air Force, the State, and USEPA is required for any modification or termination of ICs.</p> <p style="text-align: center;">Deed Restrictions and Reservation of Access</p> <p>In the event that any property subject to an IC is transferred, each federal deed or letter of transfer to another federal agency will include a description of the residual contamination on the property, as described in the, and the specific restrictions selected in the ROD. 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. Each deed will also contain a reservation of access to the property as required under CERCLA for the Air Force, USEPA, and the State of California, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the Air Force Installation Restoration Program (“IRP”) or the Federal Facility Agreement (“FFA”).</p> <p style="text-align: center;">Notice of Institutional Controls</p> | |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|---|-----------------|
| No. | Comment | Response |
| | <p>The Air Force will include the specific deed restriction language, included in the ROD, in any FOST for a parcel that includes on of the sites for which ICs are selected, 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 FOST and 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.</p> <p style="text-align: center;">Annual Evaluations/Monitoring</p> <p>The Air Force will conduct quarterly monitoring and undertake prompt action to address activity that is inconsistent with the IC objective or use restrictions, exposure assumptions (such as industrial use, rather than residential use) or any action that may interfere with the effectiveness of the ICs. The Air Force will submit to the regulatory agencies annual monitoring report on the status of the ICs and how any IC deficiencies or inconsistent uses have been addressed. The report will also address whether the owners and affected state local agencies were notified of the controls affecting the property. The IC monitoring reports</p> | |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|--|-----------------|
| No. | Comment | Response |
| | <p>will not be subject to approval and/or revision by the regulatory agencies. The annual monitoring reports will be used as part of the Five Year Review to evaluate the effectiveness of the remedy. The Five Year Review report will make recommendations on the continuation, modification, or elimination of annual reports and IC monitoring frequencies. The Five Year Review report will be submitted to the regulatory agencies for review and comment.</p> <p style="text-align: center;">Response to Violations</p> <p>The Air Force will notify EPA and the State via e-mail or telephone as soon as practicable, but no later than two weeks after discovery of any activity that is inconsistent with the IC objective or use restrictions, exposure assumptions or any action that may interfere with the effectiveness of the ICs. Not later than ten 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 is not subject to regulatory review. Any violations that breach federal, state or local criminal or civil law will be reported to the appropriate civilian authorities, as required by law.</p> <p style="text-align: center;">Enforcement</p> <p>The regulatory agencies may conduct inspections of the ICs. Prior to property transfer, the Air Force will provide access to the regulatory agencies for the purpose of inspections. The</p> | |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|--|-----------------|
| No. | Comment | Response |
| | <p>deed transferring property or letter of transfer to another federal agency will provide for such access to the regulatory agencies. Any activity that is inconsistent with the IC objective or use restriction, exposure assumptions 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 Department of Justice to enforce such rights. State law gives the State separate enforcement authority against future landowners. See “State Land Use Covenants,” below.</p> <p style="text-align: center;">Approval of Land Use Modification</p> <p>The recipient of the property will obtain joint approval from the Air Force, USEPA, and the State of California for any proposals for modification of ICs or for any proposal for a modification of land use at a site inconsistent with the use restrictions and assumptions described in the ROD.</p> <p style="text-align: center;">State Land Use Covenants</p> <p>Before transfer of title to the property including one or more of the sites at which ICs are selected to a non-federal entity, the Air Force will execute a State Land Use Covenant with</p> | |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|---|-----------------|
| No. | Comment | Response |
| | <p>the State that includes the restrictions described in Section 9, 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 California Code of Regulations, title 22, section 67391.1. The State Land Use Covenant will be based on the model Covenant to Restrict Use of Property developed by DTSC. Modifications or termination of the State Land Use Covenant must be undertaken in accordance with State law, CERCLA, the National Contingency Plan, and the Installation Restoration Program. In addition, title 22, California Code of Regulations 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. The Air Force will pay the State of California reasonable, nondiscriminatory costs associated with administration of the State Land Use Covenants, subject to appropriation of funds through the Defense Statement Memorandum of Agreement or some alternative payment mechanism.</p> <p>"Nondiscriminatory costs" means costs similar to those paid</p> | |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Bob Carr) | | |
|---|---|-----------------|
| No. | Comment | Response |
| | by other parties for such land use covenant administration. | |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| GENERAL COMMENTS | | |
| A | EPA believes that your draft version satisfactorily addresses the need of the FS Addendum to update the 1999 VOC FS and support a Proposed Plan. To the degree that you can incorporate improvements to this document as required in our comments, you will improve the general quality and clarity of the record that supports your anticipated Proposed Plan. Although the ARARs table has been updated, the narrative discussion of ICs needs to be revised. Some of the details regarding IC implementation may be included in the ROD rather than the FS Addendum. | Concur with your assessment of document. Narrative discussion of ICs has been revised based on State and EPA comments. |
| B | EPA expects you to address State concerns and provide a final version according to the current FFA schedule. I am concerned that solutions to potential disagreements between the Air Force and RWQCB over language about ARARs and the 2001 dispute resolution have not been aggressively pursued following my April 2, 2004 email to you. The email was titled "Tone of VOC FS Addendum and RWQCB ARARs." As the lead agency, please use the Legal Tiger Team to help produce a final version of the VOC FS Addendum in a timely and effective manner. | The document was revised to address State concerns. The ARAR table was restored to original version and updated for new regulations. ARAR issues will be resolved in the ROD. The Legal Tiger Team does not exist anymore. |
| C | Section 4.0 provides an update of the ARARs analysis in a rather indirect manner. While it is understandable and practical to present changes to the 1999 analysis in the form of Appendix D, there is no summary information presented directly in Section 4.0 as to the key reasons for those changes. The other key example of this indirect style is your | Section 4.1.3 was modified to include the Air Force ARAR discussion from the letter into the text of the document, and the State and EPA comments on ARARs. Added Agree to Disagree Section 4.1.3.4. See Pages 16-19 of the Draft Final Basewide VOC FS |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | <p>discussion of the Air Force position and interpretation related to the dispute that appears only in the cover letter. You seem to prefer forcing the reader to draw their own conclusions from rather lengthy documents produced years earlier and now provided without updated commentary in Appendix A. Move the ARAR discussion from your cover letter into Section 4.0 and provide space for other parties (e.g., RWQCB) who might want their opinion expressed in an immediately adjacent section of the main text. Remember, a BCT goal is to move to public comments and a draft ROD as soon as possible by avoiding dispute on the FS addendum using agree to disagree language where appropriate. The reader should not have to delve deeply into appendices to determine whether or not the parties still agree or perhaps disagree on elements of the ARAR analysis needed for a 2004 ROD.</p> | <p>Addendum.</p> <p>4.1.3.1 Air Force Interpretation</p> <p>To the Air Force, incorporation of the VOC Proposed Plan dispute decision into the VOC FS Addendum means the following:</p> <p style="margin-left: 40px;">a. The McClellan VOC Proposed Plan was resolved by consensus of the Senior Executive Committee. The parties acknowledged in the consensus statement that Section III.G of State Water Resources Control Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Basin Plan [relevant and appropriate] ARARs for the McClellan VOC Record of Decision. The Air Force has recognized Section III.G of Resolution 92-49 as a potential ARAR for cleanups at other former Air Force bases in California and AFRPA expects to do so in the future.</p> <p style="margin-left: 40px;">b. The Air Force has not, in other instances, recognized the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR, and AFRPA considers the recognition of it in the McClellan VOC Proposed Plan consensus statement to be limited to that dispute and resolution. In the case of McClellan VOC plumes, it does not require anything more than is required by Resolution 92-49. Its inclusion in the consensus statement was unnecessary, but in that instance, harmless. In other situations, as to other contaminants, it may not be accepted as a potential ARAR.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>c. In the case of the McClellan VOC plumes, AFRPA determined that the federal MCL for TCE (5 ppb) met the requirements of Resolution 92-49 and the Basin Plan’s narrative toxicity objective. EPA agreed with that determination.</p> <p>d. As a compromise, the parties agreed that in the case of the McClellan VOC plumes, the Air Force will proceed with cleanup until the plumes reach 5 ppb TCE, and then will complete a report that evaluates the technological and economic feasibility of continuing remediation until plume levels reach 2.3 ppb. The Air Force considers that agreement to be specific to the McClellan cleanup. Consideration of the technological and economic feasibility of cleaning up to a level lower than MCLs at any other site would be, as it was at McClellan, a site-specific decision based on the lead agency’s discretionary determination, in consultation with the regulatory agencies, of the cleanup levels that meet the requirements of Resolution 92-49 and other ARARs, if any.</p> <p>4.1.3.2 Environmental Protection Agency Interpretation</p> <p>EPA agrees with the 2001 SEC statement, “The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as ARARs for the McClellan VOC Record of Decision.” Because this discussion took place several years ago and ARARs are not set until a ROD is signed, EPA would recognize a</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>continuation of that discussion during the FS and Proposed Plan stages and during the preparation of the draft ROD. Certainly, at the time of a FS and prior to a Proposed Plan, portions of both 92-49 and the Basin Plan could be considered “Potential ARARs” since no final decisions have been made. A FS does not force the selection of specific ARARs.</p> <p>EPA not only still believes that both potential ARARs result in a 5 ppb cleanup for TCE, but also believes that the ARARs would likely result in MCLs for all contaminants of concern because of the new information about the water table that is presented in the VOC FS Addendum. EPA sees no problem with continuing to support the 2001 dispute resolution not only for TCE, but also for the other contaminants as well. EPA believes the FS Addendum should provide that the FFA parties could agree to proceed with cleanup to MCLs until such time as the MCL for all contaminants has been achieved in each plume as defined by the BRAC Cleanup Team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, would agree within 60 days to complete an analysis and prepare a report (using agreed upon models), which evaluates the technical and economic feasibility (TEF) of continuing remediation until plume levels reach 2.3 ppb TCE or other 1×10^{-6} levels for other contaminants. After the report, the parties would have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facility Agreement. For the purposes of the FS</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>Addendum, EPA sees no reason to modify the language of the 2001 dispute resolution, although an expansion of the concept to include the other contaminants makes sense to EPA.</p> <p>EPA fully supports the START and STOP text that was worked out over many years and was agreed to during the 2000 Alternative Dispute Resolution process by the McClellan FFA parties. EPA sees no reason to tinker with such language prior to the ROD, because the main question that drives the decision of when to start or stop SVE systems will remain the same (i.e., is it cheaper or quicker to rely solely on groundwater extraction and treatment to remove targeted VOC mass from the subsurface?).</p> <p>4.1.3.3 State Interpretation</p> <p>The McClellan VOC Proposed Plan dispute was resolved by consensus of the Senior Executive Committee (SEC). The consensus statement states that, <i>“The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as Applicable or Relevant and Appropriate Requirements (ARARs) for the McClellan VOC Record of Decision.”</i> Board staff strongly disagrees with the Air Force’s Interpretation for incorporating the VOC Proposed Plan dispute decision into the VOC FS Addendum. The Air Force interpretation states that, <i>“The Air Force has not recognized</i></p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p><i>the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR....”</i>. Board staff believes that the dispute resolution language is clear and unambiguous and states precisely that the narrative toxicity objective in Chapter III of the Basin Plan <u>is</u> an ARAR for the McClellan VOC ROD. The dispute resolution was a compromise between the Air Force, U.S. Environmental Protection Agency (EPA), and the Regional Board to resolve the nearly two-year long dispute. The Air Force’s interpretation of the dispute resolution is clearly contrary to the dispute resolution language and serves to undermine the dispute resolution process, the spirit of compromise, and good faith efforts of the SEC. Therefore, Board staff requests that the VOC FS Addendum be revised to recognize the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR for the McClellan VOC ROD.</p> <p>The Air Force interpretation states that, <i>“In other situations, as to other contaminants, it (the narrative toxicity objective in Chapter III of the Basin Plan) may not be accepted as a potential ARAR.”</i> The SEC parties recognized Section III.G of State Board Resolution 92-49 and the narrative toxicity objective in Chapter III of the Basin Plan as ARARs for the McClellan VOC ROD. As to other contaminants, Board staff believes that based on the dispute resolution agreement and applying these ARARs to the other groundwater VOC contaminants of concern (COCs), the Air Force must evaluate the technical and economic feasibility of achieving Water Quality Limits (WQLs) that are more stringent than maximum contaminant levels (MCLs) for each VOC COC. Then based on the results of this evaluation, the appropriate</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>cleanup level can be selected. Since the cleanup of groundwater contaminated with TCE will most likely drive the cleanup of other groundwater VOC COCs (with the exception of carbon tetrachloride), the final cleanup levels for the other VOC COCs will not likely drive the decision on when to terminate the groundwater remedy. Therefore, consistent with the dispute resolution, Board staff could accept MCLs as the cleanup level for other VOC COCs in the VOC Groundwater ROD under the same conditions as described in the dispute resolution for TCE.</p> <p>Specifically, the dispute resolution states in agreement Number 2: <i>“Under the currently available specific facts at McClellan, the Air Force and EPA believe that both ARARs result in a cleanup standard of 5 parts per billion (ppb) TCE, based primarily on economic feasibility. The State believes that application of both ARARs results in a cleanup standard of 2.3 ppb TCE. The Record of Decision will state 5 ppb as the cleanup standard for TCE. The parties agree to proceed with the cleanup as proposed by the Air Force until such time as 5 ppb is achieved in each plume, as defined by the BRAC Cleanup Team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, agrees within 60 days to complete an analysis and prepare a report (using agreed upon models), which evaluates the technical and economic feasibility of continuing remediation until plume levels reach 2.3 ppb TCE. After the report is complete, the parties will have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the</i></p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p><i>dispute resolution provisions of the Federal Facilities Agreement.” Therefore, for VOC COCs other than TCE, the groundwater cleanup would proceed as proposed by the Air Force until such time as the MCL for a particular VOC COC is achieved in each plume. The same process for evaluating the technical and economic feasibility of achieving cleanup levels at the WQLs would be followed, including the preparation of an analysis report (using agreed upon models) within 60 days of the Air Force notifying the parties that the MCL has been achieved in a particular plume and that subsequent extraction well shut down is proposed.</i></p> <p>4.1.3.4 Agree to Disagree Language</p> <p>The FFA parties agree that the issues presented in sections 4.1.3.1, 4.1.3.2, and 4.1.3.3 will not be disputed at this time and will be dealt with in the VOC Basewide Groundwater ROD.</p> |
