EPA/ROD/R2006090001465
2006

EPA Superfund
Record of Decision:

MATHER AIR FORCE BASE
(AC&W DISPOSAL SITE)
EPA ID: CA8570024143
OU 06
MATHER, CA
09/28/2006

MATHER AFB
CALIFORNIA

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 2646

DEPARTMENT OF THE AIR FORCE
AIR FORCE REAL PROPERTY AGENCY

SEP 1 4 2006

MEMORANDUM FOR U.S. EPA, Region IX
Attn: Rich Muza (SFD-8-1)
75 Hawthorne Street (SFD-8-1)
San Francisco CA 94105

CA DTSC
Attn: Carolyn Tatoian Cain
8800 Cal Center Drive
Sacramento CA 95826

FROM: AFRPA Western Region Execution Center
3411 Olson Street
McClellan CA 95652-1003

SUBJECT: Transmittal of the Final Record of Decision for the Supplemental Basewide Operable Unit Sites. Mather, California

1. Attached is the Final Record of Decision (ROD) for the Supplemental Basewide Operable Unit Sites for review and signature. The ROD contains the selected remedy to address institutional controls for Site 89. The ROD reflects the cleanup actions accomplished under removal authority for the four sites with No Further Action at Sites 80, 85 and 88. AFRPA would like to complete this ROD by September 30, 2006.

2. Questions should be addressed to me at 916 643-0830, x105.

STEVEN C. HAMILTON
BRAC Environmental Coordinator (Mather)

Attachment:
Final ROD, Mather OU-6

cc:
CA CVRWQCB, Attn: Karen Bessette
ASE, Inc., Attn: Bill Hughes (w/o attachment)
HQ AFRPA/COO, Attn: Bob Butler (w/o attachment)

FINAL

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 RECORD OF DECISION FOR THE SUPPLEMENTAL BASEWIDE OPERABLE UNIT SITES

Mather Air Force Base
Sacramento County, California

September 30, 2006

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Acronyms and Abbreviations

µg/dL	microgram(s) per deciliter
µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per liter
4,4'-DDD	4,4'-dichlorodiphenyldichloroethane
4,4'-DDE	4,4'-dichlorodiphenyldichloroethylene
4,4'-DDT	4,4'-dichlorodiphenyltrichloroethane
AFB	Air Force Base
AFBCA	Air Force Base Conversion Agency
AFRPA	Air Force Real Property Agency
AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirement
BRAC	Base Realignment and Closure Act
BCT	BRAC Closure Team
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
COC	contaminant of concern
CRP	Community Relations Plan
CVRWQCB	Central Valley Regional Water Quality Control Board
DTSC	Department of Toxic Substances Control
FFA	Federal Facility Agreement
FFS	Focused Feasibility Study
IC	Institutional Control
IRP	Installation Restoration Program
IT Corp.	International Technology Corporation
ITIR	Informal Technical Information Report
MCL	Maximum Contaminant Level
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
NCP	National Contingency Plan
ng/kg	nanogram(s) per kilogram
NPL	National Priorities List
OU	operable unit
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PDI	Project Definition Investigation
pg/g	picogram(s) per gram
PNA	Polynuclear aromatic (hydrocarbons)
PQL	practical quantitation limit
PRG	Preliminary Remediation Goal
RAB	Restoration Advisory Board
RAM	Removal Action Memorandum

Acronyms and Abbreviations (continued)

RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SARA	Superfund Amendments and Reauthorization Act of 1986
SLUC	State Land Use Covenant
STOLS	Surface Towed Ordnance Locator System
SVOC	Semivolatile organic compound
SWRCB	State Water Resources Control Board
TBC	to-be-considered
TCLP	Toxic Characteristic Leaching Procedure
TEL	threshold effects level
U.S. EPA	United States Environmental Protection Agency

1.0 Declaration

1.1 Site Name and Location

The Supplemental Basewide Operable Unit Record of Decision (Supplemental Basewide OU ROD) is for the former Mather Air Force Base (Mather AFB; now known as Mather, CA), located in Sacramento County, CA (Figure 1).

U.S. Environmental Protection Agency (U.S. EPA) site identification number for Mather Air Force Base as listed in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database: CA8570024143

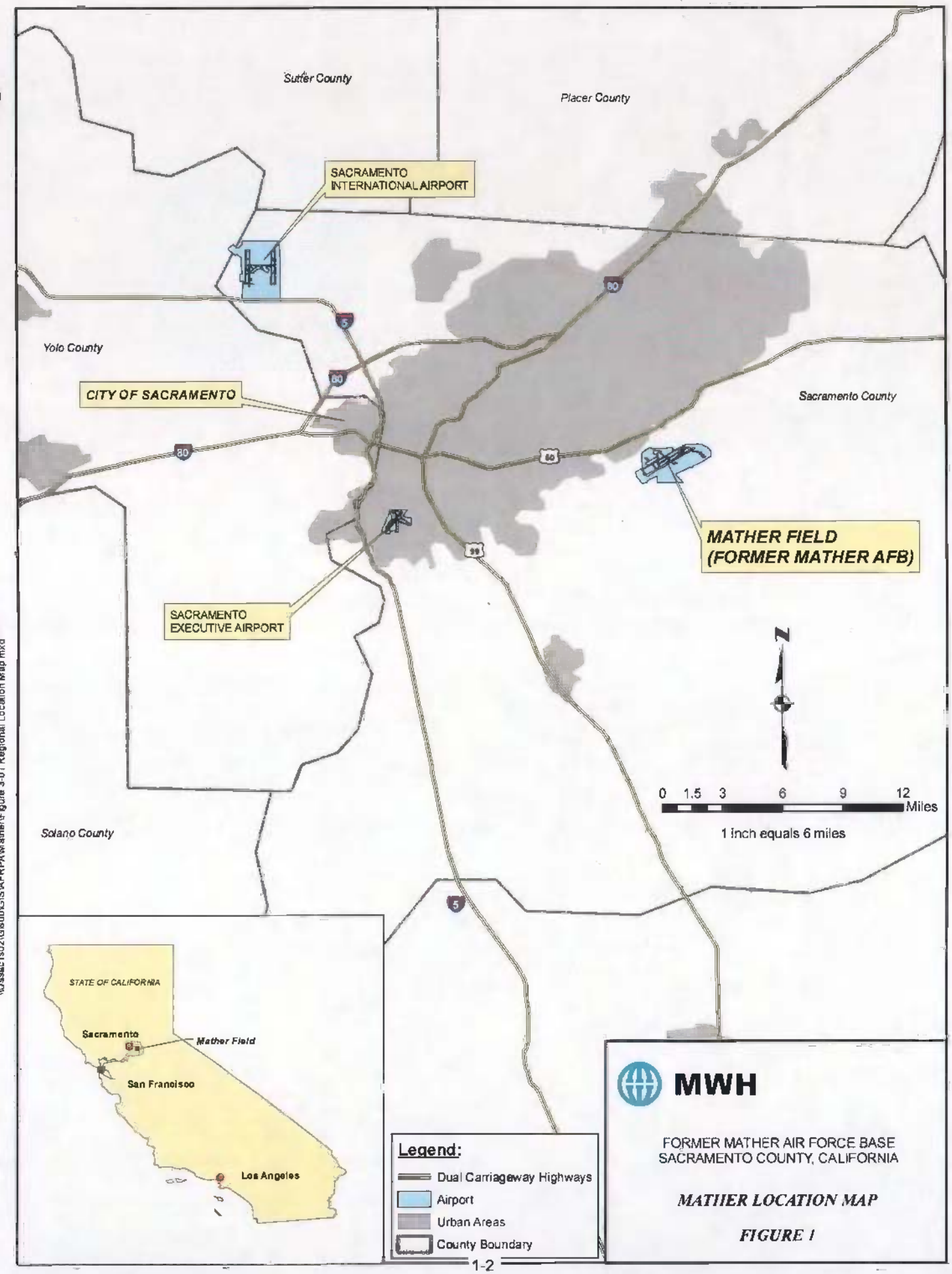
1.2 Statement of Basis and Purpose

The Supplemental Basewide ROD presents the selected remedies for four sites and one area of concern (AOC) at the former Mather air Force Base, California. The selected remedies in this Supplemental Basewide OU ROD were chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The decisions documented herein are based on information contained in the Administrative Record for the subject sites. The Administrative Record Index (Appendix A) identifies documents that were considered or relied upon to make these decisions.

The Air Force and the U.S. EPA Region IX have selected the Supplemental Basewide OU ROD remedies with the concurrence of the state of California. This ROD has been prepared in accordance with *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents* (U.S. EPA, 1999).

This Record of Decision, in combination with the following previously completed RODs, represents completion of the remedy selection process for identified sites and groundwater contamination at Mather AFB:

- Aircraft Control and Warning Site Record of Decision, Air Force Base Conversion Agency (AFBCA, 1993).
- *Landfill Operable Unit Sites Record of Decision*, AFBCA, 1995
- *Soil Operable Unit Sites and Groundwater Operable Unit Plumes Record of Decision*, (AFBCA, 1996)
- *Basewide Operable Unit Record of Decision, AFBCA, 1998*


Sutter County
Placer County
SACRAMENTO INTERNATIONAL AIRPORT
Yolo County
CITY OF SACRAMENTO
Sacramento County
MATHER FIELD (FORMER MATHER AFB)
SACRAMENTO EXECUTIVE AIRPORT
Solano County
N
0 1.5 3 6 9 12 Miles
1 inch equals 6 miles
STATE OF CALIFORNIA
Sacramento
Mather Field
San Francisco
Los Angeles
Legend:
Dual Carriageway Highways
Airport
Urban Areas
County Boundary
MWH
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA
MATHER LOCATION MAP
FIGURE 1

1.3 Assessment of the Supplemental Basewide Operable Unit Sites

The remedies selected in this ROD are necessary to protect human health and the environment from actual or threatened releases of hazardous substances and pollutants or contaminants as defined in NCP 300.5. Where no such releases were identified or where identified releases have been sufficiently addressed by prior removal actions, the Air Force has determined that no further action is necessary to protect human health and the environment. The sites and the Area of Concern addressed in this ROD, including their primary contaminants, if any, are:

- Site 80, Golf Course Maintenance Area Ditch – Ecological risks were identified in the sediments and surface water due to the presence of the pesticide dieldrin and were addressed by removal action. The site no longer presents an adverse risk to human health or the environment.
- Site 85, South Ditch – Ecological risks were identified in the sediments and surface water due to the presence of the pesticides alpha-chlordane, gamma-chlordane, 4,4'-dichlorodiphenyldichloroethane [4,4'-DDD], 4,4'-dichlorodiphenyldichloroethylene [4,4'-DDE], 4,4'-dichlorodiphenyltrichloroethane [4,4'-DDT], and dieldrin, and were addressed by removal action. The site no longer presents an adverse risk to human health or the environment.
- Site 88, Morrison Creek – Ecological risks were identified in the sediments and surface water due to the presence of the pesticides alpha-chlordane, gamma-chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin, and were addressed by removal action. The site no longer presents an adverse risk to human health or the environment.
- Sites 89, Old Trap Range – Lead concentrations in soil remain above levels allowed for unrestricted use. Surface water sampling and groundwater sampling have not identified any water quality degradation from lead contamination at this site; no further monitoring is required for this site.
- Ordnance Burial Area of Concern (AOC) – This AOC was formerly suspected of being an ordnance burial area; no evidence of contamination or ordnance burial was found.

1.4 Description of the Selected Remedies

The Supplemental Basewide OU ROD selects remedies for three sites (Sites 80, 85 and 88) that were not sufficiently characterized to be included in the previous Basewide OU ROD, one newly identified site (Site 89), and an AOC (Suspected Ordnance Burial AOC). The Supplemental Basewide OU consists of the identified sites at Mather that have not been included in prior records of decision. The Supplemental Basewide OU ROD selected remedies are:

- Site 80, Golf Course Maintenance Area Ditch – No Further Action
- Site 85, South Ditch – No Further Action
- Site 88, Morrison Creek – No Further Action

- Site 89, Old Trap Range – Institutional Controls
- Ordnance Burial AOC– No Further Action

Table 1 lists the selected remedies as well as the preferred alternative (if applicable), completed removal actions (if any) and current remedial status. Of these sites, only Site 89 has significant contamination remaining on site. The surface of Site 89 was cleaned such that residual lead contamination is compatible with recreational or industrial use, but not unrestricted (i.e. residential) use. Therefore, institutional controls constitute the selected remedy to prevent unacceptable exposure to surface and subsurface lead contamination.

1.5 Statutory Determinations

The selected remedies of the Supplemental Basewide ROD are protective of human health and the environment; comply with Federal and State requirements that are legally applicable or relevant and appropriate; are cost-effective; and use permanent solutions to the maximum extent practicable. Based on completed removal actions, active remedies are not required and therefore, the statutory preference for treatment, including alternative treatment technologies or resource recovery technologies, as a principal element of the remedy is not applicable.

A five-year review will not be required for Sites 80, 85, 88 and the Suspected Ordnance Burial AOC because they do not have hazardous substances, pollutants, or contaminants remaining on site at concentrations above levels that allow for unlimited use and unrestricted exposure. A five-year review is required at Site 89 because hazardous substances, pollutants or contaminants will remain on-site above levels that allow for unlimited use and unrestricted exposure. The next five-year review at Mather is scheduled for completion by September 24, 2009.

1.6 Data Certification Checklist

The following information is included in the decision summary section of this ROD (Section 2.0). Additional information can be found in the Administrative Record documents for this site.

- Chemicals of concern and their respective concentrations
- Baseline risk represented by the contaminants of concern (COCs)
- Cleanup levels established for COCs and the basis for these levels
- How source materials constituting principal threats are addressed
- Current and reasonably anticipated future land-use assumptions, and current and potential future beneficial uses of groundwater used in the baseline risk assessment and this ROD
- Potential land and groundwater use that will be available at the site as a result of the selected remedies

- Estimated costs for the remedial alternatives
- Key factor(s) that led to selecting the remedy

Table 1
Summary of Supplemental Basewide OU ROD Selected Remedies

Site 80, Golf Course Maintenance Area Ditch	
Initial Preferred Alternative[1]	Excavate sediments with off-base disposal
Removal Action	Excavation of sediments containing pesticides with on-base disposal (AFBCA, 1999, and AFBCA, 2001a)
Selected Remedy	No further action
Remedial Status	Not applicable
Site 85, South Ditch	
Initial **Preferred Alternative**[1]	Excavate sediments with off-base disposal
Removal Action	Excavation of sediments with on-base disposal (AFBCA, 1997a, and AFBCA, 2001a)
Selected Remedy	No further action
Remedial Status	Not applicable
Site 88, Morrison Creek	
Initial **Preferred Alternative**[1]	Excavate sediments with off-base disposal
Removal Action	Excavation of sediments containing pesticides with on-base disposal (AFBCA, 1999, and AFBCA, 2001a)
Selected Remedy	No further action
Remedial Status	Not applicable
Site 89, Old Trap Range	
Initial **Preferred Alternative**[1]	Excavation with off-base disposal, institutional controls, surface water monitoring, and groundwater well installation and monitoring
Removal Action	Excavation of soil containing lead (AFBCA, 2001b)
Selected Remedy	Institutional controls
Remedial Status	Land use controlled by lease until property is deeded.
Ordnance Burial AOC	
Initial **Preferred Alternative**[1]	No further action (AFBCA, 2000)
Removal Action	None; no contamination identified
Selected Remedy	No further action
Remedial Status	Not applicable

[1] Initial preferred alternatives are those presented in the Supplemental Basewide OU Proposed Plan (AFBCA, 2000)

1.7 Authorizing Signatures

This Supplemental Basewide ROD 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 all such counterparts shall together constitute one and the same document.

The USEPA and the Air Force jointly select the remedies described in this Final Record of Decision for the Supplemental Basewide Operable Unit Sites.

Kathryn M. Halvorson — 26 Sep 06

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

Date

Kathleen H. Johnson — 9/28/06

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

Date

The State of California Department of Toxic Substances Control (DTSC), and California Central Valley Regional Water Quality Control Board (CVRWQCB) had an opportunity to review and comment on the Supplemental Basewide ROD and their concerns were addressed (DTSC and CVRWQCB are hereafter jointly referred to as the State of California).

Anthony J. Landis — 10-10-06

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

Date

2.0 Decision Summary

This decision summary provides an overview of the site characteristics for Mather AFB and the sites addressed in the Supplemental Basewide ROD, the alternatives evaluated for the sites, and the analysis of those alternatives. The decision summary concludes with a determination of the remedies selected to protect human health and the environment at the sites, including the associated statutory determinations supporting the selected remedies.

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

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

2.1 Site Names, Locations, and Descriptions

Mather AFB is located in Sacramento County, California (Figure 1) approximately ten miles east of downtown Sacramento, California. At the time of base closure in 1993, Mather AFB encompassed approximately 5,845 acres, which includes a runway and airfield, industrial areas, housing, recreational facilities, and several non-contiguous parcels. Neighboring communities include the City of Rancho Cordova, which contains part of the former Mather AFB.

The sites and the AOC addressed in the Supplemental Basewide OU ROD are shown on Figure 2 and include:

- Site 80 – Golf Course Maintenance Area Ditch
- Site 85 – South Ditch
- Site 88 – Morrison Creek
- Site 89 – Old Trap Range
- Suspected Ordnance Burial AOC

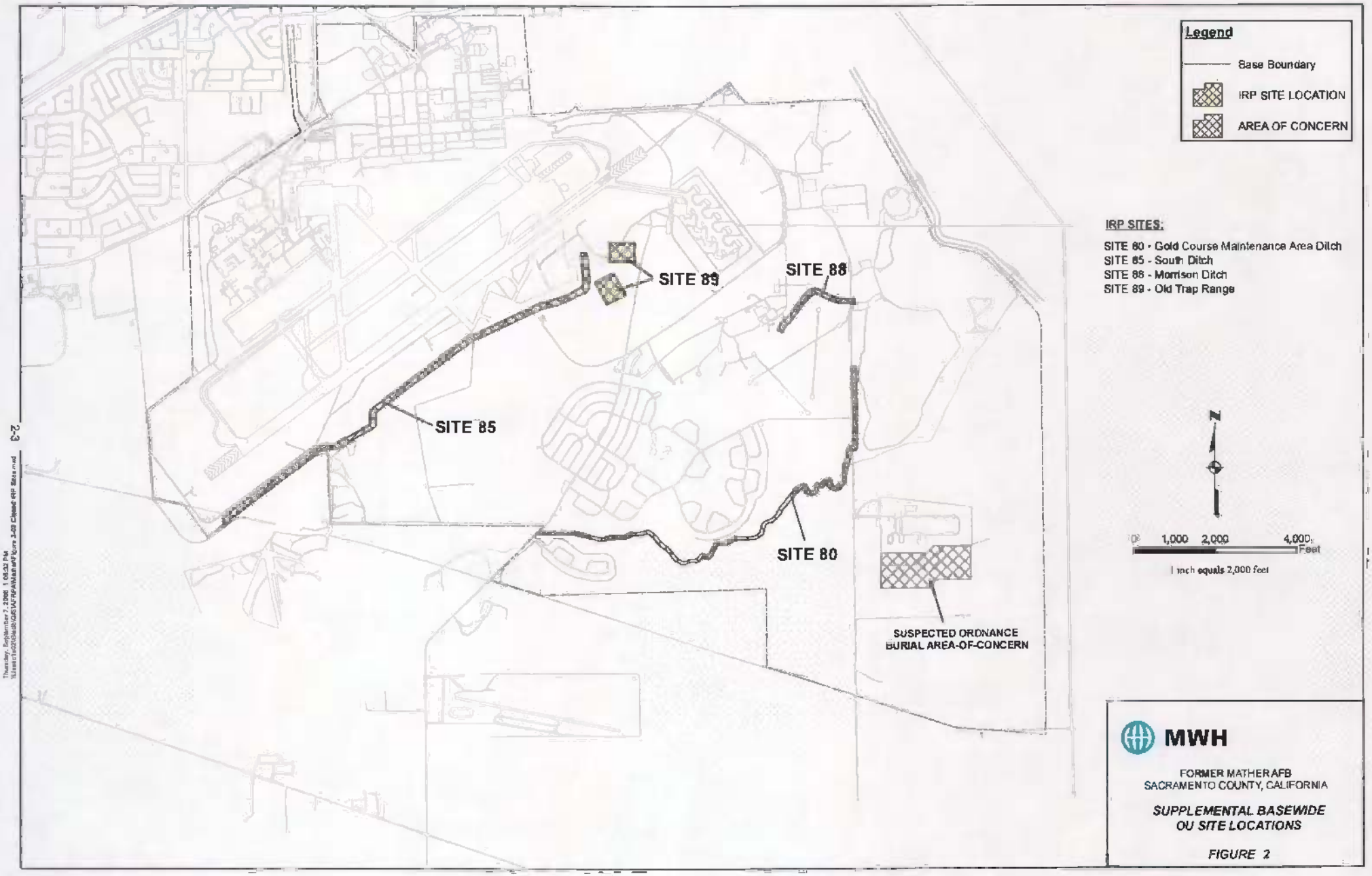
Additional site descriptions and site maps are presented in Section 2.5, Site Characterization.

2.2 Site History and Enforcement Activities

Mather AFB was built in 1918 to serve as a flight training school. After World War II, Mather AFB was the sole aerial navigation school for U.S. military and its allies. In 1958, the Strategic Air Command B-52 squadron was assigned to Mather and stayed there until 1989. Up to 1993, when Mather was decommissioned as an active air base under the Base Realignment and Closure Act (BRAC), the primary mission was training.

Mather AFB sites have been investigated under the United States Air Force Installation Restoration Program (IRP) since 1982. The entire Base was proposed for listing on the Superfund (CERCLA) NPL in July 1989, and was placed on the NPL on November 21, 1989. In July 1989, the United States Air Force, the U.S. EPA, and the State of California signed a Federal Facility Agreement (FFA), under CERCLA Section 120. The FFA is a legal/contractual document governing the relationships between the Air Force and the regulatory agencies that oversee the cleanup program at Mather. The Air Force, U.S. EPA, DTSC and the CVRWQCB remedial project managers are the key participants of the BRAC Cleanup Team (BCT), with the Air Force serving as lead agency. The BCT makes decisions regarding site assessment and cleanup at Mather AFB. The United States Air Force is the owner (or former owner and responsible party) of the site and lead agency for conducting investigative and cleanup activities.

A total of 89 IRP sites with potential soil contamination have been identified. These sites included fire training areas, drainage ditches, waste pits, oil/water separators, historical spills, landfills, a sewage treatment plant, and other areas where hazardous substances may have been present. Site contaminants included petroleum, oils, lubricants, solvents, metals and pesticides. In addition, groundwater contamination was identified beneath portions of Mather AFB.


Legend
Base Boundary
IRP SITE LOCATION
AREA OF CONCERN
IRP SITES:
SITE 80 - Gold Course Maintenance Area Ditch
SITE 85 - South Ditch
SITE 88 - Morrison Ditch
SITE 89 - Old Trap Range
SITE 89
SITE 88
SITE 85
SITE 80
SUSPECTED ORDNANCE BURIAL AREA-OF-CONCERN
0 1,000 2,000 4,000 Feet
1 inch equals 2,000 feet
MWH
FORMER MATHER AFB
SACRAMENTO COUNTY, CALIFORNIA
SUPPLEMENTAL BASEWIDE OU SITE LOCATIONS
FIGURE 2

Groundwater contaminants include perchloroethene, trichloroethene, carbon tetrachloride, and other chlorinated volatile organic contaminants.

The investigations at Sites 80, 85, and 88 were initiated in 1996, and the investigation at Site 89 was initiated in 1998. The Suspected Ordnance Burial AOC was first investigated in 1999. There have been no CERCLA enforcement actions at the Supplemental Basewide OU sites. The Air Force has implemented site characterization and removal action activities for Mather AFB under the Air Force IRP and CERCLA programs (AFBCA, 1997a; AFBCA, 1999; AFBCA, 2001a; AFBCA, 2001b; Montgomery Watson, 2002a; and Montgomery Watson, 2002b). A listing of the investigations conducted at each of these sites is presented in Table 2 and a summary of these investigations is provided in Section 2.5.

2.3 Community Participation

The most recent Community Relations Plan (CRP) for Mather AFB was completed in 2004 (MWH, 2004). The Air Force policy is that the CRP be reviewed annually and updated as needed, but at a minimum, within five years of the last update.

Consistent with the Mather's CRP, the Air Force established a Restoration Advisory Board (RAB) in 1994 composed of the Air Force, and local representatives from adjacent communities. The RAB meetings are attended by representatives of U.S. EPA, DTSC, and CVRWQCB. The RAB meets on a regular basis to provide the community representatives with information on recent events. AFRPA publishes and distributes newsletters and fact sheets to inform the community of recent activities.

The Final Supplemental Basewide OU Focused Feasibility Study (FFS) report (IT Corp., 2000) and Proposed Plan (AFBCA, 2000) became available to the public in September 2000. The FFS identified, screened, and compared alternatives applicable for site cleanup. The Proposed Plan summarized the cleanup alternatives presented in the FFS, presented the recommended cleanup actions, explained the reasons for recommending the actions, and solicited comments from the community on the actions. The Administrative Record for Mather AFB, which includes copies of the FFS report and supporting site-related documents, is available for review at the United States Air Force Real Property Agency office at McClellan, California, and are available as scanned images on the internet (see Appendix A). In addition, selected major documents are available for review at the Rancho Cordova Community Library. The Administrative Record Index for the Supplemental Basewide OU is included as Appendix A of this ROD.

Formal request for public comment on the FFS Report (IT Corp., 2000) and Proposed Plan (AFBCA, 2000) was published in the Sacramento Bee on September 24, 2000 and in The Grapevine Independent on September 27, 2000. The public participation requirements of

CERCLA Sections 113(k)(2)(B)(I-v) and 117 were met through a public comment period. The public comment period extended from September 26, 2000 through October 26, 2000, to allow

Table 2
Investigations/Studies at the Supplemental Basewide Operable Unit Sites

Site Number	Applicable Documents
80	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 18, 19
85	1, 2, 3, 4, 5, 6, 8, 13, 14, 18, 19
88	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 18, 19
89	5, 12, 15, 16, 17, 20, 22
Suspected Ordnance Area of Concern	21

1. *Mather Baseline Risk Assessment (IT Corp., 1995)*
2. *Additional Site Characterization and Final Basewide Operable Unit (OU) Remedial Investigation Report (IT Corp., 1996a)*
3. *Comprehensive Baseline Risk Assessment (IT Corp., 1996b)*
4. *Basewide OU Focused Feasibility Study Report (IT Corp., 1997)*
5. *Informal Technical Information Report for Investigations and Pilot Study at Site 89 (Montgomery Watson, 2000b)*
6. Informal Technical Information Report for Sites 69, 80, and 88 *(Montgomery Watson, 2000a)*
7. *Evaluation of Chironomus tentans Toxicity Results from Mather AFB Sediments (IT Corp., 1999)*
8. *Results of Toxicity Testing with Chironomus tentans on Sediment Samples from Mather Air Force Base (EA, 1999)*
9. *Removal Action Memorandum for Supplemental Basewide OU Sites 80 and 88 (AFBCA, 1999)*
10. *Rapid Bioassessment Protocol Level II Survey at IRP Sites 80 and 88 (IT Corp., 1998)*
11. *Project Definition Investigation Report for Surface Soil and Sediment Sites 10C, 68, 80, 81, and 88 (Montgomery Watson, 1998a)*
12. Survey Sampling Report for Soil and Sediment at the Old Trap Range *(Site 89) (Montgomery Watson, 1999a)*
13. *Memorandum on Oil and Grease Cleanup Levels for Sites 15 and 85 dated November 19, 1998 (Montgomery Watson, 1998b)*
14. *Removal Action Memorandum for Site 85 (AFBCA, 1997a)*
15. Final Removal Action Workplan for Additional Excavations at Site 89 *(Montgomery Watson, 2000c)*
16. *Memorandum on Surface Soil Sampling and Surface Water Sampling at Site 89 (Montgomery Watson, 2001a)*
17. *Memorandum on Additional Surface Water Sampling at Site 89 (Montgomery Watson, 2001b)*
18. *Removal Action Memorandum for Sites 80, 85, and 88 (AFBCA, 2001a)*
19. *Informal Technical Information Report for Additional Excavations at Installation Restoration Program Sites 80, 85, and 88 (Montgomery Watson, 2002a)*
20. *Informal Technical Information Report for Additional Excavations at Site 89 (Montgomery Watson, 2002b)*
21. *Final OE Characterization Report at the Weapons Storage Area, Mather air Force Base, Mather, California (EOD Technology, 1999).*
22. *Removal Action Memorandum for Sites 89 (AFBCA, 2001b)*

the public a chance to comment on the Proposed Plan and the supporting investigative information and FFS. A community meeting was held at Mather AFB on October 10, 2000. Representatives from the Air Force, the U.S. EPA Region 9, the CVRWQCB, and the California DTSC were present at the meeting. Representatives from the Air Force and regulatory agencies answered questions about the Supplemental Basewide OU sites and the remedial alternatives under consideration. The Responsiveness Summary (Section 2.14) contains comments received

during the public meeting and public comment period and the Air Force responses to these comments. A transcript of the October 10, 2000, public meeting is found in Appendix D.

Additionally, public participation was solicited for the following removal action memoranda that supported the Supplemental Basewide OU ROD:

- 1997 Removal Action Memorandum for Site 85 (AFBCA, 1997a): —public comment on remedial alternatives was solicited for the Basewide OU Proposed Plan (AFBCA, 1997b). A public comment period extended from May 23, 1997 to June 23, 1997, with a public meeting held on May 29, 1997.
- 1999 Removal Action Memorandum for Site 80 and Site 88 (AFBCA, 1999) - A public comment period extended from June 9, 1999 to July 8, 1999.
- 2000 removal action memoranda for Sites 80, 85, and 88 (AFBCA, 2001a) and Site 89 (AFBCA, 2001b) - A public comment period on remedial alternatives was solicited for the Supplemental Basewide OU Proposed Plan (AFBCA, 2000). A public comment period extended from September 26, 2000 to October 26, 2000, with a public meeting held on October 10, 2000.

2.4 Scope and Role of Operable Units

Environmental studies were initiated by the Air Force in 1982 to investigate contamination resulting from past operations at the Base. The U.S. EPA placed Mather AFB on the NPL (or "Superfund" list) in 1989. Sites at Mather AFB were organized into six operable units, such that sites with similar sources of contamination and site conditions could be grouped together. Previous RODs presented cleanup options for the Aircraft Control and Warning OU (AFBCA, 1993) (where contaminated groundwater is currently being extracted and treated by air stripping), the Landfill OU (AFBCA, 1995) (where landfill caps are in place or where refuse and debris have been removed), the Soil OU and Groundwater OU (AFBCA, 1996), and the Basewide OU (AFBCA, 1998). The Supplemental Basewide OU is the sixth and final operable unit for Mather AFB.

The Supplemental Basewide OU was established to address activities associated with IRP sites and an area of concern which had not been addressed in the previous Mather AFB RODs. Sites 80, 85, and 88, all of which are drainage ditch sites, were initially evaluated and proposed for remedial action in the Basewide OU FFS (IT Corp., 1997a) and Basewide OU Proposed Plan (AFBCA, 1997b). At that time, it was noted by the regulatory that the extent of contamination for these sites was not adequately defined, toxicity tests were not conclusive, and consensus was not reached on cleanup levels; therefore, the sites were not included in the Basewide OU ROD. Additionally, a newer IRP site (Site 89 – Old Trap Range), and an area of concern (the Suspected Ordnance Burial Area of Concern) are included in this Supplemental Basewide OU. These latter two had not been included in the IRP when the Basewide OU was defined.

2.5 Summary of Site Characteristics

This section provides a brief description and summary of site characterization for the Supplemental Basewide ROD sites and the AOC. Information in this section is summarized from the documents listed in Table 2. The summary here focuses on site conditions in 2006, at the time of remedial action selection. Additional information on site characterization prior to removal actions at each of the four Supplemental Basewide OU sites is provided referenced reports.

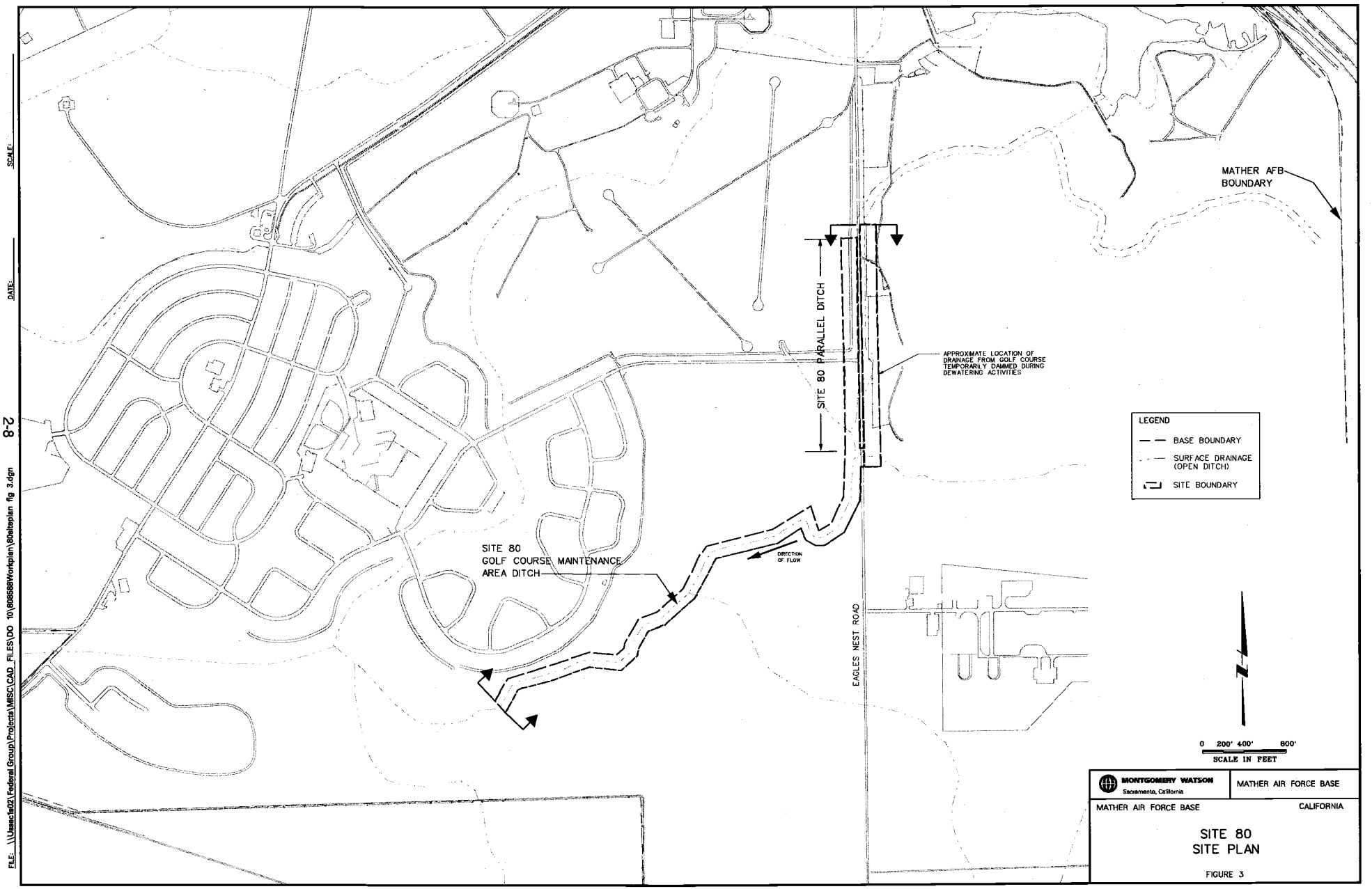
2.5.1 Site 80 – Golf Course Maintenance Area Ditch

2.5.1.1 Site Description

Site 80 is a man-made drainage ditch, which is located in the southeastern and southern portions of Mather AFB, beginning along the western border of the Golf Course Maintenance Area Yard (Site 82) and extending southwest across Eagles Nest Road to Morrison Creek with an on-base length of about two miles (Figure 3). The ditch drains the Mather Golf Course and local adjacent areas. The ditch is unlined and ranges from 10 feet to 25 feet wide at the bottom.

Site 80 was investigated for potential contamination associated with pesticide use on the golf course and possible storage and handling of pesticides in the Golf Course Maintenance Area (located just east of the northern extent of the Site 80 ditch). Sediment and surface water samples were initially obtained from the Site 80 ditch as part of the Additional Site Characterization and Final Basewide Operable Unit Remedial Investigation (IT Corp., 1996b). Sediment and surface water samples were obtained from three locations along the Site 80 ditch and analyzed for metals, semivolatile organic compounds (SVOCs) and pesticides. Pesticide and metal detections were followed up with additional sampling during the Project Definition Investigation (PDI) activities in 1998 (Montgomery Watson, 1998) and 1999 (Montgomery Watson, 2000). Analyses on these samples included total organochlorine pesticides (U.S. EPA Method 8080), soluble organochlorine pesticides (U.S. EPA Method 8081), and total and soluble metals (U.S. EPA Method 6010). Maximum contaminant detections for samples collected during the Remedial Investigation (RI) and PDI projects include those summarized in Table 3.

The historic distribution of pesticide contamination suggests that pesticides may have been applied along Eagle's Nest Road. The highest concentrations were seen from where the drainage ditch exits the golf course, and for a distance along the roadside, past the Golf Course Maintenance Area, with decreasing concentrations downstream. Site 80 was originally investigated to determine if pesticide storage and handling had resulted in the release of pesticides to the ditch. However, the investigations showed that only one sample in the Golf Course Maintenance Area had significant concentrations of pesticides, and the pattern of pesticide concentrations in the ditch were similar both upstream and downstream of the Golf Course Maintenance Area. This indicates that the source area was either upstream or along



MONTGOMERY WATSON
Sacramento, California

MATHER AIR FORCE BASE

MATHER AIR FORCE BASE CALIFORNIA

SITE 80
SITE PLAN

FIGURE 3

SCALE:

DATE:

2-8

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adjacent roadside areas where pesticides may have been applied. It is possible that pesticides were applied to portions of the golf course, and some washed into the Site 80 drainage ditch.

Table 3

Maximum Detections for Metals and Pesticides at Site 80 During RI and 1999 PDI

Analyte	RI only	RI and 1999 PDI	Units
	Concentration	Concentration	
Sediment			
Arsenic	10.3	10.3	mg/kg
Dieldrin	5.7	62	µg/kg
α-Chlordane	7.3	1400	µg/kg
γ-Chlordane	4.2	1700	µg/kg
4,4'-DDD		1700	µg/kg
4.4'-DDE		4200	µg/kg
4,4'-DDT		160	µg/kg
Surface Water			
Arsenic	8.5	8.5	µg/L
Dieldrin	0.029	0.029	µg/L
di-n-butylphthalate	0.6	0.6	µg/L
Manganese	3250	3250	µg/L
Zinc	33.2	33.2	µg/L

mg/kg = milligram(s) per kilogram ug/L = microgram(s) per liter

2.5.1.2 Removal Actions

The risk assessment for Site 80 (IT Corp., 1996) concluded on the basis of the site characterization done to that point, that there was not significant risk to human health from contamination at Site 80, but that there was risk to ecological health rated as low-medium according to the weight-of-evidence approach. This approach was used for other sites at Mather during preparation of the Final Mather Baseline Risk Assessment (MBRA) (IT Corp., 1995), and the Final Comprehensive Baseline Risk Assessment for Mather Air Force Base, California (CBRA) (IT Corp., 1996b), and is described in the Additional Site Characterization Report (IT Corp., 1996a). The weight-of-evidence approach to ecological risk assessment at the Supplemental Basewide OU sites consisted of consideration of four lines of evidence (benchmark comparisons, risk modeling, toxicity tests, and habitat quality). The site was originally assigned to the Basewide OU. The Basewide FFS (IT Corp., 1997) identified dieldrin, alpha-chlordane, and gamma-chlordane as chemicals of concern in sediment at Site 80, and dieldrin and manganese as chemicals of concern in surface water. The Basewide OU Proposed

Plan (AFBCA, 1997b) proposed excavation for pesticides and metals in sediment, and removal of surface water if present, to be protective of human health and the environment based upon risk assessments for human health and ecological health described above. However, sites 80, 85, and 88 were not included in the Basewide ROD because of requests for additional evaluation and bioassessment testing prior to selecting a final remedy. A removal action was authorized in 1999 (AFBCA, 1999) to conduct the excavation proposed in the Basewide OU Proposed Plan, but with lower removal goals for chlordane cleanup to protect ecological health, based on additional review and discussion among the Air Force, U.S. EPA, and the State of California, to achieve cleanup levels based on ecologic risk and on protection of surface water quality. These removal goals are tabulated below and were anticipated to satisfy the final remedial requirements.

The non-time-critical removal action authorized by the 1999 Removal Action Memorandum (RAM) was conducted by Montgomery Watson between July 12 and August 23, 1999, whereby approximately 1610 yards of sediment from the drainage channel were excavated and removed. The Site 80 Removal Action was conducted in two stages as described in the Informal Technical Information Report (ITIR) for Remedial Actions at Sites 69, 80 and 88 (Montgomery Watson, 2000).

Table 4

1999 Removal Goals for Site 80

COC	Concentration	Units
Sediment		
Dieldrin	7.5	µg/kg
α-Chlordane	1.7	µg/kg
γ-Chlordane	1.7	µg/kg

All but about 10 cubic yards of the excavated sediments were consolidated under or as part of the foundation layer for the engineered cap at Site 7. The 10 yards that were excavated on August 23, after the Site 7 cap geotextile layer was under construction, were stockpiled in the Mather Soils Management Area for later offsite disposal (Montgomery Watson, 2000). After the removal action, seven locations had alpha-chlordane concentrations and three locations had gamma-chlordane concentrations that slightly exceeded the removal action goals. However, a statistical analysis was conducted that showed that the 95 percent upper confidence level of the mean concentrations for alpha-chlordane (0.78 micrograms per kilogram [µg/kg]) and gamma-chlordane (0.58 µg/kg) were below the cleanup goal of 1.7 µg/kg (i.e., the practical quantitation limit, or PQL), which was established in the 1999 RAM (AFBCA, 1999).

On September 11, 2000, the Supplemental Basewide OU FFS (IT Corp., 2000) was finalized. The FFS presented revised, more stringent Preliminary Remediation Goals (PRGs), including a change to the cleanup goal for dieldrin from 7.5 µg/kg (previous removal goal based on ecological assessment) to 3.3 µg/kg (the threshold effects limit [TEL] is 2.85 µg/kg; however, the PQL of 3.3 µg/kg is higher).

The changes in PRGs resulted in four previously "clean" sample locations at Site 80 (80-CNF-10-OSO, 80-CNF-12-OSO, 80-CNF-17-OSO, and 80-CNF-19-OSO) not achieving the new cleanup goal. To further evaluate the extent of residual pesticides that would require cleanup under the anticipated new PRGs, eight sediment samples had been collected in June 2000, near the elevated sample locations and analyzed for pesticides (MWH, 2002). The results of these confirmation samples and prior sampling data indicated that the only COC identified for the sediment at Site 80 was dieldrin, and delineated the area requiring additional cleanup.

The finalization of the ROD was delayed to resolve disagreements about how institutional controls were to be implemented, so a second removal action was authorized to excavate sediments that exceeded the new removal goals (AFBCA, 2001a).

The second non-time-critical removal action at Site 80 was conducted in 2001 from August 3 through September 6, 2001 (referred to as stages 3 and 4), when the northeastern portion of the ditch was excavated from the farthest eastern portion of the ditch to a point approximately 730 linear feet along the ditch, in two stages. The details of the removal action are reported in the Informal Technical Information Report for Additional Excavations at IRP Site 80, 85, and 88 (MWH, 2002). In total, approximately 730 linear feet of ditch, approximately 3 feet in width, was excavated in 2001 along the Site 80 ditch (Figure 3, "Site 80 August 2001 Excavation Boundary and Confirmation Sampling Location"). Initial excavations were completed to a depth of 1 foot below ground surface. The estimated soil volume for the excavation was approximately 80 cubic yards; the excavated soil was disposed at Forward Landfill, a Class II facility approved by U.S. EPA for disposal of CERCLA waste (MWH, 2002). Confirmation sampling indicated that there was no dieldrin remaining at Site 80 at concentrations exceeding the 2001 removal goals.

The remedial project managers for the Air Force, the U.S. EPA, and the State of California considered the benefits of periodic excavation to remove additional pesticide-contaminated sediment that may reaccumulate in the ditches and the benefits of allowing the habitat to restore itself, and came to the conclusion that the 2001 removal excavation should occur to address the current distribution of pesticide in the Site 80 drainage channel, but that this removal action would be final, and the drainage course should be allowed to repopulate with plants and animals after that.

Some pesticides may be washed into these drainage channels in the future. However, the lack of a point source of contamination at Mather AFB and the likelihood that pesticides may be entering the drainage from upstream, make it impractical to mitigate these sources. The remedial project managers believe further periodic monitoring and ditch excavation efforts would not produce significant improvement, because the harm to the habitat from periodic excavation is judged to outweigh that from pesticides. The pesticides of concern were banned in the 1970s; it is hypothesized that the primary contamination in the ditches likely occurred during and shortly after active use of these pesticides and that dissolution and transport of contaminated water and sediment has been tailing off ever since. Therefore, it is expected that the influx of residual pesticides into these drainage channels in the future is expected to be of relatively low concentration, and no worse than that in other formerly agricultural areas surrounding the former Mather AFB.

2.5.2 Site 85 – South Ditch

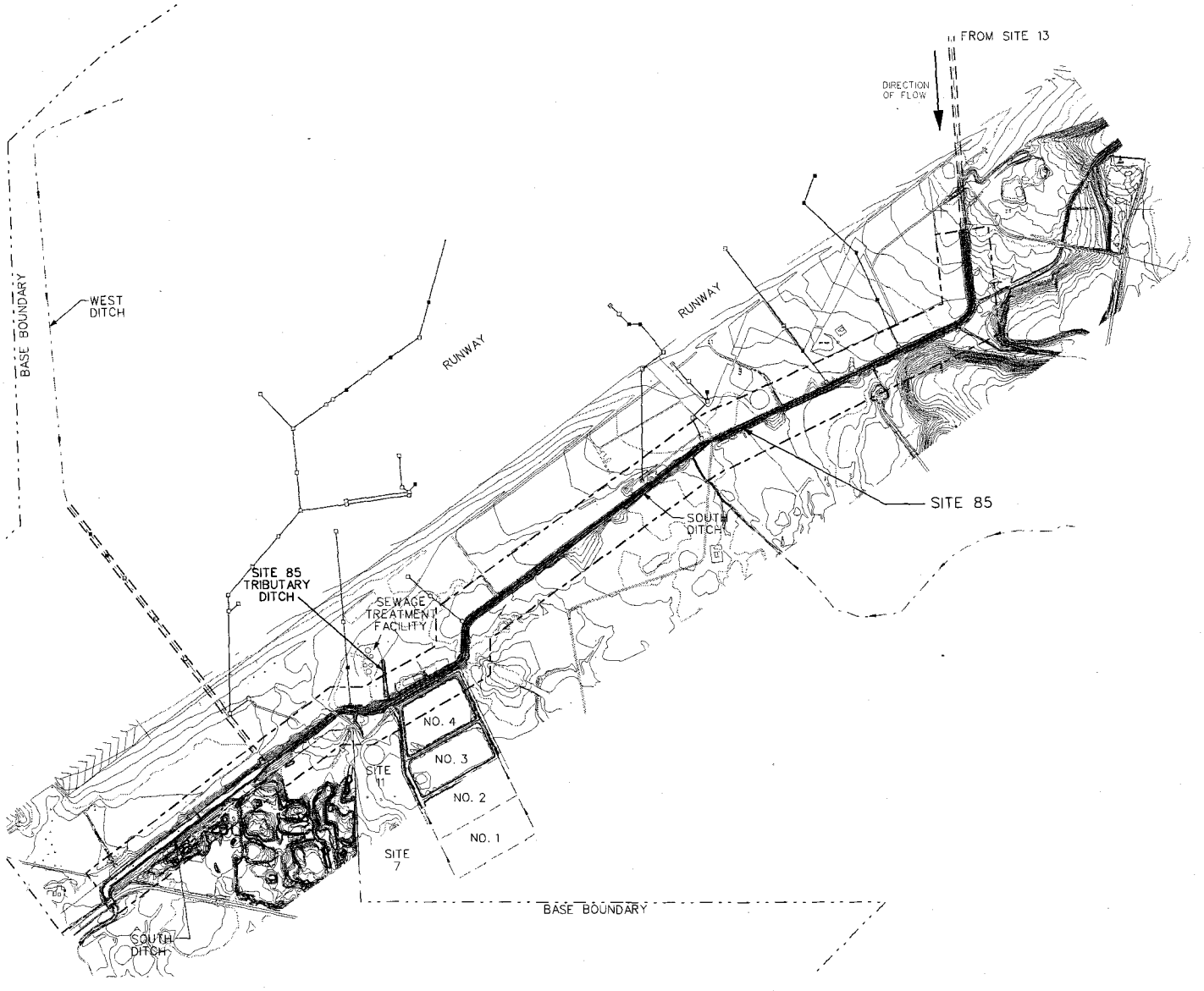
2.5.2.1 Site Description

Site 85, the South Ditch, is located in the south-central to southwestern portion of the Base, beginning at where the storm drain emerges from under the eastern portion of the runways, flowing south and then extending southwest parallel to the runways for about two miles to the point where the South Ditch flows off base and into Morrison Creek (Figure 4). The total length of the South Ditch, on Mather is approximately 12,000 feet. Historically, flowing water has not been present year round within the Site 85 drainage ditch. However, several portions of the ditch have areas of standing water as well as dense riparian vegetation. A small ditch (Site 85 tributary ditch) approximately 390 feet long that once connected the former wastewater plant to the South Ditch is considered part of Site 85 for purposes of cleanup, although at the time of site characterization, the two channels were no longer connected. The South Ditch is a jurisdictional wetland under U.S. Army Corps of Engineers definitions.

2.5.2.2 Site Characterization

Site 85 was investigated during the Basewide OU RI (IT Corp., 1996a) for potential contamination that may have accumulated in the South Ditch as a result of inflows from aircraft washing operations at Site 13 (Drainage Ditch No. 1) and from storm water runoff. Areas from which storm water drained to the South Ditch include the upstream portions of the drainage, including Site 13; the main runway; the Sewage Treatment Facility and sludge drying beds; and the West Ditch.

Sediment and water samples had previously been obtained at Site 13, the portion of the drainage system at Mather upstream from the Site 85 ditch, as part of the Group 2 RI (IT Corp., 1993). In association with sampling at IRP Site 13, 4,4'-DDE was detected at a concentration of 1800 µg/kg in sediment; Site 13 was remediated as part of the Soil OU and closure documented in a



LEGEND

- CATCH BASIN
- DROP INLET
- SURFACE DRAINAGE (OPEN DITCH)
- NATURAL DRAINAGE
- INTAKE
- OUTFALL
- CULVERT
- SITE BOUNDARY

NOTES:

1. NOT ALL UTILITIES ARE SHOWN

N

500' 250' 0 500' 1000'

SCALE IN FEET

MONTGOMERY WATSON
Sacramento, California

MATHER AIR FORCE BASE

MATHER AIR FORCE BASE CALIFORNIA

SITE 85
SITE PLAN

FIGURE 4

SCALE:

DATE:

2-13

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remedial action report (AFRPA, 2002). During the Basewide OU RI, six sediment samples obtained from the Site 85 ditch were analyzed for SVOCs, pesticides, metals, total petroleum hydrocarbons (TPH), and oil and grease (IT Corp, 1996). Four of the sediment samples were also analyzed for polychlorinated biphenyls (PCBs) and dioxins/furans. In addition, seven surface water samples were obtained to assess toxicity to aquatic life, and sampled for metals, pesticides, semivolatile organic compounds; three samples were also analyzed for polychlorinated biphenyls (PCBs) and dioxin/furans. Maximum contaminant detections for sediment and surface-water samples collected during the RI include those summarized in Table 5. It should be noted that the highest surface water concentration of iron and manganese were from the isolated and formerly tributary ditch adjacent to the wastewater plant.

The Site 85 drainage ditch has been characterized for pesticide contamination. Pesticides at Site 85 were highest in the upstream portion of the ditch where it emerges from beneath the runways, and decreased with distance from there. Potential sources included pesticide spraying that had occurred along and adjacent to the ditch, and the Sewage Treatment Facility, and upstream portions of the drainage (i.e. sites 13 and 15).

2.5.2.3 Removal Actions

The risk assessment for Site 85 (IT Corp., 1996b) concluded on the basis of the site characterization done to that point, that there was risk to human health from arsenic in surface water, and lead, cadmium, benzo(a)pyrene, benzo(b)fluoranthene, and dioxins contributing most of the risk. Risk to ecological health was rated as medium according to the weight-of-evidence approach. The Basewide Feasibility Study (IT Corp., 1997) identified preliminary remediation goals (PRGs) for metals in surface water, and metals, pesticides, dioxins and furans, polyaromatic hydrocarbons, and petroleum hydrocarbons in sediment. Based on the presence of metals, PCBs, SVOCs, dioxins/furans, pesticides and petroleum hydrocarbons in Site 85 sediments, and the results of human health and ecological health risk assessments, a removal action was undertaken, using the proposed PRGs to establish removal goals.

The weight-of-evidence approach for ecological risk assessment was used for other sites at Mather during preparation of the Final Mather Baseline Risk Assessment (MBRA) (IT Corp., 1995), and the Final Comprehensive Baseline Risk Assessment for Mather Air Force Base, California (CBRA) (IT Corp., 1996b), and is described in the Additional Site Characterization Report (IT Corp., 1996a). The weight-of-evidence approach to ecological risk assessment at the Supplemental Basewide OU sites consisted of consideration of four lines of evidence (benchmark comparisons, risk modeling, toxicity tests, and habitat quality).

A removal action memorandum (RAM) for excavation and disposal of sediments was issued in October 1997 (AFBCA, 1997). The removal goals established in the 1997 RAM were set at the

Table 5

Maximum RI Detections at Site 85

Analyte	Concentration	Units
Sediment		
Metals		
Chromium	176	mg/kg
Lead	1500	mg/kg
Mercury	1.7	mg/kg
Silver	68	mg/kg
Zinc	763	mg/kg
SVOCs, PCBs and Dioxins/Furans		
Anthracene	279	µg/kg
Benzo(a)pyrene	1700	µg/kg
Benzo(b)fluoranthene	3600	µg/kg
Benzo(g,h,i)perylene	990	µg/kg
Benzo(k)fluoranthene	1500	µg/kg
Carbazole	440	µg/kg
Dibenz(a,h)fluoranthene	500	µg/kg
Indeno(1,2,3-c,d)pyrene	2100	µg/kg
Phenanthrene	2600	µg/kg
Fluouranthene	5000	µg/kg
Pyrene	4200	µg/kg
PCB Aroclor-1254	32	µg/kg
1,2,3,4,6,7,8-Heptachlorodibenzodioxin	400	pg/g (ng/kg)
1,2,3,4,6,7,8-Heptachlorodibenzofuran	71	pg/g (ng/kg)
Octachlorodibenzodioxin	2600	pg/g (ng/kg)
Pesticides		
4,4'-DDD	510	µg/kg
4,4'-DDE	120	µg/kg
4,4'-DDT	300	µg/kg
α-Chlordane	290	µg/kg
γ-Chlordane	270	µg/kg
Oil and Grease	1880	mg/kg
TPH-Diesel	720	mg/kg

Table 5 (continued)

Surface Water		
Aluminum	404	ug/L
Iron	1520	ug/L
Lead	3.7	ug/L
Manganese	214	ug/L

Data from IT Corp., 1996a

proposed cleanup levels (PRGs) presented in the Basewide OU Focused Feasibility Study. The COCs were metals, pesticides, polynuclear aromatics, dioxins, oil and grease, and diesel-range hydrocarbons, and the cleanup levels had been selected based on the more stringent of concentrations protective of water quality, human health, and ecological health (IT Corp., 1997).

Additional sampling was conducted from June to December 1997 to further delineate the extent (including depth) of contamination at Site 85 (Montgomery Watson, 1999b). It was determined that two portions of the ditch, totaling about 8500 feet in length, contained contaminants exceeding the removal goals. These sections would need to be excavated to an average depth of 6 to 8 inches. A non-time-critical removal action was conducted between October 15 and December 19, 1997. Drainage channel sediments were excavated and removed. Most of the excavated sediments were consolidated under the engineered cap at Site 7. The other soils, totaling about 220 cubic yards, were stockpiled at the Mather Soils Management Area for ex-situ treatment. The Site 85 Removal Action was conducted in multiple stages, whereby areas where COCs remained above the removal goals after each stage of excavation were further excavated and sampled until after four stages all excavated areas met the removal goals. After the removal action, all constituents, with the exception of oil and grease met the site cleanup goals. It was determined in meetings with the regulatory agencies (Montgomery Watson, 1998b) that the concentrations of oil and grease did not pose a threat to human health, ecological receptors, or the underlying groundwater. A detailed description of each stage and sampling results may be found in the Informal Technical Information Report for Remedial Actions at Sites 15, 20, 85, 86, and 87 (Montgomery Watson, 1999b).

Sites 80, 85, and 88 were not included in the Basewide ROD because of requests for additional evaluation and bioassessment testing for pesticides prior to selecting a final remedy. During preparation of the FFS for the Supplemental Basewide OU in 2000, the remedial project managers agreed that the cleanup standards for pesticides should be the constituent-specific TEL concentrations. Due to this change, the cleanup goals for alpha- and gamma-chlordane decreased from 140 µg/kg proposed in the Basewide OU FFS to the TEL of 4.5 µg/kg and for 4,4'-DDD and 4,4'-DDT the removal goal decreased from 8 µg/kg to the PQL of 3.3 µg/kg. This resulted in

two "clean" confirmation samples (85-CNF-05 and 85-CNF-06) that met the 1997 removal goals now exceeding the chlordane TEL, two "clean" confirmation samples (85-CNF-06 and 85-CNF-25) that met the 1997 removal goal now exceeding the 4,4'-DDD TEL of 3.54 µg/kg, and one "clean" confirmation sample (85-CNF-25) that met the 1997 removal goal now exceeding the PQL of 3.3 µg/kg for 4,4'-DDT.

Although the 1997 removal goals for Site 85 had been met, residual contamination remained that still warranted concern for protection of ecological health, as a result of the revised cleanup goals. Based on this, additional sampling was undertaken in the spring of 2000, after the rainy season, to determine the extent of contamination near the sample locations with elevated concentrations and along an approximately 3,000-foot-long section of the ditch where samples were previously analyzed for only technical chlordane.

On June 12, 2000, Montgomery Watson collected a total of 10 samples from the northeastern section of Site 85. The additional sampling at Site 85 confirmed that concentrations of chlordane remained in portions of the ditch, including one sample taken where additional sediment had accumulated since the 1997 and 1998 excavation in the upstream portion of Site 85 (this sample contained alpha-chlordane, gamma-chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin). The maximum chlordane detections in the ditch were at sample location 85-CNF-31, at a depth of 1 ft below ground surface, which is below the newly accumulated sediment. However, the source of this accumulated sediment appears to have been from off base, as the sediment deposition is seen to a greater degree at the upstream Site 13 ditch, and the amount and size sorting of sediment is incompatible with the limited erosion sources on base. Site 13 is located north of the northeastern end of the Site 85 ditch and drained an area used for aircraft washing operations. The results from the June 2000 site characterization sampling confirmed that additional excavation would be required to remove sediment containing COC concentrations in excess of 2001 removal goals.

A non-time critical removal action (AFBCA, 2001a) was conducted from July 24 through September 28, 2001 in four successive stages of excavation and sampling. Approximately 3,500 cubic yards of sediment were removed from an approximately 5,700-foot- long section of the northeast ditch starting at the headwall, and another 260 cubic yards of sediment was removed from the Site 85 tributary ditch. Following the last all confirmation sample results were below the removal goals, except where trace levels remained in the Site 85 tributary ditch. The tributary ditch was later filled in with soil to avoid contact of aquatic organisms with the remaining sediment.

The remedial project managers for the Air Force, the U.S. EPA, and State of California considered the benefits of periodic excavation to remove additional pesticide-contaminated sediment that may reaccumulate in the ditches and the benefits of allowing the habitat to restore

itself, and came to the conclusion that the 2001 excavation should occur to address the current distribution of pesticide in the Site 85 drainage channel, but that this removal action would be the final remedial action, and the drainage course should be allowed to repopulate with plants and animals after that.

Some pesticides may be washed into these drainage channels in the years after the excavation occurs. However, the lack of a point source of contamination at Mather AFB and the likelihood that pesticides may be entering the drainage from upstream, make it impractical to mitigate these sources. The remedial project managers believe further periodic monitoring and excavation of the ditches would not produce significant improvement, because the harm to the habitat is judged to outweigh that from pesticides. The pesticides of concern were banned in the 1970s; it is hypothesized that the primary contamination in the ditches likely occurred during and shortly after active use of these pesticides and that dissolution and transport of contaminated water and sediment has been tailing off ever since. Therefore, it is expected that the influx of residual pesticides into these drainage channels in the future is expected to be of relatively low concentration, and no worse than that in other formerly agricultural areas surrounding the former Mather AFB.