| D | <p>Similar to the preceding general comment, another example of doing too much referencing to appendices comes in Section 5.0 where you refer the reader to Appendix C for the Dispute Resolution Agreement. The reader should instead be presented with some summary information in the main body of the text, which is where most readers will go first. An additional couple of sentences could have easily explained the potential for a plume cleanup to go to a lower concentration than MCLs in the future event that a technical and economic feasibility analysis of continuing the remedy to 2.3 ppb TCE convinced the FFA parties to do so. This in fact was a key point to the compromise made as part of the</p> | <p>Section 5.1 was revised to include a sentence that discusses the potential of going to a lower level. The first paragraph of Section 5.1 now reads, “The cleanup goals for VOC contaminants in groundwater are the Federal and/or State MCLs, whichever is more stringent. The Dispute Resolution did set up a process for plume cleanup to potentially go to a lower concentration than MCLs in the future event that a technical and economic feasibility analysis of continuing the remedy to 2.3 ppb TCE convinced the FFA parties to do so. The Air Force believes that the Dispute Resolution only applies to TCE and that only the State and Federal MCLs are applicable to other VOCs. The State does not agree with this</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | dispute resolution. Why make the reader go back and try and figure this out on their own when they are faced with over 50 pages of documents and no annotated roadmap as to what they are viewing and why! Besides, I think you meant to refer them to Tab 1 of Appendix A. | interpretation (See Section 4.0). Also, Refer to Appendix A Tab 1 (page A-60 in particular) for Dispute Resolution Agreement.” See Page 25 of the Draft Final Basewide VOC FS Addendum. |
| E | The institutional control matrix presented in Figure 2 was discussed at great length during a meeting of the FFA parties and their attorneys in 2003 at McClellan. All three separate parts of that matrix (i.e., objectives, types, and the “X”s) should be discussed in more detail. My specific comments will provide examples of the desired level of detail. | See responses to Specific Comments 26, 27, 28, and 29. |
| F | The presumptive remedies of groundwater extraction and soil vapor extraction both have treatment components for the extracted media. The FS addendum should clearly state the cleanup goals for the treated groundwater effluent and the treated air emissions by listing the expected standards as concentrations for each of the chemicals of concern. If any of these cleanup levels is dictated by an ARAR, that ARAR should be discussed in the 1999 FS. The important thing is to make sure the public is provided with up-to-date analysis of the ARAR or other requirements (e.g., risk assessment procedures required by the Air Quality Management District?). This information will be required in the ROD and should be available for public comment at the time of the Proposed Plan. | Section 5.5 Groundwater Treatment Plant Requirements, and Section 5.6 Air Emission Requirements were added to the document. See Page 28 of the Draft Final Basewide VOC FS Addendum. 5.5 Groundwater Treatment Plant Requirements The groundwater treatment plant requirements are contained in the McClellan Operations and Maintenance (O&M) Manual and Addendum. The substantive requirements are provided in Appendix D. These requirements are reviewed periodically by the State, EPA, and Air Force and updated accordingly. An investigation to determine the extent of 1,4-dioxane contamination is currently ongoing using a phased approach. Generally, the wells with the 1,4-dioxane |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>concentrations greater than Federal Preliminary Health Advisory Goal of 6.1 µg/L have been located within or close to a TCE plume. Currently, results do not suggest that 1,4-dioxane has generally migrated down gradient of the TCE target areas. The treatment processes currently in place at the GWTP reduce effluent discharge levels below the 6.1 µg/L level.</p> <p>5.6 Air Emission Requirements</p> <p>Periodic source testing is performed at all SVE and groundwater treatment systems to ensure compliance with the New Source standards contained in Section 301 of the Sacramento Metropolitan Air Quality Management District's Rule 202. It specifies that new sources must apply Best Available Control Technology (BACT). BACT is defined in Section 301.1 as any system capable of achieving specific effluent limits for contaminants including reactive organic compounds, nitrogen oxide, sulfur oxide, PM10 and carbon monoxide. Each of these compounds is monitored at each treatment system and totaled across the base. McClellan AFB has consistently met the BACT requirement on a base wide basis.</p> |
| | SPECIFIC COMMENTS | |
| 1 | <p>Title page: The draft final version of this document should no longer contain EPA as one of the authors of the document. This must clearly become an Air Force document that the Air Force takes full responsibility for. The preliminary draft</p> | <p>Modified Title page accordingly.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | text, prepared by EPA and submitted to the Air Force for consideration in the draft, were provided in the spirit of advance comments available for the Air Force to incorporate in its draft document. This effort was intended to save the Air Force time from developing those sections from scratch and to potentially reduce the number of comments EPA or other regulators might have on the draft sections developed by the Air Force from EPA's preliminary draft. I think we large succeeded in these two goals. | |
| 2 | Page I, Table of Contents, Section 4.1.2: Insert "and how" immediately preceding "they Impact". | Text modified to say: "4.1.2 SVE Turn-on (Start) and Turn-off (Stop) and How They Impact Groundwater Decisions for VOCs" See Page i (Contents) of the Draft Final Basewide VOC FS Addendum. |
| 3 | Page 4, top paragraph: You could refer the reader to the Initial Parcel ROD #2 which will also be available to address IC issues, and possible could occur before the SSG breakout ROD or this VOC ROD to resolve their possible disputes. | Section 2.1.2, first paragraph, was modified to include: "The Initial Parcel ROD Group #2 and the Shallow Soil Gas Breakout ROD are upcoming RODs that will help resolve possible Institutional Control issues." See Page 4 of the Draft Final Basewide VOC FS Addendum. |
| 4 | Page 4, Section 2.1.2, last sentence: Change to read: "dealt with in parcel FS and ROD documents." | Section 2.1.2, last paragraph, was modified and now says: "The Parcel RODs have been modified to now include the Indoor Air Inhalation Pathway as part of the FS analysis. Shallow Soil Gas (0-15 feet below ground) will be dealt with in parcel FS and ROD documents." See Page 4 of the Draft Final Basewide VOC FS Addendum. |
| 5 | Page 4, Section 2.1.3, first paragraph, second to last sentence: | Section 2.1 was modified to include a global comment for the |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | Consider inserting “vapor intrusion” between “shallow soil gas” and “pathway”. Perhaps there is a better way of stating this throughout the document (e.g., indoor air vapor intrusion pathway), or simply stating near the beginning of the document what “the shallow soil gas pathway” will mean in this document. | document. The text now says: “However, the 1999 Basewide VOC FS did not completely discuss potential land use restrictions. It also did not discuss unrestricted use goals for the shallow soil gas vapor intrusion migration pathway into indoor air (referred to as Shallow Soil Gas Pathway in the remaining portions of this document).” See Page 3 of the Draft Final Basewide VOC FS Addendum. |
| 6 | Page 5, top paragraph: Combine the last two sentences with an “and” to read: “... STOP processes, and the FFA parties...”. | Correction was made (Section 2.1.3, second paragraph). See Page 4 of the Draft Final Basewide VOC FS Addendum. |
| 7 | Page 5, second paragraph: Insert “the” into the last sentence to read: “... requirements of termination for the groundwater pathway ...”. | Correction was made (Section 2.1.3, third paragraph). See Pages 4 and 5 of the Draft Final Basewide VOC FS Addendum. |
| 8 | Page 6, Section 2.2.2, second paragraph: Near the end of the paragraph, change to read: “is contaminated with elevated levels of 1,4-dioxane.” Also change to read: “ ... (GWTP) is currently treating these elevated 1,4-dioxane levels ...”. | Text change was made to Section 2.2.2, second paragraph. The text now says: “A portion of the VOC extracted GW is contaminated with elevated levels of 1,4-dioxane. The Groundwater Treatment Plant (GWTP) is currently treating these elevated 1,4-dioxane levels prior to discharge to Magpie Creek.” See Page 6 of the Draft Final Basewide VOC FS Addendum. |
| 9 | Page 6, Section 2.3, second paragraph, fourth sentence: Change to read “A breakout VOC ROD will address shallow soil gas.” | DTSC specific comment 14 revised this paragraph extensively. Section 2.3 has been revised to say: “One other IROD has been completed for polychlorinated biphenyl (PCB)-contaminated soil at Operable Unit (OU) B1; was signed in 1993. Two RODs have been completed: <ul style="list-style-type: none"> o Six Site No Action ROD was signed in 2003 |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <ul style="list-style-type: none"> ○ Seven Site LRA Initial Parcel Non-VOC Group #1 ROD signed in 2004 <p>Eight additional RODs are currently planned for completion over the next 8 years. All these RODs focus on soil contamination. Additional studies planned for these RODs are not anticipated to find new sources of groundwater contamination, although they will all consider this possibility. In the event that additional groundwater concerns are uncovered, they will be addressed in the Non-VOC Groundwater ROD or by an amendment to the Basewide VOC Groundwater ROD.</p> <ul style="list-style-type: none"> ○ Two of these RODs address sites in the LRA Initial Parcel. ○ A Breakout ROD will address shallow soil gas. ○ Two other RODs will focus on particularly troublesome sites, Confirmed Site (CS) 10 and Building 252. ○ The final three RODs will focus on small volume sites, large volume strategic sites (e.g., large disposal pit areas), and ecological areas.” <p>See Pages 6 of the Draft Final Basewide VOC FS Addendum.</p> |
| 10 | Page 7, Section 2.4.2, last sentence: Change to read “Additional shallow soil gas characterization work ...”. | <p>The last sentence of Section 2.4.2, was revised to say, “Additional shallow soil gas characterization work is currently underway at McClellan, which may identify additional VOC sites.”</p> <p>See Page 7 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| 11 | Page 10, Figure 1: Change the legend on the y-axis or add an additional legend on the other end of the graph using units of feet below ground surface (bgs) because this is what you introduced to the reader in the first paragraph of Section 3.1. Also, if you retain the MSL units, define them in the text or on the figure. | Figure 1 was modified accordingly. See Page 12 of the Draft Final Basewide VOC FS Addendum. |
| 12 | Page 14, end of Section 4.1.1: It seems like you would need to add closing quotation marks after the final sentence, assuming that entire section is a direct quotation. If that is the case, the quoted paragraphs should be introduced in the beginning line of this section (on page 13) which a reference to the document from which it is extracted. | Quotation mark inserted at the end of the quote in Section 4.1.1. See Page 16 of the Draft Final Basewide VOC FS Addendum. |
| 13 | Page 14, Section 4.1.2: Replace “It was agreed” with the following: “Using alternative dispute resolution, the FFA parties agreed”. | Section 4.1.2 text modified to say: “Using alternative dispute resolution, the FFA parties agreed to use the Start/Stop process described in Appendix A as the criteria for determining at which sites, SVE operations should commence, and once operational, when those operations should terminate.” See Page 16 of the Draft Final Basewide VOC FS Addendum. |
| 14 | Page 14, new Section 4.1.3: Perhaps this new section could be titled “Current Status of Interpretations of Dispute Resolution Agreements”. Whatever you call it, or wherever you locate it within Section 4, you must compare your current thinking, presumably presented in the cover letter to this draft document, with the current thinking of the RWQCB, which you would need to request. We all know this remains somewhat controversial of a topic and you must try to find a | Modified title of Section 4.1.3 to say: “FFA Parties’ Interpretation What the Dispute Resolution Means” See Page 16 of the Draft Final Basewide VOC FS Addendum. See response to Healy General Comment C for description of the FAA parties’ interpretations. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | way of all sides having their views expressed side by side, maybe concluding with some agreed to disagree language. At least, point the reader to the ROD as the place where final resolution, if needed, will likely occur. | |
| 15 | Page 14, Section 4.2: Please add more analysis or information on the nature of the State Land Use Covenant in this section or a subsequent section. This topic has had a recent history which might be relevant to briefly discuss. Certainly you should make sure the reader understands in Section 4 what may have been controversial before and now is no longer controversial. | This section was updated extensively. See response to Bob Carr's Comment 3. See Page 20 of the Draft Final Basewide VOC FS Addendum. |
| 16 | Page 15, Section 4.3, first paragraph: Refer the reader to an appendix for this VOC FS Addendum, and include in that appendix the discharge standards for the discharge of COCs (including hexavalent chromium) in the treated groundwater effluent. This will be required in the ROD and should be clearly presented to the public in support of the Proposed Plan. | The following sentence was added to the first paragraph of Section 4.3: "Refer to Appendix D for the substantive requirements." Also, Appendix D was added to the document to show what the current substantive requirement." See Page 22 of the Draft Final Basewide VOC FS Addendum. |
| 17 | Page 17, Section 5.1, new sentence after first sentence: Insert a new sentence or sentences. The first new sentence should start with the word "However," and your subsequent inserted text should summarize the second half of the paragraph labeled "(2)" in the December 5, 2001 dispute resolution statement shown on page 94 of Appendix A. You might even be able to lift some of that text directly out of the dispute resolution statement to most accurately reflect the results of the resolution as to what the cleanup goal should be. Leaving this information out of the main body of the text of this FS | The first paragraph of Section 5.1 was modified as follows: "The cleanup goals for VOC contaminants in groundwater are the Federal and/or State MCLs, whichever is more stringent. The Dispute Resolution did set up a process for plume cleanup to potentially go to a lower concentration than MCLs in the future event that a technical and economic feasibility analysis of continuing the remedy to 2.3 ppb TCE convinced the FFA parties to do so. The Air Force believes that the Dispute Resolution only applies to TCE and that only the State and Federal MCLs are applicable to other VOCs. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | addendum probably unnecessarily irritates the RWQCB and certainly hides the ball from members of the public who might read this section. The results of two years of intense negotiation effort deserves to be stated in plain view. | The State does not agree with this interpretation (See Section 4.0). Also refer to Appendix A Tab 1 (page A-60 in particular) for Dispute Resolution Agreement.” See Page 25 of the Draft Final Basewide VOC FS Addendum. |
| 18 | Page 17, Section 5.1, second sentence: Change to read “Refer to Appendix A (page 93 in particular) for the Dispute Resolution Agreement.” | See Response to Healy Comment 17. |
| 19 | Page 17, Section 5.2, bracketed text: Please remove the brackets. I suggest changing part of that sentence to read “... to help achieve a prescribed total risk value (e.g., 10^{-6}) for a parcel ...”. As I understand it, you are rarely, if ever, expecting the total risk from all residuals in all media combined after cleanup is complete to exceed 9.4×10^{-6} , and thus could make the statement I suggested. You might want to double check with DTSC to be certain that they share my understanding of the documents you reference in Appendix A. | The fourth sentence in Section 5.2 was modified to say: “Thus, the Air Force does not expect to change groundwater cleanup goals in the future to help achieve a prescribed total risk value (e.g., 10^{-6}) for a parcel, all media and contaminants combined.” See Page 25 of the Draft Final Basewide VOC FS Addendum. |
| 20 | Page 17, Section 5.3, second sentence: Replace the entire second sentence with: “Refer to Section 5.1 above.” | Section 5.3 was modified to say: “The VOC cleanup goals for unrestricted use of groundwater are the State and Federal MCLs. Refer to Section 5.1 above.” See Page 25 of the Draft Final Basewide VOC FS Addendum. |
| 21 | Page 17, Section 5.4: I did not understand the text presented in Appendix E and I suspect some members of the community will have similar difficulties understanding it. The main body of the text needs to explain the meaning of | Section 5.4 was modified extensively. Figures were included to show Prohibition Zones. Appendix E was deleted since there was no longer a need for it. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | Appendix E, as well as other boundaries that might apply, in a manner more easily understood by the public (e.g., maps). A map with two differently shaded areas could distinguish the 2000 foot buffer zone from the boundaries described for the “Former McClellan Air Force Base Prohibition Area”. What is the difference between these two areas in terms of restrictions? Property owners and other community members should be able to tell how close their property interests are to the restricted areas. | See Pages 25-27 of the Draft Final Basewide VOC FS Addendum. |
| 22 | Page 17, Section 5.4: Are there any other types of areas that should be presented on maps to indicate compliance boundaries for other types of ICs? For example, are the MCL plume boundaries used for prohibitions on the operation or use of existing wells for drinking? Are there areas for which major pumping of large production wells is prohibited? If so, show these on maps and briefly discuss them. Property owners and other community members should be able to tell how close their property interests are to the restricted areas. | There are no other restricted areas currently in affect. |
| 23 | Page 17, Section 5.4: The Consultation zone in Appendix E is defined by a 2000 foot zone around a “known groundwater contaminant plume”. What contaminant concentrations recognized by Sacramento County defines the “plume”. Would the County want concentrations different from MCLs (e.g., non detect, and if so, what analytical method)? Has the County approved a map you produced to show that you understand this area. | The Consultation Zone was added to Section 5.4 (see response to Healy comment 21) and the following sentence was added to the new Section 5.4.1: “The edge of the contaminated plume is based on State Water Quality Objectives.” The County receives plumes maps from the RWQCB. See Page 26 of the Draft Final Basewide VOC FS Addendum. |