2.5.3 Site 88 – Morrison Creek

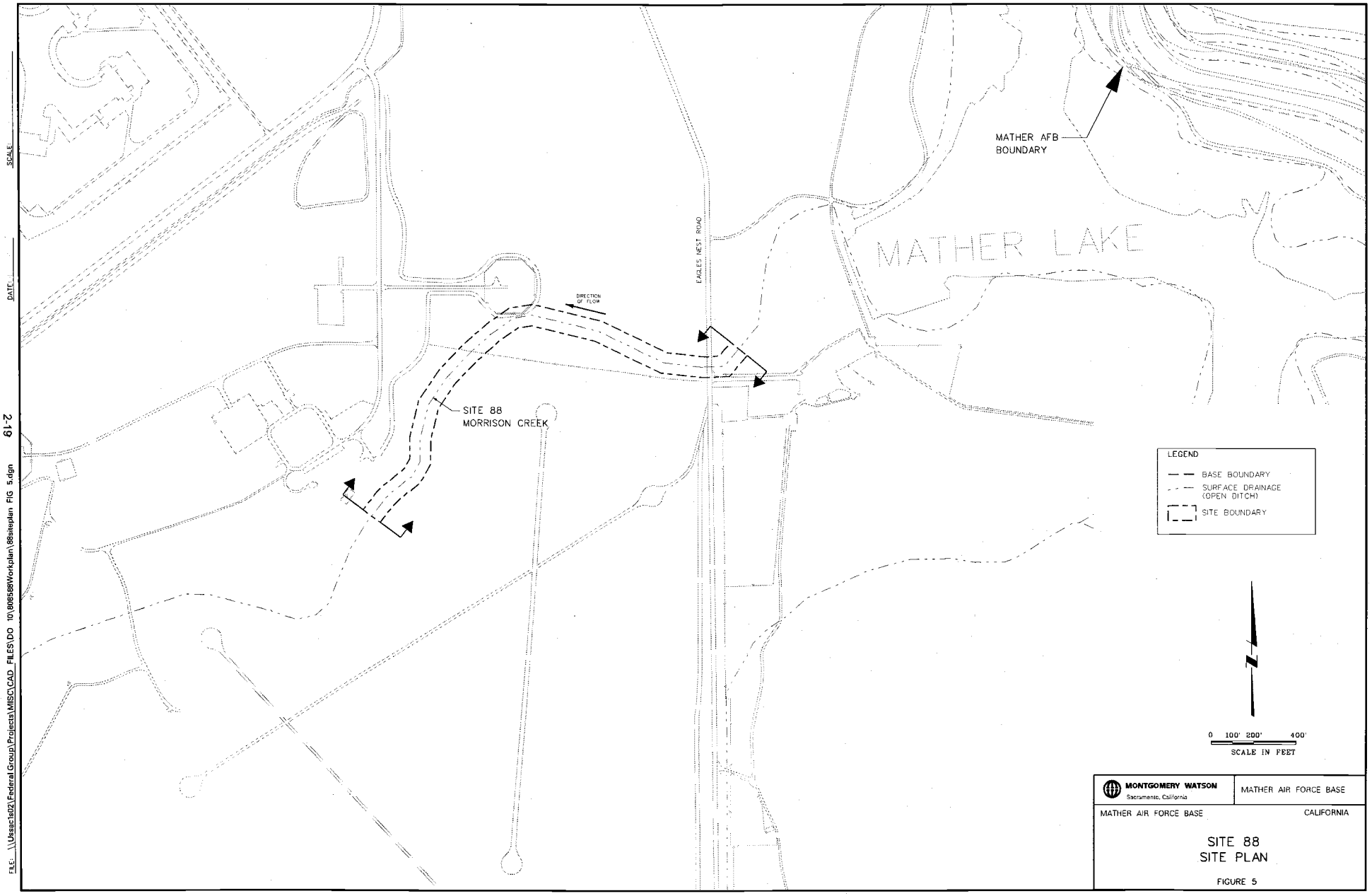
2.5.3.1 Site Description

Site 88 is an unlined drainage channel, which originates at the outlet from Mather Lake in the northeastern portion of Mather. The creek flows southwesterly across the Base and is joined by the Golf Course Maintenance Area Ditch (Site 80) drainage prior to flowing off base (Figure 5). The Site 88 ditch was initially sampled as a reference site assumed to be uncontaminated.

Information from this site was to be used to help determine the effect of contamination at other ditch sites on ecologic receptors. When pesticides were discovered at the reference site, it was designated as Site 88 and evaluated for remediation.

2.5.3.2 Site Characterization

Site 88 was investigated for potential contamination associated with pesticide application along Eagle's Nest Road where it transects Morrison Creek. Sediment samples were initially obtained from Site 88 as part of the Additional Site Characterization and Final Basewide Operable Unit Remedial Investigation (IT Corp., 1996b). Three sediment and surface water samples were obtained from Morrison Creek and analyzed for metals, semivolatile organic compounds (SVOCs) and pesticides. Pesticide and metal detections were followed up with additional sampling during project definition investigation (PDI) investigations in 1998 (Montgomery Watson, 1998) and 1999 (Montgomery Watson, 2000). Analyses on these samples included total organochlorine pesticides (U.S. EPA Method 8080), soluble organochlorine pesticides (U.S. EPA Method 8081), total and soluble metals (U.S. EPA Method 6010) and naphthalene (Method



MONTGOMERY WATSON
Sacramento, California

MATHER AIR FORCE BASE

MATHER AIR FORCE BASE CALIFORNIA

SITE 88
SITE PLAN

FIGURE 5

SCALE

DATE

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8270). Maximum contaminant detections for samples collected during the RI include those summarized in Table 6.

Table 6

Maximum RI Detections at Site 88

Analyte	Concentration	Units
Sediment		
Arsenic	12.1	mg/kg
4,4'-DDD	540	µg/kg
4,4'-DDE	240	µg/kg
4,4'-DDT	490	µg/kg
Dieldrin	480	µg/kg
α-Chlordane	210	µg/kg
γ-Chlordane	210	µg/kg
Total chlordane	100	µg/kg
Lead	33	mg/kg
Surface Water		
Copper	55.5	ug/L
Manganese	147	ug/L

Data from IT Corp., 1996a

The historic distribution of pesticide contamination suggests that pesticides may have been applied along Eagle's Nest Road and migrated via storm drainage to Morrison Creek. The highest concentrations in Morrison Creek were near the road crossing, and the concentrations decreased downstream.

2.5.3.3 Removal Action

The risk assessment for Site 88 concluded on the basis of the site characterization done to that point, that there was risk to human health from arsenic in sediments, and ecological health rated as low-medium according to the weight-of-evidence approach based on pesticides and metals, primarily manganese and arsenic. Later it was recognized that the arsenic concentrations were within the background value for soils. The site was originally assigned to the Basewide OU.

The weight-of-evidence approach for ecological risk assessment was used for other sites at Mather during preparation of the Final Mather Baseline Risk Assessment (MBRA) (IT Corp., 1995), and the Final Comprehensive Baseline Risk Assessment for Mather Air Force Base, California (CBRA) (IT Corp., 1996b), and is described in the Additional Site Characterization Report (IT Corp., 1996a). The weight-of-evidence approach to ecological risk assessment at the

Supplemental Basewide OU sites consisted of consideration of four lines of evidence (benchmark comparisons, risk modeling, toxicity tests, and habitat quality).

The Basewide FFS (IT Corp., 1997) identified dieldrin; alpha-chlordane; gamma-chlordane; 4,4'-DDD; 4,4'-DDE, 4,4'-DDD; naphthalene, and eight metals as chemicals of concern in sediment at Site 88, and copper and manganese as chemicals of concern in surface water, most based both on potential human health and potential ecological risk. The Basewide OU Proposed Plan (AFBCA, 1997b) proposed excavation for pesticides and metals in sediment, and removal of surface water if present. However, sites 80, 85, and 88 were not included in the Basewide ROD because of requests for additional evaluation and bioassessment testing prior to selecting a final remedy. A removal action was authorized in 1999 (AFBCA, 1999) to conduct the excavation proposed in the Basewide OU Proposed Plan, but with a refined list of contaminants of concern and PRGs based on additional site sampling and bioassessment, to achieve cleanup levels based on ecologic risk and on protection of surface water quality. These removal goals are tabulated below and were anticipated to satisfy the final remedial requirements.

Table 7

1999 Removal Goals for Site 88

COC	Concentration	Units
Sediment		
Arsenic	9.6	mg/kg
Dieldrin	7.5	µg/kg
α-Chlordane	1.7	µg/kg
γ-Chlordane	1.7	µg/kg
4,4'-DDD	3.3	µg/kg
4,4'-DDE	3.3	µg/kg
4,4'-DDT	3.3	µg/kg
Surface Water		
Manganese	(clean up sediments)	
Dieldrin	(clean up sediments)	

The Removal Action Memorandum for Supplemental Basewide Operable Unit Sites 80 and 88 was issued in July 1999 (AFBCA, 1999).

The non-time-critical removal action authorized by the 1999 RAM was conducted at Site 88 by Montgomery Watson subcontractor Aronson between July 12 and August 4, 1999, whereby approximately 2860 cubic yards of sediment from the drainage channel were excavated and removed. The Site 80 Removal Action was conducted in two stages as described in the Informal

Technical Information Report (ITIR) for Remedial Actions at Sites 69, 80 and 88 (Montgomery Watson, 2000).

All the sediments excavated from Site 88 were consolidated under, or as part of, the foundation layer for the engineered cap at Site 7 (Montgomery Watson, 2000). After the removal action, the remaining concentrations of contaminants were shown to statistically meet the removal goals (Montgomery Watson, 2000); for each contaminant, the 90 percent upper confidence level estimate of the mean concentration met the removal goal for that contaminant established in the Removal Action Memorandum (AFBCA, 1999).

During the preparation of the Supplemental Basewide OU FFS, there was much discussion about how to interpret the available information developed during the ecological risk assessment, and what the information indicated about toxicity for each of the pesticides. On September 11, 2000, the Supplemental Basewide OU FFS (IT Corp., 2000) was finalized. The FFS presented revised, more stringent Preliminary Remediation Goals (PRGs), including a change to the cleanup goal for dieldrin from 7.5 µg/kg (previous removal goal based on ecological assessment) to 3.3 µg/kg based on the threshold effects level (TEL) (the TEL is 2.85 µg/kg; however, the PQL of 3.3 µg/kg is higher).

The changes in PRGs resulted in two previously "clean" sample locations that had met the 1999 removal goal for dieldrin not achieving the new PRG. To further evaluate the extent of residual pesticides that would require cleanup under the anticipated new PRGs, seven sediment samples had been collected in June 2000, near the two sample locations, just upstream from the prior removal action, and downstream from the prior removal action, and analyzed for pesticides (MWH, 2002). The additional sampling confirmed one portion of the Site 88 drainage channel contained residual contamination of alpha-chlordane, gamma-chlordane, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin. A very limited amount of new sediment was observed at Site 88. However, residual concentrations of pesticides remained above the threshold effect levels. All human cancer and non-cancer risks were within or below the protective range for unrestricted use. Pesticide cleanup goals were identified in the sediments based on an ecological risk (i.e., exceeds TELs). Pesticides were identified as COCs in the surface water based on exceeding Ambient Water Quality Criteria. However it was determined that if contaminants in sediments were removed, then any potential surface water impacts from Site 88 would have been eliminated.

The finalization of the ROD was delayed to resolve disagreements about how institutional controls were to be implemented, so a second removal action was authorized to excavate sediments that exceeded the new removal goals (AFBCA, 2001a).

A second non-time critical removal action (AFBCA, 2001a) was conducted in two stages (Stages 3 and 4) from August 1 through September 6, 2001. The details of the removal action are reported in the Informal Technical Information Report for Additional Excavations at IRP Site 80, 85, and 88 (MWH, 2002).

Excavation of the ditch floor was conducted extending approximately 370 linear feet west from Eagles Nest Road and approximately 50 linear feet east from Eagles Nest Road. Excavation was conducted in stages (termed stages 3 and 4) until confirmation samples indicated that remaining sediment concentrations were at or below the removal goals. After the second stage confirmation samples were found to be below the pesticide removal goals. No further excavation was deemed necessary at Site 88 (Figure 2-8, "Site 88 August 2001 Excavation Boundary and Confirmation Sampling Locations"). A total of approximately 330 cubic yards of sediment were excavated from site 88 during the 2001 removal action; this sediment was transported in September 2001 to Forward Landfill in Stockton, California, a facility approved by U.S. EPA for disposal of CERCLA waste.

The remedial project managers for the Air Force, the U.S. EPA, and State of California have considered the benefits of periodic excavation to remove additional pesticide contaminated sediment that may reaccumulate in the ditches and the benefits of allowing the habitat to restore itself, and have come to the conclusion that the 2001 excavation addressed the distribution of pesticide in the Site 88 drainage channel at that time, that this removal action would be final, and that the drainage should be allowed to repopulate with plants and animals after that.

Some pesticides may be washed into these drainage channels in the years after the excavation occurs. However, the lack of a point source of contamination at Mather AFB and the likelihood that pesticides may be entering the drainage from upstream, make it impractical to mitigate these sources. The remedial project managers believe further periodic monitoring and excavation of the ditches would not produce significant improvement, because the harm to the habitat is judged to outweigh that from pesticides. The pesticides of concern were banned in the 1970s; it is hypothesized that the primary contamination in the ditches likely occurred during and shortly after active use of these pesticides and that dissolution and transport of contaminated water and sediment has been tailing off ever since. Therefore, it is expected that the influx of residual pesticides into these drainage channels in the future is expected to be of relatively low concentration, and no worse than that in other formerly agricultural areas surrounding the former Mather AFB.

2.5.4 Site 89 – Old Trap Range

2.5.4.1 Site Description

Site 89 is located between the northeast end of the runway and the former Base family housing area (Figure 6). Little information is available for the site; however, aerial photographs suggest

MWH Sacramento, California
MONTGOMERY WATSON HARZA

MATHER AIR FORCE BASE

MATHER AIR FORCE BASE CALIFORNIA

SITE 89, OLD TRAP RANGE
SITE PLAN

FIGURE 6

2-24

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that the range was operational during the 1940s and early 1950s. The site contained two semi-circular sets of firing stations and several support buildings that were removed during the 1950s. The areas of greatest suspected shot density correspond to the shotfall area for each of the sets of firing stations and are referred to as the North area and Southwest area. Since use of the ranges ended, extensive reworking of the soils in the area has occurred. The Southwest area was covered with as much as 10 ft of fill material over the area of greatest shot density, and portions of the North area have been regraded during construction of a ditch that runs through the area. Several unnamed drainage ditches traverse through the two areas (see Section 2.5.4.4).

2.5.4.2 Site Characterization

Site 89 was added to the Installation Restoration Program during the time a similar skeet range site, Site 87, was undergoing remedial action. An initial site characterization sampling effort was undertaken in 1998, with gridded sampling locations and evaluation for both lead and soluble lead (using both the waste extraction test with deionized water as solvent, and the toxic characteristic leaching procedure (TCLP) using an acid solvent) as well as arsenic and polycyclic aromatic hydrocarbons (PAHs; also known as polynuclear aromatic hydrocarbons, or PNAs). This sampling effort resulted in identification of three locations where lead exceeded the TCLP hazardous threshold of 5000 ug/L, although none of the total lead concentrations exceeded 458 mg/kg (Montgomery Watson, 1999a). Anticipating the need to remediate the locations with high soluble lead concentrations, and with the Site 87 remediation underway, about 650 cubic yards of soil from Site 89 with high lead content were used as part of a stabilization pilot study to determine whether the method developed for treatment of Site 87 soils would also be applicable to Site 89 soils (Montgomery Watson, 2000b). These soils were successfully stabilized and then placed into the Site 7 landfill. Site investigation, excavation, and pilot study activities at Site 89 were completed in July 1999 (Montgomery Watson, 2000b).

Following excavation of contaminated soil and completion of the pilot study, the initial confirmation samples at Site 89 met the anticipated site cleanup goal of 700 mg/kg for total lead. However, the sampling showed inconsistencies between the reported total lead concentrations, soluble lead concentrations, and lead shot count density in the surface soils (approximately 0 to 3 inches) at the North shotfall area and at the exposed margin of the fill area at the Southwest shotfall area. This discrepancy was attributed to the removal of vegetation prior to sampling activities during the 1999 site characterization sampling activities. Therefore, a further characterization effort was initiated on June 13, 2000, to characterize the root-zone soils at Site 89. These activities included:

- Collecting samples on an approximate 100-ft grid pattern (similar to that done for the initial site characterization sampling [Montgomery Watson, 1999a])
- Cut vegetation to slightly above ground surface prior to collecting samples

- Collecting soil samples at a depth of 0 to 3 inches below ground surface
- Collecting 24 soil samples from the North area and 8 soil samples from the Southwest area
- Analyzing samples in the laboratory for total lead (using U.S. EPA Method 6010 and the total threshold limit concentration procedure)
- Collecting ten samples for shot count analysis after the total lead concentration results were obtained (six from highest area found and four from lower concentration areas)
- Analyzing samples with the highest total lead concentration for soluble lead (using U.S. EPA Method 6010 and the deionized water-waste extraction test procedure)

The results showed that all 32 samples for total lead were below the applicable ecological and nonresidential cleanup standards (i.e., 700 mg/kg lead in soil based on plant toxicity, which meets the industrial PRG of 1000 mg/kg lead). The six locations with the highest total lead concentration (89-RZ8SW, 89-RZ17N, 89-RZ21N, 89-RZ23N, 89-RZ25N, and 89-RZ28N) were analyzed by deionized water-waste extraction test methods. Two samples (89-RZ17N and 89-RZ28N) with the highest total lead concentrations had significant soluble lead concentrations (19,200 micrograms per liter [µg/L] and 25,000 µg/L) relative to the 1,500 µg/L soluble lead level above which groundwater quality may be threatened. This concentration is based on an assumed 100-fold environmental attenuation and a water quality goal of 15 µg/L (tap-water maximum contaminant level). Since the soluble concentrations were elevated, it would require that the excavated soils be disposed at a Class II facility. All other soluble lead concentrations were below 1,000 µg/L. The highest lead shot count (27 shot per kilogram of soil) was observed in sample 89-RZ17N, which also contained the highest total lead concentration. Lead shot was also found in three of the four samples with the highest total lead concentration.

Based on the root zone sampling results, it was determined that a removal action would be conducted to excavate at the two locations (89-RZ17N and 89-RZ28N) where elevated soluble lead concentrations were observed (Montgomery Watson, 2000c).

2.5.4.3 Removal Action

Lead was identified as a COC in the surface soils and subsurface soils based on human health risk and ecological health risk calculated for a similar skeet range site, Site 87. The planned land use at Site 89 is occupational use as an airport. A risk assessment for Site 89 is included in appendices B and C of the Final Supplemental Basewide Operable Unit Focused Feasibility Study for Mather Air Force Base, California (IT Corp., 2000). The range of total lead detections in the surface soils is within acceptable range for industrial use, consistent with future use of the site as part of the airports. However, high concentrations of soluble lead existed in soil samples from two locations which indicated surface water quality was threatened, so a limited removal

action was authorized to excavate coil from these two locations (AFBCA, 2001b). Removal action cleanup goals were developed for lead, which were consistent with the Site 87 (a similar trap range site) cleanup goals. The Site 87 cleanup goals are 700 milligrams per kilogram (mg/kg) for soils based on ecological risk to plants and 15.5 mg/kg for sediments. The Site 87 cleanup goals were considered suitable for comparison and adoption at Site 89 because:

- Site 87 was a former skeet range and was contaminated with lead
- Site 87 has similar topographic, drainage, and ecological conditions
- Site 87 has similar future land uses

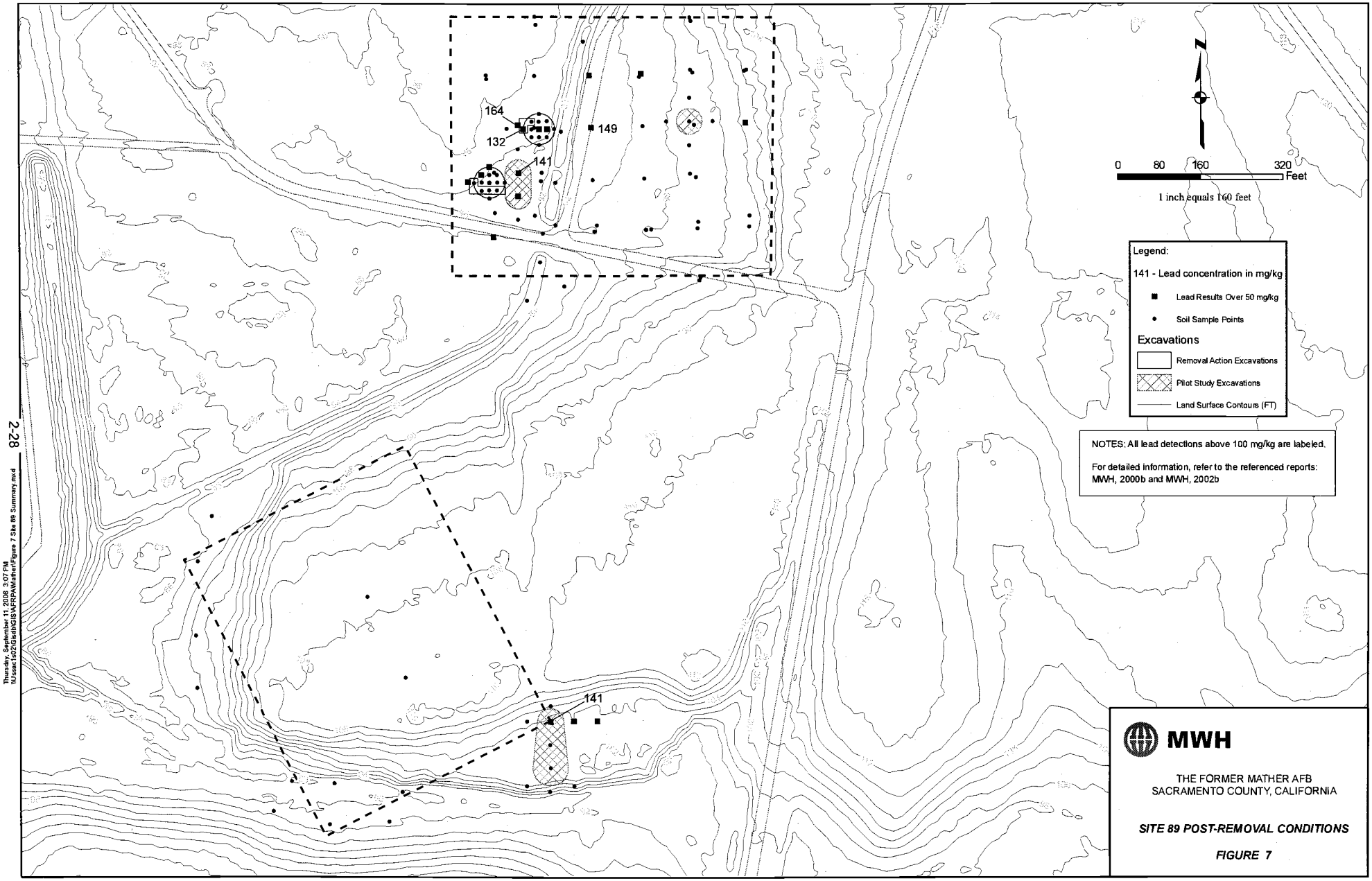
An additional removal goal was identified for soluble lead in soil at the soluble threshold limit concentration of 5,000 ug/L, above which the soil would be classified as hazardous waste for disposal purposes.

Excavation activities for the removal actions at Site 89 commenced on July 5, 2001 (Montgomery Watson, 2002b) according to the work plan (Montgomery Watson, 2000c). The two excavation boundaries consisted of a 30-ft radius around each elevated previous sample location (89-RZ17N and 89-RZ28N). The final outer boundary area was confirmed by the shot count analysis. There was no lead shot observed immediately outside the 30-ft radius boundary, which indicated that the extent of the excavation was sufficient, but five confirmation samples exceeded the STLC goal, so an additional 6 inches of soil was excavated in these areas. Approximately 300 cubic yards of soil were excavated and removed. Confirmation samples were collected on a 15-ft grid within the excavation boundary and analyzed. Based on the confirmation results, the removal goals specified in the Removal Action Memorandum (AFBCA, 2001a) were achieved. Removal activities at Site 89 were completed in December 2001. The total quantity of lead-contaminated surface soils excavated from the site was 275 tons; 205 tons was shipped to the Class II Forward Landfill and 70 tons was shipped to the Class I Kettleman Hills Landfill, both approved by U.S. EPA for disposal of CERCLA waste.

The current post-removal conditions are shown on Figure 7.

In conjunction with this, water quality sampling was conducted of both surface water and groundwater to determine whether there was any evidence that the residual lead at Site 89 was degrading water quality. Water sampling results are summarized in this report in sections 2.5.4.4 and 2.5.4.5.

The cleanup goal of 700 mg/kg for lead in surface soil at Site 89 that was developed in the feasibility study (IT Corp., 2000a) is based upon protection of ecologic health, and is compatible with the protection of human health under recreational- and industrial-use scenarios. However,



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N:\Cad\GDB\GIS\AFRP\Mather\Figure 7 Site 89 Summary.mxd

portions of the site where lead may be present in a buried soil horizon may not be compatible with recreational and industrial use if disturbed.

2.5.4.4 Surface Water Sampling

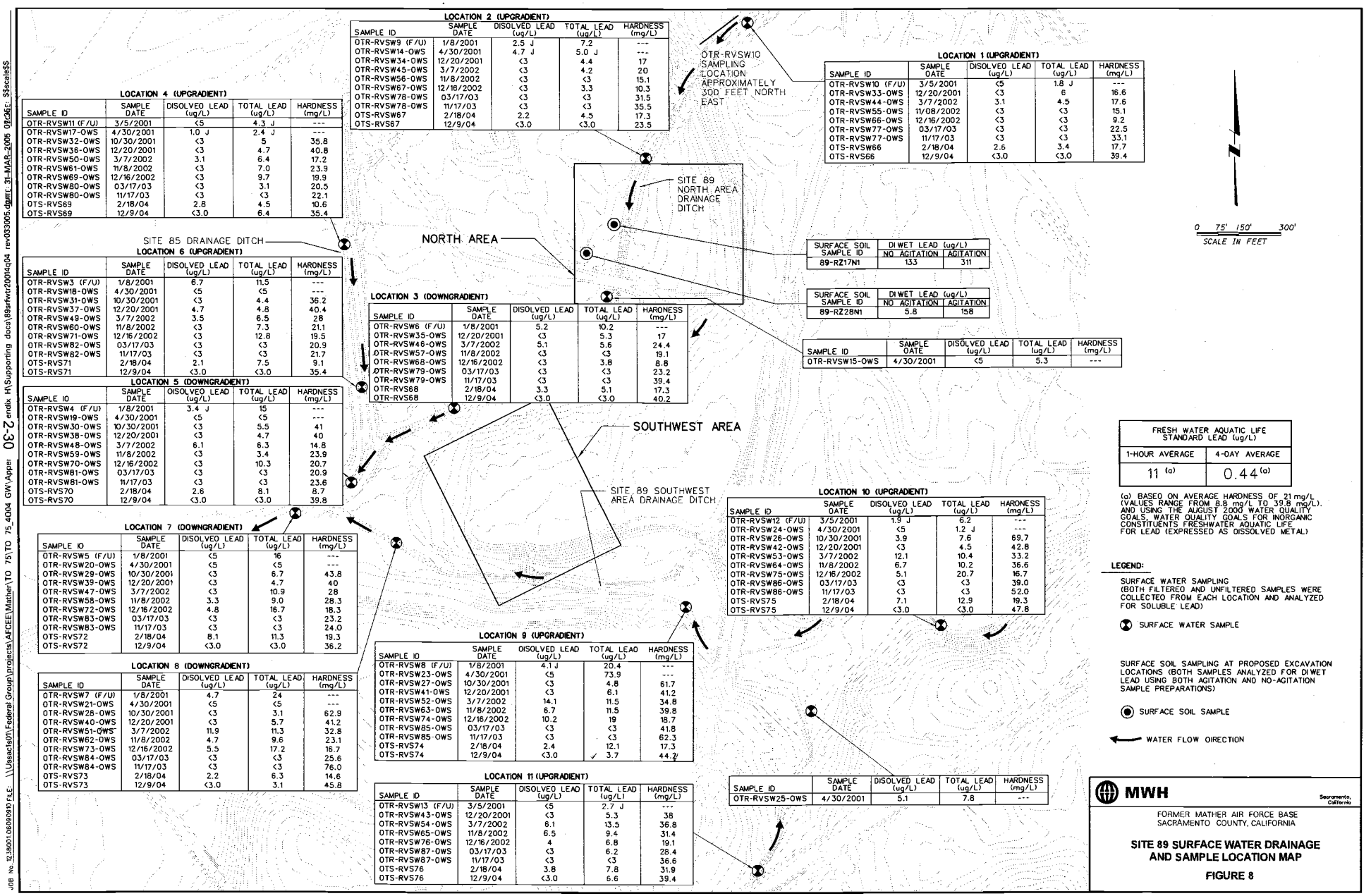
Remedial alternative 89.3, developed and documented in the Supplemental Basewide OU FS and Proposed Plan, included surface water sampling for a minimum of three years to determine whether residual lead was degrading surface-water quality. Surface-water sampling locations were determined at BCT meetings held on December 20, 2000 and April 25, 2001 (Figure 8). The purpose of collecting samples was to determine if a measurable change in lead concentration could be observed, thereby indicating that dissolved lead may have migrated into the drainages surrounding Site 89 and/or the nearby Site 85 drainage ditch, as a result of dissolution of residual lead present in the Site 89 soils.

The surface-water sampling began in March 2001, and continued through December 2004. Samples were collected at locations upstream and downstream in one drainage channel passing through or adjacent to each shotfall areas at Site 89, and also upstream, between, and downstream of the intersections of the local channels with the South Ditch (Site 85) channel. The results were reported in each year's annual groundwater monitoring report, most recently and comprehensively in Appendix H of the Annual and Fourth Quarter 2004 Mather Groundwater Monitoring Report (MWH, 2005). Inspection of the surface-water results reveals some variance between sampling episodes, and sporadic higher lead concentration in the southern drainage channel, but no systematic increase from upstream to downstream samples that would indicate a contribution of lead from Site 89. The lead detections occurred both upstream and downstream of Site 89, giving no clear indication that Site 89 was contributing significantly to degradation of water quality. Therefore there is no indication that additional cleanup is required to protect water quality.

The termination of surface water sampling was proposed by AFRPA in 2005, and concurrence was received from U.S. EPA and the State of California (U.S. EPA, 2005; DTSC, 2005).

2.5.4.5 Groundwater Sampling

Remedial alternative 89.3, developed and documented in the Supplemental Basewide OU FS and Proposed Plan, included installation of groundwater-monitoring wells, and sampling groundwater for a minimum of three years to determine whether residual lead was degrading groundwater quality. Two groundwater-monitoring wells (MAFB-389 and MAFB-390) were installed in April 2001 by Montgomery Watson downgradient from Site 89, to measure lead concentrations in groundwater in order to evaluate whether there was any measurable contribution of lead to the groundwater from Site 89. One well was installed downgradient from each of the two shotfall areas, and monitoring began in April 2001. Although the Supplemental


LOCATION 2 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW9 (F/U) | 1/8/2001 | 2.5 J | 7.2 | ---
OTR-RVSW14-OWS | 4/30/2001 | 4.7 J | 5.0 J | ---
OTR-RVSW34-OWS | 12/20/2001 | <3 | 4.4 | 17
OTR-RVSW45-OWS | 3/7/2002 | <3 | 4.2 | 20
OTR-RVSW56-OWS | 11/8/2002 | <3 | <3 | 15.1
OTR-RVSW67-OWS | 12/16/2002 | <3 | 3.3 | 10.3
OTR-RVSW78-OWS | 03/17/03 | <3 | <3 | 31.5
OTR-RVSW78-OWS | 11/17/03 | <3 | <3 | 35.5
OTS-RVSW67 | 2/18/04 | 2.2 | 4.5 | 17.3
OTS-RVS67 | 12/9/04 | <3.0 | <3.0 | 23.5
OTR-RVSW10 SAMPLING LOCATION APPROXIMATELY 300 FEET NORTH EAST
LOCATION 1 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW10 (F/U) | 3/5/2001 | <5 | 1.8 J | ---
OTR-RVSW33-OWS | 12/20/2001 | <3 | 6 | 16.6
OTR-RVSW44-OWS | 3/7/2002 | 3.1 | 4.5 | 17.6
OTR-RVSW55-OWS | 11/08/2002 | <3 | <3 | 15.1
OTR-RVSW66-OWS | 12/16/2002 | <3 | <3 | 9.2
OTR-RVSW77-OWS | 03/17/03 | <3 | <3 | 22.5
OTR-RVSW77-OWS | 11/17/03 | <3 | <3 | 33.1
OTS-RVSW66 | 2/18/04 | 2.6 | 3.4 | 17.7
OTS-RVS66 | 12/9/04 | <3.0 | <3.0 | 39.4
LOCATION 4 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW11 (F/U) | 3/5/2001 | <5 | 4.3 J | ---
OTR-RVSW17-OWS | 4/30/2001 | 1.0 J | 2.4 J | ---
OTR-RVSW32-OWS | 10/30/2001 | <3 | 5 | 35.8
OTR-RVSW36-OWS | 12/20/2001 | <3 | 4.7 | 40.8
OTR-RVSW50-OWS | 3/7/2002 | 3.1 | 6.4 | 17.2
OTR-RVSW61-OWS | 11/8/2002 | <3 | 7.0 | 23.9
OTR-RVSW69-OWS | 12/16/2002 | <3 | 9.7 | 19.9
OTR-RVSW80-OWS | 03/17/03 | <3 | 3.1 | 20.5
OTR-RVSW80-OWS | 11/17/03 | <3 | <3 | 22.1
OTS-RVS69 | 2/18/04 | 2.8 | 4.5 | 10.6
OTS-RVS69 | 12/9/04 | <3.0 | 6.4 | 35.4
SITE 89 NORTH AREA DRAINAGE DITCH
NORTH AREA
SITE 85 DRAINAGE DITCH
SURFACE SOIL SAMPLE ID | DIWET LEAD (ug/L) NO AGITATION | AGITATION
89-RZ17N1 | 133 | 311
SURFACE SOIL SAMPLE ID | DIWET LEAD (ug/L) NO AGITATION | AGITATION
89-RZ28N1 | 5.8 | 158
LOCATION 6 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW3 (F/U) | 1/8/2001 | 6.7 | 11.5 | ---
OTR-RVSW18-OWS | 4/30/2001 | <5 | <5 | ---
OTR-RVSW31-OWS | 10/30/2001 | <3 | 4.4 | 36.2
OTR-RVSW37-OWS | 12/20/2001 | 4.7 | 4.8 | 40.4
OTR-RVSW49-OWS | 3/7/2002 | 3.5 | 6.5 | 28
OTR-RVSW60-OWS | 11/8/2002 | <3 | 7.3 | 21.1
OTR-RVSW71-OWS | 12/16/2002 | <3 | 12.8 | 19.5
OTR-RVSW82-OWS | 03/17/03 | <3 | <3 | 20.9
OTR-RVSW82-OWS | 11/17/03 | <3 | <3 | 21.7
OTS-RVS71 | 2/18/04 | 2.1 | 7.5 | 9.1
OTS-RVS71 | 12/9/04 | <3.0 | <3.0 | 35.4
LOCATION 3 (DOWNGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARONESS (mg/L)
OTR-RVSW6 (F/U) | 1/8/2001 | 5.2 | 10.2 | ---
OTR-RVSW35-OWS | 12/20/2001 | <3 | 5.3 | 17
OTR-RVSW46-OWS | 3/7/2002 | 5.1 | 5.6 | 24.4
OTR-RVSW57-OWS | 11/8/2002 | <3 | <3 | 19.1
OTR-RVSW68-OWS | 12/16/2002 | <3 | 3.8 | 8.8
OTR-RVSW79-OWS | 03/17/03 | <3 | <3 | 23.2
OTR-RVSW79-OWS | 11/17/03 | <3 | <3 | 39.4
OTR-RVS68 | 2/18/04 | 3.3 | 5.1 | 17.3
OTR-RVS68 | 12/9/04 | <3.0 | <3.0 | 40.2
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW15-OWS | 4/30/2001 | <5 | 5.3 | ---
LOCATION 5 (DOWNGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW4 (F/U) | 1/8/2001 | 3.4 J | 15 | ---
OTR-RVSW19-OWS | 4/30/2001 | <5 | <5 | ---
OTR-RVSW30-OWS | 10/30/2001 | <3 | 5.5 | 41
OTR-RVSW38-OWS | 12/20/2001 | <3 | 4.7 | 40
OTR-RVSW48-OWS | 3/7/2002 | 6.1 | 6.3 | 14.8
OTR-RVSW59-OWS | 11/8/2002 | <3 | 3.4 | 23.9
OTR-RVSW70-OWS | 12/16/2002 | <3 | 10.3 | 20.7
OTR-RVSW81-OWS | 03/17/03 | <3 | <3 | 20.9
OTR-RVSW81-OWS | 11/17/03 | <3 | <3 | 23.6
OTS-RVS70 | 2/18/04 | 2.6 | 8.1 | 8.7
OTS-RVS70 | 12/9/04 | <3.0 | <3.0 | 39.8
SOUTHWEST AREA
SITE 89 SOUTHWEST AREA DRAINAGE DITCH
LOCATION 7 (DOWNGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW5 (F/U) | 1/8/2001 | <5 | 16 | ---
OTR-RVSW20-OWS | 4/30/2001 | <5 | <5 | ---
OTR-RVSW29-OWS | 10/30/2001 | <3 | 6.7 | 43.8
OTR-RVSW39-OWS | 12/20/2001 | <3 | 4.7 | 40
OTR-RVSW47-OWS | 3/7/2002 | <3 | 10.9 | 28
OTR-RVSW58-OWS | 11/8/2002 | 3.3 | 9.0 | 28.3
OTR-RVSW72-OWS | 12/16/2002 | 4.8 | 16.7 | 18.3
OTR-RVSW83-OWS | 03/17/03 | <3 | <3 | 23.2
OTR-RVSW83-OWS | 11/17/03 | <3 | <3 | 24.0
OTS-RVS72 | 2/18/04 | 8.1 | 11.3 | 19.3
OTS-RVS72 | 12/9/04 | <3.0 | <3.0 | 36.2
LOCATION 8 (DOWNGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW7 (F/U) | 1/8/2001 | 4.7 | 24 | ---
OTR-RVSW21-OWS | 4/30/2001 | <5 | <5 | ---
OTR-RVSW28-OWS | 10/30/2001 | <3 | 3.1 | 62.9
OTR-RVSW40-OWS | 12/20/2001 | <3 | 5.7 | 41.2
OTR-RVSW51-OWS | 3/7/2002 | 11.9 | 11.3 | 32.8
OTR-RVSW62-OWS | 11/8/2002 | 4.7 | 9.6 | 23.1
OTR-RVSW73-OWS | 12/16/2002 | 5.5 | 17.2 | 18.7
OTR-RVSW84-OWS | 03/17/03 | <3 | <3 | 25.6
OTR-RVSW84-OWS | 11/17/03 | <3 | <3 | 76.0
OTS-RVS73 | 2/18/04 | 2.2 | 6.3 | 14.6
OTS-RVS73 | 12/9/04 | <3.0 | 3.1 | 45.8
LOCATION 10 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARONESS (mg/L)
OTR-RVSW12 (F/U) | 3/5/2001 | 1.9 J | 6.2 | ---
OTR-RVSW24-OWS | 4/30/2001 | <5 | 1.2 J | ---
OTR-RVSW26-OWS | 10/30/2001 | 3.9 | 7.6 | 69.7
OTR-RVSW42-OWS | 12/20/2001 | <3 | 4.5 | 42.8
OTR-RVSW53-OWS | 3/7/2002 | 12.1 | 10.4 | 33.2
OTR-RVSW64-OWS | 11/8/2002 | 6.7 | 10.2 | 36.6
OTR-RVSW75-OWS | 12/16/2002 | 5.1 | 20.7 | 16.7
OTR-RVSW86-OWS | 03/17/03 | <3 | <3 | 39.0
OTR-RVSW86-OWS | 11/17/03 | <3 | <3 | 52.0
OTS-RVS75 | 2/18/04 | 7.1 | 12.9 | 19.3
OTS-RVS75 | 12/9/04 | <3.0 | <3.0 | 47.8
LOCATION 9 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW8 (F/U) | 1/8/2001 | 4.1 J | 20.4 | ---
OTR-RVSW23-OWS | 4/30/2001 | <5 | 73.9 | ---
OTR-RVSW27-OWS | 10/30/2001 | <3 | 4.8 | 61.7
OTR-RVSW41-OWS | 12/20/2001 | <3 | 6.1 | 41.2
OTR-RVSW52-OWS | 3/7/2002 | 14.1 | 11.5 | 34.8
OTR-RVSW63-OWS | 11/8/2002 | 8.7 | 11.5 | 39.8
OTR-RVSW74-OWS | 12/16/2002 | 10.2 | 19 | 18.7
OTR-RVSW85-OWS | 03/17/03 | <3 | <3 | 41.8
OTR-RVSW85-OWS | 11/17/03 | <3 | <3 | 62.3
OTS-RVS74 | 2/18/04 | 2.4 | 12.1 | 17.3
OTS-RVS74 | 12/9/04 | <3.0 | 3.7 | 44.2
LOCATION 11 (UPGRADIENT)
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW13 (F/U) | 3/5/2001 | <5 | 2.7 J | ---
OTR-RVSW43-OWS | 12/20/2001 | <3 | 5.3 | 38
OTR-RVSW54-OWS | 3/7/2002 | 6.1 | 13.5 | 36.8
OTR-RVSW65-OWS | 11/8/2002 | 6.5 | 9.4 | 31.4
OTR-RVSW76-OWS | 12/16/2002 | 4 | 6.8 | 19.1
OTR-RVSW87-OWS | 03/17/03 | <3 | 6.2 | 28.4
OTR-RVSW87-OWS | 11/17/03 | <3 | <3 | 36.6
OTS-RVS76 | 2/18/04 | 3.8 | 7.8 | 31.9
OTS-RVS76 | 12/9/04 | <3.0 | 6.6 | 39.4
SAMPLE ID | SAMPLE DATE | DISOLVED LEAD (ug/L) | TOTAL LEAD (ug/L) | HARDNESS (mg/L)
OTR-RVSW25-OWS | 4/30/2001 | 5.1 | 7.8 | ---
N
0 75' 150' 300'
SCALE IN FEET
FRESH WATER AQUATIC LIFE STANDARD LEAD (ug/L)
1-HOUR AVERAGE | 4-DAY AVERAGE
11 (a) | 0.44 (a)
(a) BASED ON AVERAGE HARDNESS OF 21 mg/L (VALUES RANGE FROM 8.8 mg/L TO 39.8 mg/L). AND USING THE AUGUST 2000 WATER QUALITY GOALS, WATER QUALITY GOALS FOR INORGANIC CONSTITUENTS FRESHWATER AQUATIC LIFE FOR LEAD (EXPRESSED AS DISSOLVED METAL)
LEGEND:
SURFACE WATER SAMPLING (BOTH FILTERED AND UNFILTERED SAMPLES WERE COLLECTED FROM EACH LOCATION AND ANALYZED FOR SOLUBLE LEAD)
SURFACE WATER SAMPLE
SURFACE SOIL SAMPLING AT PROPOSED EXCAVATION LOCATIONS (BOTH SAMPLES ANALYZED FOR DIWET LEAD USING BOTH AGITATION AND NO-AGITATION SAMPLE PREPARATIONS)
SURFACE SOIL SAMPLE
WATER FLOW DIRECTION
MWH
Sacramento, California
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA
SITE 89 SURFACE WATER DRAINAGE AND SAMPLE LOCATION MAP
FIGURE 8
JOB No: 12500106090910 FILE: \\Usacs1s01\Federal Group\projects\AFCEE\Mather\TO 75\TO 75_4004 GW\Appendix H\Supporting docs\89swfwtr200104q04 rev033005.dgn TIME: 31-MAR-2005 08:36 USER: $$scale$$
2-30

Basewide FFS contained remedial alternatives identifying installation and monitoring of three groundwater wells, the Air Force decided to eliminate the upgradient well and assume that upgradient concentrations were not elevated. If the downgradient wells had indicated elevated lead concentrations, an upgradient well could be installed later.

Groundwater sampling occurred from April 2001 through October 2004. Results are shown in Table 8. There has only been one detection of lead above the practical quantitation limit in each well. There were an estimated detection of 1.3 µg/L in MAFB-389 in April 2001, and a detection of 3.5 ug/L in second quarter 2003 in MAFB-389; and there was a detection of 3 µg/L in MAFB-390 in August 2001. All other results were below the detection limit, which is generally 3 µg/L.

Table 8

Groundwater Sampling Summary for Site 89

Lead Results	MAFB-389	MAFB-390
2Q01	1.3 F ug/L	<5.0 ug/L
3Q01	<3.0 ug/L	3 ug/L
4Q01	<3.0 ug/L	<3.0 ug/L
1Q02	<3.0 ug/L	<3.0 ug/L
2Q02	<3.0 ug/L	<3.0 ug/L
3Q02	<3.0 ug/L	<3.0 ug/L
4Q02	<3.0 ug/L	<3.0 ug/L
1Q03	<3.0 ug/L	not sampled
2Q03	3.5 ug/L.	<3.0 ug/L
3Q03	<3.0 ug/L	<3.0 ug/L
4Q03	<3.0 ug/L	<3.0 ug/L
1Q04	not sampled	not sampled
2Q04	<3.0 ug/L	<3.0 ug/L
3Q04	not sampled	not sampled
4Q04	<3.0 ug/L	<3.0 ug/L
1Q05	not sampled	not sampled

The proposed remedial alternative for Site 89 developed in the FFS (IT, 2000) identified three years of groundwater monitoring, "quarterly sampling for the first year, and annual sampling for two years thereafter, unless contamination is encountered." However, the concept was further developed in the Draft Final ROD to state, "The results will be evaluated after three years of sampling to determine whether there is a measurable contribution to groundwater of lead from Site 89. Well construction diagrams for the two new monitoring wells can be found in Appendix C. The sampling results over the 14-quarter span did not indicate a consistent or significant measurable contribution to groundwater of lead from Site 89 (Table 8).

The termination of groundwater monitoring for Site 89 was proposed by AFRPA in 2005, and concurrence was received from U.S. EPA and the State of California (U.S. EPA, 2005; DTSC, 2005).

2.5.5 Ordnance Burial Area of Concern

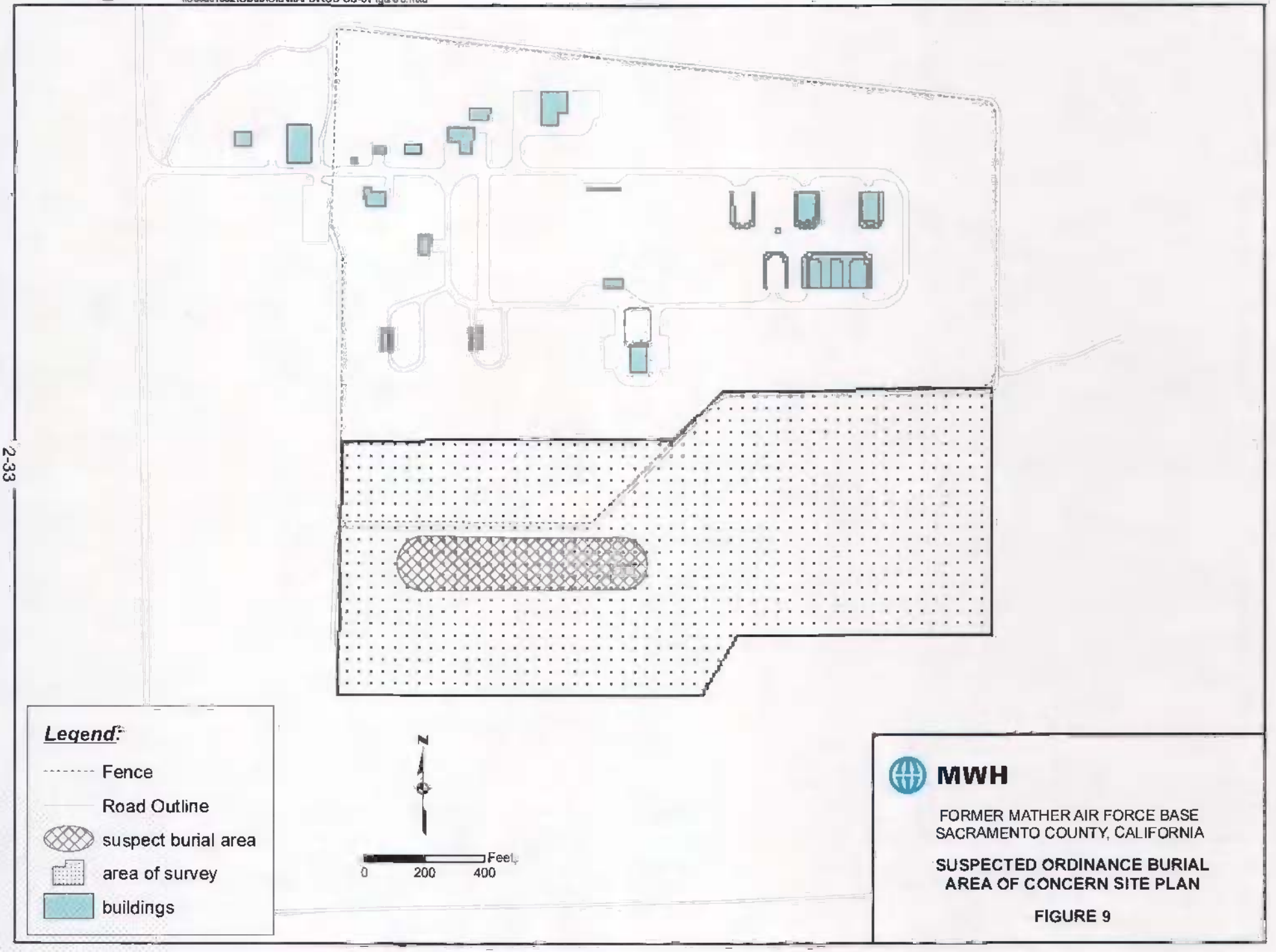
2.5.5.1 Site Description

The Suspected Ordnance Burial AOC is an area of where landfill or ordnance disposal was suspected based on limited information. The AOC is located near the southern boundary of the former weapons storage area (Figure 9).

2.5.5.2 Site Characterization

The Suspected Ordnance Burial location was investigated as an area of concern based upon two indications that burial of unknown material or waste may have occurred. First, an Air Force drawing depicting landfill sites showed a landfill site near the southern boundary of the former weapons storage area. This location is in the western half of the Area of Concern. Second, an Air Force retiree reportedly had briefly observed a dragline trenching operation in which wooden crates about 1 by 4 ft were being buried and covered with dirt in a trench he described as near the southern boundary of the weapons storage area, but in the eastern half of the area of concern. He understood that the boundary fence jogged to avoid this area. No other corroborating information was found indicating possible burial in either of these areas. Therefore, AFBCA contracted through the Army Corps of Engineers to conduct a magnetic survey to cover the entire area, near the southern boundary of the former weapons storage area, in order to survey both areas for signs of ferrous metal.

An ordnance and explosives characterization was conducted over an area of approximately 41 acres by EOD Technology, Inc., tasked by the U.S. Army Engineering and Support Center, Huntsville (EOD, 1999). EOD Technology, Inc., used the Surface Towed Ordnance Locator System (STOLS) for the geophysical mapping. The STOLS array is reportedly capable of detecting a 500-pound general-purpose bomb at a depth of 20 ft. The STOLS was equipped with seven cesium-vapor magnetometers to collect data while positional data points were collected by a global positioning system. The data was analyzed to delineate any magnetic character, which could indicate buried ordnance within the surveyed area. Based on interpretation of the geophysical mapping conducted, it was interpreted that a trench had been located. It was estimated to be 18 ft deep and 20 ft long and located in the north central quadrant of the site. EOD Technology, Inc. planned and performed an intrusive investigation, digging two trenches with a backhoe. No ordnance was detected; EOD Technology, Inc. attributed an anomaly to a ferrous-bearing clay unit at depth. The remedial project managers from AFBCA, DTSC, and CVRWQCB visited the site view the excavation and determine whether or not to continue or fill in the excavation. It was unanimously decided to fill in the excavation.



MWH

FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA

SUSPECTED ORDINANCE BURIAL AREA OF CONCERN SITE PLAN

FIGURE 9

Four shallow magnetic anomalies were also identified during geophysical activities and investigated. The anomalies consisted of a sign post cut-off at ground level; a sign laying on its side; a piece of 4-ft long rebar; and a 10-ft long anomaly at an approximate depth of 1 ft (which was determined to be a cut, disconnected section of utility cable). The Final OE Characterization Report at the Weapons Storage Area, Mather Air Force Base (EOD, 1999) documents the investigation.

2.6 Current and Potential Future Site and Resource Uses

At the time of base closure in 1993, Mather AFB encompassed 5,845 acres, including 19 acres of easements. Most of the base was ruled surplus to the needs of the federal government and has been transferred or leased to various entities, primarily the County of Sacramento. The *Final Environmental Impact Statement for the Disposal and Reuse of Mather AFB* (AFBCA, 1992) presented the proposed reuse as a general aviation airport with air cargo operations and non-aviation uses including industrial, commercial, residential, educational, parks and recreation and natural habitat. In 1995, Mather Airport was officially opened as a 2,675-acre cargo airport and another 1,242 acres became Mather Regional Park. Both the airport and park areas are under long-term lease from the Air Force to Sacramento County. The four Supplemental Basewide OU sites are in these parcels. Sites 80 and 88 are in the parks parcel, and sites 85 and 89 are in the airport parcel. The land-use of these the Airport and Park parcels is limited under terms of the planned conveyances to those compatible with airport and parks uses, respectively. Other areas of the former AFB have been developed for housing, a business park, the Department of Veterans Affairs Medical Center, and the Federal Aviation Administration's Northern California TRACON facility.

Lands in the vicinity of Mather AFB include a variety of residential, commercial, resource development/industrial, light industrial and undeveloped uses ranging from urbanized areas to open rural land. Areas to the west of the base primarily include light industrial and research and development uses with some agricultural land. North of the Mather Airport, the City of Rancho Cordova contains residential, commercial, research and development and related uses. There is strip commercial development along Folsom Boulevard and Mather Field Drive, and commercial development uses along the interchanges along U.S. Highway 50. Lands east and south of the base are mostly rural residential, agricultural or undeveloped, but housing developments are under construction east of Mather. Future land uses at the Supplemental Basewide OU sites are expected to be consistent with current uses.

Morrison Creek, an intermittent stream, is the only prominent natural drainage on Mather AFB. Morrison Creek is a tributary of the Sacramento River that traverses the base from northeast to southwest. Sites 80, 85, and 88 are part of the Morrison Creek drainage system, and have been transferred as part of the storm drain easement, except for portions east of Eagles Nest Road,

which are still owned by AFRPA but slated to be transferred to Sacramento County as part of the regional park. Site 89 is within the area leased by AFRPA to Sacramento County as an airport.

2.7 Assessment of Site Risks

The initial assessments of site risks for sites 80, 85, 88, and 89, were conducted based on site characterization data, and incorporated into the selection of contaminants of concern (COCs) and preliminary remediation goals in the Basewide OU FFS (IT Corp., 1997) (sites 80, 85, and 88) and again in the Supplemental Basewide OU FFS (IT Corp, 2000). The removal actions conducted at sites 80, 85, and 88, resulted in excavation and disposal of sediment with chemicals of concern such that the removal goals, set at the PRGs, were met. There has not been a quantitative assessment of site risks for the residual contamination that remains at these sites at concentrations at or below the removal goals, set at or lower than PRGs proposed in the Basewide OU FFS, which are judged protective of human health and the environment, including protection of water quality.

At Site 89, the removal action resulted in lead concentrations in surface soil meeting the PRGs, which are protective of human health under an occupational exposure scenario and protective of the environment. However, because the residual buried lead in the southwestern shot-fall area is not compatible with unrestricted (i.e. residential) land use, land-use restrictions are required to be protective of human health. No quantitative assessment has been performed for the buried lead horizon, which is generally about eight to ten feet below the ground surface.

2.7.1 Human Health Risk Assessment for Residual Contaminants of Concern

Only Site 89 of the Supplemental Basewide OU sites has remaining contaminants of concern; the sole contaminant of concern at Site 89 is lead. The highest concentration remaining at the north shotfall area is 190 mg/kg, and the highest concentration remaining at the southwestern shotfall area is 255 mg/kg. These values are protective of human health under occupational exposure scenarios. However, to determine whether they are compatible with unrestricted use, human health risk for lead was calculated using the DTSC LEADSPREAD model default exposure assumptions except where site-specific but conservative soil and drinking water concentrations are entered instead of default values. Typically the value for soil concentration entered would be a 95% upper confidence level estimate of the mean of site samples. However, for the north shotfall area, the highest concentration represents acceptable human health risk (i.e., more than 99% of children exposed to soil at the north shotfall area would be predicted to have blood lead levels less than 10 ug/dL), so no statistical estimate is warranted. For the southwestern shotfall area, sampling was not conducted to provide a representative estimate of the mean concentration, so again the maximum value was used. The threshold of concern is a predicted blood lead level of 10 ug/dL; the maximum concentration of lead in surface soil from the southwestern shotfall area is protective of the 10 ug/dL value for a child receptor at the 95th percentile estimate,

assuming concurrent exposure to a lead concentration in drinking water of 6 ug/L, the 90th percentile reported from nearby drinking water supplies.

2.7.2 Exposure Assessment

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

The DTSC LEADSPREAD model incorporates exposure from inhalation of dust, ingestion of soil and water, and ingestion of plants. The model was used with default values for exposure and in addition with a more reasonable yet still conservative estimate of the lead concentration of drinking water. Although the concentration in drinking water systems is often below detection, there have been one reported detection by the Sacramento County Water Agency from surface water and one from groundwater at about 6 ug/L. Therefore, a value of 6 ug/L was used in lieu of the default value, which is set at the maximum legal concentration of 15 ug/L that can be provided long-term by a water system subject to the Safe Drinking Water Act.

2.7.3 Toxicity Assessment

No additional toxicity assessments were done for post-removal contaminants, as the only remaining contaminant of concern, lead, was assessed using toxicity values inherent in the DTSC LEADSPREAD model and the agreed-upon blood lead threshold level of concern, 10 ug/dL.

2.7.4 Risk Characterization

The only risk characterization done for post-removal site conditions was for lead in soil for the unrestricted land-use exposure scenario using the DTSC LEADSPREAD model.

Pre-removal risk characterization is documented in the Administrative Record. Risk assessment methodology is described in the Comprehensive Baseline Risk Assessment (IT Corp., 1996b). Site-specific risk assessments for the Supplemental Basewide OU sites are reported as shown in Table 9.

2.7.5 Uncertainty Analysis

Risk characterization includes sources of uncertainty inherent to the risk assessment process. The uncertainties are due to limitations in the available site data and methods used to quantify risk. Uncertainty may be compounded and the resulting risk estimates may be overestimated or underestimated by several orders of magnitude. The uncertainties associated with the Site 89

Table 9

Baseline Risk Assessment Documentation

Site	Documentation
80	Additional Site Characterization (IT Corp, 1996a) and FFS (IT Corp., 2000a, App B, C)
85	
88	
89	FFS (IT Corp., 2000a, App B, C) Based on Site 87 assessment in Basewide OU ROD (AFBCA, 1998)

LEADSPREAD blood lead level estimates are primarily in the exposure assumptions of concentration. Site-specific lead in air (dust) and edible plants have not been determined, so default values are used. The values for drinking water supply are chosen conservatively with a bias to higher concentrations so that risk is not underestimated; two values were compared, the default of 15 ug/L and a highest value for local water systems of 6 ug/L.

Perhaps the largest uncertainty related to the Site 89 risk assessment is the concentration of lead in buried soil at the southwest shotfall area of Site 89 that was not characterized. The Air Force decided that it was more cost-effective to restrict digging to control exposure to buried lead than excavate to characterize it. It was reasonably assumed that the concentrations that are buried are similar to those found during investigations of the companion north shotfall area.

2.8 Remedial Action Objectives

This section identifies the remedial action objectives (RAOs) for Site 89, the Old Trap Range. RAOs are not necessary for Sites 80, 85 and 88 or the Suspected Ordnance Burial AOC since they do not pose an adverse risk to human health or the environment, and no further remedial action is required for these sites.

2.8.1 Site 89 - Old Trap Range

Based on concentrations of lead remaining in soil at Site 89, the Old Trap Range, after the completed removal action, the site does not pose an adverse risk to human health for an occupational exposure scenario, but poses a potential adverse risk to human health for an unrestricted use scenario. Site 89 soil and sediment does not pose an adverse risk to ecological receptors or water quality. The acceptable risks for exposure to surface soil are based on the

undisturbed site, unacceptable risks may result from disturbance of subsurface soils at Site 89, and this is the reason institutional controls are included in the selected remedy for Site 89.

The RAOs for lead in soil at Site 89 are listed in Table 10.

Table 10

Remedial Action Objectives for Site 89

Contaminant of Concern	Remedial Action Objective	Basis
Lead in soil	Prevent human exposure to concentrations above 192 mg/kg	Unrestricted (i.e. residential) scenario; basis for institutional controls
Lead in soil	Prevent plant exposure to concentrations above 700 mg/kg	Ecological Risk Assessment
Lead in soil	Prevent disturbance of subsurface soil that could threaten water quality.	If excavation exposes buried soil, the remedy might no longer be protective of human health and the environment, including surface-water quality.

2.9 Description of Alternatives

Remedial alternatives (including the no further action alternative) were developed for Sites 80, 85, 88 and 89 in the FFS (IT Corp., 2000). These remedial alternatives addressed cleanup of contaminants in soil and sediments, as appropriate to protect human health and the environment. These remedial alternatives were presented for public comment in the Proposed Plan (AFBCA, 2000). For sites 80, 85, and 88, and the proposed remedial alternatives were implemented under removal authority, resulting in no COCs remaining at these sites that threaten human health or the environment, resulting in only the no action alternative being considered in this ROD. However, for completeness, the alternatives identified in the FFS are listed in Table 11. The full description of the alternatives for sites 80, 85, and 88 can be found in the FFS.

2.9.1 Site 89 Remedial Alternatives

Table 12 summarizes the four alternatives that were developed and evaluated for possible application at Site 89 and were presented in the FFS (IT Corp., 2000) and the Proposed Plan (AFBCA, 2000). The no action alternative was considered as specified by CERCLA guidance

Table 11

Remedial Action Alternatives from the Supplemental Basewide OU FFS (IT Corp., 2000)

Site	Remedial Alternatives
80	80.1: No Further Action 80.2: Excavation (sediments) with Off Base Disposal
85	85.1: No Further Action 85.2: Excavation with Off Base Disposal
88	88.1: No Further Action 88.2: Excavation with Off Base Disposal
89	89.1: No Further Action 89.2: Institutional Controls 89.3: Excavation with Off Base Disposal, Institutional Control, Surface Water monitoring, and Groundwater Well Installation and Monitoring 89.4: Excavation and Stabilization with Off Base Disposal, Institutional Control, Surface Water monitoring, and Groundwater Well Installation and Monitoring

(U.S. EPA, 1989). The CERCLA preference for treatment that reduces contaminant toxicity, mobility or volume was addressed by evaluating soil stabilization in alternative 89.4.