| 24 | Page 17, Section 5.4: Section F of the Sacramento County Code, Chapter 6.28 (Appendix E) needs clarification as to | Section F of the Sacramento County Code, Chapter 6.28 (Appendix E) does not apply to McClellan contaminated |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | how it would apply to McClellan especially in terms of boundaries. I would like to think that a person who discovers contamination would not report it because they are in a consultation zone of McClellan's plumes. I don't see how DTSC would find out on their own, as could be implied from Section F, unless what is meant is that DTSC was directly overseeing that person's drilling operation. | plumes. McClellan plumes and wells are overseen by DTSC and RWQCB. |
| 25 | Page 17, Section 5.4: Subsequent comments address differences between a list of institutional control objectives prepared in 2003 and the shorter version that you present in Figure 2 of this draft VOC FS Addendum. For example, the IC Objective "provide right of access to perform verification sampling for compliance" is probably more difficult for those properties off base that the Air Force does not own. A map showing those off base areas that the Air Force will likely need access for installing and monitoring or sampling a boring or well, or to sample an existing well should be included. This would allow property owners to see how close they might be to possible future activity or even current routine monitoring activity. They should have an opportunity to comment on this during the Proposed Plan comment period. | Section 5.4 was rewritten as follows: "Groundwater use restrictions are adequately described in the Final Basewide VOC FS. There are two groundwater use restricted areas of particular interest that are described in Sacramento County Well Ordinance (Sections 6.28.000G, and 6.28.025), and City of Sacramento Ordinance 86-080 (C) and (D). Also shown on Figure 2 is the current location of the groundwater plume (above and below MCL). The Air Force has installed a network of monitoring wells within and outside of the plume area to ensure the plume is contained. In the future, if needed, additional monitoring wells, or sampling activity could be implemented to ensure groundwater cleanup is completed." See Pages 25 and 26 of the Draft Final Basewide VOC FS Addendum. |
| 26 | Page 20, Section 6.1.2, Figure 2: This figure is quite different from the one that all the parties jointly agreed on at a working meeting in 2003 at McClellan. Why did you reduce the number of Institutional Control Objectives listed in the left-hand column of the table? Why did you add a different objective than appeared in the July 30, 2003 version | The changes to the matrix table (July 30, 2003 version) are a result of comments received from AFRPA Headquarters during the preparation of the AFRPA LUC/IC Management Plan. These changes were presented to the BCT in a handout at the November 5, 2003 BCT Meeting. The rationale for the changes is as follows: |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | of the table that we had previously agreed on? | <p>(1) “Provide information to stakeholders” and “Ensure long-term IC monitoring is performed” were removed as objectives because these are not LUC/IC goals or objectives, but rather are processes used to ensure that the goals and objectives (prevent exposure to contamination and disturbance of systems) are met. These processes are included in the LUC/IC Management Plan. For example, the Communications Plan (Appendix A of the LUC/IC Management Plan) talks extensively about providing information to stakeholders, and Section 5 of the LUC/IC Management Plan describes LUC/IC Monitoring. LUC/IC monitoring will also be discussed in the ROD as was done for the March AFB ROD.</p> <p>(2) The “Rights of Access” objectives were also removed because these items are more appropriately classified as LUC/IC layers that should be identified as controls for other LUC/IC Objective/Goals. These are in fact included as “Reservation of Access” clauses in the deed. Figure 4 of Section 6.1.2 annotates this under the deed covenant IC type. The “Rights of Access” are also included as site controls in the AFRPA LUC/IC Management Plan for some of the objectives listed in Figure 4 of Section 6.1.2.</p> <p>(3) “Prohibit installation of private wells” is a use restriction that is put in place to achieve the LUC/IC goals and objectives (e.g., preventing exposure, preventing migration of contamination) and, therefore, was removed as an LUC/IC objective.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>(4) “Prevent migration of contaminated groundwater” was added as an LUC/IC objective because the Air Force felt that this was not covered under any of the other objectives, which focused on exposure to contamination and disturbance of systems. The use restriction that prevents installation of private wells (deed covenant) as mentioned in item (3) above is one IC type used to achieve this objective.</p> <p>See Page 30 of the Draft Final Basewide VOC FS Addendum.</p> |
| 27 | <p>Page 20, Section 6.1.2, Figure 2: The types of individual controls listed along the top of the table shown in Figure 2 are all discussed in detail in Section 6.1.3. However, the Institutional Control Objectives listed in the left-hand column of the table are not discussed in detail in this section or elsewhere in the Addendum. They are also not discussed in detail in the 1999 FS. Add text to this section that explains them and also explains the objectives that were removed from the table in its July 30, 2003 version and why they are no longer considered objectives.</p> | <p>Section 6.1.2 was rewritten as follows to address comment: “The 1999 Basewide VOC FS provided a list of general and specific remedial action objectives. Since then, the FFA parties met and organized the specific IC objectives into a chart (Figure 4; Section 6.1.2) showing the type of ICs available to address each objective. This chart has evolved over the last year and was revised as a result of Air Force comments/input during the preparation of the AFRPA Land Use Control/Institutional Control (LUC/IC) Management Plan. The resulting Figure 4 chart is different from the July 30, 2003 version presented to the BCT regulators, and the changes were presented to the BCT at the November 5, 2003 BCT Meeting. The rationale for the changes is as follows:</p> <p>(1) “Provide information to stakeholders” and “Ensure long-term IC monitoring is performed” were removed as objectives because these are not LUC/IC goals or objectives, but rather are processes used to ensure that the goals and objectives (prevent exposure to contamination and</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>disturbance of systems) are met. These processes are included in the LUC/IC Management Plan. For example, the Communications Plan (Appendix A of the LUC/IC Management Plan) talks extensively about providing information to stakeholders, and Section 5 of the LUC/IC Management Plan describes LUC/IC Monitoring. LUC/IC monitoring will also be discussed in the ROD as was done for the March AFB ROD.</p> <p>(2) The “Rights of Access” objectives were also removed because these items are more appropriately classified as LUC/IC layers that should be identified as controls for other LUC/IC Objective/Goals. These are in fact included as “Reservation of Access” clauses in the deed. Figure 4 annotates this under the deed covenant IC type. The “Rights of Access” are also included as site controls in the AFRPA LUC/IC Management Plan for some of the objectives listed in Figure 4.</p> <p>(3) “Prohibit installation of private wells” is a use restriction that is put in place to achieve the LUC/IC goals and objectives (e.g., preventing exposure, preventing migration of contamination) and, therefore, was removed as an LUC/IC objective.</p> <p>(4) “Prevent migration of contaminated groundwater” was added as an LUC/IC objective because the Air Force feels that this was not covered under any of the other objectives, which focus on exposure to contamination and disturbance of systems. The use restriction that prevents</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>installation of private wells (deed covenant) as mentioned in item 3 above is one IC type used to achieve this objective.</p> <p>The following describes the IC objectives listed in Figure 4. A full description of the individual IC types associated with these objectives is provided in the next Section 6.1.3. Engineered land use controls and monitoring are described and analyzed under the remedial alternatives in the 1999 Basewide VOC FS.</p> <p>Protect and Control Surface Covers: Maintaining adequate surface cover (existing asphalt, concrete, soil, grass, etc.) helps to prevent intrusion of surface and rainwater, which could contribute to additional contaminants reaching the groundwater table from the vadose zone source areas. A use restriction on digging/excavation activities (in deed covenant and SLUC) above and around source areas serves to achieve this IC objective.</p> <p>Prevent Migration of Contaminated Groundwater: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that prohibits installation of private wells (contained in deed covenant and SLUC) serves to achieve this IC objective. Operation of existing wells (extraction and domestic) is closely monitored by the Air Force to ensure that plume containment is maintained.</p> <p>Prevent or Reduce Exposure to Contaminated</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>Groundwater: The intent of this objective is to ensure that contaminated groundwater is not used for human consumption or introduced into the environment that could be a detriment to sensitive ecological habitat. The use restriction that prohibits installation of private wells (deed covenant) serves to achieve this IC objective. Operation of an existing domestic well (Base Well 10) is closely monitored by the Air Force to ensure that plume containment is maintained and contaminants are not drawn towards this well, which is used as a drinking water source.</p> <p>Prohibit Disturbance of Extraction, Treatment, and Monitoring Systems: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that prohibits development or land use that interferes with remedial operations (deed covenant) serves to achieve this IC objective.”</p> <p>See Pages 30 and 31 of the Draft Final Basewide VOC FS Addendum.</p> |
| 28 | Page 20, Section 6.1.2, Figure 2: As an example of the level of detail appropriate for addressing the preceding comment, discuss two aspects of the operation of existing wells located close to or within contaminant plumes. It seems like the objective of “prevent migration of contaminated groundwater” or the objective of “prohibit disturbance of extraction, treatment and monitoring systems” would both be concerned with the operation of wells that would cause the | See response to comment Specific Comment 27. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | <p>plume to be pulled out of its targeted containment volume. Another aspect of operating existing wells located close to or within contaminant plumes is the possibility that the extracted groundwater might be used for drinking or cause some other undesired exposure. Would such operation be prohibited under the objective of prevent or reduce exposure to contaminated groundwater"? Is it only plume volumes with concentrations greater than MCLs that you are concerned about people not being exposed to or might it be volumes where contaminants are detectable? If operation of existing wells near the plumes is not a concern, you need to state why since this is an obvious question some in the community would likely ask. Under each of the above three objectives, are there other details that they are intended to address?</p> | |
| 29 | <p>Page 20, Section 6.1.3: Detail in addition to that described in the preceding two comments should be added to the detail already provided for types of institutional controls in this section. For example, on page 23 you present details on zoning and other ordinances. Figure 2 indicates two institutional control objectives that will be addressed by this type of institutional control. In this case, you should add a brief paragraph or a few sentences that explain which details of the objectives are met by which existing ordinances and which details will need ordinances to be written to provide the level of protection you want to select for your groundwater remedy.</p> | <p>More detail was added to "Deed Covenants" and "Zoning and Other Ordinances". The State provided language for Section 6.1.3.3, which was incorporated.</p> <p>See Pages 34 and 35 respectively, of the Draft Final Basewide VOC FS Addendum.</p> |
| 30 | <p>Page 23, Section 6.1.3.4, first paragraph: Provide more detail on the annual reporting element and clarify the role of the</p> | <p>Suggested language was incorporated. The first paragraph of Section 6.1.3.4 reads as follows: "Monitoring and</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | <p>various IC implementing agencies in contributing to the annual letter report. This can be best accomplished by adding explanatory text immediately following the first sentence and then starting a new paragraph with the current second sentence that begins “To develop costs for the IC component, ...”. EPA recommends the following explanatory text to complete the first paragraph suggested above:</p> <p>“This annual monitoring report, submitted to the regulatory agencies by the Air Force, will evaluate the status of all ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the use restrictions and controls referenced above were communicated in the deed(s), whether owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls.”</p> | <p>enforcement of land use will be performed as part of the long-term Air Force O&M for the site and will be documented in a letter report each year and in the 5-year CERCLA review. This annual monitoring report, submitted to the regulatory agencies by the Air Force, will evaluate the status of all ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the use restrictions and controls references above were communicated in the deed(s), whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls.”</p> <p>See Page 36 of the Draft Final Basewide VOC FS Addendum.</p> |
| 31 | <p>Page 25, Section 6.2.2: The 1999 Basewide VOC FS did not analyze the State ARAR for Land Use Covenants since that ARAR was not formulated until after 1999. Add that analysis here or briefly summarize analysis that you provide elsewhere in this addendum. You also need to go back and check that no other ARARs relevant to ICs have been created or updated since your 1999 analysis.</p> | <p>Section 6.2.2 was rewritten to read, “The ICs as discussed in this FS addendum are in compliance with Federal and State ARARs. The December 1999 Basewide VOC FS ARARs are applicable but were updated to reflect the State ARAR for the SLUC (see Section 4.2). The SLUC is discussed in Section 6.1.3.3 and other relevant criteria analyses in Section 6.2.”</p> <p>See Page 38 of the Draft Final Basewide VOC FS Addendum.</p> |
| 32 | <p>Page 26, top paragraph, last sentence: Consider inserting a sentence that explains the status of the State’s beliefs on this</p> | <p>The last sentence of the third paragraph in Section 6.2.3, was replaced with the following: “The Air Force will pay the</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | <p>matter. If this is potentially a big issue, wouldn't it affect what you discuss two paragraphs further on the long term reliability of ICs? Maybe you simply need to refer the reader to another location (Section 6.2.6?) where you deal with this potential issue of who pays for what, willingly.</p> | <p>State of California reasonable, nondiscriminatory costs associated with administration of the SLUC, subject to appropriation of funds through the Defense State Memorandum of Agreement (DSMOA) or some alternative payment mechanism. "Nondiscriminatory costs" means costs similar to those paid by other parties for such land use covenant administration." This was also used to address DTSC Comment #52.</p> <p>See Pages 38 of the Draft Final Basewide VOC FS Addendum.</p> |
| 33 | <p>Page 29, Section 6.2.7, first paragraph, second sentence: This statement about "the primary IC" confuses me because it uses the word "prohibition" and then in the next paragraph refers to the Sacramento County Code presented in Appendix E. I would think you need an IC that restricts owners of existing wells from using the water for drinking if they live close to existing plumes or could affect existing plumes by pumping. If this is not a concern, I think you should at least clarify why you don't need to prohibit or prevent "operation" of wells, since the County Code seems to only address "installation" of wells and says nothing about operation.</p> | <p>The first paragraph of Section 6.2.7 was revised for clarification and now reads, "To estimate the costs of groundwater institutional controls, it is helpful to first examine the likely incremental cost over implementation, monitoring and enforcement of soil ICs. A key IC necessary to prevent exposure of human and ecological receptors to contaminated groundwater is the deed covenant (use restriction) that prohibits water supply wells above or near contaminated plumes defined by the VOC Groundwater ROD. Cost for implementation of these controls is minimal, as measures to prevent the drilling of groundwater supply wells have already been adopted by the County of Sacramento (Sacramento County Code 6.28.000 G)."</p> <p>Operation of existing wells is not a concern as there has been no evidence of existing off-base wells impacting the groundwater contamination plume. In 1986 and 1987, McClellan negotiated with off-base residents that were on well water to supply them with municipal water supply. 550</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>off-base residences west of the base were given a municipal water supply connection to prevent possible exposure to contaminants (contaminants had been detected in 13 off-base wells). This language related to operation of off-base wells was also added to Section 6.1.3.2 (Zoning and Other Ordinances).</p> <p>See Page 42 of the Draft Final Basewide VOC FS Addendum.</p> |
| 34 | <p>Page 29, Section 6.2.7, second paragraph: The colon at the end of the paragraph seems to imply you might have intended to add some explanatory text for the preceding statement. I think some appropriate text would be to distinguish the Prohibition Area as prohibiting installation of new wells without permission and consultation but not a prohibition against operating or using existing wells for drinking, unless I am not correctly interpreting Appendix E.</p> | <p>Section 6.2.7, second paragraph, was modified to read: “An additional layer of protection specific to McClellan is the Former McClellan Air Force Base Prohibition Area described in Sacramento County Code 6.28.025 (reference Section 5.4).”</p> <p>See Page 42 of the Draft Final Basewide VOC FS Addendum.</p> |