Descriptions of these alternatives and the degree to which they satisfy the CERCLA threshold criteria (protection of human health and the environment and compliance with applicable or relevant requirements (ARARs) are described in the FFS (IT Corp, 2000) and summarized below.

2.9.1.1 Site 89- Alternative 89.1, No Further Action

The No Further Action Alternative consists of no cleanup, with no remedial activities conducted at the site. This alternative is required for purposes of comparison. This alternative does not meet the CERCLA threshold criteria of protection of human health and the environment.

Table 12
Site 89 Remedial Alternatives

Alternative	Description
89.1	No Further Action
89.2 (FFS)	Institutional Controls
89.2 (Proposed Plan)	Excavation (contaminated sediments and surface soils) with off-base disposal
89.3	Excavation (contaminated sediments and surface soils) with off-base disposal. Institutional controls will be implemented to restrict activities that may endanger public health, since cleanup at the site is to nonresidential standards. Surface water monitoring. Groundwater monitoring well installation and monitoring.
89.4	Excavation (contaminated sediments and surface soils) with treatment (i.e., stabilization) and off-base disposal. Institutional controls will be implemented to restrict activities that may endanger public health, since cleanup at this site is to nonresidential standards. Surface water monitoring. Groundwater monitoring well installation and monitoring.

2.9.1.2 Site 89-Alternative 89.2, Excavation and Off-base Disposal (Presented in Proposed Plan)

The Supplemental Basewide OU Proposed Plan (AFBCA, 2000) identified Alternative 89.2 as Excavation and Off-base Disposal, a different alternative 89.2 than presented in the supporting Feasibility Study report (IT Corp., 2000). No additional information was provided about this alternative, and it is believed that the name of the alternative was changed in error, as the cost presented in the Proposed Plan ($14,470) for alternative 89.2 was the cost developed in the Feasibility Study for the alternative described below, consisting of institutional controls. Both these alternatives are presented here for completeness.

2.9.1.3 Site 89-Alternative 89.2 Institutional Controls (Presented in Feasibility Study)

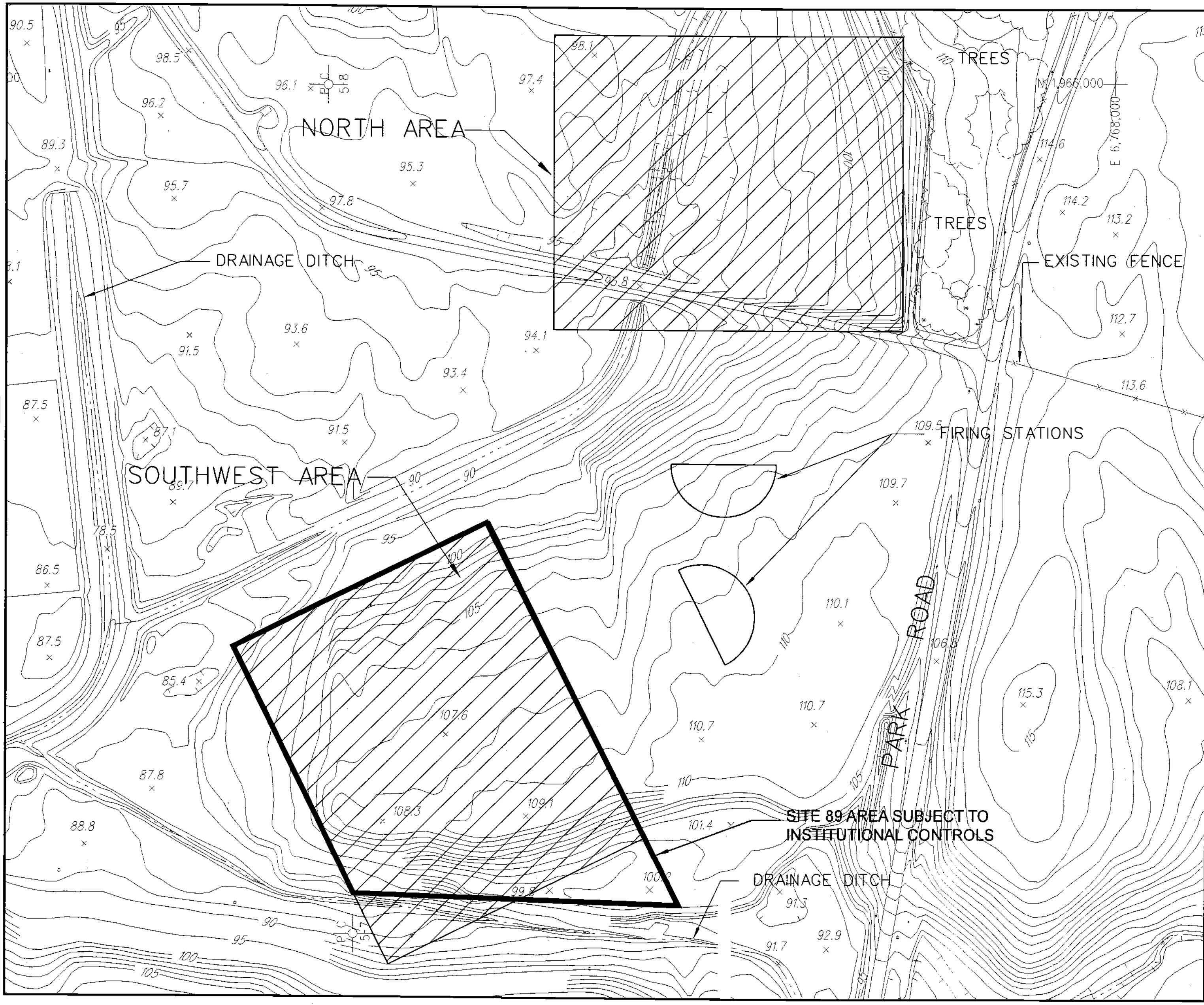
The Institutional Controls (ICs) alternative consists of leaving all contamination in place, and controlling exposure by restricting land use and disturbance of soil without an approved plan to protect human health and the environment in all areas where residual lead contamination is not compatible with unrestricted use. When this alternative was presented to the public in 2000, no removal action or water quality monitoring had been conducted. However, this alternative is now equivalent to the remaining portion of Alternative 89.3 that has not been completed.

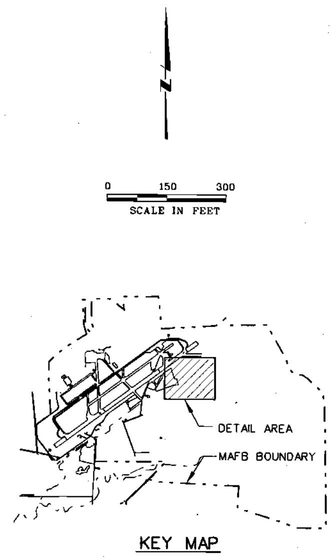
The cleanup level for lead is compatible with recreational or industrial uses, but not residential use. The use is not expected to change from airport, but the locations with known or expected lead concentrations above those compatible with unrestricted use will require use restrictions.

The removal of lead from the northern shotfall area resulted in residual lead concentrations lower than the cleanup level, such that the lead concentrations within the northern shotfall area of Site 89 are compatible with unrestricted land use, and require no land-use restrictions. The threshold of concern for lead in soil at Site 89 is the concentration (192 mg/kg) above which unrestricted exposure could result in a blood lead level greater than 10 micrograms per deciliter (ug/dL). This has been estimated using the LEADSPREAD model developed by DTSC. The default values in the model result in a soil lead level of 146 mg/kg (default PRG) as a preliminary remediation goal, that is, 99% of children exposed to soil with lead at 146 mg/kg or less are predicted to have blood lead levels no greater than 10 µg/dL. The default values assume ingestion of drinking water at the highest lead concentration allowed by the Safe Drinking Water Act, 15 ug/L. Substituting a conservative upper bound on lead (6 ug/L) reported in drinking water at Mather or the adjacent Suburban water system owned by California American Water Company results in a preliminary remediation goal of 192 mg/kg lead in soil, which is protective at the 99th percentile estimate of blood lead level in a child exposed in a residential scenario. All values of residual lead in the northern area are below the PRG of 192 mg/kg, and therefore the site conditions in the northern shotfall area are protective of human health.

Lead concentrations at the surface in the southwestern shotfall area at Site 89 are compatible with industrial use. However, lead concentrations within the subsurface soil where the former ground surface of the southwestern shot-fall area has been buried under an estimated 8 – 10 feet of fill, may not be compatible with industrial land use, and may present a risk if they are uncovered. The residual lead measured at the surface lead-bearing soil from the southwestern shotfall include only two locations where the concentrations exceed the default PRG, but these concentrations are protective of human health as indicated by predicted blood lead levels at the 95th percentile estimate; at the 98th percentile estimate, the maximum value of 255 mg/kg would result in a blood lead level in a child of 10.9 ug/dL. However, the concern in the southwestern shot-fall area is with exposure to higher concentrations of lead which probably exist at the former ground surface, buried under an estimated 8 to 10 feet of soil. The Air Force opted to restrict digging in the southwestern shot-fall area rather than excavate the area to find, characterize, and remediate the former ground surface. The southwestern shotfall area not only poses a potential exposure human and ecological health risk if it is disturbed but also may threaten water quality if exposed or become a California Designated Waste if placed where the contaminants in the soil would threaten water quality.

Therefore, institutional controls would be implemented to restrict activities that could endanger public health. Specifically, where lead concentrations exceed 192 mg/kg (Figure 10) and also within the Southwest area where the shot-fall area is covered by fill (i.e., that may contain a buried soil horizon with lead concentrations exceeding 192 mg/kg or even exceeding values compatible with industrial use), institutional controls will prohibit residential and other use that





MWH MONTGOMERY WATSON HARZA Sacramento, California

MATHER AIR FORCE BASE

MATHER AIR FORCE BASE CALIFORNIA

SITE 89, OLD TRAP RANGE
SITE PLAN

FIGURE 10

could result in unacceptable health risk from ingestion of soil containing lead contamination. Signs will be posted at Site 89 to notify the public of the authorities that must be contacted before any subsurface disturbance activities may be initiated at the site.

2.9.1.4 Site 89- Alternative 89.3, Excavation and Offsite Disposal, Institutional Controls, Monitoring

This alternative consists of excavating surface soils (approximately the upper three inches) containing lead contamination, and transporting these soils to an approved off-base facility for disposal. In addition, lead shot may exist in the southwestern part of Site 89, buried beneath 8 to 10 feet of fill material. Therefore, potentially significant concentrations of lead could be exposed during excavation at the site, and could threaten water quality. Therefore, this alternative includes both surface water monitoring and groundwater monitoring (with installation of monitoring wells) and institutional controls (as described for Alternative 89.2 in Section 2.9.1.3) to prevent exposure or any excavation that could threaten human health or the environment.

2.9.1.5 Site 89- Alternative 89.4, Excavation with Stabilization and Offsite Disposal, Institutional Controls, Monitoring

Alternative 89.4 is similar to Alternative 89.3 except that the excavated soil would be stabilized prior to disposal, to render it non-hazardous. The water quality monitoring and institutional controls are the same for these two alternatives.

2.10 Comparative Analysis of Alternatives

The remedial alternatives developed in the FFS (IT Corp., 2000) were analyzed in detail using the first seven evaluation criteria required by the National Contingency Plan (Section 300.430(e)(7)) (NCP). These criteria are classified as either threshold or primary balancing criteria.

Threshold criteria must be met for a remedial alternative to be selected and include:

- Overall protection of human health and the environment
- Compliance with ARARs

Primary balancing criteria are designed to identify trade-offs between those alternatives, which meet the threshold criteria and include:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume
- Short-term effectiveness
- Implementability
- Cost

Two additional criteria, referred to as modifying criteria, are evaluated during the public comment period and development of this document. The modifying criteria include:

- State acceptance
- Community acceptance

The relative ability of each alternative to meet each of the nine criteria (Figure 11, "Selecting a Cleanup Remedy") was weighed to identify the alternative providing the best tradeoffs for each site. The following sections summarize the nine criteria. Table 13 "Comparative Analysis of Remedial Alternatives for the Supplemental Basewide Operable Unit Sites" summarizes the results of the comparative analysis for Site 89.

2.10.1 State Acceptance

The State Acceptance Criterion indicates whether, based on review of the characterization data, FFS (IT Corp., 2000), and Proposed Plan (AFBCA, 2000), the State concurs with, opposes, or has no comment on the preferred cleanup options. The State of California is represented by the California Environmental Protection Agency, DTSC, as a support agency under the Federal Facility Agreement for Mather AFB; DTSC coordinates review comments from other state agencies, such as the CVRWQCB. Section 1.7 of this ROD presents signature showing State concurrence with the selected remedies.

2.10.2 Community Acceptance

Criteria are an assessment of the general public's response to the Proposed Plan (AFBCA, 2000) following review of the public comments received during the public comment period (from September 26 through October 26, 2000) and open community meeting (held on October 10, 2000). It indicates whether community concerns are addressed by the cleanup option and whether or not the community has a preference for a cleanup option. Section 2.14 of this ROD documents the community acceptance of the selected remedies, as presented in the Responsiveness Summary.

2.11 Principal Threat Waste

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable. The principal threat concept applies to source materials that are highly mobile or highly toxic and cannot be reliably controlled in place, or would present a significant risk to human health or the environment should exposure occur. A source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure.

Lead contamination remaining in subsurface soil at Site 89 is assumed to be at concentrations that have been determined through risk assessment to pose a threat to human health. However, the lead at this site is not be considered a principal threat waste because the contamination is not highly mobile; monitoring has shown no impact to water quality; and the residual lead is buried beneath approximately 8 feet of soil.

2.12 Selected Remedies

This section presents the remedies selected by the Air Force, with concurrence by the U.S. EPA and the State of California, for each of the Supplemental Basewide OU sites.

Figure 11
Selecting a Cleanup Remedy

THRESHOLD CRITERIA

Overall Protection of Human Health and the Environment. Addresses whether or not a cleanup option provides adequate protection and describes how risks, posed through each pathway, are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements. Addresses whether a cleanup option will meet all applicable or relevant and appropriate requirements promulgated under federal or state environmental statutes and/or provide grounds for invoking a waiver.

BALANCING CRITERIA

Long-Term Effectiveness of Permanence. Refers to the ability of a cleanup option to maintain reliable protection of human health and the environment over time, once cleanup goals (i.e., cleanup standards) have been met.

Reduction of Toxicity, Mobility, and Volume through Treatment. Refers to the anticipated performance of the treatment technologies that may be included as part of the remedy.

Short-Term Effectiveness. Addresses the period of time needed to complete the cleanup option, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the cleanup goals (i.e., cleanup standards) are achieved.

Implementability. Refers to the technical and administrative feasibility of a cleanup option, including the availability of materials and services and coordinating with other government entities needed to carry out a particular option.

Cost. Refers to the estimated capital and operation and maintenance costs.

MODIFYING CRITERIA

State Acceptance. Indicates whether, based on its review of the information, the State concurs with, opposes, or has no comment on the preferred cleanup options.

Community Acceptance. Indicates whether community concerns are addressed by the cleanup option and whether or not the community has a preference for a cleanup option.

Table 13
Comparative Analysis of Remedial Alternatives for Site 89

Evaluation Criteria	Site Number / Alternative	89			
		89.1	89.2	89.3	89.4
Long-Term Effectiveness and Permanence		P	P	B	B
Reduction of Toxicity, Mobility, and Volume		P	P	B	B
Short-Term Effectiveness		P	P	B	B
Implementability		B	G	G	G
Community Acceptance		No	No	Yes	No
State Acceptance		No	No	Yes	No
Cost*		$0	$14,470	$52,505	$77,185

SOURCE:

IT Corporation (IT Corp.), 2000, Final Supplemental Basewide Operable Unit Focused Feasibility Study for Mather Air Force Base, California, *prepared for the Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas, Richland, Washington.*

Note(s):

Several components of the Site 89 selected remedial alternative (89.3) have been completed or implemented (Montgomery Watson, 2002b). The excavation of contaminated sediments and surface soils, the installation of two groundwater monitoring wells, and the implementation of surface water and groundwater sampling have been accomplished. Therefore, the remaining costs will be reduced.

* *The information for the cost estimates, which are presented in the Focused Feasibility Study (IT Corp., 2000a) is based on the best available information regarding the anticipated scope of the remedial alternative. Changes in the cost estimate are likely to occur. This is an order-of-magnitude engineering cost estimate that is expected to be within plus 50 percent and minus 30 percent of the actual project cost.*

Shaded columns indicate preferred alternative

P denotes Poor

G denotes Good

B denotes Best

2.12.1 Site 80 – Golf Course Maintenance Area Ditch

The selected remedy for Site 80, Golf Course Maintenance Area Ditch, is No Further Action. The proposed remedy of Excavation and Offsite Disposal (Alternative 80.2), presented in the Proposed Plan (AFBCA, 2000) was implemented by removal action (AFBCA, 2001a). Site 80 does not pose an adverse risk to human health or the environment.

2.12.2 Site 85 – South Ditch

The selected remedy for Site 85, South Ditch, is No Further Action. The proposed remedy of Excavation and Offsite Disposal (Alternative 85.2), presented in the Proposed Plan (AFBCA, 2000), was implemented by removal action (AFBCA, 2001a). Site 85 does not pose an adverse risk to human health or the environment.

2.12.3 Site 88 – Morrison Creek

The selected remedy for Site 88, Morrison Creek, is No Further Action. The proposed remedy of Excavation and Offsite Disposal (Alternative 88.2), presented in the Proposed Plan (AFBCA, 2000), was implemented by removal action (AFBCA, 2001a). Site 88 does not pose an adverse risk to human health or the environment.

2.12.4 Site 89 – Old Trap Range

The selected remedy for Site 89, Old Trap Range, is Institutional Controls. Except for institutional controls, the proposed remedy of Excavation and Offsite Disposal, Monitoring and Institutional Controls (Alternative 89.3), presented in the Proposed Plan (AFBCA, 2000), was implemented by Removal Action (AFBCA, 2001b) and monitoring of surface water and groundwater . This alternative complies with applicable or relevant and appropriate requirements (ARAR). This alternative will not further reduce contaminant toxicity, mobility or volume of contaminants beyond that already accomplished by the completed Site 89 Removal Action.

Institutional controls expressly prohibiting activities inconsistent with the remedial action objectives of this ROD will include restrictions to prevent exposure to contaminated soil, and to ensure soil is not disturbed without ensuring protection of human health and the environment. ICs will be maintained for Site 89 as long as soil contaminants are at levels that preclude unrestricted use and exposure. For any deed transferring all or part of the Southwest institutional control area (Figure 10), the following land use restrictions will be incorporated in the deed as grantee covenants, in substantially the following language:

- *Residential Development*: Grantee covenants for itself and its successors and assigns that it will not use, or allow others to use the designated Site 89 area for residential development, or construction of schools, day care facilities for children, or hospitals for human care, and that any uses of the site that would allow exposure to the buried contaminated soils by the public will be prohibited.
- *Disturbance of Soil*. Grantee covenants for itself and its successors and assigns that it will not disturb or allow others to disturb the soil where it may contain elevated lead concentrations (Figure 2-8), without prior approval from the ROD signatory agencies to ensure that the activity will not compromise protection of human health and the environment. This includes any activities that would alter drainage, or sub-drainage, in the area.

The deed will also include a condition that the transferee execute and record a State Land Use Covenant (SLUC), within 10 days of transfer, to address any State obligations pursuant to State law, including 22 Code of California Regulations, Section 67391.1.

Specific language is included in this ROD regarding implementation, monitoring, reporting and enforcement of 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 are specifically described in the following subsections, it is not necessary for the Air Force to submit any new, post-ROD IC implementation documents, such as a Land Use Control Implementation Plan, new operation and maintenance plans, or remedial action work plans.

The IC alternative includes an enforceable use restriction and institutional control on the use of certain properties where the Site 89 remedy requires use restrictions. The Air Force is responsible for implementing, maintaining and monitoring the remedial actions (including the IC) before and after property transfer. The parcel of property encompassing Site 89 is currently leased in furtherance of conveyance to the County of Sacramento. The current lease restrictions, which are as protective as the IC alternative use restrictions, are in place and operational, and will remain in place until the property is transferred by deed. At the moment of deed transfer, the lease restrictions will be superseded by the use restriction to be included in the federal deed and the SLUC.

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

Meeting the RAOs (Table 10) shall be the primary and fundamental indicator of IC performance, the ultimate aim of which is to protect human health and the environment. Performance measures for ICs are the RAO plus the actions necessary to achieve those objectives. It is anticipated that successful implementation, operation, maintenance and completion of these measures will achieve protection of human health and the environment and compliance with all legal requirements.

The Air Force may contractually arrange for third parties to perform any and all of the actions associated with ICs, although the Air Force is ultimately responsible under CERCLA for the successful implementation of the ICs, including monitoring, maintenance and review of a protective remedy. Monitoring, maintenance and other controls as established in accordance with this ROD and the appropriate transfer documents will be continued until ICs are no longer necessary

A description of the ICs as they will be applied to Site 89 is provided below.

2.12.4.1 Deed Restrictions and Reservation of Access

Each federal deed for any property containing part of Site 89 will include a description of the residual contamination on the property, consistent with the Air Force's obligations under

CERCLA Section 120(h) and the specific restrictions subsequently set forth in Section 2.12.4. The ICs, in the form of deed restrictions are "environmental restrictions" under California Civil Code section 1471. The deeds will include a legal description of the affected area and will contain the provisions and specific language required by Section 1471 to qualify the ICs as "environmental restrictions" so that they run with the land.

The Air Force and regulatory agencies may conduct inspections of ICs and the property. The Air Force will continue to provide access to the property for those purposes, as required under the Federal Facilities Agreement, prior to transfer by deed. Each deed will also contain a reservation of access to the property for the Air Force, U.S. EPA and the State of California, and their respective officials, agents, employees, contractors, and subcontractors for purposes consistent with the Air Force IRP or the FFA.

The environmental restrictions are the basis for part of the CERCLA 120(h)(3) covenant that the United States is required to include in the deed for any property that has had hazardous substances stored for one year or more, known to have been released or disposed of on the property.

During the time between adoption of this ROD and deeding of the property, appropriate restrictions, at least as restrictive as those contained in this ROD, are implemented by the lease between the Air Force and the County of Sacramento. The lease restrictions are in place and operational and will remain in place until the property is transferred by deed. At the time of deed transfer, lease restrictions will be superseded by equivalent restriction to be included in the federal deed and the State Land Use Covenant as described in this ROD

2.12.4.2 Notice of Institutional Controls

The Air Force will include the specific deed restriction language set forth in this ROD in any deed for any parcel that includes any part of Site 89 for which ICs are selected pursuant to this ROD, and will provide a copy of the deed(s) to the regulatory agencies as soon as practicable after the transfer of fee title. The Air Force will provide information to the property owners regarding the necessary IC in the draft deed. The signed deed will also include the specific land use restriction as well as a condition that the transferee execute and record a State Land Use Covenant, within 10 days of transfer, to address any State obligations pursuant to State law, including 22 Code of California Regulations, Section 67391.1. 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.

Prior to conveyance of any Air Force property containing any part of Site 89 requiring ICs, EPA and State of California representatives will be given reasonable opportunity to review and comment on the applicable deed language and associated rights of entry for the EPA and State of California for purposes of IC oversight and enforcement. The Air Force will also provide a draft deed, identifying the IC language, to the transferee.

Concurrent with the transfer of fee title from the Air Force to transferee, the Finding of Suitability for Transfer or the Finding of Suitability for Early Transfer and location of the administrative record will be communicated in writing to the property owners and the State single point of contact to ensure State agencies can factor such conditions into their oversight and decision-making activities regarding the property.

The Air Force will require as a condition of property transfer that the transferee enter into an agreement acceptable to the State of California to cover obligations pursuant to California Code of Regulations, title 22, Section 67391.1, including, without limitation, the payment of State costs identified and incurred by the State of California.

2.12.4.3 Annual Evaluations/Monitoring

Prior to property transfer, the Air Force will conduct annual monitoring, provide annual reports and undertake prompt action to address activity that is inconsistent with the IC objective or use restrictions, or any action that may interfere with IC effectiveness. The Air Force will submit to the regulatory agencies annual monitoring reports on the status of ICs and how any IC deficiencies or inconsistent uses have been addressed. The annual monitoring reports will be used in preparation of five-year reviews to evaluate the remedy's effectiveness. Prior to transfer, the annual monitoring report submitted to the regulatory agencies by the Air Force will evaluate the status of ICs and how any IC deficiencies or inconsistent uses have been addressed.

The transferee[1] or subsequent property owner(s) will conduct annual physical inspections of property where Site 89 ICs are required to confirm continued compliance with all IC objectives unless and until the IC at the site is terminated. The transferee or subsequent property owner(s) will provide to the Air Force, the EPA, and the State of California an annual monitoring report on the status of the IC and how any IC deficiency or inconsistent use has been addressed. The Air Force will place these transferee obligations in the transfer documentation.

The annual evaluation will address whether the use restrictions and controls referenced above were communicated in the deed(s), whether the owners and the State single point of contact

1 Or other entity accepting such obligations (which may include, without limitation, subsequent transferees)

were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls.

The five-year reviews conducted by the Air Force will also address whether the IC in the ROD was inserted in the deed, if property was transferred during the period covered, whether the owners and State and local agencies were notified of the IC affecting the property and whether use of the property has conformed to such an IC. Five-year review reports will make recommendations on the continuation, modification or elimination of annual reports and IC monitoring frequencies. Five-year review reports are submitted by the Air Force to the regulatory agencies for review and comment.

Although the Air Force is transferring procedural responsibilities to the transferee and its successors by provisions to be included in the deed(s) and may contractually arrange for third parties to perform any and all of the actions associated with the IC, the Air Force is ultimately responsible for the integrity of the remedy and for enforcing the land use controls.

2.12.4.4 Response to Violations

Prior to property transfer, the Air Force will notify the EPA and the State of California as soon as practicable but no longer than 10 days after discovery of any activity that is inconsistent with the IC objectives or use restrictions or any action that may interfere with the effectiveness of the ICs. The Air Force will notify the EPA and the State of California regarding how the Air Force has addressed or will address the breach within 10 days of sending the EPA and the State of California notification of the breach.

The deed will require that post transfer, the transferee will notify the Air Force, the EPA, and the State of California of any activity that is inconsistent with the institutional control objectives or use restrictions, or any other action that may interfere with the effectiveness of the institutional controls, and will address such activity or condition as soon as practicable, but in no case will the process be initiated later than 10 days after the transferee becomes aware of the breach.

If the transferee fails to satisfy its obligations under state law associated with the SLUC, the State of California may, per the SLUC, enforce such obligations against the transferee. If there is failure of the selected remedy or a violation of selected remedy obligations, the State of California will notify the Air Force in writing of such failure and initially seek corrective action or other recourse from the transferee, including recovery of its associated costs. If, after diligent efforts, the State of California is unable to enforce the obligations of the SLUC or remedy obligations against the transferee, the State shall confer with the Air Force to resolve re-implementation of the selected remedy or other necessary remedial actions to address failure of

the selected remedy. Costs incurred by the State of California in undertaking regulatory oversight of remedies re-implemented by the Air Force will be addressed using funding appropriated to the Department of Defense to pay such costs.

2.12.4.5 Approval of Land Use Modification

Prior to transfer, the Air Force shall not modify or terminate land use controls or implementation actions that are part of the selected remedy, or modify land use without approval by the U.S. EPA and the State of California. The Air Force shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the land use control or any action that may alter or negate the need for land use controls.

Any grantee of property constrained by the IC imposed through their transfer document(s) may request modification or termination of the IC. Modification or termination of the IC, except the State Land Use Covenant (discussed below), requires Air Force, U.S. EPA, and the State of California approval. Prior to seeking approval from the EPA and the State, the recipient of the property must notify and obtain approval from the Air Force of any proposals for a land use change at a site inconsistent with the use restrictions and assumptions described in this ROD.

2.12.4.6 State Land Use Covenant Modification

Any modification or termination of the State Land Use Covenant, following approval of the Air Force, U.S. EPA, and the State of California, must be undertaken in accordance with State law and will be the responsibility of the transferee or then-current owner or operator.

2.12.5 Suspected Ordnance Disposal Area of Concern

The selected remedy for the Suspected Ordnance Disposal AOC is No Further Action. Site investigations did not identify site contamination at the AOC and no further action is warranted.

2.13 Documentation of Significant Changes

The significant changes between the remedial actions proposed in the Proposed Plan and those selected in this ROD consist of changes in site conditions. Removal actions were undertaken at sites 80, 85, 88, and 89 that accomplished the excavation and disposal activities proposed for these sites in the Proposed Plan. During the time the ROD was delayed for resolution of policies on implementation of institutional controls, surface water and groundwater monitoring proposed for Site 89 occurred. Therefore the selected remedies consist of the remaining portions of the remedies proposed in the Proposed Plan, which are no further action for sites 80, 85, and 88, and institutional controls for Site 89.

2.14 Statutory Determinations

The selected remedies of the Supplemental Basewide ROD are protective of human health and the environment; comply with Federal and State requirements that are legally applicable or relevant and appropriate; are cost-effective; and use permanent solutions to the maximum extent practicable. Based on completed removal actions, active remedies are not required and therefore, the statutory preference for treatment, including alternative treatment technologies or resource recovery technologies, as a principal element of the remedy is not applicable.

A five-year review will not be required for Sites 80, 85, 88 and the Suspected Ordnance Burial AOC because they do not have hazardous substances, pollutants, or contaminants remaining on site at concentrations above levels that allow for unlimited use and unrestricted exposure. A five-year review is required at Site 89 because hazardous substances, pollutants or contaminants will remain on-site above levels that allow for unlimited use and unrestricted exposure. The next five-year review at Mather is scheduled for completion by September 24, 2009.

2.14.1 Applicable or Relevant and Appropriate Requirements

Pursuant to Section 121(d)(1) of CERCLA, remedial actions must attain a degree of cleanup, which are protective of human health and the environment, and they must comply with ARARs. Additionally, remedial actions that leave hazardous substances, pollutants, or contaminants on site must meet standards, requirements, limitations, or criteria that are applicable or relevant and appropriate requirements. Federal ARARs include requirements under any federal environmental law, while State ARARs include promulgated requirements under State environmental or facility-siting laws that are more stringent than federal ARARs, and that have been identified as ARARs by the State of California in a timely manner. To be an ARAR, the requirement must be either (U.S. EPA, 1988):

- Applicable requirements: which include those cleanup standards, control standards, or other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically addresses a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

  Under CERCLA regulation, onsite actions need comply only with the substantive aspects of ARARs, not with corresponding administrative requirements (but not limited to, permits, recordkeeping, and reporting). However, substantive components of apparently administrative requirements, such as recordkeeping, are potential ARARs. For example, a regulation that describes required reports could include specific measures of remediation performance that must be made. The report is not a potential ARAR but the specific measures needed to document remediation performance are substantive requirements and may be ARARs.

- Relevant and appropriate requirements: consists of cleanup standards or other substantive environmental requirements promulgated under Federal or State law that, while not

"applicable" at a CERCLA site, nevertheless address problems or situations sufficiently similar to those encountered at a CERCLA site to indicate their use.

A requirement must be both relevant and appropriate to be designated an ARAR. If no ARAR addresses a particular situation, or if an ARAR is insufficient to protect human health or the environment, then nonpromulgated standards, criteria, guidance, and to-be-considered (TBC) advisories may be used to provide a protective remedy. Where a TBC was used to develop a remedy or cleanup goal, it becomes a performance standard that must be met for the remediation project. Applicable or relevant and appropriate requirements are identified on a site-specific basis from information about site-specific chemicals, specific actions that are being considered, and specific features of the site location.