| 35 | <p>Page 29, Section 6.2.7, fourth paragraph, first sentence: Explain why costs for enforcement etc., are not included. Is it because they are included elsewhere (e.g., GW O&M Plan)? Perhaps you need to distinguish between a breach in the IC (e.g., advisories no longer issued or language dropped from a deed) and the physical breach (e.g., someone begins pumping an existing private well and using it for drinking water or causing a plume to migrate out of containment zone) that results from the breached IC.</p> | <p>As discussed in Section 6.2.7 (fourth paragraph), costs for enforcement and for responding to breaches in the institutional controls are not included. The sole breach anticipated is the drilling of a water supply well, and this activity is difficult for an individual to perform with County zoning and ordinances in place. Therefore, it is considered unlikely and not considered for the purposes of this FS Addendum. In the remote chance that enforcement was required, it would be funded under long-term O&M as mention in Section 6.1.3.4 (first paragraph).</p> <p>See Page 42 (Section 6.2.7) and Pages 36 and 37</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
|--|---|--|
| No. | Comments | Response |
| | | (Section 6.1.3.4) of the Draft Final Basewide VOC FS Addendum. |
| 36 | Page 29, Section 6.2.7, fourth paragraph, third sentence: Depending on your answer to my comment on the first paragraph of this section, you may need to discuss the difficulty of an inspection or other type of IC monitoring activity that would let you know that someone is actually operating an existing well in an unsafe area for drinking or for affecting the containment of the plumes. This activity would not be visible from great distance. | See response to Specific Comment 33 regarding operation of any existing wells. |
| 37 | Page 29, Section 6.2.9, second sentence: Delete “and operation” unless it is correctly stated. | <p>“and operation” was deleted from the second paragraph of Section 6.2.9. The sentence now reads, “ Although the LRA has issued a reuse plan and the County created a zoning ordinance that prohibits installation of private wells in a 2000 foot buffer zone around contaminant plumes, AFRPA has not yet received any written statements of appropriate local agencies’ and governments’ willingness to implement, monitor and enforce ICs under their jurisdictions.”</p> <p>See Page 44 of the Draft Final Basewide VOC FS Addendum.</p> |
| 38 | Page 115, Appendix B: Add an introductory paragraph to this Appendix that briefly explains the information that is presented (e.g., these are annual costs, Air Force (AF), Sacramento County (SC), State Land Use Covenant (SLUC) overseen by DTSC. Easement costs for well locations are part of O&M, EPA inspection/oversight costs not shown because ...). | An introductory paragraph was added to Appendix B as follows, “The costs for ICs described in this Appendix are annual costs based on discussions as provided in Section 6.2.7 and Sections 6.1.3.1 through 6.1.3.4. A summary of the assumptions is included within the cost tables in this Appendix. Air Force (AF), Sacramento County (SC), the State Land Use Covenant (SLUC) overseen by DTSC, and EPA oversight costs are included in this Appendix. The cost |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: EPA (Joe Healy) | | |
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| No. | Comments | Response |
| | | <p>associated with easements is not included here because these would be included as part of the long-term O&M of the site.”</p> <p>See Page B-1 (Appendix B) of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

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Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| GENERAL COMMENTS | | |
| 1 | We noted that McAFB removed from the FS substantial Applicable or Relevant and Appropriate Requirements (ARARs) language developed by the Central Valley Regional Water Quality Control Board (RWQCB). We have consulted with the RWQCB and understand that they have developed comments requesting that the ARARs be put back into the FS. While RWQCB is lead in regards to their ARARs, DTSC concurs with their comments. | <p>The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD.</p> <p>For additional insight into this discussion see responses to RWQCB comments</p> |
| SPECIFIC COMMENTS | | |
| 2 | Page 2, Section 2.1.1, first paragraph, second sentence: The “national debate” over sampling and risk assessment methodologies appears to be superfluous for this document. We recommend deleting this sentence. Should McAFB choose to keep this sentence, we recommend “ <i>as some locations</i> ” be inserted between “ <i>is needed</i> ” and “ <i>and the</i> ”. | <p>The first sentence of the first paragraph in Section 2.1.1 was deleted.</p> <p>See Page 3 of the Draft Final Basewide VOC FS Addendum.</p> |
| 3 | Page 3, Section 2.1.1, third paragraph, first sentence: It is unclear what is meant by “ <i>The only major issues that might arise</i> ”. Do you mean “unresolved” issues that the Record of Decision (ROD) will address? Or, do you mean that these are a “post-ROD” issue? Please rewrite to make the point clear. | <p>Section 2.1.1, third paragraph, first sentence, revised to say: “The significant issues to be addressed for a groundwater pathway ROD involve institutional control analysis and implementation; and the identification, and implementation of ARARs.”</p> <p>See Page 3 of the Draft Final Basewide VOC FS Addendum.</p> |
| 4 | Page 4, Section 2.1.3, first paragraph: Following the first sentence, we recommend adding the sentence “ <i>It has proven</i> | Sentence was inserted into the paragraph. Section 2.1.3, first paragraph now reads: “SVE is a presumptive remedy at |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | <i>to be effective at removing VOCs from the vadose zone at McClellan”.</i> | McClellan and is directed at VOC contamination in the vadose zone. It has proven to be effective at removing VOCs from the vadose zone at McClellan. While it is primarily designed to minimize VOC migration to groundwater, it likely also affects the potential for shallow VOCs to migrate to the surface. Thus, it is a remedy component for both the groundwater pathway and the shallow soil gas pathway. SVE initiation and termination will be described in all future McClellan RODs that deal with VOCs.” See Page 4 of the Draft Final Basewide VOC FS Addendum. |
| 5 | Page 5, first paragraph, second sentence: Please define and/or describe “START” and “STOP”. | The first sentence in the second paragraph of Section 2.1.3 describes the Start and Stop processes. The first sentence says: “Recent alternative and formal dispute resolutions determined prescribed processes for initiating and terminating SVE systems.” No additional text was added to the document. See Page 4 of the Draft Final Basewide VOC FS Addendum. |
| 6 | Page 5, second paragraph, second sentence: We believe the term “VOC RODS” is inaccurate. The current ROD strategy outlines one shallow soil gas breakout ROD, a deeper (groundwater) VOC ROD and multiple site-specific RODs. Please modify the text to be more clear on this issue. Likewise, please clearly identify what the “ <i>shallow soil gas ROD</i> ” is in the third sentence. | The third paragraph in Section 2.1.3 was modified to say: “Because most of the SVE systems are already installed and operating as part of a SVE removal action program, these same systems will often be subject to multiple RODs that deal with VOCs. Termination of a SVE system is linked to these RODs by the language in a STOP document. The STOP language requires that termination of the SVE system must involve satisfying the requirements of the termination for the shallow soil gas pathway (i.e., meeting the cleanup standard developed in the Breakout Shallow Soil Gas ROD) |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>and the requirements of termination for VOCs reaching groundwater. The STOP process is a series of steps for determining whether the residual vadose zone mass is no longer a concern and also if it could be addressed in a more timely or cost effective manner by groundwater extraction alone.”</p> <p>See Pages 4 and 5 of the Draft Final Basewide VOC FS Addendum.</p> |
| 7 | Page 5, second paragraph, second sentence: Please change “ <i>in the STOP</i> ” to “ <i>in a STOP</i> ”. | Text was modified; see response to DTSC Specific Comment 6 above. |
| 8 | Page 5, second paragraph, third sentence: It is unclear what is meant by “ <i>requirements of termination for groundwater pathway</i> ” means. Please make this clear. | <p>The entire paragraph was modified. The third paragraph of Section 2.1.2 now reads: “Because most of the SVE systems are already installed and operating as part of a SVE removal action program, these same systems will often be subject to multiple RODs that deal with VOCs. Termination of a SVE system is linked to these RODs by the language in a STOP document. The STOP language requires that termination of the SVE system must involve satisfying the requirements of the termination for the shallow soil gas pathway (i.e., meeting the cleanup standard developed in the Breakout Shallow Soil Gas ROD) and the requirements of termination for VOCs reaching groundwater. The STOP process is a series of steps for determining whether the residual vadose zone mass is no longer a concern and also if it could be addressed in a more timely or cost effective manner by groundwater extraction alone.”</p> <p>See Pages 4 and 5 of the Draft Final Basewide VOC FS</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | Addendum. |
| 9 | Page 5, third paragraph, second sentence: We believe “ <i>would have been</i> ” should be written as “ <i>could be</i> ”. | The second sentence in the fifth paragraph of Section 2.1.3 was modified to say: “However, it is quite possible that the extraction well configuration and depth could be optimized to address only the remaining threatened pathway in the event that the other pathway is no longer threatened.” See Page 5 of the Draft Final Basewide VOC FS Addendum. |
| 10 | Page 5, Section 2.2, third sentence: We believe it would be useful to insert “ <i>other measures to remediated groundwater (e.g.,</i> ”. | Section 2.2 text was modified to say: “The Basewide Groundwater VOC ROD will not be the only ROD addressing groundwater for McClellan. It will supersede a previous Interim ROD (IROD) that addressed groundwater containment in 1995. A ROD addressing non-VOC contamination in groundwater is planned for 2011 and could result in other measures to remediate groundwater (e.g., additional extraction wells and a non-VOC treatment train integrated into the current VOC treatment train).” See Page 5 of the Draft Final Basewide VOC FS Addendum. |
| 11 | Page 5, Section 2.2.1, first sentence: It would be useful to insert the acronym “IROD” after the <i>Interim Record of Decision</i> , and insert “I” in front of “ROD” in the second sentence. Lastly, make a similar adjustment to the first sentence, Page 6, second paragraph. | The first two sentences of Section 2.2.1, first paragraph, were modified to say: “The May 1995 Basewide Groundwater Operable Unit Interim Record of Decision (IROD) addresses groundwater contaminated with trichloroethylene (TCE) and other VOC solvents. This IROD requires the Air Force to construct a groundwater containment system in three phases and maintain this extraction and treatment system until a final groundwater remedy is selected.” The first sentence of Section 2.2.1, second paragraph, was |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>modified to say: “During the course of implementing the 1995 Groundwater IROD, the Air Force has learned more about the nature and extent of groundwater contamination.”</p> <p>See Pages 5 of the Draft Final Basewide VOC FS Addendum.</p> |
| 12 | Page 6, second paragraph, last sentence: We recommend editing the sentence to “ <i>Section 3 in this Addendum discusses these changes and their</i> ”. | <p>The last sentence of Section 2.2.1, second paragraph was modified to say: “Section 3 in this Addendum discusses these changes and their consequences for time and cost to complete.”</p> <p>See Page 5 of the Draft Final Basewide VOC FS Addendum.</p> |
| 13 | Page 6, Section 2.2.2, last paragraph, last sentence: We recommend inserting “ <i>planned</i> ” between “ <i>The</i> ” and “ <i>2004</i> ”. | <p>Correction was made. The last sentence of the second paragraph in Section 2.2.2 was modified to say: “The planned 2004 Basewide VOC Groundwater ROD is expected to require the continued operation of the hexavalent chromium treatment system.”</p> <p>See Page 6 of the Draft Final Basewide VOC FS Addendum.</p> |
| 14 | Page 6, Section 2.3, second paragraph: This paragraph is quite confusing and requires editing to be clear. One solution may be to present the information in bullet format. | <p>Section 2.3 has been rewritten. The text was modified to say: “One other IROD has been completed for polychlorinated biphenyl (PCB)-contaminated soil at Operable Unit (OU) B1; was signed in 1993. Two RODs have been completed:</p> <ul style="list-style-type: none"> ○ Six Site No Action ROD was signed in 2003 ○ Seven Site LRA Initial Parcel Non-VOC Group #1 ROD signed in 2004 <p>Eight additional RODs are currently planned for completion over the next 8 years. All these RODs focus on soil contamination. Additional studies planned for these RODs</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>are not anticipated to find new sources of groundwater contamination, although they will all consider this possibility. In the event that additional groundwater concerns are uncovered, they will be addressed in the Non-VOC Groundwater ROD or by an amendment to the Basewide VOC Groundwater ROD.</p> <ul style="list-style-type: none"> ○ Two of these RODs address sites in the LRA Initial Parcel. ○ A Breakout ROD will address shallow soil gas. ○ Two other RODs will focus on particularly troublesome sites, Confirmed Site (CS) 10 and Building 252. ○ The final three RODs will focus on small volume sites, large volume strategic sites (e.g., large disposal pit areas), and ecological areas.” <p>See Page 6 of the Draft Final Basewide VOC FS Addendum.</p> |
| 15 | Page 7, first paragraph, last sentence: Please explain what the “ <i>two final groundwater RODs</i> ” are. | Text was modified. See response to DTSC Specific Comment 14. |
| 16 | Page 7, Section 2.4.1, second sentence: It is unclear the purpose of this sentence. We also believe it is inaccurate. Several groundwater plumes may be tied to specific sources (e.g., site CS-24). | <p>Section 2.4.1 was modified to say: “The Remedy and proposed cleanup levels are to be applied basewide. To date, it has been nearly impossible to identify which VOC sites created specific plumes of VOC groundwater contamination. An exception is the OU D groundwater plume.”</p> <p>See Page 7 of the Draft Final Basewide VOC FS Addendum.</p> |
| 17 | Page 7, Section 2.4.3.1, second sentence: We recommend replacing <i>its ability to raise groundwater concentrations above MCLs</i> ” with “ <i>the potential for VOCs in the vadose</i> | Section 2.4.3.1, second sentence, was modified to say: “Cleanup levels for the vadose zone are based on the potential for VOCs in the vadose zone to leach into the |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | <i>zone to leach into the groundwater resulting in groundwater concentrations above MCLs”.</i> | groundwater resulting in groundwater concentrations above MCL.” See Page 7 of the Draft Final Basewide VOC FS Addendum. |
| 18 | Page 7, Section 2.4.3.1, fourth sentence: We believe it is important to add the qualifier “ <i>based on the model,</i> ” between “ <i>Therefore,</i> ” and “ <i>if the maximum</i> ”. | We do not believe the comment to be accurate. This discussion centers on properties of individual contaminants. |
| 19 | Page 8, Section 2.4.3.2: To facilitate reading, we recommend at the beginning of this section the model be identified and why the model is used. Subsequent text should be added stating that this section provides a brief summary of the model and then refer to the appropriate document (e.g., General Framework, or SVE Remedial Action Work Plan) for a detailed discussion of the model. | Text has been added to the first two paragraphs in Section, 2.4.3.2 to clearly identify the equation used to calculate the partitioning of contaminant into the three standard compartments and to direct the reader to the SVE RAWP for a more detailed discussion of volatile contaminant transport. The first two paragraphs of Section 2.4.3.2 now read: “Almost all soil concentrations of volatile organic hydrocarbons at McClellan are calculated from measured soil gas concentrations using the equilibrium equation in the McClellan Basewide General Framework Document. Consistent with the conceptual model presented in the SVE RAWP (Removal Action Work Plan), this equation partitions the total contaminant mass into compartments of soil, comprising inorganic soil minerals and organic detritus, interstitial water, and soil gas. Two of the three compartments, soil gas and interstitial water (leachate) are mobile while the carbon is fixed. Concentrations in each compartment are determined by chemical specific constants like Henry’s Law and Carbon adsorption coefficient. Relative mass in each compartment is determined by its volume. As a contaminant migrates through the soil column, toward the groundwater, the ratio of soil gas concentration to |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>the concentration in the other two compartments remains essentially unchanged although the mass in each may change because different soil types have different amounts of void space, water filled porosity and organic carbon.</p> <p>There are no mechanisms in the conceptual vadose zone transport model that allow soil gas concentration to increase above the maximum in the soil column. All mechanisms serve to dilute the maximum concentration. Contaminant mass can be transported between layers by soil gas diffusion or by percolating water. For a more detailed discussion of the subsurface environment, the reader is directed to the SVE RAWP.”</p> <p>See Pages 7 and 8 of the Draft Final Basewide VOC FS Addendum.</p> |