In order for a State requirement to be considered an ARAR, it must be:

- Legally enforceable
- Generally applicable to all circumstances covered by the requirement, not just Superfund sites
- More stringent than the federal regulation

The three categories of ARARs are as follows:

- Chemical-Specific ARARs—that represent a health-based or risk-based standard or the results of methodologies, which when applied to site-specific conditions, are used to establish the acceptable amount or concentration of a chemical that may be found in, or discharged to, the ambient environment.
- Location-Specific ARARs—restrictions on the conduct of activities solely because the site occurs in certain environmentally sensitive areas. Examples are wetlands, floodplains, endangered species habitat, or historically significant resources.
- Action-Specific ARARs—technology-based or activity-based requirements or limitations on actions taken with respect to hazardous waste.

The ARARs and performance standards for this Supplemental Basewide OU were originally developed through a solicitation of ARARs to the regulatory agencies. However, because the excavation at these sites had been undertaken through removal actions, the remaining actions consist of institutional controls. Therefore the chemical-specific, action-specific, and location-specific ARARs and performance standards originally identified for these sites no longer apply.

2.14.1.1 Action-Specific Applicable or Relevant and Appropriate Requirements and Performance Standards

Action-specific ARARs are technology- or activity-based requirements or limitations on actions taken with respect to the waste.

The State regulation at 22 Code of California Regulations, Section 67391.1, requiring a land-use covenant for a portion of Site 89, and at California Civil Code Section 1471, requiring land-use covenants to apply to successors in title to the land, have been added to the ARAR list (Table

14). AFRPA has agreed not to transfer property at Site 89 with CERCLA institutional controls unless the property recipient enters into a State Land-Use Covenant with the State allowing the State to enforce the compliance with the institutional controls.

TABLE 14: Site 89 Relevant and Appropriate State Requirements

Requirement	ARAR Status	Source	Description
Action Specific			
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1(a)	Requires imposition of appropriate limitations 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.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1(b)	Requires that the cleanup decision document contain an implementation and enforcement plan for land use limitations.
Land Use Covenant	Relevant and Appropriate	CCR, title 22, section 67391.1(d)	Requires that the land use covenant be recorded in the county where the land is located.
Land Use Covenant	Relevant and Appropriate	California Civil Code Section 1471(a) & (b)	Specifies requirements for land use covenants to apply to successors in title to the land.

CCR = California Code of Regulations

2.15 Responsiveness Summary

The public comment period for the Proposed Plan (AFBCA, 2000) began on September 26, 2000 and ended on October 26, 2000. A community meeting was held on October 10, 2000, at which the Proposed Plan was summarized, and questions and public comments solicited. The transcript from the public meeting is included in the Administrative Record File and presented in Appendix D, "Community Meeting Transcript (October 10, 2000)." One member of the public asked a question at the public meeting, and no formal written comments were received.

The question from the public and Air Force response are presented in the following excerpt.

Comment 1 (see page 35 of the public meeting transcript) and Response:

MR. SHACKELFORD: My comment is this, that you've done a wonderful job of evaluating the problems at Mather Air Force Base back to the eighty years when it started. And all of the things that you've found, you've concentrated on cleaning it up in a timely manner. It may have been more expensive than we ever anticipated, but you've certainly done a good job of pointing out everything that could possibly be a contaminant that you could remove has been removed or is in the process. And I've been here 41 years and I've seen great progress. Thank you.

BRAC ENVIRONMENTAL COORDINATOR WONG: Thank you for the comment.

Response: The comment is noted and appreciated.

3.0 References

Note: the referenced documents followed by an Administrative Record number (AR # xxx) may be viewed via the internet at:

https://afrpaar.afrpa.pentagon.af.mil/docsearch/newdocsearchform.asp?base=MATHR

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Air Force Base Conversion Agency (AFBCA), 1995, *Superfund Final Record of Decision, Landfill Operable Unit Sites, Mather Air Force Base, Sacramento County, California.* AR # 844

Air Force Base Conversion Agency (AFBCA), 1996, *Soil Operable Unit Sites and Groundwater Operable Unit Plumes Record of Decision.* AR # 799

Air Force Base Conversion Agency (AFBCA), 1997a, *Removal Action Memorandum for Site 85: South Ditch, Mather Air Force Base, Mather, California.* AR # 1417

Air Force Base Conversion Agency (AFBCA), 1997b, *Proposed Plan for Environmental Cleanup at the Basewide Operable Unit Site*, prepared by IT Corporation for Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas, Richland, Washington. AR # 1310

Air Force Base Conversion Agency (AFBCA), 1998, *Basewide Operable Units Sites Record of Decision, Mather Air Force Base, California.* AR # 1135

Air Force Base Conversion Agency (AFBCA), 1999, *Removal Action Memorandum for Mather Air Force Base Supplemental Basewide Operable Unit Site 80: Golf Course Maintenance Area Ditch, and Site 88: Morrison Creek.* July. AR # 2156

Air Force Base Conversion Agency (AFBCA), 2000, *Proposed Plan for Environmental Cleanup at the Supplemental Basewide Operable Unit Sites, prepared for the Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas*, Richland, Washington. AR # 2162

Air Force Base Conversion Agency (AFBCA), 2001a, Final *Removal Action Memorandum (RAM) to Change Scope of Continued Response for Non-Time Critical Removal Actions Initiated Under the 1997 RAM for Site 85 and 1999 RAM for Sites 80 and 88, Mather Air Force Base, California*, Mather, California. AR # 1951

Air Force Base Conversion Agency (AFBCA), 2001b, *Removal Action Memorandum for Mather Air Force Base Supplemental Basewide Operable Unit Site 89, Old Trap Range*, Mather, California. AR # 1953

Air Force Base Conversion Agency (AFBCA), 2002, *Remedial Action Report For Installation Restoration Program Site SD-13, Drainage Ditch No. 1*, September. AR # TBD

Air Force Real Property Agency (AFRPA), 2005, *Proposed Termination of Water Sampling for Site 89*, July AR # TBD

California Department of Toxic Substances Control (DTSC), 2005, *Proposed Termination of Water Sampling for Site 89, Mather Airport, Sacramento County*, October AR # TBD

EA Engineering, Science, and Technology (EA), 1999, *Results of Toxicity Testing with Chironomus tentans on Sediment Samples from Mather Air Force Base*. AR # 1515.

EOD Technology, Inc. (EOD), 1999, *Final OE Characterization Report at the Weapons Storage Area, Mather Air Force Base, Mather, California*. AR # 2149

IT Corporation (IT Corp.), 1993, *Final Remedial Investigation Report for Group 2 Sites*, April. AR # 1624 through 1635

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IT Corporation (IT Corp.), 1997, *Final Basewide Operable Unit Focused Feasibility Study Report for Mather Air Force Base, California*. AR # 1312, 1332, 1333

IT Corporation (IT Corp.), 1998, *Rapid Bioassessment Protocol Level II Survey at Installation Restoration Program Sites 80 and 88, Mather Air Force Base, California*. AR # 1685

IT Corporation (IT Corp.), 1999, *Evaluation of Chironomus tentans Toxicity Results from Mather Air Force Base, California*. AR # 1888

IT Corporation (IT Corp.), 2000, *Final Supplemental Basewide Operable Unit Focused Feasibility Study for Mather Air Force Base, California*. AR # 1703

Montgomery Watson (MW), 1998a, *Draft Final Project Definition Investigation Report for Surface Soil Sites 10C, 69, 80, 81, and 88*. AR # 1121

Montgomery Watson (MW), 1998b, *Oil and Grease Cleanup Levels for Sites 15 and 85*, Memorandum from Montgomery Watson to Ralph Rosales, AFCEE/ERB, November 19. AR # TBD

Montgomery Watson (MW), 1999a, *Survey Sampling Report for Soil and Sediment at the Old Trap Range (Site 89), Mather, California.* AR # 1848

Montgomery Watson (MW), 1999b, *Informal Technical Information Report for Remedial Actions at Sites 15, 20, 85, 86, and 87*, August. AR #2119, 2119, 2120

Montgomery Watson (MW), 2000a, *Informal Technical Information Report for Sites 69, 80, and 88.* AR # 1849

Montgomery Watson (MW), 2000b, *Informal Technical Information Report for Investigations and Pilot Study at Site 89.* AR # 1846

Montgomery Watson (MW), 2000c, *Final Removal Action Workplan for Additional Excavations at Site 89.* AR # 1740

Montgomery Watson (MW), 2001a, *Memorandum to Kevin Thomas (AFBCA) on Surface Soil Sampling and Surface Water Sampling at Site 89.* AR # TBD

Montgomery Watson (MW), 2001b, *Memorandum to Juan Perez (AFCEE) on Additional Surface Water Sampling at Site 89, Old Trap Range, Mather Air Force Base, California.* AR # TBD

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Montgomery Watson (MW), 2002b, *Informal Technical Information Report for Additional Excavation at Site 89.* AR # TBD (draft document is # 2271)

United States Air Force (USAF), 1992, *Final Environmental Impact Statement for the Disposal and Reuse of Mather AFB*)

United States Air Force (USAF), 1993, *Final Record of Decision, Disposal and Reuse of Mather Air Force Base, Environmental Impact Statement.* AR # 2164

U.S. Environmental Protection Agency (U.S. EPA), 1999, *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents.*

U.S. Environmental Protection Agency (U.S. EPA), 2005, *Concurrence on the Request for Termination of Water-Quality Monitoring at Site 89, Former Mather Air Force Base, Sacramento, California*, September. AR # TBD

Appendix A
Administrative Record Index
Supplemental Basewide Operable Unit
Mather Air Force Base, California

This index documents the Administrative Record for the Supplemental Basewide Operable Unit Sites, Mather Air Force Base, Sacramento County, Mather, California. The documents described within are maintained at the Administrative Record File located in the Air Force Real Property Agency Office, 3411 Olson Street, at the former McClellan Air Force Base, McClellan, California. This Administrative Record contains the documents which the Air Force has relied upon or considered in identifying the appropriate response action for these sites.

The Administrative Record is available for inspection by the public during regular business hours (Monday through Friday 9am to 4pm).

In addition, many of the Administrative Record documents are available as scanned images posted on the internet at the address below. The file numbers of these documents are provided in the index as available.

https://afrpaar.afrpa.pentagon.af.mil/docsearch/newdocsearchform.asp?base=MATHR

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
Jun 82	Phase I, Records Search Report	CH2M Hill	4
04 Oct 82	CVRWQCB Letter to Air Force Transmitting Comments on Records Search Report	Johnson, William S California Regional Water Quality Control Board	5
12 Aug 83	Waste Discharge Requirements for Mather AFB, Sacramento County	Crooks, William California Regional Water Quality Control Board	911
20 Dec 83	CVRWQCB Letter to Base Transmitting Summary of 6 Dec 83 Meeting	Pinkos, Thomas R California Regional Water Quality Control Board	11
01 Aug 84	CDHS Letter to Base Outlining State Requirements	Allen, James T California Department of Health Services	14
17 Aug 84	Minutes of 2 Aug 84 IRP Meeting 323 ABG/CC	Slaughter, John T, Col	15
17 Aug 84	Minutes of 6 Aug 84 TWG Meeting	Curran, James P, Capt USAF Hosp/SGPB	450
20 Aug 84	Minutes of 20 Aug 84 TWG Meeting	Slaughter, John T, Col 323 ABG/CC	16
24 Oct 84	Minutes of 1 Oct 84 TWG Meeting	Slaughter, John T, Col 323 ABG/CC	17
05 Dec 84	Minutes of 26 Oct 84 IRP Meeting	Slaughter, John T, Col 323 ABG/CC	19
18 Apr 85	Minutes of 18 Apr 85 IRP Work Group	Bost, Thomas D, LtCol 323 ABG/CC	24
27 Jun 86	Memorandum for Record Concerning Technical Advisory Group Meeting Held 25 Jun 86	Curran, James P, Capt USAF Hosp/SGPB	54
03 Jun 87	Assembly California Legislature Letter to Base on Subjects Discussed at Toxic Contamination Cleanup Meeting	Connelly, Lloyd G California Legislative Assembly	75

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
12 Jun 87	Base Letter to Technical Advisory Committee Members on Initial Coordination Meeting	Johnson, Bruce R, Col 323 ABG/CC	76
27 Jun 87	Memo for Record on Technical Advisory Group Meeting	Curran, James P, Capt USAF Hosp/SGPB	79
22 Jul 87	IT Letter to HAZWRAP on Coordination Meeting Minutes	Bradley, A Allen IT Corp.	84
06 Nov 87	Plan for Conducting a Geologic Investigation	HAZWRAP	96
22 Dec 87	Minutes of 15 Dec 87 TRC Meeting	Kosovac, Don E, Col 323 FTW/EM	98
09 Feb 88	Minutes of 27 Jan 88 Mini TRC Meeting	Kosovac, Don E, Col 323 FTW/EM	104
14 Apr 88	Minutes of 22 Mar 88 TRC Meeting	Kosovac, Don E, Col 323 FTW/EM	135
30 Jun 88	Minutes of 30 Jun 88 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	142
30 Nov 88	Minutes of 6 Oct 88 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	156
06 Mar 89	Minutes of 12 Jan 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	163
20 Mar 89	Internal Base Letter Concerning Public Review Committee Meeting	Wimberly, M Cathryn 323 FTW/PA	164
Apr 89	Mather AFB Community Relations Plan	Wimberly, Cathryn 323rd Flying Training Wing, Public Affairs	903
01 May 89	Minutes of 6 Apr 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	170
10 Jul 89	Transcript of 10 Jul 89 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	177
20 Jul 89	Minutes of 10 Jul 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	178

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
21 Jul 89	Federal Facility Agreement Under CERCLA Section 120, for Mather Air Force Base	U.S. EPA, State of California, and the U.S. Air Force	
03 Oct 89	Transcript of 3 Oct 89 TRC Meeting	Peters, Ronald J Peters Shorthand Reporting Corp.	188
13 Nov 89	Minutes of 3 Oct 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	195
30 Nov 89	Transcript of 30 Nov 89 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	199
Dec 89	Mather AFB Community Relations Plan	Wimberly, Cathryn 323 Flying Training Wing, Public Affairs	913
03 Jan 90	CVRWQCB Letter with Review Comments to DTSC on Draft RI/FS Work Plan	Matteoli, Robert J California Regional Water Quality Control Board	655
12 Jan 90	EPA Letter to MAJCOM Transmitting Review Comments on the Nov 89 RI/FS Draft Work Plans	Chesnutt, John D EPA Region IX	202
16 Jan 90	Dept. of Health Services review comments on Draft Workplan for RI/FS at the Group 2 Sites	Landis, Anthony J California Department of Health Services	1068
16 Jan 90	CDHS Letter to Base Transmitting Comments on Nov 89 RI/FS Draft Work Plans for Identified Sites (Group 2 Sites)	Landis, Anthony J California Department of Health Services	203
16 Jan 90	Internal CVRWQCB Memo Providing Review Comments on RI/FS Draft Sampling and Analysis Plan for Identified Sites	Mosbacher, Michael H California Regional Water Quality Control Board	204
18 Jan 90	Dept. of Health Services' additional comments on Draft Workplan for RI/FS for Group 2 Sites	Billington, Tracie L California Department of Health Services	1067
30 Jan 90	Transcript of 30 Jan 90 TRC Meeting	Parks, Nadine J Peters Shorthand	206

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		Reporting Corp.	
07 Mar 90	Minutes of 30 Jan 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	212
08 Mar 90	Transcript of 8 Mar 90 TRC Meeting	Peters, Ronald J Peters Shorthand Reporting Corp.	213
23 Mar 90	Minutes of 8 Mar 90 Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM	214
Apr 90	RI/FS, Draft Final Work Plan, Vol I of IV, Group 2 Sites	IT Corp.	215
Apr 90	RI/FS, Draft Final Sampling and Analysis Plan, Vol II of IV, Group 2 Sites	IT Corp.	216
Apr 90	RI/FS, Draft Final Quality Assurance Project Plan, Vol III of IV, Group 2 Sites	IT Corp.	217
Apr 90	RI/FS, Draft Final Health and Safety Plan, Vol IV of IV, Group 2 Sites	IT Corp.	218
10 May 90	Transcript of 10 May 90 TRC Meeting	McNulty, Bernadette Peters Shorthand Reporting Corp.	223
17 May 90	CDHS Letter to Base Concerning Finalization of RI/FS Draft Final Work Plans, Group 2 Sites	Landis, Anthony J California Department of Health Services	224
21 May 90	EPA Letter to Base Concerning RI/FS Draft Final Work Plans, Group 2 Sites	Chesnutt, John D EPA Region IX	225
25 May 90	Minutes of 10 May 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	451
Aug 90	RI/FS, Final Site Inspection Report	IT Corp.	253
02 Aug 90	Transcript of 2 Aug 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	254
31 Aug 90	CDHS Letter to Base Providing Comments on FS Draft Work Plan, AC&W Site, and	Diebert, Donn California Department of	256

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	RI/FS QAPP Addendum, Group 2 and AC&W Sites	Health Services	
06 Sep 90	Minutes of 2 Aug 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	257
19 Sep 90	CDHS Letter to Base Providing Comments on RI/FS Solid Waste Water Quality Assessment Test, Draft Project Plans Addendum, Group 2 Sites	Wang, David California Department of Health Services	258
19 Sep 90	EPA Letter to Base Providing Comments on RI Draft Work Plan Addendum,	Chesnutt, John D EPA Region IX Group 2 Sites	259
23 Oct 90	Transcript of 23 Oct 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	264
08 Nov 90	Memorandum Summarizing Regulators Review Comments on RI/FS Work Plan, Group 2 Sites	323 FTW/EM	364
09 Nov 90	MAJCOM Letter to EPA Transmitting No Further Action Decision Documents and Response to Regulatory Comments	Sizemore, Daniel L, LtCol HQ ATC/DEEV	270
09 Nov 90	MAJCOM Letter to CDHS Transmitting No Further Action Decision Documents and Response to Regulatory Comments	Sizemore, Daniel L, LtCol HQ ATC/DEEV	271
15 Nov 90	Transcript of 15 Nov 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	272
19 Nov 90	Minutes of 23 Oct 90 TRC Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM	274
28 Nov 90	CDHS Letter to Base Concerning Final Site Inspection Report and FS Draft Final Work Plan, AC&W Site	Wang, David California Department of Health Services	275
29 Nov 90	Minutes of 15 Nov 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	276
19 Dec 90	EPA Letter to Base Providing Conditional Approval of Draft Final Project Plans Addendum for Group 2	Chesnutt, John D EPA Region IX	279

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	Sites		
26 Dec 90	CDHS Letter to Base Approving Draft Final Project Plans Addendum for Group 2 Sites	Wang, David California Department of Health Services	280
30 Jan 91	Transcript of 30 Jan 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	286
14 Feb 91	Minutes of 30 Jan 91 TRC Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM	288
15 Feb 91	CVRWQCB Letter to Base Transmitting Comments on Draft Final Project Plans Addendum, Group 2 Sites	Mosbacher, Michael H California Regional Water Quality Control Board	289
28 Mar 91	Transcript of 28 Mar 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	296
15 Apr 91	Minutes of 28 Mar 91 TRC Meeting	Blank, Richard A, LtCol 323 ABG/EM	299
21 May 91	Transcript of 21 May 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	306
18 Jun 91	Minutes of 21 May 91 TRC Meeting	Blank, Richard A, LtCol 323 ABG/EM	314
25 Jun 91	Transcript of 25 Jun 91 Project Managers' Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	315
25 Jul 91	Minutes of 25 Jul 91 Project Managers Meeting	Blank, Richard A, LtCol 323 ABG/EM	324
20 Aug 91	Transcript of 20 Aug 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.	330
17 Sep 91	Minutes of 20 Aug 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	341
17 Sep 91	DTSC Letter to Base Transmitting Summary of State and Local ARARs	Billington, Tracie L California Department of Toxic Substances Control	342

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24 Oct 91	Minutes of 25-26 Sep 91 Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM	350
21 Nov 91	Minutes of 21 Nov 91 TRC Meeting	Bailey, Doris M Peters Shorthand Reporting Corp.	351
03 Dec 91	Minutes of 21 Nov 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	360
Jan 92	Community Relations Plan	IT Corp.	368
08 Jan 92	EPA Letter to Base on Review of Background Soils Sampling Strategy	Moore, Katherine L EPA Region IX	374
08 Jan 92	U.S. EPA's comments on Background Soils Sampling Strategy	Moore, Katherine L EPA Region IX	890
23 Jan 92	Minutes of 9 Jan 92 RPM Meeting	Blank, Richard A, LtCol 323 FTW/EM	377
11 Mar 92	Transcript of 11 Mar 92 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.	395
27 Mar 92	Minutes of 11 Mar 92 RPM Meeting	Blank, Richard A, LtCol 323 FTW/EM	399
27 Mar 92	Minutes of 11 Mar 92 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	400
01 Apr 92	Final EIS, Disposal and Reuse of Mather Air Force Base	The Earth Technology Corp.	1831
06 May 92	EPA Letter to Base on Review of RI, Draft Group 2 Report	Moore, Katherine L EPA Region IX	413
27 May 92	California Integrated Waste Management Board comments on Group 2 RI Management Board	Zielinski, Tamara California Integrated Waste	855
03 Jun 92	Minutes of 3 Jun 92 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	423
15 Jun 92	DTSC Letter to Base with Comments on RI, Group 2 Report	Billington, Tracie L California Department of Toxic Substances Control	432

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06 Jul 92	Minutes of 3 Jun 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	434
28 Jul 92	Transcript of 28 Jul 92 TRC Meeting	Medeiros, Vicki L Peters Shorthand Reporting Corp.	444
28 Sep 92	HQ ATC/DEEV Letter to DTSC on TRC Meeting	Pehlivanian, William HQ ATC/DEEV	466
28 Sep 92	HQ ATC/DEEV Letter to EPA on TRC Meeting	Pehlivanian, William HQ ATC/DEEV	467
30 Sep 92	Base Letter to TRC Members on Agenda for the 8 Oct Meeting	Blank, Richard A, LtCol 323 FTW/EM	470
08 Oct 92	Transcript of 8 Oct 92 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.	474
09 Oct 92	EPA Letter to Base Transmitting Comments on RI Report, Group 2 Sites	Moore, Katherine L EPA Region IX	476
12 Nov 92	EPA Letter to Base Transmitting Comments on Chapter 6 and Missing Appendices, RI Report, Group 2 Sites	Moore, Katherine L EPA Region IX	484
27 Nov 92	Minutes of 8 Oct 92 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM	491
27 Nov 92	Minutes of 8/9 Oct 92 RPM Meeting	Blank, Richard A, LtCol 323 FTW/EM	492
30 Nov 92	DTSC Letter to Base Transmitting Comments on Comprehensive Baseline Risk Assessment, Draft Work Plan,	Billington, Tracie L California Regional Water Quality Control Board	493
10 Dec 92	Transcript of 10 Dec 92 TRC Meeting	Medeiros, Vicki L Peters Shorthand Reporting Corp.	499
24 Dec 92	DTSC Comments on Background Soils Sampling Strategy	Billington, Tracie L California Department of Toxic Substances Control	891
30 Dec 92	CVRWQCB comments on Background	Mosbacher, Michael H	892

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	Soil Sampling Strategy	California Regional Water Quality Control Board	
Jan 93	Work Plan, Comprehensive Baseline Risk Assessment	IT Corp.	506
19 Jan 93	IT Letter with Comments to Base on Draft Final Work Plan, Comprehensive Baseline Risk Assessment	Dove, F Harvey IT Corp.	514
26 Jan 93	SAF/MIQ Letter to EPA on Dispute Resolution Under the Federal Facility Agreement	Vest, Gary D Deputy Assistant Secretary of the Air Force	515
25 Mar 93	Transcript of 25 Mar 93 RPM Meeting	Bailey, Doris M Peters Shorthand Reporting Corp.	534
26 Mar 93	Transcript of 26 Mar 93 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.	535
31 Mar 93	Final Record of Decision, Disposal and Reuse of Mather Air Force Base, Environmental Impact Statement	USAF	2164
Apr 93	RI Report, Volume 1 through 12, Group 2 Sites	IT Corporation	1624 to 1635
03 May 93	Request for Historical Data on use of Pesticides and Herbicides	Blank, Richard A, LtCol 323rd Flying Training Wing	873
16 May 93	U.S. EPA's review of Comprehensive Baseline Risk Assessment's 1) Human Health Risk Assessment and 2) Ecological Risk Assessment	Lowe, Debbie EPA Region IX	1047
16 May 93	EPA Draft Comments on Human Health Risk Assessment of CBRA	Serda, Sophia EPA Region IX	546
18 May 93	Draft Comments on Draft Comprehensive Baseline Risk Assessment	Christopher, John P California Department of Toxic Substances Control	547
07 Jun 93	CVRWQCB Letter to Base Providing Comments on Draft Final Work Plan,	Taylor, James D California Regional Water	553

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	Appendix A: Background Soils and Groundwater Sampling Strategy	Quality Control Board	
07 Jun 93	EPA Letter to Base Transmitting Comments on Appendix A of Draft Final Comprehensive Baseline Risk Assessment Work Plan and Background Soils Sampling Strategy	Swarthout, Brian EPA Region IX	554
15 Jun 93	21 May 1993 Remedial Project Manager's Meeting Minutes	AFBCA/OL-D	958
Jul 93	Final Installation Restoration Program Data Summary	IT Corp.	915
16 Jul 93	DTSC Letter to Base on Draft Final Work Plan, Appendix A, Groundwater and Soil Sampling	Strong, Kent California Department of Toxic Substances Control	572
Aug 93	Draft Final Work Plan, Comprehensive Baseline Risk Assessment	IT Corp.	580
20 Aug 93	27 July 1993 Remedial Project Manager (BCT) Meeting Minutes	AFBCA/OL-D	957
31 Aug 93	IT Letter to AFCEE/ESB on RPM and TRC Meeting Minutes	Shafer, William C IT Corp.	579
22 Sep 93	CVRWQCB Letter to Base on Draft Final Work Plan, Comprehensive Baseline Risk Assessment	Williams, Camilla California Regional Water Quality Control Board	582
24 Sep 93	EPA Letter to Base on Draft Final Work Plan, Comprehensive Baseline Risk Assessment	Swarthout, Brian EPA Region IX	583
13 Oct 93	Transcript of 13 Oct 93 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.	589
23 Nov 93	DTSC Letter to Base on Establishment of Restoration Advisory Board	Wang, David California Department of Toxic Substances Control	599
Dec 93	Basewide Environmental Baseline Survey	Department of the Air Force	955

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01 Dec 93	EPA Letter to AFCEE Providing Comments on Preliminary Final Environmental Baseline Survey	Swarthout, Brian EPA Region IX	606
06 Dec 93	DTSC Letter to Base Providing Comments on the Background Inorganic Soils Report	Strong, Kent California Department of Toxic Substances Control	609
08 Dec 93	CVRWQCB Letter to Base Providing Comments on the Background Inorganic Soils Report	Williams, Camilla California Regional Water Quality Control Board	611
06 Jan 94	Earth Technology's Giant Garter Snake Survey	Hildreth, Jane Earth Technology Corp.	1052
10 Jan 94	DTSC Letter to Base Transmitting Comments on Draft Final EE/CA, ST-20, ST-29, ST-32	Strong, Kent California Department of Toxic Substances Control	618
12 Jan 94	Removal of Hydrant Fueling System	Erikson, Susan Sacramento County Environmental Management Department	1096
18 Jan 94	EPA Letter with Review Comments to AFBDA/NW-D on EE/CA, ST-20, ST-29 and ST-32	Lowe, Debbie EPA Region IX	671
24 Jan 94	13 January 1994 Restoration Advisory Board (RAB) Meeting Minutes	Smith, Charles H AFBCA/OL-D	619
01 Feb 94	DTSC Letter to Base on Environmental Baseline Survey	Strong, Kent California Department of Toxic Substances Control	673
15 Feb 94	Department of Health Services comments on Basewide Environmental Baseline Survey	Williams, Camilla California Regional Water Quality Control Board	1048
15 Feb 94	CVRWQCB Letter with Comments to DTSC on Environmental Baseline Survey	Williams, Camilla California Regional Water Quality Control Board	674

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16 May 94	State's request for Federal Facility Agreement Extension to Draft Comprehensive Baseline Risk Assessment	Strong, Kent California Department of Toxic Substances Control	1046
18 May 94	State's comments on Draft Comprehensive Baseline Risk Assessment	Strong, Kent California Department of Toxic Substances Control	1045
14 Jun 94	IT Corp.'s surrogate toxicity values for Comprehensive Baseline Risk Assessment (COBRA)	Dove, Harvey IT Corp.	1043
16 Jun 94	IT Corp.'s Strawman Outline for Additional Ecological Risk Assessment Sampling	Dove, Harvey IT Corp.	1042
17 Jun 94	U.S. EPA's summary of Comprehensive Baseline Risk Assessment revisions	Lowe, Debbie EPA Region IX	1041
29 Jun 94	U.S. EPA's comments on the Strawperson Outline for Additional Ecological Sampling	Lowe, Debbie EPA Region IX	1040
Jul 1994	RAB comments on Proposed Plan for Landfill ROD, RAM, Draft Comprehensive Baseline Risk Assessment	RAB members	995
14 Jul 94	U.S. EPA's suggested inclusions to program strategies of Additional Field Investigation, Focused Feasibility Study, and Risk Assessment reports	Lowe, Debbie EPA Region IX	1038
18 Jul 94	Air Force's request for extension of Draft Final Comprehensive Baseline Risk Assessment Report	Wong, Anthony AFBCA/OL-D	1032
18 Jul 94	Note on U.S. EPA's program strategy letter involving Additional Field Investigation, Focused Feasibility Study, and Risk Assessment Reports	Hughes, William Operational Technologies Corp	1039
18 Aug 94	Draft Final Mather Baseline Risk Assessment Consensus Statement for Delivery of Draft Final Report and evolution of name from Comprehensive	Smith, Charles H., AFBCA/OL-D; Lowe, Debbie, EPA Region IX;	1035

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	Baseline Risk Assessment	Strong, Kent, California Department of Toxic Substances Control	
18 Aug 94	AFBCA submits proposed revision to Appendix D to accommodate Request for Extension, Draft Final Comprehensive Baseline Risk Assessment Report	Wong, Anthony AFBCA/OL-D	981
19 Aug 94	Preliminary Summary Tables for Comprehensive Baseline Risk Assessment Revised Risk Estimates	IT Corp.	794
09 Sep 94	Sacramento Metropolitan Air Quality Management District's Regulatory Oversight of Remedial Activities at Military Bases	DeGuzman, Jorge Sacramento County Air Pollution Control District	977
23 Sep 94	Mather Baseline Risk Assessment (MBRA) suggested changes and effects on the Groundwater and Soil Operable Unit Focused Feasibility Study	Lowe, Debbie EPA Region IX	715
28 Sep 94	IT Corp Letter to AFCEE Transmitting Comments on Appendix J of Draft Mather Baseline Risk Assessment	Dove, F Harvey IT Corp.	701
28 Sep 94	Draft Mather Baseline Risk Assessment revised comment resolution	Dove, F. Harvey, Ph.D., P.H. IT Corp.	716
04 Oct 94	October 1994 BCT Meeting Minutes	AFBCA/OL-D	922
17 Nov 94	State's announcement of applicability of Resolution 92-49	Strong, Kent California Department of Toxic Substances Control	1060
21 Nov 94	Mather Phase II Detailed Ecological Risk Assessment: Proposed Tasks	Meyers-Schone, Linda IT Corp.	1031
Dec 94	Final Quality Project Plans for Fuel Distribution System Pipeline Removal and Abandonment-In-Place	OGDEN Environmental and Energy Services	693
07 Dec 94	Proposed Tasks for the Mather Phase II Ecological Risk Assessments	Meyers-Schone, Linda IT Corp.	1030

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21 Dec 94	Identification of ARARs	Strong, Kent California Department of Toxic Substances Control	917
Jan 95	10 January 1995 BCT Meeting Minutes	AFBCA/OL-D	924
23 Jan 95	ARARs Identified by the Sacramento Metropolitan Air Quality Management District for the Groundwater Operable Unit and Soil Operable Unit Focused Feasibility Study	DeGuzman, Jorge Sacramento Metropolitan Air Quality Management District	807
25 Jan 95	15 November 1994 BCT Meeting Minutes	AFBCA/OL-D	724
30 Jan 95	30 November 1994 Restoration Advisory Board (RAB) Meeting Minutes	Byrne, Ruth AFBCA/OL-D	937
31 Jan 95	Montgomery Watson's Meeting Notes for 10-11 January BCT Meeting	Scott, John Montgomery Watson Americas, Inc	1011
07 Feb 95	Groundwater and Soils Operable Unit (OU-2, OU-3) Focused Feasibility Study State ARARs	Strong, Kent California Department of Toxic Substances Control	732
23 Feb 95	U.S. EPA's comments on Draft Phase II Ecological Risk Assessment Work Plan	Lowe, Debbie EPA Region IX	1002
24 Feb 95	Thelma Estrada, U.S. EPA's, comment responses on the revised ARARs Table for the Soil and Groundwater Feasibility Study	Estrada, Thelma EPA Region IX	719
14 Mar 95	08 February 1995 Restoration Advisory Board (RAB) Meeting Minutes	Byrne, Ruth AFBCA/OL-D	938
17 Mar 95	Cleanup Criteria and Monitoring for VOC's Discussion Paper for Draft Groundwater and Soils Operable Unit (OU-2, OU-3) Focused Feasibility Study	Taylor, James California Regional Water Quality Control Board	741
27 Mar 95	28 February 1995 BCT Meeting Minutes	AFBCA/OL-D	925
12 Apr 95	Solicitation of Applicable or Relevant and Appropriate Requirements (ARARs) for the Groundwater and Soil Operable Units (OU-2, OU-3) Focused Feasibility	Wong, Anthony AFBCA/OL-D	731

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	Study		
18 Apr 95	Draft Final Phase II Detailed Ecological Risk Assessment Work Plan for Groundwater and Soils OU	IT Corp.	723
16 May 95	U.S. EPA suggestions regarding Special Status Plant, Wildlife, and Species Assessment	Lowe, Debbie EPA Region IX	850
26 May 95	Quality Program Plan for Mather AFB	Montgomery Watson Americas, Inc.	923
07 Jun 95	DTSC ARARs for the Groundwater and Soil Operable Units (OU-2, OU-3) Record of Decision	Strong, Kent AFBCA/OL-D	743
14 Jun 95	31 May - 01 June 1995 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc.	926
27 Jun 95	Air Force review of ARARs on Draft Mather Groundwater and Soil Operable Units (OU-2, OU-3) ROD	Rupe, Sam C., LtCol Department of the Air Force, Office of the Regional Counsel/ Western Region	751
10 Jul 95	26 April 1995 Restoration Advisory Board Meeting Minutes	Byrne, Ruth AFBCA/OL-D	939
12 Jul 95	Cal-EPA's and Regional Water Quality Control Board's comments on the Draft Remedial Investigation, Additional Site Characterization for the Soil and Groundwater Operable Units	Taylor, James Regional Water Quality Control Board	749
14 Jul 95	US-EPA request for extended review of Remedial Investigation, Additional Site Characterization, and Remedial Design Support Draft Work Plan	Lowe, Debbie EPA Region IX	748
21 Jul 95	US-EPA's comments on Draft Remedial Investigation, Additional Site Characterization and Remedial Design Support Work for Soil and Groundwater Operable Units	Lowe, Debbie EPA Region IX	746

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21 Jul 95	Dioxin and Furan Sampling Request in the Draft Remedial Investigation, Additional Site Characterization, and Remedial Design Work Plan	Strong, Kent California Department of Toxic Substances Control	813
24 Jul 95	19 July 1995 Restoration Advisory Board Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc.	940
25 Jul 95	12-13 July 1995 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc.	927
28 Jul 95	EPA Request for Extension for Review and Comment on Mather Baseline Risk Assessment	Lowe, Debbie EPA Region IX	758
30 Aug 95	U.S. EPA's request for extension for review and comment of Draft Final Mather Baseline Risk Assessment	Lowe, Debbie EPA Region IX	836
31 Aug 95	Approval of Extension for Review of Draft Final Mather Baseline Risk Assessment to 15 Sep 1995	Smith, Charles H AFBCA/OL-D	771
05 Sep 95	Special-Status Plant and Wildlife Species Assessment for Landfill Areas	Sugnet & Associates	849
07 Sep 95	29-30 August 1995 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc.	928
07 Sep 95	30 August 1995 Restoration Advisory Board Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc.	941
12 Sep 95	State's request for extension for review of the Draft Final Mather Baseline Risk Assessment	Strong, Kent California Department of Toxic Substances Control	827
14 Sep 95	AFCEE requests extension for delivery of MBRA from HSC/PKVA	Loudon, Fred AFCEE/ERB	1115
19 Sep 95	U.S. EPA approves extension request for Draft Final Mather Baseline Risk Assessment (MBRA)	Lowe, Debbie EPA Region IX	935

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29 Sep 95	27-28 September 1995 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc.	929
Oct 95	Additional Site Characterization and Remedial Design Support Work (vol 1 Work Plan; vol 2-4 SAP, QAPP, and HSP)	IT Corp.	1118
05 Oct 95	Draft Final Mather Baseline Risk Assessment, comments from EPA Region IX	Lowe, Debbie EPA Region IX	768
06 Oct 95	Mather Baseline Risk Assessment comments from California Department of	Strong, Kent California Toxic Substances Control Department of Toxic Substances Control	767
16 Oct 95	11 October 1995 Amended Restoration Advisory Board Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc.	943
9 Oct 95	Contractor Response to Regulators' Comments on the Draft Final Mather Baseline Risk Assessment	Meyers-Schone, Linda IT Corp.	1099
27 Oct 95	State's review comments on Additional Site Characterization Contract Modification, Draft Work Plan Addendum	Christopher, John California Department of Toxic Substances Control	1069
14 Nov 95	07-08 November 1995 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc.	930
16 Nov 95	15 November 1995 Restoration Advisory Board Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc.	942
20 Nov 95	State's request for delivery extension for Draft Final Mather Baseline Risk Assessment and Draft Final Soils OU and Groundwater OU Record of Decision	Strong, Kent California Department of Toxic Substances Control	936
21 Nov 95	State's Request for Additional	Smith, Charles H	971

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	Extensions on Revised Draft Final Mather Baseline Risk Assessment and Draft Final Soil and Groundwater ROD	AFBCA/OL-D	
22 Nov 95	Comments from the State on Additional Site Characterization Contract Modification, Draft Workplan Addendum	Strong, Kent California Department of Toxic Substances Control	818
22 Nov 95	U.S. EPA's Request for Extended Review of Additional Site Characterization Work Plan Addendum	Lowe, Debbie EPA Region IX	825
01 Dec 95	US-EPA Request for Extension for Review of Additional Site Characterization Work Plan Addendum	Lowe, Debbie EPA Region IX	820
05 Dec 95	U.S. EPA's review comments on the Comprehensive and Final Baseline Risk Assessment Workplan	Lowe, Debbie EPA Region IX	1098
05 Dec 95	U.S. EPA's comments on Draft Additional Site Characterization Addendum Work Plan	Lowe, Debbie EPA Region IX	822
19 Dec 95	Mather Baseline Risk Assessment	IT Corp.	762, 809 - 811
Jan 96	Additional Site Characterization for Groundwater, Soil, and Basewide Operable Units, vol. 1-4 (Final Work Plan, SAP, QAPP, and Health and Safety Plan)	IT Corp.	765
Jan 96	January 1996 Draft Final Community Relations Plan	Gutierrez-Palmenberg, Inc.	805
10 Jan 96	09-10 January 1996 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc.	931
17 Jan 96	Mather RAB Meeting Minutes, 10 January, 1996	AFBCA/DBM	944
07 Feb 96	Work Plan Addendum, Additional Site Characterization Contract Modification Plan Addendum	IT Corp.	761
18 Mar 96	Mather RAB Meeting Minutes, 13 March, 1996	AFBCA/DBM	1598

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18 Mar 96	13 March 1996 RAB Meeting Minutes	Gutierrez-Palmenberg, Inc.	1076
20 Mar 96	13-14 March 1996 BCT Meeting Summary	Gutierrez-Palmenberg, Inc.	1077
26 Mar 96	Air Force's solicitation from State of potential ARARs pertaining to Final OU	Wong, Anthony AFBCA/OL-D	1086
29 Apr 96	Final Record of Decision for Soil Operable Unit Sites and Groundwater Operable Unit Plumes	AFBCA/OL-D	945
08 May 96	Mather RAB Meeting Minutes, May 1, 1996	AFBCA/DBM	1599
09 May 96	Minutes of the BRAC Cleanup Team Meeting, 1 and 2 May, 1996	AFBCA/DBM	1580
24 May 96	EPA Letter to Base Concerning Additional Site Characterization RI Report	Lowe, Debbie EPA Region IX	1063
19 Jun 96	Minutes of the BRAC Cleanup Team Meeting and Reuse Meeting, 18 – 20 June, 1996	AFBCA/DBM	1581
24 Jun 96	Mather RAB Meeting Minutes, 18 June, 1996	AFBCA/DBM	1600
01 Jul 96	Mather AFB Federal Facility Agreement Appendix D Document Deliverable Dates	Wong, Anthony C. AFBCA/OL-D	1140
25 Jul 96	Mather BCT and Reuse Meeting Minutes 23-24 July 1996	AFBCA/DBM	1582
31 Jul 96	Mather RAB Meeting Minutes, 23 July, 1996	AFBCA/DBM	1601
Sep 96	Additional Site Characterization and Final Basewide OU Remedial Investigation Report, vol 1 through 6	IT Corp.	1636 to 1641
10 Sept 96	Memorandum for IT, Review of Contractor's Response to Comments on the Revised Draft of the Comprehensive Baseline Risk	Watts, Debra, Major HQ AFCEE/ERB	1173
22 Sep 96	Mather BCT and Reuse Meeting Minutes	AFBCA/DBM	1583

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	11 - 12 September, 1996		
22 Sep 96	Mather RAB Meeting Minutes, 11 September, 1996	AFBCA/DBM	1602
01 Oct 96	Request for FFA Schedule Adjustments, Final CBRA and Draft Proposed Plan	Wong, Anthony C. AFBCA/DBM	1162
15 Oct 96	Mem for IT: Review of Draft Additional Site Characterization and Final Basewide Operable Unit Work Plan Addendum	Watts, Debra, Major HQ AFCEE/ERB	1172
17 Oct 96	Comprehensive Baseline Risk Assessment, Vol I through III Appendices J through L	IT Corp.	626 to 628
17 Oct 96	Final Comprehensive Baseline Risk Assessment (transmittal of replacement pages)	Dove, F. Harvey IT Corp.	1175
21 Oct 96	Review of Draft Basewide Operable Unit Focused Feasibility Study, Mather AFB, CA	Watts, Debra, Major HQ AFBCA/EV	1183
21 Oct 96	Request for Addition to Administrative Record Comprehensive Baseline Risk Assessment (CBRA)	Watts, Debra, Major HQ AFCEE/ERB	1191
22 Oct 96	Draft Basewide Operable Unit Focused Feasibility Study Report, Mather (Review extension)	Strong, Kent California Department of Toxic Substances Control	1176
31 Oct 96	Comments for Draft Basewide Operable Unit Focused Feasibility Study Report for MAFB	Lowe, Debbie U.S. EPA Region IX	1198
01 Nov 96	Mather BCT and Reuse Meeting Minutes, 23-24 October, 1996	AFBCA/DBM	1584
01 Nov 96	Amended Summary, Mather RAB Meeting, 23 October 1996	AFBCA/DBM	1603
08 Nov 96	Draft Basewide Operable Unit Focused Feasibility Study Report for Mather Air Force Base	Strong, Kent California Department of Toxic Substances Control	1197

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08 Nov 96	EPA Letter to Base Concerning Comments on Draft Basewide OU FFS Report	Lowe, Debbie EPA Region IX	1198
12 Nov 96	Lunceford comments to Draft Basewide Focused Feasibility Study	Lunceford, Sandra	1199
23 Dec 96	Mather BCT and Reuse Meeting Minutes, 11-12 December, 1996	AFBCA/DBM	1585
23 Dec 96	Mather RAB Meeting Minutes, 11 Dec, 1996	AFBCA/DBM	1604
06 Jan 97	FFA Schedule Adjustments, Draft Final Mather AFB Off-Base Water Supply Contingency Plan, Draft Final Basewide Operable Unit Focused Feasibility Study, and Draft Basewide Operable Unit Proposed Plan	Wong, Anthony C. AFBCA/DBM	1224
21 Jan 97	Transmittal of Consensus Statement for FFA Schedule Adjustments, Draft Final Basewide Operable Unit Focused Feasibility Study	Wong, Anthony C. AFBCA/DBM	1229
27 Jan 97	Mather BCT and Reuse Meeting Minutes, 15-16 January 1997	AFBCA/DBM	1586
27 Jan 97	Mather Restoration Advisory Board Meeting Minutes, 15 January, 1997	AFBCA/DBM	1605
04 Feb 97	FFA Schedule Extension Request for the Draft Final Basewide Operable Unit Focused Feasibility Study, and Draft Basewide Operable Unit Proposed Plan	Wong, Anthony C. AFBCA/DBM	1239
11 Mar 97	Mather BCT and Reuse Meeting Minutes, 26-27 February, 1997	AFBCA/DBM	1587
11 Mar 97	Mather Restoration Advisory Board Meeting Minutes, 26 February, 1997	AFBCA/DBM	1606
13 Mar 97	CDTSC Letter to Base Concerning Draft Final SEBS and FOSL for Storm Drain System	Hogg, Linda D California Department of Toxic Substances Control	1074

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
13 Mar 97	EPA Letter to Base Concerning Comments on Draft Final Supplemental Environmental Baseline Survey and the FOSL for the Storm Drain System	Salyer, Kathleen EPA Region IX	1275
Apr 97	Final Basewide Operable Unit, Focused Feasibility Study for Mather Air Force Base, Volumes I through III	IT Corporation	1312, 1332, 1333
07 Apr 97	DTSC Memorandum Concerning Comments on Draft Basewide OU OU Proposed Plan	Hogg, Linda D California Department of Toxic Substances Control	1078
08 Apr 97	IT Corp. Letter to AFCEE Concerning Comments on Draft Basewide OU FFS	Loy, Ken IT Corporation	1271
17 Apr 97	EPA comments to the [Draft] Proposed Plan for Environmental Cleanup at the Basewide Operable Unit Sites	Salyer, Kathleen U.S. EPA Region IX	1288
18 Apr 97	Mather Restoration Advisory Board Meeting Minutes, 09 April 1997	AFBCA/DBM	1607
19 Apr 97	Transmittal of the Final Basewide Operable Unit Focused Feasibility Study	Wong, Anthony C. AFBCA/DBM	1312
21 Apr 97	IT Corp. Letter to AFCEE Transmitting Response to AFCEE/ERB Comments on Final Basewide OU FFS	Loy, Ken IT Corporation	1337
22 Apr 97	RWQCB comments to Draft Basewide Operable Unit Proposed Plan, Mather Air Force Base (MAFB), Sacramento County	Taylor, James California Regional Water Quality Control Board	1285
23 Apr 97	Mather BCT and Reuse Meeting Minutes, 09-10 April, 1997	AFBCA/DBM	1588
24 Apr 97	Basewide OU comments	Vorster, Ton California Regional Water Quality Control Board	1339
28 Apr 97	CDTSC Letter to Base Concerning Comments on Draft Basewide OU Proposed Plan	Whiten, Joyce, A California Department of Toxic Substances Control	1080

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
12 May 97	Wetlands/Endangered or Threatened Species Issues at Sites 13, 15 and 85	Cummings, John R. Montgomery Watson Americas, Inc.	1317
13 May 97	IT Responses to Proposed Plan Basewide OU	Silva, Mike IT Corp.	1338
19 May 97	Proposed Plan for Environmental Environmental Cleanup at Basewide OU Sites	Wong, Anthony C. AFBCA/DB Mather	1310
29 May 97	(Corrected 9/23/97) Public Hearing The Proposed Plan for Environmental Cleanup at the Basewide Operable Unit Sites	Peters, James F. CSR, RPR Peters Shorthand Reporting Corporation	1327
03 Jun 97	Mather Restoration Advisory Board Meeting Minutes, 21 May 1997	AFBCA/DBM	1608
06 Jun 97	Mather BCT and Reuse Meeting Minutes, 21-22 May, 1997	AFBCA/DBM	1589
12 Jun 97	Basewide Operable Unit Focused Feasibility Study, Mather (IWMB)	Strong, Kent California Department of Toxic Substances Control	1340
23 Jun 97	Comments to Final Basewide OU FFS	Lunceford, Sandra	1326
30 Jun 97	Basewide Operable Unit Focused Feasibility Study (DTSC comments were addressed)	Strong, Kent California Department of Toxic Substances Control	1342
05 Aug 97	Revised Appendix D: Proposed FFA Deadlines for Draft Primary Documents	Wong, Anthony C. AFBCA/DBM	1366
07 Aug 97	EPA Letter to Base Concerning Comments on Draft Final Technical Plans and Quality Program Plan for RA Sites 7, 11, 13, 15, 37, 39, 54, and 85	Salyer, Kathleen EPA Region IX	1369
14 Aug 97	Mather BCT and Reuse Meeting Minutes, 30-31 July, 1997	AFBCA/DBM	1590

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
18 Aug 97	Mather Restoration Advisory Board Board Meeting Minutes, 31 July 1997	AFBCA/DBM	1609
20 Aug 97	EPA request for 30 day extension for the Draft Superfund Record of Decision Basewide Operable Unit Sites, Mather Air Force Base, California, July 1, 1997	Salyer, Kathleen U.S. EPA Region IX	1387
20 Aug 97	(Comments on) Draft Superfund Record of Decision for Basewide Operable Units	Rak, Andrew HQ AFCEE/ERC	1406
29 Aug 97	CRWQCB Letter to CDTSC Concerning Draft Removal Action Memorandum, SD-85	Taylor, James D Regional Water Quality Control Board	1398
Sep 97	Final Technical Plans and Quality Program Plan for Remedial Action Sites 7, 11, 13, 15, 37, 39, 54, and 85	Montgomery Watson	1349
08 Sept 97	Mather AFB Quality Program Plan, Volume IV, Sampling and Analysis Plan	Montgomery Watson Americas, Inc.	1390
11 Sep 97	CDTSC Letter to Base Concerning Draft Removal Action Memorandum, SD-85	Hogg, Linda D Department of Toxic Substances Control	1397
12 Sep 97	BCT and Reuse Meeting Minutes, 04 February 1997	AFBCA/DBM	1591
16 Sep 97	Mather Restoration Advisory Board Meeting Minutes, 03 September, 1997	AFBCA/DBM	1610
18 Sep 97	EPA Letter to Base Concerning Comments to Draft Removal Action Memorandum, SD-85	Salyer, Kathleen EPA Region IX	1415
18 Sep 97	Sampling Plan for Surface Soil Sampling Sites (Covers sites 10C, 20, 69, 80, 81, and 88)	Montgomery Watson	TBD
24 Sep 97	USFWS Letter to Base Concerning Excavation and Removal of Contaminated Sediment at Sites 13, 15, and 85	White, Wayne S US Fish and Wildlife Service	1412
26 Sept 97	(Comments on) Draft Superfund Record of Decision for the Basewide Operable Unit Sites	Truszkowski, Thomas County of Sacramento, Dept. of Economic Development	1402

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
30 Sept 97	Comments on the Basewide OU ROD (Submitted through the RAB)	Lunceford, Sandra	1403
01 Oct 97	(Comments on) Draft Record of Decision, Basewide Operable Unit Sites, Mather Field	Taylor, James California Regional Water Quality Control Board	1414
02 Oct 97	EPA Comments on the Draft Superfund Record of Decision, Basewide Operable Unit Sites	Salyer, Kathleen U.S. EPA Region IX	1423
02 Oct 97	(Comments on) Draft Record of Decision for the Basewide Operable Unit Sites	Strong, Kent California Department of Toxic Substances Control	1416
03 Oct 97	Removal Action Memorandum, SD-85	AFBCA/DB Mather	1417
16 Oct 97	EPA Additional Comments on the Draft Superfund Record of Decision, Basewide Operable Unit Sites	Salyer, Kathleen U.S. EPA Region IX	1616
27 Oct 97	Letter to Base Concerning Use of Dioxin Contaminated Soil for Cap Foundation Construction, Site 7	RWQCB Taylor, James D	1431
12 Nov 97	Comments on Draft Superfund Record of Decision, Basewide Operable Unit Sites	Wong, Anthony C. AFBCA/DBM	1437
18 Nov 97	BRAC Cleanup Team (BCT) and Reuse Meeting Minutes, 04 November, 1997	AFBCA/DBM	1592
18 Nov 97	Mather Restoration Advisory Board Meeting Minutes, 05 November, 1997	AFBCA/DBM	1611
18 Nov 97	Proposed Institutional Control Language for Basewide Record of Decision, Mather	Hogg, Linda D. Department of Toxic Substances Control	1444
26 Nov 97	FFA Schedule Extension Request for the Draft Final Basewide Operable Unit Record of Decision	Wong, Anthony C. AFBCA/DBM	1452
03 Dec 97	Mather BCT and Reuse Meeting Minutes, 03-04 December, 1997	AFBCA/DBM	1593

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15 Dec 97	Mather Restoration Advisory Board Meeting Minutes, 03 December, 1997	AFBCA/DBM	1612
19 Dec 97	EPA review of the proposed disclosure notices for contaminated soil in Parcels A, F and G, dated September 30, 1997	Salyer, Kathleen U.S. EPA Region IX	1469
29 Jan 98	Draft Project Definition Investigation Report for Surface Soil Sites 10C, 69, 80, 81, and 88	Wong, Anthony C. AFBCA/DBM	1509
02 Feb 98	BRAC Cleanup Team (BCT) and Reuse Meeting Minutes, 28-29 January, 1998	AFBCA/DBM	1594
02 Feb 98	Mather Restoration Advisory Meeting Minutes, 28 January, 1998	AFBCA/DBM	1613
12 Mar 98	Basewide Operable Unit Record of Decision Consensus Statement, 3/12/98	Wong, Anthony C. AFBCA/DBM	1537
23 Mar 98	Mather Restoration Advisory Board Meeting Minutes, 11 March, 1998	AFBCA/DBM	1614
24 Mar 98	Base Cleanup Team (BCT) and Reuse Meeting Minutes, 11 March, 1998	AFBCA/DBM	1595
24 Mar 98	EPA Letter to Base Concerning RCRA Regulations as ARARs for Vadose Zone Cleanup	Salyer, Kathleen EPA Region IX	1710
25 Mar 98	Additional Applicable or Relevant and Appropriate Requirements (ARARs) for the Draft Basewide Record of Decision	Hogg, Linda D. California Department of Toxic Substances Control	1554
07 Apr 98	DTSC request for extension on Draft Document Review of Technical Plan for Sites 20, 86 and 87; and Draft Project Definition Investigation Report for Sites 10C, 69, 80, 81, and 88	Hogg, Linda D. California Department of Toxic Substances Control	1571
20 Apr 98	Request for Review and Comment - Resolution of Remaining Issues for Basewide Operable Unit Record of Decision	Wong, Anthony C. AFBCA/DBM	1577

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20 Apr 98	DTSC Comments on Interim Draft Final Basewide Record of Decision (ROD), Mather Air Force Base, Sacramento County	Hogg, Linda D. California Department of Toxic Substances Control	1578
20 Apr 98	CDTSC Letter to Base Concerning Comments on Interim Draft Final Basewide Record of Decision	Hogg, Linda D Department of Toxic Substances Control	1617
21 Apr 98	Transmittal of Adopted Resolution No. 98-105, Former Mather Air Force Base, Sacramento County	Vorster, Antonia K. J. California Regional Water Quality Control Board	1618
05 May 98	Base Cleanup Team (BCT) and Reuse Meeting Minutes, April 22, 1998	AFBCA/DBM	1596
08 May 98	EPA review of Draft Project Definition Investigation Report for Surface Soil Sites 10C, 69, 80, 81, and 88, Mather AFB	Salyer, Kathleen U.S. EPA Region IX	1622
08 May 98	Draft Project Definition Investigation Report for Surface Soil Sites 10C, 69, 80, 81, and 88, Former Mather Air Force Base, Sacramento County	Taylor, James California Regional Water Quality Control Board	1623
11 May 98	Comments on Interim Draft Final Basewide Record of Decision (ROD), Mather Air Force Base, Sacramento County	Hogg, Linda D. California Department of Toxic Substances Control	1617
11 May 98	Draft Project Definition Investigation Report for Soil Sites 10C, 69, 80, 81 and 88, January 1998, Mather Air Force Base, Sacramento County	Hogg, Linda D. California Department of Toxic Substances Control	1616
21 May 98	Evaluation of Cleanup Standards for Basewide Operable Unit Soils	Wong, Anthony C. AFBCA/DA Mather	1054
22 May 98	CDFG Letter to CDTSC Concerning Comprehensive Baseline Risk Assessment and ROD	Ellis, Susan R California Department of Fish and Game	1100
19 Jun 98	Rapid Bioassessment Protocol, Level II Survey Report, SD-80, DD-88	IT Corporation	1685
26 Jun 98	Base Letter to AFCEE Concerning Request for No-Cost Extension of	Wong, Anthony C. AFBCA/DA Mather	1674

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
	Performance Period to Finalize Basewide ROD		
Jul 98	Project Definition Investigation Report for Surface Soil and Sediment Sites 10C, 69, 80, 81, and 88	Montgomery Watson	1121
07 Jul 98	CRWQCB Memorandum to Base Concerning Draft Final Basewide ROD	Taylor, James D. Regional Water Quality Control Board	1712
17 Jul 98	CDTSC Letter to Base Concerning Comments on Draft Final Basewide Record of Decision	Hogg, Linda D. California Department of Toxic Substances Control	1696
31 Jul 98	CDTSC Letter to Base Concerning Ecological Risk Assessment and Draft Final Basewide Record of Decision	Hogg, Linda D. California Department of Toxic Substances Control	1720
Aug 1998	Removal Action, Final Technical Plan and Quality Assurance Project Plan, ST-20, OT-86, OT-87	Montgomery Watson	1678
07 Aug 98	CRWQCB Letter to Base Concerning Rapid Bioassessment Protocol Level II Survey, SD-80, DD-88	Taylor, James D. Regional Water Quality Control Board	1727
24 Aug 98	Final Record of Decision, Basewide OU	AFBCA/DA Mather	1135
31 Aug 98	CDTSC Letter to Base Concerning Draft Final Project Definition Investigation Report for Soil Sites 10C, 69, 80, 81, and 88	Hogg, Linda D. California Department of Toxic Substances Control	1739
1998	Oil and Grease Cleanup Levels for Sites 15 and 85, Memorandum from Montgomery Watson to Ralph Rosales, AFCEE/ERB, Sacramento, California	Montgomery Watson	TBD
02 Oct 98	CDFG Letter to CDTSC Concerning Ecological Evaluations at Sites 80 and 88	Chernoff, Gerald F. California Department of Fish and Game	1783
20 Oct 98	CDFG Letter to CDTSC Concerning Comments on Ecological Evaluation	Chernoff, Gerald F. California Department of Fish and Game	1822

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05 Nov 98	BCT Minutes, 28 - 29 October 1998 Meeting	AFBCA	1816
10 Nov 98	CDFG Letter to CDTSC Concerning Ecological Evaluation	Chernoff, Gerald F. California Department of Fish and Game	1826
14 Dec 98	BCT Minutes, 09 -10 December 1998 Meeting	AFBCA	1184
06 Jan 99	Base Memorandum Concerning Solicitation of Concurrence with ARARs	Wong, Anthony C. AFBCA/DA Mather	1209
29 Jan 99	Quarterly Report, October 1998 Through December 1998, Mather Soils Bioremediation Facility	Montgomery Watson	1201
03 Feb 99	USFWS Letter to Base Concerning Solicitation of ARARs, OU-6	Goude, Cay C. US Fish and Wildlife Service	1265
05 Feb 99	USACE Memorandum to Base Concerning Identification of ARARs	Durham-Aguilera, Karen; US Army Corps of Engineers – Sacramento District	1266
08 Feb 99	CRWQCB Letter to CDTSC Concerning Solicitation of ARARs, OU-6	Taylor, James D. Regional Water Quality Control Board	1268
11 Feb 99	BCT Minutes, 03 - 04 February 99 Meeting	AFBCA	1277
18 Feb 99	CDTSC Letter to IT Corporation Concerning ARARs for Draft FS for Supplemental ROD, OU-6	Hogg, Linda D. Department of Toxic Substances Control	1280
22 Feb 99	Results of Toxicity Testing with Chironomus Tentans on Sediment Samples from Mather Air Force Base	EA Engineering Science, and Technology	1515
29 Mar 99	Site 80 and Site 88 Sediment Sampling and Biological Toxicity Results	Montgomery Watson	1564
01 Apr 99	Final OE Characterization Report at the Weapons Storage Area	EOD Technology, Inc.	2149
22 Apr 99	RAB Minutes, 14 April 1999 Meeting	AFBCA	1375

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26 Apr 99	BCT Minutes, 14 - 15 April 1999 Meeting	AFBCA	1371
13 May 99	Quarterly Report, January 1999 Through March 1999, Mather Soils Bioremediation Facility and Post-Closure Landfill Inspection	Montgomery Watson	1381
01 Jun 99	Community Relations Plan (CRP)	Gutierrez-Palmenberg, Inc.	1854
16 Jun 99	Department of Fish and Game comments on the Draft Focused Feasibility Study for Operable Unit Sites 80 (Golf Course Drainage Ditch), 85 (South Ditch), 88 (Morrison Creek), and 89 (Old Trap Range) at Mather Air Force Base	CA Department of Fish and Game	TBD
16 Jun 99	BCT Minutes, 9 - 10 June 1999 Meeting	AFBCA	1940
21 Jun 99	AFSLA Letter to Base Concerning Recommended Institutional Control Language, Decision Documents in EPA Region IX	Vecera, David R	1862
22 Jun 99	(Request for) Amendment to Streambed Alteration Permit No. II-311-98 for Two Unnamed Tributaries to Morrison Creek, Site 80 and Site 88 at the Former Mather Air Force Base, Mather, California	Montgomery Watson	TBD
23 Jun 99	EPA Letter to Base Concerning Review of Draft Closure Report for Sites 15, 20, 85, 86, and 87	U.S. EPA	1889
24 Jun 99	Evaluation of *Chironomus tentans* Toxicity Results from Mather Air Force Base Sediments	IT Corporation	1888
29 Jun 99	DTSC comments, Draft Closure Report for Sites 15, 20, 85, 86, and 87	DTSC	1892
29 Jun 99	RWQCB comments, Draft Closure Report for Sites 15, 20, 85, 86, and 87	RWQCB	1893
30 Jun 99	Survey Sampling Report for Soil and Sediment Sampling at the Old Trap Range (Site 89)	Montgomery Watson	1848