| 20 | <p>Page 8, Section 2.4.3.2: We think it is important conveying to the reader whether or not the model is “conservative” at predicting groundwater contamination. If so, the text should indicate that the model is “conservative” with the results erring on the likelihood that groundwater contamination will be shown in areas where contamination may not be present as opposed to predicting no groundwater contamination in areas where contamination actually exists. Alternately, this discussion could be put in Section 2.4.3.3.</p> | <p>Section 2.4.3.2 is not based on a model. Rather, it is a discussion of the physics associated with multiphase transport of volatile chemicals in the vadose zone. However, as stated in the discussion, all transport mechanisms reduce the concentration of contaminant rather than increase it. In the subsequent Conclusions (Section 2.4.3.3), it is stated that the soil gas concentration anywhere in the soil column is compared to its MCL equivalent soil gas concentration. Section 2.4.3.3 has been rewritten as follows: “The above discussion of the transport physics was used as a preliminary screening tool for all sites where VOCs were detected during soil gas sampling. Any site where no soil gas sample exceeds its MCL equivalent was removed from consideration for further VOC cleanup to protect groundwater. This procedure</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>ignores the dilution by either gaseous diffusion or rainfall infiltration and percolation, which would allow more sites to be removed. Sites with at least one contaminant in a single sample above its MCL equivalent will require further investigation. This procedure will not exclude any sites that may have a groundwater impact. However, it will include some sites that upon further analysis will require no VOC cleanup action to protect groundwater. Consequently, it is conservative and protective of human health.”</p> <p>See Pages 8 and 9 of the Draft Final Basewide VOC FS Addendum.</p> |
| 21 | <p>Page 8, Section 2.4.3.2, first paragraph, first sentence: We recommend inserting “<i>McClellan basewide</i>” in front of and capitalizing “<i>General Framework Document</i>”. Furthermore, a reference should be provided.</p> | <p>Section 2.4.3.2, first paragraph, first sentence, now reads: “Almost all soil concentrations of volatile organic hydrocarbons at McClellan are calculated from measured soil gas concentrations using the equilibrium equation in the McClellan Basewide General Framework Document.”</p> <p>See Page 7 of the Draft Final Basewide VOC FS Addendum.</p> |
| 22 | <p>Page 8, Section 2.4.3.2, first paragraph, last sentence: This statement does not appear accurate. It would make sense for the total mass to remain constant, but the ratios of the individual components are highly variable throughout the column.</p> | <p>The ratios of mass contained in each compartment may be variable as soil characteristics change. However, the ratio of the concentration of a contaminant in the soil gas to its adjacent interstitial water is fixed by the Henry’s Law coefficient. For clarity, the last sentence in the first paragraph of Section 2.4.3.2 was augmented with the following text: “<i>although the mass in each may change because different soil types have different amounts of void space, water filled porosity and organic carbon.</i>”</p> <p>See Page 8 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| 23 | <p>Page 8, Section 2.4.3.2, third paragraph: This paragraph does not clearly convey what we believe is intended. We recommend replacing this paragraph with the following text: <i>“Contaminant transport by diffusion is caused by the propensity of contaminants to ‘spread out’ or migrate from areas of greater concentrations to areas of lesser concentrations. This transfer continues until equilibrium is attained. After equilibrium is attained the maximum concentration (in the area of previous greater concentration) will be lower due to the contaminant transfer.”</i></p> | <p>The third paragraph in Section 2.4.3.2 has been modified as follows: “Contaminant transport by diffusion is caused by the random motion of individual molecules in soil gas which results in a net migration from greater concentration areas to lesser concentration areas. The transfer continues until equilibrium is attained and the two concentrations are equal. After equilibrium is attained, the resulting concentration in the original greater area is reduced, the concentration in the original lesser area is increased, and both are less than the original greater.”</p> <p>See Page 8 of the Draft Final Basewide VOC FS Addendum.</p> |
| 24 | <p>Page 8, Section 2.4.3.2, fourth paragraph: For clarity, in the first sentence, we recommend replacing “to those below” with <i>“to soil lower in the soil column”</i>. We further recommend replacing the last two sentences with the following text. <i>“Similar to diffusion, the contaminant migrates (percolates) from an area of higher concentration (in the upper portion of the soil column) to an area of lesser concentration in the lower portion of the soil column. Contaminant concentration in the lower portion of the column will increase as the contaminant migration proceeds, but will not reach or exceed the contaminant concentration previously present in the overlaying area of higher concentration. Also similar to diffusion, upon transfer completion (equilibrium) the maximum concentration in the soil column will be lower than the prior maximum concentration that was present in the upper portion of the soil column.”</i></p> | <p>The fourth paragraph in Section 2.4.3.2 has been modified as follows: “Similar to diffusion, interstitial water can migrate in all directions. However, because water is applied to the surface as infiltrating rainwater the net direction is downward, moving contaminants to the groundwater. As water moves from an area of greater contamination to an area of less contamination (lower in the soil column), the concentration in the lower soil area is increased but can never exceed the original concentration in the upper soil area. The resulting concentration is necessarily lower due to dilution by the lesser contaminated water. The converse is also true. If water moves from a lesser concentration area to a higher concentration area, the resulting concentration is less than the previous greater area and greater than the previous lesser area. In either case, a maximum column concentration will be reduced.”</p> <p>See Page 8 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| 25 | Page 8, Section 2.4.3.2, fifth paragraph, first sentence: We recommend making this sentence proactive by rewriting it as <i>“Henry’s law coefficient is a constant that.... in soil gas.”</i> | The first sentence in the fifth paragraph of Section 2.4.3.2 has been modified to read: “The Henry’s law coefficient characterizes the ratio of contaminant concentration in the interstitial water to that in soil gas.” See Page 8 of the Draft Final Basewide VOC FS Addendum. |
| 26 | Page 8, Section 2.4.3.3, first sentence: We believe it would be more clear to rewrite this sentence as <i>“The model was used as a preliminary.... VOCs were detected in the soil gas at McClellan”</i> . | As stated in the response to Comment 20, the discussion is not based on a numeric model but is rather an exposition of the physics of contaminant transport. To help clarify this, the text has been modified to read: “The above discussion of the transport physics was used as a preliminary screening tool for all sites where VOCs were detected during soil gas sampling.” See Page 8 of the Draft Final Basewide VOC FS Addendum. |
| 27 | Page 8, Section 2.4.3.3, first paragraph, last sentence: This sentence requires revisions to make it clear what message is being conveyed. Please rewrite so that the message is clearly conveyed. | The response to Specific Comment 20 added text to this paragraph, which clarifies the message. See Page 8 of the Draft Final Basewide VOC FS Addendum. |
| 28 | Page 9, Section 3, third sentence: This sentence appears superfluous to us; we recommend deleting it. | Sentence was deleted from the first paragraph in Section 3.0. See Page 11 of the Draft Final Basewide VOC FS Addendum. |
| 29 | Page 9, Section 3, fourth sentence: We recommend editing this sentence to be more direct. Say instead that the time to remediated groundwater will likely be much longer than previously predicted in the VOC FS. | The text in Section 3 was modified to say: “The most dramatic change is that the anticipated groundwater drop of one foot per year will most likely not occur over the next 30 years. As a result, the time to remediate groundwater will likely be much longer than previously predicted in the 1999 Basewide VOC FS.” |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|---|---|
| No. | Comment | Response |
| | | See Page 11 of the Draft Final Basewide VOC FS Addendum. |
| 30 | Page 9, Section 3, last sentence: Please change “ <i>Also</i> ” with “ <i>As a result</i> ” and insert “ <i>correspondingly</i> ” between “ <i>would</i> ” and “ <i>significantly</i> ”. | See Response to DTSC Specific Comment 29. |
| 31 | Page 9, Section 3.1, first paragraph, second sentence: For clarity, we recommend changing this sentence to “ <i>Because most of the contaminant target volumes are currently present between 100 and 130 feet bgs, groundwater extraction would no longer be practical and VOC remediation would be best achieved by the much faster soil vapor extraction method.</i> ”. | The first paragraph in Section 3.1 was modified to say: “At the time of the 1999 Basewide VOC FS, the conceptual model for groundwater assumed that the water table would continue to drop about 1 foot per year for the next 30 years before it stabilized at about 130 feet below ground surface (bgs). Because most of the contaminant target volumes are currently present between 100 and 130 feet bgs, groundwater extraction would no longer be practical and VOC remediation would be best achieved by the much faster soil vapor extraction method. Some of the 1999 Basewide VOC FS alternatives employed strategically located dual-phase wells to accomplish this shift.” See Page 11 of the Draft Final Basewide VOC FS Addendum. |
| 32 | Page 9, Section 3.1, first paragraph, third sentence: For clarity, we recommend changing the beginning of this sentence to “ <i>Some of the 1999 Basewide VOC FS alternatives employed....</i> ”. | Text modified; see response to Specific Comment 31. |
| 33 | Page 9, Section 3.1, second paragraph, first sentence: The apparent time shown in to hydrograph appears more likely 8 to 10 years which is different than the 4 to 5 years mentioned in the text. Please clarify this. | The text in the second paragraph of Section 3.1 was modified as follows: “However, regional and McClellan-specific groundwater monitoring results during the past 8 to 10 years have indicated a major change from the previous long-term |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | Note: This comment was deleted from the DTSC final comments provided in a letter dated June 7, 2004. We had already addressed the comment from the April 27, 2004 DTSC “draft” letter and the text in Section 3.1 was modified. | trend of a relatively static water table. Figure 1 (Section 3.1) presents the results of recent analysis by the California State Department of Toxic Substances Control (DTSC) that shows the water table has stabilized and slightly rising. Based on this new information, it is no longer reasonable to assume that the water table will drop another 30 feet any time soon. Part of the reason for the GW stabilization is because water districts in the vicinity of McClellan have opted to utilize their surface water rights in order to reduce the usage of groundwater resources.” See Page 11 of the Draft Final Basewide VOC FS Addendum. |
| 34 | Page 9, Section 3.1, second paragraph, first sentence: For clarity, we recommend substituting “ <i>change from</i> ” to “ <i>shift in</i> ” in this sentence. Additionally, insert “ <i>to a relatively static water table</i> ” at the end of the sentence. | See response to DTSC Specific Comment 33. |
| 35 | Page 9, Section 3.1, second paragraph, last sentence: For accuracy, we recommend substituting “ <i>usage</i> ” for “ <i>degradation</i> ” in this sentence. | See response to DTSC Specific Comment 33. |
| 36 | Page 10, Section 3.2, second sentence: For clarity, we recommended substituting “ <i>are consistent with what is shown on Figure 1</i> ” for “ <i>basically agree with the ones that would be used with Figure 1</i> ”. | The text in Section 3.2 was modified to say: “Section 6.8 of the 1999 Basewide VOC FS presents a sensitivity analysis that has already considered the possibility of an earlier stabilization of the groundwater table at McClellan. Using those assumptions, which are consistent with what is shown on Figure 1 (Section 3.1), the time to achieve cleanup goals for Alternative 2b would increase from 147 years with a falling water table to approximately 500 years using the updated conceptual model of this Addendum.” |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|---|---|
| No. | Comment | Response |
| | | See Page 12 of the Draft Final Basewide VOC FS Addendum. |
| 37 | Page 11, Section 3.4: Please explain how the stabilized water table scenario fits into this discussion. Does the number of wells “currently under design” take this scenario into consideration? | <p>The text in Section 3.4 was modified to say: “Changes to the required number of extraction and monitoring wells have been identified after the 1999 Basewide VOC FS was completed. These changes are due to the work involved with completing the implementation of the Basewide Groundwater IROD, particularly Phase III. The IROD Phase III extraction well design took into account the now static water table. Shown below is a comparison of wells for the preferred Alternative 2b:”</p> <p>See Page 13 of the Draft Final Basewide VOC FS Addendum.</p> |
| 38 | Page 14, Section 4.2: Please correct the miscellaneous typographical efforts in the second and third sentence. They should read, “ <i>The updated ARAR analysis incorporates agreements reached during the dispute resolution process. It also includes a description and list of ARARs from the State of California law regarding land use covenants to protect human health, safety, and the environment when waste is left in place.</i> ” | <p>Section 4.2 was extensively revised.</p> <p>See Page 20 of the Draft Final Basewide VOC FS Addendum.</p> |
| 39 | Page 19, Section 6.1.1, second paragraph: For clarity, we recommend not using the term “ <i>things</i> ” in the discussion. Please delete “ <i>are things</i> ” from the first sentence, replace “ <i>things</i> ” with “ <i>structures</i> ” in the second sentence, and replace “ <i>paper things</i> ” with “ <i>documented restrictions</i> ” in the third sentence. | Suggested changes in Section 6.1.1 were incorporated, except for the third sentence, which incorporates language that is more consistent with the McClellan LUC/IC Management Plan and EPA guidance. Also, the site control discussion in the next paragraph was incorporated into this paragraph. The second paragraph in Section 6.1.1 now reads, “Land use |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|--|--|
| No. | Comment | Response |
| | | <p>controls limit or control the use of land features such as soil or groundwater. Two main types of land use controls are site controls and institutional controls. Site controls are physical structures located at the site (e.g., engineered systems or physical structures). Site controls such as engineered barriers are physical structures or equipment that prevent or inhibit access or use of land features present at defined site locations. These barriers can be complex structures (e.g., multi-layered caps) or simple devices (e.g., alarms or fences). Guards or security patrols are other types of site controls that can support land use restrictions or assist in maintaining the integrity of engineered systems. Site controls are typically described in detail in O&M Plans. Institutional Controls are non-engineered instruments such as administrative and/or legal controls (e.g., zoning permits and deed covenants) used to prevent (or control) exposure to contaminants by limiting land use or resource (e.g., groundwater) use. They are used to supplement and complement the engineering and/or technical process controls. Institutional controls are information based and generally do not involve engineered equipment or devices as mentioned previously.”</p> <p>See Page 29 of the Draft Final Basewide VOC FS Addendum.</p> |
| 40 | Page 19, Section 6.1.1, third paragraph, first sentence: For clarity, we recommend inserting “ <i>Site controls such as....</i> ” at the beginning of this sentence. | Language was inserted, see Section 6.1.1, second paragraph. Sentence now reads, “Site controls such as engineered barriers are physical structures or equipment that prevent or inhibit access or use of land features present at defined site |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|--|--|
| No. | Comment | Response |
| | | locations.” This paragraph was combined with the Site Control sentence in the previous paragraph. See Page 29 of the Draft Final Basewide VOC FS Addendum. |
| 41 | Page 19, Section 6.1.1, fourth paragraph: The text describes two types of ICs (those that apply to specific parcels and those that apply to geographic areas). It is unclear what the difference is. Please provide examples. If you are unable to clarify this, please remove this discussion. | This discussion was removed from Section 6.1.1 except for the last sentence, which was incorporated into the IC discussion in the previous paragraph. See Page 29 of the Draft Final Basewide VOC FS Addendum. |
| 42 | Page 20, Section 6.1.1, first paragraph, last sentence: The text states that “ <i>The State of California envisions Land Use Control Implementation Plans (LUCIPs), which would at least describe the implementation of ICs,</i> ” DTSC would prefer this to read, “ <i>The State of California, pursuant to California Code of Regulations, Title 22, section 67391.1, requires that any response action decision document include, among other things, an implementation and enforcement plan. This plan may be in the form of a Land Use Control Implementation Plan (LUCIP), which would at least describe the implementation of ICs</i> ” | The suggested language was incorporated and the last few sentences of Section 6.1.1 now read, “The State of California, pursuant to California Code of Regulations, Title 22, section 67391.1, requires that any response action decision document include, among other things, an implementation and enforcement plan. This plan may be in the form of a Land Use Control Implementation Plan (LUCIP), which would at least describe the implementation of ICs, including establishment, maintenance and administrative monitoring and reporting requirements.” See Page 30 of the Draft Final Basewide VOC FS Addendum. |
| 43 | Page 20, Section 6.1.2, second sentence: Please make it clear that this matrix is comprehensive for the VOC FS and Addendum. We think, but are uncertain that this matrix captures all the discussed in the VOC FS, and subsequent Institutional Controls (ICs) developed as part of this | The text in Section 6.1.2 was modified to say: “The 1999 Basewide VOC FS provided a list of general and specific remedial action objectives. Since then, the FFA parties met and organized the specific IC objectives into a chart (Figure 4; Section 6.1.2) showing the type of ICs available to address |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|----------------|--|
| No. | Comment | Response |
| | Addendum | <p>each objective. This chart has evolved over the last year and was revised as a result of Air Force comments/input during the preparation of the AFRPA Land Use Control/Institutional Control (LUC/IC) Management Plan. The resulting Figure 4 chart is different from the July 30, 2003 version presented to the BCT regulators, and the changes were presented to the BCT at the November 5, 2003 BCT Meeting. The rationale for the changes is as follows:</p> <p>(1) “Provide information to stakeholders” and “Ensure long-term IC monitoring is performed” were removed as objectives because these are not LUC/IC goals or objectives, but rather are processes used to ensure that the goals and objectives (prevent exposure to contamination and disturbance of systems) are met. These processes are included in the LUC/IC Management Plan. For example, the Communications Plan (Appendix A of the LUC/IC Management Plan) talks extensively about providing information to stakeholders, and Section 5 of the LUC/IC Management Plan describes LUC/IC Monitoring. LUC/IC monitoring will also be discussed in the ROD as was done for the March AFB ROD.</p> <p>2) The “Rights of Access” objectives were also removed because these items are more appropriately classified as LUC/IC layers that should be identified as controls for other LUC/IC Objective/Goals. These are in fact included as “Reservation of Access” clauses in the deed. Figure 4 annotates this under the deed covenant IC type. The “Rights of Access” are also included as site controls in the AFRPA</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|----------------|---|
| No. | Comment | Response |
| | | <p>LUC/IC Management Plan for some of the objectives listed in Figure 4.</p> <p>(3) “Prohibit installation of private wells” is a use restriction that is put in place to achieve the LUC/IC goals and objectives (e.g., preventing exposure, preventing migration of contamination) and, therefore, was removed as an LUC/IC objective.</p> <p>(4) “Prevent migration of contaminated groundwater” was added as an LUC/IC objective because the Air Force feels that this was not covered under any of the other objectives, which focus on exposure to contamination and disturbance of systems. The use restriction that prevents installation of private wells (deed covenant) as mentioned in item 3 above is one IC type used to achieve this objective.</p> <p>The following describes the IC objectives listed in Figure 4. A full description of the individual IC types associated with these objectives is provided in the next Section 6.1.3. Engineered land use controls and monitoring are described and analyzed under the remedial alternatives in the 1999 Basewide VOC FS.</p> <p>Protect and Control Surface Covers: Maintaining adequate surface cover (existing asphalt, concrete, soil, grass, etc.) helps to prevent intrusion of surface and rainwater, which could contribute to additional contaminants reaching the groundwater table from the vadose zone source areas. A use restriction on digging/excavation activities (in deed</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>covenant and SLUC) above and around source areas serves to achieve this IC objective.</p> <p>Prevent Migration of Contaminated Groundwater: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that prohibits installation of private wells (contained in a deed covenant and SLUC) serves to achieve this IC objective. Operation of existing wells (extraction and domestic) is closely monitored by the Air Force to ensure that plume containment is maintained.</p> <p>Prevent or Reduce Exposure to Contaminated Groundwater: The intent of this objective is to ensure that contaminated groundwater is not used for human consumption or introduced into the environment that could be a detriment to sensitive ecological habitat. The use restriction that prohibits installation of private wells (deed covenant) serves to achieve this IC objective. Operation of an existing domestic well (Base Well 10) is closely monitored by the Air Force to ensure that plume containment is maintained and contaminants are not drawn towards this well, which is used as a drinking water source.</p> <p>Prohibit Disturbance of Extraction, Treatment, and Monitoring Systems: The intent of this objective is to prevent groundwater contamination from being pulled out of its targeted containment volume. The use restriction that</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>prohibits development or land use that interferes with remedial operations (deed covenant) serves to achieve this IC objective.”</p> <p>See Pages 30 and 31 of the Draft Final Basewide VOC FS Addendum.</p> |
| 44 | <p>Page 20, Figure 2: It’s unclear to us how the State Land Use Covenant prevents migration of contaminated groundwater conveyed in the matrix. Please clarify this.</p> | <p>The State Land Use Covenant should have a restriction on installing private wells. The use restriction that prohibits installation of private wells (contained in a deed covenant and SLUC) serves to achieve this IC objective. This was added to Section 6.1.2.</p> <p>See Pages 30 and 31 of the Draft Final Basewide VOC FS Addendum.</p> |
| 45 | <p>Page 21, Section 6.1.3, first paragraph, first sentence: For clarity, we recommend deleting “<i>basically</i>”, and change “<i>all</i>” to “<i>each</i>”. In the second sentence, insert “<i>is a</i>” between “<i>following</i>” and “<i>more</i>”, and change “<i>still applies to all</i>” to “<i>of the ICs for</i>”. Lastly, delete the first “<i>the</i>” from the third sentence</p> | <p>The edits were made as suggested, and the first three sentences in Section 6.1.3 now read, “The 1999 Basewide VOC FS described ICs that would apply to each of the remediation alternatives. The following is a more detailed description of the ICs for the cleanup alternatives. However, because the presumptive remedy of groundwater extraction and treatment with a cleanup goal of MCLs is most likely to continue to be the preferred alternative, the following description will be most compatible with Alternative 2B.”</p> <p>See Page 33 of the Draft Final Basewide VOC FS Addendum.</p> |
| 46 | <p>Page 21, Section 6.1.3, third paragraph, last sentence: The text as written implies that all parties can enforce against any violations of any of the ICs listed. For example, the county</p> | <p>The last sentence and additional language was added to the third paragraph in Section 6.1.3 to clarify the sentence. The last few sentences of the paragraph now read, “In addition, all</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | could enforce against violations of the State LUCs unless they are the owner. Or, the DTSC could enforce against violations of a zoning law or easement. Please change the text to clarify this. | cleanup alternatives include monitoring and enforcement of the institutional controls by each of the three parties and the U.S. EPA as applicable. For example, the County could enforce against any zoning or ordinance violation, and the EPA could enforce against a deed covenant restricting use of contaminated groundwater. The State would not enforce against zoning or ordinance violations.” See Page 33 of the Draft Final Basewide VOC FS Addendum. |
| 47 | Page 22, Section 6.1.3.1, fourth paragraph (Deed Covenants), Penultimate Sentence: We believe the appropriate section to be referenced is Section 6.2.7. | Concur. The sentence in Section 6.1.3.1 (Deed Covenants) now reads, “However, costs to monitor and enforce the deed covenants are included as discussed in Section 6.2.7.” See Page 34 of the Draft Final Basewide VOC FS Addendum. |
| 48 | Page 23, Section 6.1.3.2, second paragraph, third sentence: Please clarify what you mean by a “revised” GIS database. Do you mean an “updated” database? | It is an update of the existing database. The sentence in Section 6.1.3.2 (Zoning and Other Ordinances) was changed to reflect this and now reads, “For example, AFRPA will provide the County with an updated GIS database to track the status of the property with environmental contamination.” See Page 35 of the Draft Final Basewide VOC FS Addendum. |
| 49 | Page 23, Section 6.1.3.3: Please re-write (to be more consistent with the way the other sections are worded) this section to read as follows: “ <i>Before transfer of title to the property, the Air Force will execute and record an SLUC with the State that restricts property as necessary to protect</i> ” | Section 6.1.3.3 was rewritten as suggested and now reads, “Before transfer of title to the property, the Air Force will execute and record a SLUC with the State that restricts property as necessary to protect human health and the environment, pursuant to State law, including California |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | <i>human health and the environment, pursuant to applicable State law. The SLUC will include a legal description of the property restricted, a description of the contamination left in place, a brief summary of the health risk assessment and site history, and provisions for access and enforcement. The SLUC will be based upon the State model Covenant to Restrict Use of Property.”</i> | Code of Regulations, Title 22, Section 67391.1. The SLUC will include a legal description of the property restricted, a description of the contamination left in place, a brief summary of the health risk assessment and site history, and provisions for access and enforcement. The SLUC will be based upon the State model Covenant to Restrict Use of Property. The SLUC serves to achieve the same goals and objectives as the Air Force deed covenants.” See Page 36 of the Draft Final Basewide VOC FS Addendum. |
| 50 | Page 25, Section 6.2.3, first paragraph, last sentence: Please explain how these risk numbers were derived. Alternately, reference where the information is provided. | Based on a comment from EPA, these risk numbers (and the entire sentence) were deleted from the paragraph. Please see EPA TechLaw Specific Comment 4. See Page 38 of the Draft Final Basewide VOC FS Addendum. |
| 51 | Page 25, Section 6.2.3, second paragraph, first sentence: Not all ICs will “run with the land” in perpetuity. Zoning, ordinances, or local permits, for instance, do not as a matter of law “run with the land.” These ICs are amendable/removable under less onerous circumstances than those that are recorded against the deed, such as the SLUC. | Concur. The first sentence in the second paragraph of Section 6.2.3 was rewritten for clarification and now reads, “Some institutional controls will “run with the land” for centuries, if necessary (e.g., deed covenants, SLUC).” See Page 38 of the Draft Final Basewide VOC FS Addendum. |
| 52 | Page 26, Section 6.2.3, first paragraph, last sentence: The State strongly disagrees with the last sentence of the third paragraph of this section. <u>No costs</u> of ICs, in any form, shall be incurred by the State. | Concur. The last sentence of the third paragraph in Section 6.2.3 was replaced with the following, which is based on language used in the March ARB ROD: “The Air Force will pay the State of California reasonable, nondiscriminatory costs associated with administration of the SLUC, subject to |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>appropriation of funds through the Defense State Memorandum of Agreement (DSMOA) or some alternative payment mechanism. “Nondiscriminatory costs” means costs similar to those paid by other parties for such land use covenant administration.”</p> <p>See Page 38 of the Draft Final Basewide VOC FS Addendum.</p> |
| 53 | <p>Page 26, second paragraph: The following should be added at the end of the paragraph (after “<i>inspections</i>”): “..., and for ensuring restriction of use to protect public health and the environment in perpetuity.”</p> | <p>The language was added at the end of the fourth paragraph of Section 6.2.3 as suggested and now reads, “.....the SLUC may be more effective for providing a right-of-access for regulatory agency inspections and for ensuring restriction of use to protect public health and the environment in perpetuity.”</p> <p>See Page 39 of the Draft Final Basewide VOC FS Addendum.</p> |
| 54 | <p>Page 26, third paragraph: We suggest replacing the first two sentences with “<i>With the exception of restrictions on disposal of contaminated soil, the IC objectives can be achieved by layering two or more institutional control process options, thereby increasing the effectiveness of ICs through time should any one institutional control process option fail.</i>” Also, remove “<i>under Parts A and B</i>” from the last sentence.</p> | <p>The suggested changes were made and the fifth paragraph of Section 6.2.3 now reads, “<i>With the exception of restrictions on disposal of contaminated soil, the IC objectives can be achieved by layering two or more institutional control process options, thereby increasing the effectiveness of ICs through time should any one institutional control process option fail. The long-term effectiveness and permanence can be achieved through monitoring and enforcement of the institutional controls; however, failure of an institutional control process option can occur if the party responsible for implementation, monitoring, and enforcement does not perform these functions.</i>”</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
|--|---|---|
| No. | Comment | Response |
| | | See Page 39 of the Draft Final Basewide VOC FS Addendum. |
| 55 | <p>Page 26, fourth paragraph, first sentence: We do not understand how <i>“difficulties and uncertainties in implement long-term ICs are increased if...property transfer occurs...”</i></p> <p>The concept behind the ICs is that they are in place regardless of property transfer. How is this a difficulty? Please explain in more detail, and if the statement remains in the FS Addendum, please exclude SLUCs from this category, as it runs with the land, regardless of property transfer.</p> | <p>Concur. The phrase related to property transfer was removed from the first sentence, sixth paragraph, Section 6.2.3, and it now reads, “Difficulties and uncertainties in implementing long-term institutional controls are increased if funding is not sufficient or tenants are not aware of the institutional controls.”</p> <p>See Page 39 of the Draft Final Basewide VOC FS Addendum.</p> |
| 56 | <p>Page 27, first paragraph, second sentence: It is unclear to us why Part C (SLUC) is omitted? A SLUC reinforces the implementation of IC objectives as well. If not, please explain why; otherwise, please add Part C to this sentence. Further, the third and fourth sentences in this paragraph give the impression that SLUCs do not prohibit installation of private wells since “Part C” is not included in the third sentence. It also sounds like the State is “overseeing” the ICs. This is not the case. The State may monitor and enforce against violations of the SLUC. Please re-write this paragraph as follows <i>“Implementation of Parts A, B, and C enhance the long-term effectiveness and permanence of ICs. Parts A, B, and C further reinforce the implementation of IC objectives identified on Figure 2; Section 6.1.2, through several layers of protection by enabling the County, Air Force, State, and U.S. EPA to notify, monitor, control, and/or enforce against prohibited uses on the land.”</i></p> | <p>Agree. The seventh paragraph of Section 6.2.3 was rewritten and now reads, “Implementation of Parts A, B, and C enhance the long-term effectiveness and permanence of ICs. Parts A, B, and C further reinforce the implementation of institutional control objectives identified on Figure 4; Section 6.1.2, through several layers of protection by enabling the County, Air Force, State, and U.S. EPA to notify, monitor, control, and/or enforce against prohibited uses on the land.”</p> <p>See Page 39 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| 57 | Page 28, Section 6.2.6, second paragraph, third sentence: Please clarify what document is being referred to here. We are unaware of our participation in the development of the draft VOC FS Addendum, if that is what is being referred to. | <p>The sentence is written as if the document were final indicating that regulatory agencies commented on the draft (improved the draft). For clarification, the sentence in the second paragraph of Section 6.2.6 was reworded and now reads, “The regulatory agencies also provided comments and suggestions on the draft of this document, which were considered and incorporated as applicable.”</p> <p>See Page 41 of the Draft Final Basewide VOC FS Addendum.</p> |
| 58 | Page 28, Section 6.2.6, second paragraph, fifth sentence: Please replace this sentence with “ <i>However, the County has not decided whether they are willing to operate the encroachment permit process.</i> ” We suspect this was the Air Force’s intention; because as written, pursuant to CCR Title 22, section 67391.1, if a SLUC is required, DTSC must enter into the SLUC with the Air Force prior to transfer of the property. In the last sentence in this paragraph, “ <i>and the State</i> ” should be removed from the sentence, since it implies there may be an option that the State may pay for ICs, and this is not a possibility. | <p>The last few sentences of the second paragraph in Section 6.2.6 were revised as follows to address the comment: “However, the County has not decided whether they are willing to operate the encroachment permit process if the Air Force does not. No agreements have been completed specifying whether Sacramento County will pay for the institutional controls under Parts B and C, respectively, or the Air Force reimburses the entities. (See Section 6.2.3 for a discussion how the costs associated with ICs might be paid.)”</p> <p>See Page 41 of the Draft Final Basewide VOC FS Addendum.</p> |
| 59 | Page 28, Section 6.2.6, fourth paragraph, first sentence: The ext isn’t very clear. We suggest it be written as “ <i>To enhance the safety of human and ecological receptors, ICs can be applied to a parcel being transferred via FOSET before the ROD for that parcel has been completed.</i> ” | <p>The first sentence of the fourth paragraph in Section 6.2.6 was replaced as suggested and now reads, “To enhance the safety of human and ecological receptors, ICs can be applied to a parcel being transferred via a FOSET before the ROD for that parcel has been completed.”</p> <p>See Page 41 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | Addendum. |
| 60 | Page 29, Section 6.2.7, fourth paragraph, second and third sentences: We don't agree that this activity is implausible. It is not uncommon for non-permitted wells to be installed. Additionally, while a drill rig on-base would be conspicuous, a rig off-base would not be easily detected as few Air Force or regulatory representatives are monitoring off-base activities. We recommend 'softening' the position put forward in these sentences. Lastly, over the past few years, we have had several indications of homeowners re-activating previously disconnected wells. | <p>The sentences in the fourth paragraph of Section 6.2.7 were revised to read, "The sole breach anticipated is the drilling of a water supply well, and this activity is difficult for an individual to perform with County zoning and ordinances in place. Therefore, it is considered unlikely and not considered for the purposes of this FS Addendum. For the same reason, the incremental cost of inspections is not estimated, as the Air Force feels that a drill rig would be visible at great distances (even off-site areas) to anyone inspecting and monitoring other ICs as well as during the routine monitoring of groundwater systems as part of the groundwater O&M."</p> <p>Regarding the last sentence of DTSC Comment 60, the Air Force has no knowledge of this activity.</p> <p>See Page 42 of the Draft Final Basewide VOC FS Addendum.</p> |
| 61 | Page 30, Bullet List. We have some concerns regarding cost estimates. They are incorporated in our comments on Appendix B, discussed below. | See comments 65 through 72. |
| 62 | Page 30, last paragraph, second sentence: Please make the number of years here consistent with the current time estimate presented in Section 3.2. | <p>The second sentence of the last paragraph in Section 6.2.7 was changed to be consistent with Section 3.2 and now reads, "Cleanup is estimated at approximately 500 years based on the updated conceptual model presented in this Addendum."</p> <p>See Page 43 of the Draft Final Basewide VOC FS Addendum.</p> |
| 63 | Page 31, Section 6.2.8, second paragraph, second sentence: | The acronym SLUC was used in the sentence. The second |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | For clarity, we recommend being consistent on the use of acronyms (i.e., SLUC). | sentence in the second paragraph of Section 6.2.8 now reads, "At the time of this Basewide VOC FS Addendum, AFRPA understands that the State wants to implement, monitor, and enforce a SLUC that will address all of the IC objectives." See Page 44 of the Draft Final Basewide VOC FS Addendum. |
| 64 | Page 31, Section 6.2.8, second paragraph, last sentence: Consistent with our earlier comments, the State does not intend to fund ICs at McAFB. This sentence should be removed. | Concur. The last sentence of Section 6.2.8 was deleted. See Page 44 of the Draft Final Basewide VOC FS Addendum. |
| SPECIFIC COMMENTS ON APPENDIX B | | |
| 65 | Appendix B: No time (hours) has been assigned for IC monitoring and inspection. We believe these costs should be factored into the analysis. | No time hours were included for Air Force because these costs are associated with long term O&M as mentioned in Section 6.1.3.4 (first paragraph) and Section 6.2.7 (fourth paragraph). Costs were added for the County. |
| 66 | Appendix B: Please explain why no time has been assigned for "Violations". | As discussed in Section 6.2.7 (fourth paragraph), costs for enforcement and for responding to breaches in the institutional controls are not included. The sole breach anticipated is the drilling of a water supply well, and this activity is difficult for an individual to perform with County zoning and ordinances in place. Therefore, it is considered unlikely and not considered for the purposes of this FS Addendum. In the remote chance that enforcement were required, it would be funded under long-term O&M as mentioned in Section 6.1.3.4 (first paragraph). |
| 67 | Appendix B: We believe that the analysis should include the cost for preparation/distribution of an annual report. | Cost of an annual report was added to the Air Force costs in Appendix B and Section 6.2.7. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | See Pages B-5 (Appendix B) and 43 respectively, of the Draft Final Basewide VOC FS Addendum. |
| 68 | Appendix B, Air Force IC Cost, Section 3 Advisories: We believe that there are some incidental costs (such as graphics generation, printing, and postage) that should be included in the analysis. | Appendix B cost estimates for advisories for both the Air Force and the County were revised to incorporate comment. This resulted in an increase of \$50 for the annual cost. See Pages B-5 and B-7 (Appendix B) of the Draft Final Basewide VOC FS Addendum. |
| 69 | Appendix B, Sacramento County IC Cost: We recommend that McAFB consult with the County of this analysis. | County costs are based on informal discussions with County personnel and represent reasonable estimates of total cost. |
| 70 | Appendix B, Sacramento County IC Cost, Section 1, Zoning: Please identify was “SC Zoning” is. | “SC Zoning” refers to Sacramento County (SC) Zoning requirements, which are discussed in Section 6.1.3.2. |
| 71 | Appendix B, Sacramento County IC Cost, Section 4, Permits: We believe that an engineer will be required to handle the permit review. This likely would be at a higher rate than proposed (\$62). | An engineer was used at a rate of \$100/hour. This increased the cost of this item to \$1,000. See Page B-7 (Appendix B) of the Draft Final Basewide VOC FS Addendum. |
| 72 | Appendix B, State IC Cost: Please specify what activities are being done for the “ <i>Technical Time</i> ” (2 hours) and “ <i>Regulator</i> ” (16 hours). | The “ <i>Technical Time</i> ” is the estimated time it would take to maintain the SLUC Sites List Web database. I discussed this database with Dan Ward on May 26, 2004. The 16 hours for “ <i>Regulator</i> ” is inspection time. The Appendix B cost estimate was annotated to reflect this. See Page B-8 (Appendix B) of the Draft Final Basewide VOC FS Addendum. |
| SPECIFIC COMMENTS ON APPENDIX D | | |
| 73 | Section B1, first paragraph, last sentence: In conjunction | The updated Potential ARAR table (Appendix D) of the draft |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | with what is presented in Section 4.2, we found this sentence confusing. This sentence states that <i>“This Appendix reflects the consensus statement resolving the McClellan AFB Baseline VOC ROD dispute.”</i> It is our understanding that Appendix D provides the ARAR analysis for this FS, including applicable results of the dispute resolution. Therefore, we believe the last sentence should read as or similar to the following <i>“This Appendix reflects the current description and list of ARARs, including those agreed upon in the McClellan AFB Baseline VOC ROD dispute process.”</i> | Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD. |
| 74 | Section B.4.2: The beginning of the second paragraph implies that California has a separate RCRA program than the federal program. Please delete <i>“Under the California RCRA Program, i.e.,”</i> or instead, indicate that the subsequent text is part of how California implements the RCRA program. | The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD. |
| 75 | Table B-4: The section titled <i>Federal ARARs</i> ” is confusing to us. Next to this is a footnote that states, <i>“DTSC believes these to be State ARARs”</i> . Listed under <i>“Federal ARARs”</i> are California regulations (CCRs). Explain how California regulations can be listed as Federal ARARs. | The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD. |
| 76 | Table B-4, Page 152, last section: Please replace this section with the attached tabulated information. | Section 4.2, Updated ARAR Analysis, was modified to include this information. See Page 20 of the Draft Final Basewide VOC FS Addendum. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD. |
| 77 | Section B.6.3: Please re-write this to read as follows: “Provisions of 22 CCR Section 67391.1 require that when hazardous materials, hazardous wastes or constituents, or hazardous substances remain at the property at levels which are not suitable for unrestricted use of the land, a land use covenant (LUC) imposing appropriate limitations on land use must be executed and recorded before transfer of title of the property. Therefore, when AFRPA conveys property outside the federal government, it will execute an LUC, if waste is left in place, with the State that includes specific use restrictions along with a legal description of the property and affected areas, and a description of the waste and its risks. The LUC will be recorded before the recording of the federal deed transferring ownership. The State and AFRPA will enter into the LUC, as required by CCR Title 22, section 67391.1, and pursuant to California Health and Safety Code and Civil Code sections as specified in Table 1. The LUC will be based upon the model Covenant to Restrict Use of Property, developed by DTSC.” | <p>Section 4.2 was updated to reflect a more detailed description of the SLUC as it relates to the specific requirements. Appendix D was deleted from the document. The language used is consistent with the March OU2 ROD (April 2004) and reads as follows:</p> <p>For CCR, title 22, section 67391.1(a): Requires imposition of appropriate limitation on land use by recorded land use covenant when hazardous substances remain on the property at levels that are not suitable for unrestricted use of the land.</p> <p>For CCR, title 22, section 67391.1(b): Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations.</p> <p>For CCR, title 22, section 67391.1(d): Requires that the land use covenant be recorded in the county where the land is located.</p> <p>For CCR, title 22, section 67391.1(i): Definitions.</p> <p>For CA Civil Code Section 1471(a) & (b): Specifies</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: DTSC (Kevin Depies) | | |
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| No. | Comment | Response |
| | | <p>requirements for land use covenants to apply to successors in the title to the land.</p> <p>See Page 20 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

Review comments by: DTSC (Kevin Depies)

Information to be inserted into Table B-4:

| Action | Requirement | Description | ARAR Determination | Comments |
|---|---|---|--------------------------|---|
| California Civil Code | | | | |
| Deed Restrictions and State Land Use Covenant | California Civil Code § 1471 | Provides conditions under which land-use restrictions will apply to successive owners of land. | Relevant and appropriate | Generally, California Civil Code § 1471 allows an owner of land to make a covenant to restrict the use of land for the benefit of a covenantee. This narrative standard would be implemented through incorporation of restrictive covenants in the deed and Environmental Restriction and Covenant Agreement at the time of transfer. |
| California Health and Safety Code | | | | |
| Deed Restrictions and State Land Use Covenant | California Health & Safety Code § 25202.5 | Allows DTSC to enter into an agreement with the owner of a hazardous waste facility to restrict present and future land uses. | Relevant and appropriate | The substantive provisions of California Health & Safety Code § 25202.5 are the general narrative standards to restrict “present and future uses of all or part of the land on which the . . . facility . . . is located . . .” |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Action | Requirement | Description | ARAR Determination | Comments |
|---|---|---|--------------------------|---|
| | California Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C) | Provides a streamlined process to be used to enter into an agreement to restrict specific use of property | Relevant and appropriate | Generally, California Health & Safety Code §§ 25222.1 and 25355.5(a)(1)(C) provides the authority for the Department of Toxic Substances Control to enter into voluntary agreements with landowners to restrict the use of property. |
| Deed Restrictions and State Land Use Covenant | California Health & Safety Code §§ 25233(c) and 25234 | Provides processes and criteria for obtaining written variances from a land-use restriction and for removal of the land use restrictions. | Relevant and appropriate | California Health & Safety Code § 25233(c) sets forth “relevant and appropriate” substantive criteria for granting variances based upon specified environmental and health criteria. California Health & Safety Code § 25234 sets forth the following “relevant and appropriate” substantive criteria for the removal of a land use restriction on the grounds that “...the waste no longer creates a significant existing or potential hazard to present or future public health or safety.” |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Action | Requirement | Description | ARAR Determination | Comments |
|---------------|--|-------------------------------------|---------------------------|---|
| | California Code of Regulations Title 22, § 67391.1 | Requirements for land-use covenants | Relevant and appropriate | California Code of Regulations Title 22 § 67391.1 provides for a land-use covenant to be executed and recorded when remedial actions are taken and hazardous substances will remain at the property at concentrations that are unsuitable for unrestricted use of the land. The substantive provisions of this regulation have been determined to be “relevant and appropriate” state ARARs by the DON. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| GENERAL COMMENTS | | |
| 1 | <p>Cover Letter, paragraphs 4.a and 4.b: As stated in paragraph 4.a in the cover letter, the McClellan VOC Proposed Plan was resolved by consensus of the Senior Executive Committee (SEC). The consensus statement states that, <i>“The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as Applicable or Relevant and Appropriate Requirements (ARARs) for the McClellan VOC Record of Decisions.”</i> Board staff strongly disagrees with the Air Force’s interpretation for incorporating the VOC Proposed Plan dispute decision into the VOC FS Addendum. Paragraph 4.b states that, <i>“The Air Force has not recognized the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR...”</i> Board staff believes that the dispute resolution language is clear and unambiguous and states precisely that the narrative toxicity objective in Chapter III of the Basin Plan <u>is</u> an ARAR for the McClellan VOC ROD. The dispute resolution was a compromise between the Air Force, U.S. Environmental Protection Agency (EPA), and the Regional Board to resolve the nearly two-year long dispute. The Air Force’s interpretation of the dispute resolution is clearly contrary to the dispute resolution language and serves to undermine the dispute resolution process, the spirit of compromise, and good faith efforts of the SEC. Therefore, Board staff requests that the VOC FS Addendum be revised to recognize the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR for the</p> | <p>The Air Force agrees that Resolution 68-16 is applicable to the discharge of treated groundwater to Magpie Creek.</p> <p>The Air Force and RWQCB disagree on the remaining items in this comment. The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the dispute resolution means will occur in the ROD.</p> <p>The following text was added to (new) Section 4.1.3 FFA Parties’ Interpretation What the Dispute Resolution Means</p> <p>“4.1.3.3 State Interpretation The McClellan VOC Proposed Plan dispute was resolved by consensus of the Senior Executive Committee (SEC). The consensus statement states that, <i>“The parties recognize Section III.G of State Board Resolution 92-49 and the narrative toxicity objective for groundwater in Chapter III of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins as Applicable or Relevant and Appropriate Requirements (ARARs) for the McClellan VOC Record of Decision.”</i></p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | <p>McClellan VOC ROD.</p> <p>Board staff also believes that Resolution 68-16 is applicable to the discharge of treated groundwater to Magpie Creek. Resolution 68-16 is presented as a strike-out in Appendix D, Table B-1. This resolution requires the continued maintenance of high quality water of the State. Remedial actions that involve discharge of treated groundwater to surface water or surface water drainage courses must take into account the protection of beneficial uses and the maintenance of high quality waters in the area. Please revise the VOC FS Addendum to recognize Resolution 68-16 as an ARAR for the McClellan VOC ROD.</p> | <p>Board staff strongly disagrees with the Air Force’s interpretation for incorporating the VOC Proposed Plan dispute decision into the VOC FS Addendum. The Air Force interpretation states that, “<i>The Air Force has not recognized the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR...</i>”. Board staff believes that the dispute resolution language is clear and unambiguous and states precisely that the narrative toxicity objective in Chapter III of the Basin Plan <u>is</u> an ARAR for the McClellan VOC ROD. The dispute resolution was a compromise between the Air Force, U.S. Environmental Protection Agency (EPA), and the Regional Board to resolve the nearly two-year long dispute. The Air Force’s interpretation of the dispute resolution is clearly contrary to the dispute resolution language and serves to undermine the dispute resolution process, the spirit of compromise, and good faith efforts of the SEC. Therefore, Board staff requests that the VOC FS Addendum be revised to recognize the narrative toxicity objective in Chapter III of the Basin Plan as an ARAR for the McClellan VOC ROD.”</p> <p>The Air Force interpretation states that, “In other situations, as to other contaminants, it (the narrative toxicity objective in Chapter III of the Basin Plan) may not be accepted as a potential ARAR.” The SEC parties recognized Section III.G of State Board Resolution 92-49 and the narrative toxicity objective in Chapter III of the Basin Plan as ARARs for the McClellan VOC ROD. As to other contaminants, Board staff believes that based on the dispute resolution agreement and applying these ARARs to the other groundwater VOC</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | | <p>contaminants of concern (COCs), the Air Force must evaluate the technical and economic feasibility of achieving Water Quality Limits (WQLs) that are more stringent than maximum contaminant levels (MCLs) for each VOC COC. Then based on the results of this evaluation, the appropriate cleanup level can be selected. Since the cleanup of groundwater contaminated with TCE will most likely drive the cleanup of other groundwater VOC COCs (with the exception of carbon tetrachloride), the final cleanup levels for the other VOC COCs will not likely drive the decision on when to terminate the groundwater remedy. Therefore, consistent with the dispute resolution, Board staff could accept MCLs as the cleanup level for other VOC COCs in the VOC Groundwater ROD under the same conditions as described in the dispute resolution for TCE.</p> <p>Specifically, the dispute resolution states in agreement Number 2: “Under the currently available specific facts at McClellan, the Air Force and EPA believe that both ARARs result in a cleanup standard of 5 parts per billion (ppb) TCE, based primarily on economic feasibility. The State believes that application of both ARARs results in a cleanup standard of 2.3 ppb TCE. The Record of Decision will state 5 ppb as the cleanup standard for TCE. The parties agree to proceed with the cleanup as proposed by the Air Force until such time as 5 ppb is achieved in each plume, as defined by the BRAC Cleanup Team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, agrees within 60 days to complete an analysis and prepare a report (using agreed upon models), which evaluates the technical</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | | <p>and economic feasibility of continuing remediation until plume levels reach 2.3 ppb TCE. After the report is complete, the parties will have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facilities Agreement.” Therefore, for VOC COCs other than TCE, the groundwater cleanup would proceed as proposed by the Air Force until such time as the MCL for a particular VOC COC is achieved in each plume. The same process for evaluating the technical and economic feasibility of achieving cleanup levels at the WQLs would be followed, including the preparation of an analysis report (using agreed upon models) within 60 days of the Air Force notifying the parties that the MCL has been achieved in a particular plume and that subsequent extraction well shut down is proposed.</p> <p>“4.1.3.4 Agree to Disagree Language</p> <p>The FFA parties agree that the issues presented in Sections 4.1.3.1, 4.1.3.2, and 4.1.3.3 will not be disputed at this time and will be dealt with in the VOC Basewide Groundwater ROD.”</p> <p>See Pages 18 and 19 of the Draft Final Basewide VOC FS Addendum</p> |
| 2 | Cover Letter, paragraph 4.b, last sentence: This sentence states that, <i>“In other situations, as to other contaminants, it (the narrative toxicity objective in Chapter III of the Basin Plan) may not be accepted as a potential ARAR.”</i> The SEC | The Air Force and RWQCB disagree on these items. The Air Force believes that the Dispute Resolution only applies to TCE and that only the State and Federal MCLs are applicable to other VOCs. The updated Potential ARAR |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | <p>parties recognized Section III.G of the State Board Resolution 92-49 and the narrative toxicity objective in Chapter III of the Basin Plan as ARARs for the McClellan VOC ROD. As to other contaminants, Board staff believes that based on the dispute resolution agreement and applying these ARARs to the other groundwater VOC contaminants of concern (COCs), the Air Force must evaluate the technical and economic feasibility of achieving Water Quality Limits (WQLs) that are more stringent than maximum contaminant levels (MCLs) for each VOC COC. Then based on the results of this evaluation, the appropriate cleanup level can be selected. Since the cleanup of groundwater contaminated with TCE will most likely drive the cleanup of other groundwater VOC COCs (with the exception of carbon tetrachloride) the final cleanup levels for the other VOC COCs will not likely drive the decision on when to terminate the groundwater remedy. Therefore, consistent with the dispute resolution, Board staff could accept MCLs as the cleanup level for other VOC COCs in the VOC Groundwater ROD under the same conditions as described in the dispute resolution for TCE.</p> <p>Specifically, the dispute resolution states in agreement Number 2: <i>“Under the currently available specific facts at McClellan, the Air Force and EPA believe that both ARARs result in a cleanup standard of 5 parts per billion (ppb) TCE, based primarily on economic feasibility. The State believes that application of both ARARs results in a cleanup standard of 2.3 ppb TCE. The Record of Decision will state 5 ppb as the cleanup standard for TCE. The parties agree to proceed with the cleanup as proposed by the Air Force until such time</i></p> | <p>table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD.</p> <p>The following text was added to (new) Section 4.1.3 FFA Parties’ Interpretation What the Dispute Resolution Means</p> <p>Section 4.1.3.3 State Interpretation.....“The Air Force interpretation states that, <i>“In other situations, as to other contaminants, it (the narrative toxicity objective in Chapter III of the Basin Plan) may not be accepted as a potential ARAR.”</i> The SEC parties recognized Section III.G of State Board Resolution 92-49 and the narrative toxicity objective in Chapter III of the Basin Plan as ARARs for the McClellan VOC ROD. As to other contaminants, Board staff believes that based on the dispute resolution agreement and applying these ARARs to the other groundwater VOC contaminants of concern (COCs), the Air Force must evaluate the technical and economic feasibility of achieving Water Quality Limits (WQLs) that are more stringent than maximum contaminant levels (MCLs) for each VOC COC. Then based on the results of this evaluation, the appropriate cleanup level can be selected. Since the cleanup of groundwater contaminated with TCE will most likely drive the cleanup of other groundwater VOC COCs (with the exception of carbon</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | <p><i>as 5 ppb is achieved in each plume, as defined by the BRAC cleanup team. At that point, the Air Force, in collaboration with the State and EPA Remedial Project Managers, agrees within 60 days to complete an analysis and prepare a report (using agreed upon models) which evaluates the technical and economic feasibility of continuing remedial until plume levels reach 2.3 ppb TCE. After the report is complete, the parties will have another 30 days to reach an agreement. If an agreement cannot be reached, the Air Force may shut off the wells and any party may use the dispute resolution provisions of the Federal Facilities Agreement.”</i> Therefore, for VOC COCs other than TCE, the groundwater cleanup would proceed as proposed by the Air Force until such time as the MCL for a particular VOC COC is achieved in each plume. The same process for evaluating the technical and economic feasibility of achieving cleanup levels at the WQLs would be followed, including the preparation of an analysis report (using agreed upon models) within 60 days of the Air Force notifying the parties that the MCL has been achieved in a particular plume and that subsequent extraction well shut down is proposed. The Report should be revised to include this concept.</p> | <p>tetrachloride), the final cleanup levels for the other VOC COCs will not likely drive the decision on when to terminate the groundwater remedy. Therefore, consistent with the dispute resolution, Board staff could accept MCLs as the cleanup level for other VOC COCs in the VOC Groundwater ROD under the same conditions as described in the dispute resolution for TCE.”</p> <p>“4.1.3.4 Agree to Disagree Language</p> <p>The FFA parties agree that the issues presented in Sections 4.1.3.1, 4.1.3.2, and 4.1.3.3 will not be disputed at this time and will be dealt with in the VOC Basewide Groundwater ROD.”</p> <p>See Pages 18 and 19 of the Draft Final Basewide VOC FS Addendum</p> |
| 3 | <p>Cover Letter, paragraphs 4.a through 4.d: The VOC Dispute Resolution discussion in these paragraphs presents the Air Force interpretation on several important issues related to the VOC Proposed Plan dispute. These critical dispute issues should be included in the body of the VOC FS Addendum, not just the cover letter. Since the Air Force appears to be changing its position on the dispute consensus statement, both the Air Force and State’s positions should be described in</p> | <p>The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | <p>Section 4.0 of the Report. To avoid potential dispute on the VOC FS Addendum, Board staff proposes that all of the Board ARARs in question (i.e., presented as strike-outs in Table B-1, in Appendix D, pages 140 and 141, and text in Sections B.1, page 137, B.4.4, pages 143 and 144, B.4.5, page 144, B.4.6.4, page 146, B.4.7, page 146, B.4.7.1, page 146, and B.4.7.2, page 147) be identified as contentious, but remain as potential ARARs in the VOC FS Addendum. Removal or strike-out of the contentious Board ARARs at this point in the VOC Groundwater ROD process is unacceptable, and may result in dispute of the VOC FS Addendum, if challenged by the Air Force in this document.</p> | |
| SPECIFIC COMMENTS | | |
| 1 | <p>Section 2.1.1, page 3, third paragraph, first sentence: This sentence states that the only major issues that might arise for a groundwater pathway ROD involve institutional control analysis and implementation. Because of the issues raised in General Comments 1 through 3 this section should be revised to explain that identification, interpretation, and implementation of ARARs may also be a major issue in the VOC Groundwater ROD.</p> | <p>The first sentence in Section 2.1.1, third paragraph, was modified to say: “The significant issues to be addressed for a groundwater pathway ROD involve institutional control analysis and implementation; and the identification, and implementation of ARARs.”</p> <p>See Page 3 of the Draft Final Basewide VOC FS Addendum.</p> |
| 2 | <p>Section 2.2.2, page 6, second paragraph, last sentences: This section discusses elevated levels of 1,4-dioxane in extracted groundwater. The UV/OX system is being operated to address the levels of 1,4-dioxane prior to discharge to Magpie Creek. However, at this time there is no effluent limit for 1-4-dioxane that governs the operation of the UV/OX system. Board staff will be revising the NPDES permit for the</p> | <p>This section (Section 2.2.2) was not modified. The Air Force recognizes that the RWQCB will perform a Reasonable Potential Analysis (RPA) in the future. The results of the RPA may lead to an additional substantive requirement for the McClellan Groundwater Treatment Plant Discharge.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
|---|---|---|
| No. | Comment | Response |
| | groundwater treatment plant later this year to include the increased Phase III treatment capacity. A Reasonable Potential Analysis (RPA) will be performed during the permit revision process to determine if revised or new effluent limits are required based on the results of the RPA analysis. An effluent limit for 1,4-dioxane may be identified that would require that the UV/OX system be operated to control effluent concentrations for the discharge to Magpie Creek. The VOC Groundwater ROD will have to address any issues related to discharge requirements to surface water, including effluent limits for 1,4-dioxane and the operation of the UV/OX system. Please update this section to describe the issues that the VOC Groundwater ROD will need to address for surface water discharge, including if treatment of 1,4-dioxane and operation of the UV/OX system is deemed necessary. | |
| 3 | Section 2.4.1, page 7, second sentence: This sentence states that, <i>“To date, it has been impossible to identify which VOC sites created specific plumes of VOC groundwater contamination.”</i> In general this statement is true, however, the OU D groundwater plume is directly attributed to the disposal sites located in the OU D operable unit. Therefore, this sentence would be more accurate if presented more qualitatively. For example, the sentence could state: <i>With the exception of the OU D groundwater plume, it has been difficult to identify which VOC sites created specific plumes of VOC groundwater contamination.</i> | The text in Section 2.4.1 was modified to say: “The Remedy and proposed cleanup levels are to be applied basewide. To date, it has been nearly impossible to identify which VOC sites created specific plumes of VOC groundwater contamination. An exception is the OU D groundwater plume.” See Page 7 of the Draft Final Basewide VOC FS Addendum. |
| 4 | Section 4.2, page 14, second sentence: Board staff strongly disagrees with this sentence that states that the updated ARAR analysis (in Appendix D) incorporates agreements reached during the dispute resolution process. Other than the | The text has been modified extensively. See Responses to General Comments 1, 2, and 3. |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| | cover letter, this section does not include any rationale for the strike-out of contentious Board ARARs. See General Comments 1 through 3, and revise the VOC FS Addendum accordingly. | |
| 5 | Section 4.3, page 15, second and third paragraphs: These paragraphs describe the Air Force position that the CERCLA permit exclusion applies to the discharge of treated groundwater to surface water. Specifically, the Air Force asserts that the groundwater treatment plant is exempt from the NPDES permit governing the discharge of treated groundwater to Magpie Creek. Board staff disagrees with this position, and maintains that the NPDES permit is required and enforceable. Board staff's position on this issue is documented in Finding No. 8 of the NPDES Permit Order No. R5-2003-0052. This section should be revised to include the Board staff's position as stated in Finding No. 8. | <p>Finding No. 8 of the NPDES Permit Order No. R5-2003-0052 was inserted in Section 4.3, (new) paragraph four.</p> <p>The RWQCB's position is documented in Finding No. 8 of the NPDES Permit Order No. R5-2003-0052 as follows: "The Discharger did not submit a Report of Waste Discharge to revise Order No. 99-067, but did submit information necessary for permit renewal in several other documents. The Discharger has stated that they are not required to obtain a permit as CERCLA allows for an exemption from the necessity of obtaining a permit for onsite remedial response activities. However, one of the requirements that allows the exemption is that all substantive requirements that would be contained in the permit must be in the CERCLA decision document that governs the activity that would be permitted. An Interim Record of Decision (IROD) was signed in the summer of 1995 which does not contain all the substantive requirements contained in the NPDES permit. The substantive requirements are also known as Applicable, Relevant, and Appropriate Requirements (ARARs). Since the appropriate decision document, the IROD, does not contain all of the necessary ARARs, the NPDES permit is necessary to regulate the discharge."</p> <p>See Page 22 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| 6 | Section 4.3, page 15, fourth paragraph, last sentence: This sentence states that the next event (i.e., NPDES permit renewal) is planned to occur in 2008. As stated in Specific Comment 2, Board staff will be revising the NPDES permit for the groundwater treatment plant later this year to include the increased Phase III treatment capacity. Board staff anticipates the NPDES permit will be renewed late in 2004 or early 2005. The goal will be to have the permit renewed before the increased Phase III flows are brought online. Please revise this sentence accordingly. | <p>The text (Section 4.3, last paragraph) was modified to say: “Typically, the State issues new permit requirements every 5 years and the steps above are repeated. The next regular update would be in 2008; however, the State plans on updating the permit in the next one to two years when Phase III of the Groundwater IROD expanded groundwater extraction and treatment system is finished. At this time the GWTP O&M Manual will be updated for substantive requirements.”</p> <p>See Page 23 of the Draft Final Basewide VOC FS Addendum.</p> |
| 7 | Section 5.1, page 17, first paragraph: This paragraph states that the cleanup goals for VOC contaminants in groundwater are the Federal MCLs, and refers the reader to the Appendix C for the Dispute Resolution Agreement. The cleanup goals for VOC groundwater contaminants are based on both Federal and State MCLs, depending on which value is more stringent. Also, this section should be expanded to include the conditions (as stated in the Dispute Resolution Agreement) in which the technical and economic feasibility of achieving a lower cleanup level will be evaluated. The Dispute Resolution Agreements are located in Appendix A. Please expand this section as described and correct the discrepancies. | <p>The text in the first paragraph of Section 5.1 was modified to say: “The cleanup goals for VOC contaminants in groundwater are the Federal and/or State MCLs, whichever is more stringent. The Dispute Resolution did set up a process for plume cleanup to potentially go to a lower concentration than MCLs in the future event that a technical and economic feasibility analysis of continuing the remedy to 2.3 ppb TCE convinced the FFA parties to do so. The Air Force believes that the Dispute Resolution only applies to TCE and that only the State and Federal MCLs are applicable to other VOCs. The State does not agree with this interpretation (See Section 4.0). Also, refer to Appendix A Tab 1k (page A-60 in particular) for Dispute Resolution Agreement.”</p> <p>See Page 25 of the Draft Final Basewide VOC FS Addendum.</p> |

Response to Comments
Draft Volatile Organic Compound Feasibility Study (VOC FS) Addendum

| Review Comments by: RWQCB (James Taylor) | | |
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| No. | Comment | Response |
| 8 | Section 6.2.1, page 24, first paragraph, first sentence: This sentence states that, “ <i>Protection of human health and surface water is achieved...</i> ” Several institutional controls would be utilized to protect humans from exposure to contaminated groundwater, such as the Sacramento County Consultation Zone and the McClellan Prohibition Area. It appears that this discussion should include groundwater protection as well. This comment applies also to Section 6.2.3 (page 25, first paragraph, first sentence) and Section 6.2.5 (page 7, first paragraph, first sentence). Please revise these sections on institutional controls to include protection of groundwater. | <p>It’s implied that protection of human health is from contaminated groundwater. We are protecting human health (from contaminated groundwater) and we are protecting surface water. The sentences were clarified in Sections 6.2.1, 6.2.3, and 6.2.5 as follows: <u>Section 6.2.1</u>: “Protection of human health (from contaminated groundwater) and surface water is achieved and maintained by preventing exposure to contaminants.” <u>Section 6.2.3</u>: “ICs will provide continued protection of human health (from contaminated groundwater) and surface water as long as the institutional controls and engineered controls, particularly prohibiting installation of private wells, are monitored and enforced.” <u>Section 6.2.5</u>: “The Remedial Action Objectives (RAOs) for protection of human health (from contaminated groundwater) and surface water are achieved in the short-term because contaminants are not improperly disturbed under the IC component.”</p> <p>See Pages 37, 38 and 40 respectively, of the Draft Final Basewide VOC FS Addendum.</p> |
| 9 | Appendix D: Please see General Comments 1 through 3 and revise Appendix D accordingly. | The updated Potential ARAR table (Appendix D) of the draft Basewide VOC FS Addendum has been deleted from this document. The 1999 Basewide VOC FS Potential ARAR list will be used for the Final Basewide VOC FS Addendum and updated for new regulations. Section 4.0 has the updates to the ARAR table. Resolution of ARAR issues and what the Dispute Resolution means will occur in the ROD. |