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01 Jul 99	Project Definition Investigation Report for Surface Soil and Sediment Sites	Montgomery Watson	1121
02 Jul 99	Remedial Actions at Sites 80 and 88, Mather Air Force Base, California	Montgomery Watson	TBD
12 Jul 99	Removal Action Memorandum, Mather Air Force Base Supplemental Basewide Operable Unit, Site 80: Golf Course Maintenance Area Ditch and Site 88: Morrison Creek	AFBCA	2156
13 Jul 99	Department of Fish and Game comments on the Evaluation of Sediment Toxicity Results, Mather Air Force Base	CA Department of Fish and Game	TBD
30 Jul 99	RWQCB comments, Final Removal Action Memorandum for Supplemental Basewide Operable Unit Sites 80 and 88	RWQCB	1896
01 Aug 99	Draft Final Informal Technical Information Report for Remedial Actions at Sites 15, 20, 85, 86, and 87	Montgomery Watson	2118 - 2120
12 Aug 99	Quarterly Report, April 1999 Through June 1999, Mather Soils Bioremediation Facility and Post-Closure Landfill Inspection	Montgomery Watson	1843
16 Aug 99	U.S. EPA comments, Final Removal Action Memorandum, Mather Air Force Base Supplemental Basewide Operable Unit, Site 80:Golf Course Maintenance Area Ditch and Site 88: Morrison Creek	U.S. EPA	2158
19 Aug 99	BCT Minutes, 11 - 12 1999 August	AFBCA Meeting	1937
19 Aug 99	RAB Minutes, 11 August 1999 Meeting	AFBCA Meeting	1936
23 Sep 99	DTSC comments, Draft Final Survey Sampling Report for Soil and Sediment Sampling, Site 89	DTSC	1904
29 Oct 99	BCT Minutes, 21 October 1999 Meeting	AFBCA	1938

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04 Nov 99	DTSC comments, Draft Final Informal Technical Information Report, Sites 15, 20, 85, 86, and 87	DTSC	2645
11 Nov 99	Quarterly Report, July 1999 Through September 1999, Mather Soils Bioremediation Facility and Post-Closure Landfill Inspection	Montgomery Watson	1852
19 Nov 99	Oil and Grease Cleanup Levels for Sites 15 and 85; memo to Ralph Rosales, AFCEE/ERB	Montgomery Watson	TBD
24 Nov 99	U.S. EPA comments, Draft Informal Technical Information Report, Sites 37, 39, and 54, and Draft Informal Technical Information Report, Site 89	U.S. EPA	1919
24 Nov 99	U.S. EPA letter to AFBCA concerning FFS, Supplemental Basewide Operable Unit	U.S. EPA	1920
03 Dec 99	RWQCB comments, Draft Informal Technical Information Report for Site 89	RWQCB	1911
17 Dec 99	U.S. EPA comments, Draft Informal Technical Information Report for Sites 69, 80, and 88	U.S. EPA	1914
17 Dec 99	RWQCB comments, Draft Informal Technical Information Report for Sites 69, 80, and 88	RWQCB	1916
22 Dec 99	BCT Minutes, 08 -09 December 1999	AFBCA Meeting	1939
23 Dec 99	RAB Minutes, 08 December 1999 Meeting	AFBCA	1942
09 Feb 00	Consensus Statement, FFS, Draft Final, Supplemental Basewide OU	AFBCA (RPMs)	1933
14 Feb 00	Quarterly Report, October 1999 Through December 1999, Mather Soils Bioremediation Facility and Post-Closure Landfill Inspection	Montgomery Watson	1875

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17 Feb 00	Informal Technical Information Report for Sites 69, 80, and 88	Montgomery Watson	1849
23 Feb 00	BCT Minutes, 09 February 2000 Meeting	AFBCA	1941
24 Feb 00	Informal Technical Information Report, Investigations and Pilot Study at Site 89	Montgomery Watson	1846
15 Mar 00	Sampling at Sites 80, 85, and 88 to Support the Basewide Operable Unit Focused Feasibility Study	AFBCA	1932
21 Mar 00	U.S. EPA comments on the Draft Final Informal Technical Information Report for Remedial Actions at Sites 69, 80, and 88	U.S. EPA	1912
12 May 00	Quarterly Report, January 2000 Through March 2000, Mather Soils Bioremediation Facility and Post-Closure Landfill Inspection	Montgomery Watson	1598
07 Jun 00	Additional Sampling at Site 80, 85, and 88, Mather Air Force Base, California	Montgomery Watson	TBD
30 Aug 00	Time Extension for Streambed Alteration Permit No. II-718-97 for Site 85 and Streambed Alteration Permit No. II-311-98 for Two Unnamed Tributaries to Morrison Creek, Site 80 and Site 88 at the Former Mather Air Force Base, Mather, California	Montgomery Watson	2534
05 Sep 00	Final Supplemental Basewide Operable Unit Focused Feasibility Study Report, Mather Air Force Base, California	IT Corporation	1703
Sep 00	Proposed Plan for Environmental Cleanup at the Supplemental Basewide Operable Unit Sites	AFBCA	2162
19 Sep 00	Site 89: (Old Trap Range) Root Zone Sampling	Montgomery Watson	1382
06 Oct 00	U.S. EPA review of Draft Remedial Action Workplan for Additional Excavation at Ditch Sites 80, 85, and 88	U.S. EPA	1393

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06 Oct 00	DTSC review of Draft Remedial Action Workplan for Additional Excavation at Ditch Sites 80, 85, and 88	DTSC	TBD
10 Oct 00	AFBCA comments on the Draft Remedial Action Workplan for Additional Excavation at Ditch Sites 80, 85, and 88	AFBCA	1409
23 Oct 00	RWQCB comments on Draft Removal Action Workplan for Additional Excavations at Site 89	RWQCB	1425
25 Oct 00	AFBCA comments on the Draft Removal Action Workplan for Additional Excavations at Site 89	AFBCA	1432
25 Oct 00	Draft Final Closure Report, Mather Soils Bioremediation Facility	Montgomery Watson	1705
27 Oct 00	U.S. EPA comments on the Draft Remedial Action Workplan for Additional Excavation at Site 89	U.S. EPA	1541
01 Nov 00	DTSC comments on the Draft Removal Action Workplan for Additional Excavations at Site 89	DTSC	1434
17 Nov 00	Final Removal Action Workplan for Additional Excavations at IRP Sites 80, 85, and 88	Montgomery Watson	1732
22 Dec 00	Final Removal Action Workplan for Additional Excavations at Site 89	Montgomery Watson	1740
22 Jan 01	U.S. EPA comments on Final Removal Action Workplan for Additional Excavations at Site 89	U.S. EPA	1748
24 Jan 01	DTSC comments on Final Removal Action Workplan for Additional Excavations at Site 89	DTSC	1756
22 Feb 01	AFBCA Comments, Draft Workplan Letter for the Construction of Three Groundwater Monitoring Wells At Site 89	AFBCA	1768

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28 Feb 01	RWQCB comments on Draft Workplan Letter for the Construction of Three Groundwater Monitoring Wells at Site 89	RWQCB	1776
01 Mar 01	Draft Final Work Plan for Construction of Groundwater Monitoring Wells, OT-89	Montgomery Watson	1779
02 Mar 01	Surface Soil Sampling and Surface Water Sampling at Site 89, Mather Air Force Base	Montgomery Watson	TBD
20 Apr 01	Additional Surface Water Sampling at Site 89, Mather Air Force Base	Montgomery Watson	TBD
21 Jun 01	Removal Action Memorandum for Sites 80, 85, and 88	AFBCA	1951
21 Jun 01	Removal Action Memorandum for Site 89	AFBCA	1953
21 Jun 01	Additional Surface Water Sampling at Site 89, Old Trap Range	Montgomery Watson	TBD
28 Jun 01	BCT Meeting Minutes, 13 Jun 01	AFRPA/DB	1956
13 Jul 01	DTSC Letter to Base Concerning Removal Action Memoranda, Sites 80, 85, 88, 89	DTSC Tami Trearse	1959
31 Jul 01	RWQCB Letter to Base Concerning Draft Final ROD, Supplemental Basewide OU	RWQCB	1966
31 Jul 01	SWRCB Letter to CRWQCB Concerning Comments on ARARs Table for Draft Final ROD, Supplemental Basewide OU	SWRCB	1967
07 Aug 01	DTSC letter to AFBCA and U.S. EPA disputing the Draft Final OU-6 ROD	DTSC	1973
09 Aug 01	U.S. EPA comments on the Draft Final OU-6 ROD	U.S. EPA	1974
30 Aug 01	RAB Meeting Minutes, 15 Aug 01, including errata for 25 April 01 meeting minutes	AFBCA/DM	1977

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30 Aug 01	BCT Meeting Minutes, 15 Aug 01	AFBCA/DM	1978
24 Oct 01	BCT Meeting Minutes, 9 - 10 Oct 01	AFBCA/DM	1998
24 Oct 01	RAB Meeting Minutes, 10 Oct 01	AFBCA/DM	1999
04 Dec 01	CDTSC Letter to Base Concerning Draft Closure Report, Old Transportation Yard and Comments on Proposed Actions, SD-85	DTSC	2021
2001	Memorandum to Kevin Thomas (AFCEE) on Surface Soil Sampling and Surface Water Sampling at Site 89, Sacramento, California	Montgomery Watson	TBD
2001	Memorandum to Juan Perez (AFCEE) on Additional Surface Water Sampling at Site 89, Old Trap Range, Mather Air Force Base, California	Montgomery Watson	TBD
09 Jan 02	BCT meeting minutes 11 - 12 Dec 01	AFBCA/DM	2033
09 Jan 02	RAB meeting minutes 12 Dec 01	AFBCA/DM	2034
08 Mar 02	RAB meeting minutes 13 Feb 02	AFBCA/DM	2056
08 Mar 02	BCT meeting minutes 13 - 14 Feb 02	AFBCA/DM	2057
24 Apr 02	RAB meeting minutes 10 Apr 02	AFBCA/DM	2064
01 May 02	EPA Letter to Base Concerning Draft ITIR for Additional Excavation, OT-89	U.S. EPA Carmen White	2070
01 May 02	EPA Letter to Base Concerning Draft ITIR for Additional Excavation, Site 80, 85, and 88	U.S. EPA Carmen White	2071
15 May 02	DTSC Letter to Base Concerning Draft ITIR for Additional Excavation, Sites 80, 85, and 88	DTSC Tami Trearse	2076
16 May 02	DTSC Letter to Base Concerning Draft ITIR for Additional Excavation, OT-89	DTSC Tami Trearse	2075

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
31 May 02	Letter to AFCEE, Revision of Draft Final OU-6 ROD	AFBCA/DD	1969
June 02	ITIR for Additional Excavations, Sites 80, 85, and 88	Montgomery Watson	TBD
June 02	ITIR for Additional Excavations, Site 89	Montgomery Watson	TBD
30 Jul 02	RAB meeting minutes 19 Jun 02	AFBCA/DD	TBD
30 Jul 02	BCT meeting minutes 19 – 20 Jun 02	AFBCA/DD	TBD
18 Sep 02	RAB meeting minutes 14 Aug 02	AFBCA/DD	TBD
18 Sep 02	BCT meeting minutes 14 – 15 Aug 02	AFBCA/DD	TBD
12 Nov 02	RAB meeting minutes 9 Oct 02	AFRPA/DD	TBD
19 Nov 02	BCT meeting minutes 15 – 16 Oct 02	AFRPA/DD	TBD
17 Jan 03	RAB meeting minutes 11 Dec 03	AFRPA/DD	TBD
17 Jan 03	BCT meeting minutes 11 – 12 Dec 03	AFRPA/DD	TBD
3 Apr 03	RAB meeting minutes 18 Feb 03	AFRPA/DD	TBD
3 Apr 03	BCT meeting minutes 18 - 19 Feb 03	AFRPA/DD	TBD
12 May 03	RAB meeting minutes 9 Apr 03	AFRPA/DD	TBD
12 May 03	BCT meeting minutes 9 – 10 Apr 03	AFRPA/DD	TBD
24 Jul 03	BCT meeting minutes 10 – 11 Jun 03	AFRPA/DD	TBD
12 Sep 03	RAB meeting minutes 13 Aug 03	AFRPA/DD	TBD
12 Sep 03	BCT meeting minutes 13 – 14 Aug 03	AFRPA/DD	TBD
14 Nov 03	BCT meeting minutes 8 – 9 Oct 03	AFRPA/DD	TBD
14 Jan 04	BCT meeting minutes 3 Dec 03	AFRPA/DD	TBD
28 Jan 04	RAB meeting minutes 3 Dec 03	AFRPA/DD	TBD
11 Mar 04	RAB meeting minutes 11 Feb 04	AFRPA/DD	TBD

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
12 Mar 04	BCT meeting minutes 11 Feb 04	AFRPA/DD	TBD
18 May 04	BCT meeting minutes 22 Apr 04	AFRPA/DD	TBD
13 Jul 04	BCT meeting minutes 9 – 10 Jun 04	AFRPA/DD	TBD
17 Sep 04	RAB meeting minutes 11 Aug 04	AFRPA/DD	TBD
21 Sep 04	BCT meeting minutes 11 – 12 Aug 04	AFRPA/DD	TBD
2 Dec 05	BCT meeting minutes 13 – 14 Oct 04	AFRPA/DD	TBD
22 Feb 05	RAB meeting minutes 8 Dec 04	AFRPA/DD	TBD
22 Feb 05	BCT meeting minutes 8 Dec 04	AFRPA/DD	TBD
31 Mar 05	RAB meeting minutes 22 Feb 05	AFRPA/DD	TBD
5 Apr 05	BCT meeting minutes 22 Feb 05	AFRPA/DD	TBD
22 Jun 05	RAB meeting minutes 11 May 05	MWH	TBD
19 Jul 05	BCT meeting minutes 11 May 05	MWH	TBD
20 July 05	Proposed Termination of Water Sampling For Site 89	AFRPA/DD	TBD
3 Aug 05	BCT meeting minutes 8 Jun 05	MWH	TBD
Sep 05	Concurrence on the Request for Termination of Water-Quality Monitoring at Site 89, Former Mather Air Force Base, Sacramento, California	U.S. EPA	TBD
Oct 05	DTSC letter on Proposed Termination of Water Sampling for Site 89, Mather Airport, Sacramento County	DTSC	TBD
15 Nov 05	BCT meeting minutes 10 Aug 05	MWH	TBD
28 Nov 05	RAB meeting minutes 10 Aug 05	MWH	TBD
1 Dec 05	BCT meeting minutes 13 Sep 05	MWH	TBD
10 Apr 06	BCT meeting minutes 10 Aug 05	CH2M Hill	TBD

DOC. DATE	AUTHOR or SUBJECT OR TITLE	AR FILE CORP. AUTHOR	NUMBER
2 Jun 06	RAB meeting minutes 19 Apr 05	CH2M Hill	TBD
6 Jun 06	BCT meeting minutes 19 Apr 05	CH2M Hill	TBD

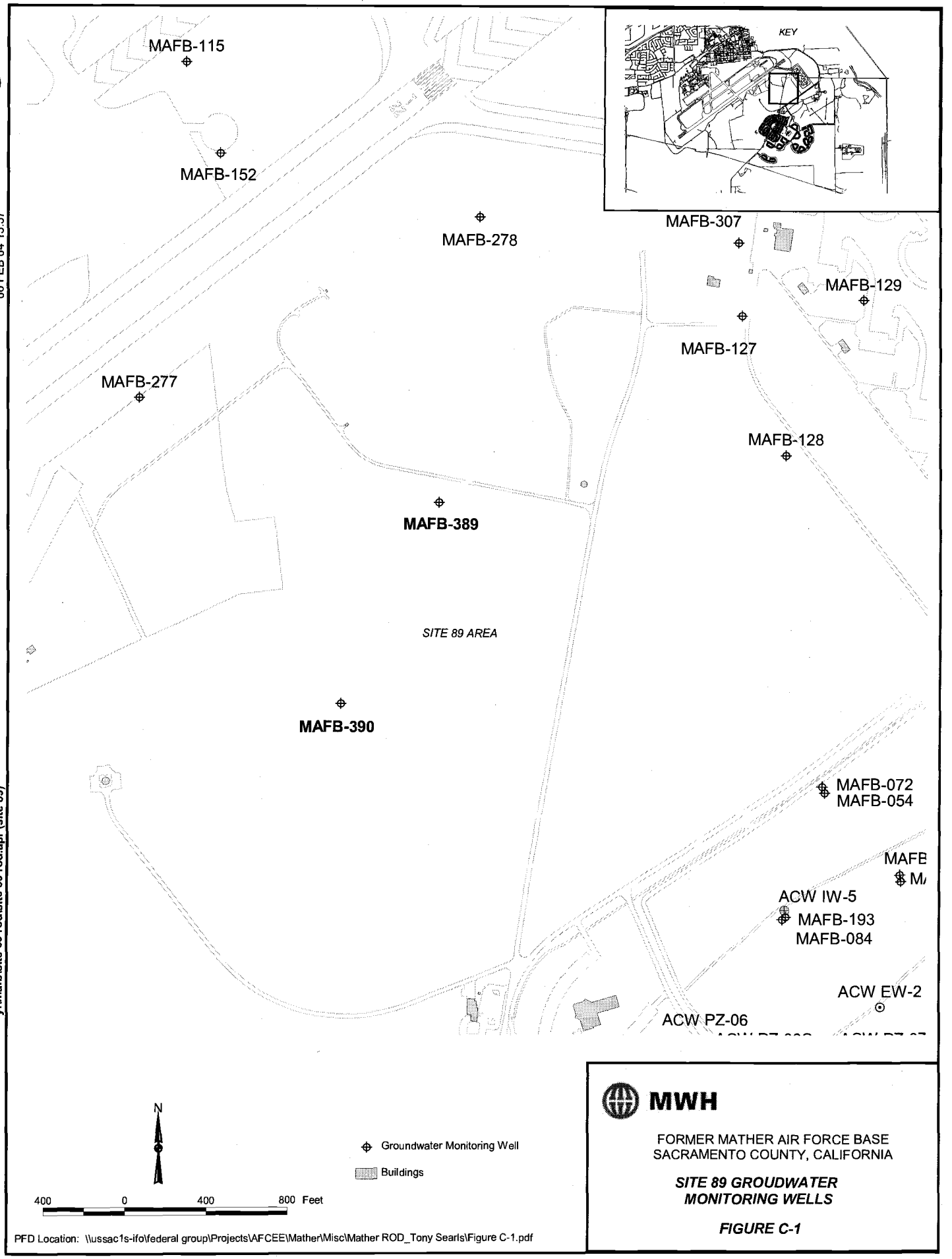
Appendix B
Summary of Surface Water Sampling Activities

SURFACE WATER SAMPLING AT SITE 89

Results for surface water sampling at Site 89 are summarized in the Fourth Quarter and Annual Groundwater Monitoring Report, Appendix H. Figure 7 in the body of the ROD text depicts sampling location and results. Surface-water sampling was conducted at Site 89, the Old Trap Range, from March 2001 through December 2004. Drainage water in two ditches at Site 89 draining the north and southwest shotfall areas flows into the Site 85 ditch located west of Site 89. Locations upstream from the Site 89 shotfall areas are considered upgradient and those downstream are considered downgradient. The purpose of collecting upgradient and downgradient surface-water samples was to determine whether dissolved lead from dissolution of residual lead present in the Site 89 soils after the removal actions, has impacted the surface water in the adjacent drainages. This would be indicated by concentrations in downgradient samples being higher than those in upgradient samples from the same drainage channel.

Comparison of upgradient and downgradient samples, analyzed for both dissolved lead and total lead, failed to reveal evidence that Site 89 is contributing measurable lead to the adjacent surface water. Regulatory concurrence was obtained in 2005 to terminate the surface water sampling at Site 89.

Appendix C
Site 89 Groundwater Monitoring Well Construction Diagrams


KEY
MAFB-115
MAFB-152
MAFB-278
MAFB-307
MAFB-129
MAFB-127
MAFB-277
MAFB-128
MAFB-389
SITE 89 AREA
MAFB-390
MAFB-072
MAFB-054
MAFB
M
ACW IW-5
MAFB-193
MAFB-084
ACW EW-2
ACW PZ-06
N
Groundwater Monitoring Well
Buildings
400 0 400 800 Feet
PFD Location: \\ussac1s-ifo\federal group\Projects\AFCEE\Mather\Misc\Mather ROD_Tony Searls\Figure C-1.pdf
MWH
FORMER MATHER AIR FORCE BASE
SACRAMENTO COUNTY, CALIFORNIA
SITE 89 GROUDWATER MONITORING WELLS
FIGURE C-1

MWH

Boring ID: **MAFB-389** Well ID: **MAFB-389**

Borehole Diam. (in.): **9.63**	Total Depth (ft): **120.0**	Project: **MATHER**	
Northing (ft): **1965560.13**	Easting (ft): **6767016.52**	Job Number: **1238111**	Site: **SITE 89**
Drill Start Date: **04-18-2001**	Start Time: **13:00**	Logged By: **J. ATTAK**	Reviewed By: **P. CANUMAY**
Drill Finish Date: **04-18-2001**	Finish Time: **16:50**	Drilling Contractor: **Water Development**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **100.00** ▽	Date / Time: **04-18-2001 16:20**	Drill Rig Type/Method: **ARCH**	
Depth H_2O After Drilling (ft): **91.00** ▼	Date / Time: **04-19-2001 08:05**	Driller's Name: **J. CHAVEZ**	
Comments:		Well Comp. Date: **04-19-2001**	Completion Time:
Samplers:		Soil Backfill Date: **N/A**	Backfill Time: **N/A**

Well Completion	Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description (Surface Elevation: 93.84)	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						0		CL-ML	SILTY CLAY/CLAYEY CILT, reddish brown (5YR 4/4), stiff, moist, moderate, MEDIUM TO HIGH PLASTICITY	2	5	5	10	78
						5		SP	POORLY GRADED SAND WITH GRAVEL, yellowish brown (10YR 5/6), very loose, dry, noncemented, SUBROUNDED GRAVEL, 0.3"-1" IN DIAMETER	30	25	25	15	5
0-90': 4" dia. Blank Casing, Schedule 80 PVC,						10								
						15		SP	POORLY GRADED SAND WITH GRAVEL, dark yellowish brown (10YR 4/6), loose, damp, noncemented, NON-PLASTIC, SUBROUNDED TO SUB ANGULAR GRAVELS	25	40	20	10	5
						20								
						25		GP	POORLY GRADED GRAVEL WITH SAND, yellowish brown (10YR 5/4), loose, moist, noncemented, NON-PLASTIC, MOSTLY SUBROUNDED, LARGE GRAVELS, 1-3" DIAMETER COATED WITH FINE SANDS.	50	20	20	10	0
						30								
						35		SW	WELL GRADED SAND WITH GRAVEL, light yellowish brown (10YR 6/4), loose, moist, noncemented, MOSTLY MEDIUM SAND WITH LARGE SUBROUNDED GRAVELS (1.5" DIAMETER), NON- PLASTIC	25	15	50	10	0
Cement/Bentonite Grout, 0-75'						40								
						45		SP	POORLY GRADED SAND, yellowish brown (10YR 5/6), loose, moist, noncemented, MOSTLY MEDIUM AND FINE SANDS, NON-PLASTIC	0	10	50	30	10

Log Continued on Next Page

LOG OF BORING MATHER.GPJ MWH WC.GDT 6/20/03

MWH | Boring ID: **MAFB-389** | Well ID: **MAFB-389**

Borehole Diam. (in.): 9.63	Total Depth (ft): 120.0	Project: MATHER	
Northing (ft): 1965560.13	Easting (ft): 6767016.52	Job Number: 1238111	Site: SITE 89
Drill Start Date: 04-18-2001	Start Time: 13:00	Logged By: J. ATTAK	Reviewed By: P. CANUMAY
Drill Finish Date: 04-18-2001	Finish Time: 16:50	Drilling Contractor: Water Development	Field Instrumentation: PID
Depth 1st H_2O (ft): 100.00 ▽	Date / Time: 04-18-2001 16:20	Drill Rig Type/Method: ARCH	
Depth H_2O After Drilling (ft): 91.00 ▼	Date / Time: 04-19-2001 08:05	Driller's Name: J. CHAVEZ	
Comments:		Well Comp. Date: 04-19-2001	Completion Time:
Samplers:		Soil Backfill Date: N/A	Backfill Time: N/A

Well Completion	Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						45								
						50		SP	POORLY GRADED SAND WITH GRAVEL, dark yellowish brown (10YR 4/6), loose, moist, noncemented, SUBROUNDED GRAVEL (0.3"-0.8"), NON-PLASTIC.	20	20	30	25	5
						55		GP	POORLY GRADED GRAVEL WITH SAND, yellowish brown (10YR 5/4), loose, dry, noncemented, SUBANGULAR TO SUBROUNDED GRAVELS, <1" DIAMETER, MOSTLY COARSE SANDS.	60	25	10	5	0
								SP	POORLY GRADED SAND WITH GRAVEL, yellowish brown (10YR 5/4), loose, moist, noncemented, MOSTLY COARSE AND MEDIUM SANDS WITH SUBANGULAR GRAVEL, <1" DIAMETER, NON-PASTIC	30	30	25	10	5
						60								
						65								
								ML	GRAVELLY SILT, dark yellowish brown (10YR 4/4), soft to loose, moist, weak, LOW PLASTICITY, SUBANGULAR GRAVELS WITH SILT WITH SILT ON SURFACE AND SILT IN MATRIX.	45	0	0	15	40
						70								
								SW-SM	WELL GRADED SAND WITH SILT, dark yellowish brown (10YR 4/4), loose, moist, noncemented, NON-PLASTIC, MOSTLY MEDIUM SANDS WITH SILT LENSES, SOME MICA PRESENT.	0	5	65	15	15
						75								
								SM	SILTY SAND WITH SANDY SILT, dark yellowish brown (10YR 3/4), soft, moist, weak, LOW PLASTICITY, MOSTLY FINE SANDS AND SILT WITH MICA.	0	0	30	35	35
75'-85': Bentonite seal						80		ML	SILT WITH FINE SAND, dark yellowish brown (10YR 3/4), soft, moist, weak, LOW	0	0	0	10	90
								SP-SM	POORLY GRADED SAND WITH SILT, yellowish brown (10YR 5/4), loose to medium dense, moist, noncemented, NON-PLASTIC	0	20	50	25	5
								SP	POORLY GRADED SAND WITH TRACE GRAVEL, yellowish brown (10YR 5/4), loose to medium dense, moist, noncemented, NON-PLASTIC	5	20	50	20	5
85'-87': #60 Transition Sand						85		SP	POORLY GRADED SAND WITH GRAVEL, dark yellowish brown (10YR 4/4), loose, moist to dry, noncemented, NON-PLASTIC, SUBANGULAR GRAVELS.	20	25	30	20	5
87'-120': Filter Pack, #3 Sand						90								

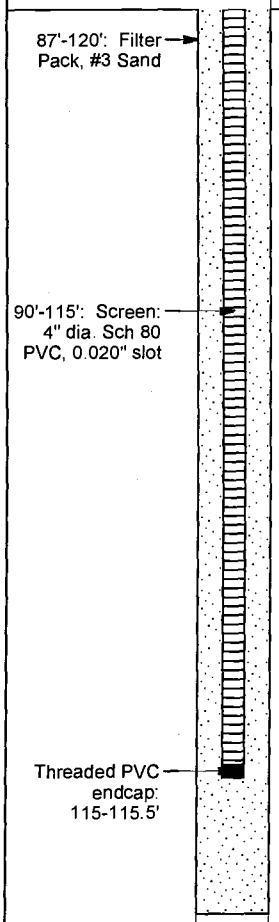
Log Continued on Next Page

Sheet 2 of 3

LOG OF BORING MATHER.GPJ MWH WC.GDT 6/20/03

MWH | Boring ID: **MAFB-389** | Well ID: **MAFB-389**

Borehole Diam. (in.): **9.63**	Total Depth (ft): **120.0**	Project: **MATHER**	
Northing (ft): **1965560.13**	Easting (ft): **6767016.52**	Job Number: **1238111**	Site: **SITE 89**
Drill Start Date: **04-18-2001**	Start Time: **13:00**	Logged By: **J. ATTAK**	Reviewed By: **P. CANUMAY**
Drill Finish Date: **04-18-2001**	Finish Time: **16:50**	Drilling Contractor: **Water Development**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **100.00** ▽	Date / Time: **04-18-2001 16:20**	Drill Rig Type/Method: **ARCH**	
Depth H_2O After Drilling (ft): **91.00** ▼	Date / Time: **04-19-2001 08:05**	Driller's Name: **J. CHAVEZ**	
Comments:		Well Comp. Date: **04-19-2001**	Completion Time:
Samplers:		Soil Backfill Date: **N/A**	Backfill Time: **N/A**



Depth (feet)	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
90	SW	WELL GRADED SAND WITH GRAVEL, dark yellowish brown (10YR 3/4), loose, moist, noncemented, NON-PLASTIC, MOSTLY MEDIUM SANDS WITH SUBANGULAR AND SUBROUNDED GRAVEO (0.4"-1").	25	15	50	5	5
95	GP	POORLY GRADED GRAVEL WITH SAND, dark yellowish brown (10YR 4/4), loose, moist, noncemented, NON-PLASTIC, SUBANGULAR AND SUBROUNDED GRAVEL (0.2"-1") WITH MOSTLY COURSE AND MEDIUM SANDS.	45	25	20	10	0
100	ML	SANDY SILT WITH GRAVEL, dark yellowish brown (10YR 4/4), soft, wet, noncemented, NON-PLASTIC	5	0	10	25	60
105	ML	SANDY SILT WITH GRAVEL, dark yellowish brown (10YR 4/4), soft, wet, noncemented, NON-PLASTIC, COURSE SANDS INCREASE.	15	10	10	20	45
110	SW	FINE SANDS WITH SILT AND GRAVEL, dark yellowish brown (10YR 3/4), loose, wet, noncemented, NON-PLASTIC, MOSTLY FINE SANDS WITH FEW SUBANGULAR (0.4"-1") GRAVELS.	10	5	20	50	15
115							
120		Total Depth: 120'					
125							
130							
135							

LOG OF BORING MATHER.GPJ MWH WC.GDT 6/20/03

Sheet 3 of 3

MWH

Boring ID: **MAFB-390** Well ID: **MAFB-390**

Borehole Diam. (in.): **9.63**	Total Depth (ft): **120.0**	Project: **MATHER**	
Northing (ft): **1964569.28**	Easting (ft): **6766530.63**	Job Number: **1238111**	Site: **SITE 89**
Drill Start Date: **04-16-2001**	Start Time: **16:00**	Logged By: **J. ATTAK**	Reviewed By: **L. CARR**
Drill Finish Date: **04-17-2001**	Finish Time: **13:45**	Drilling Contractor: **Water Development**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **100.00**	Date / Time: **04-17-2001 12:10**	Drill Rig Type/Method: **ARCH**	
Depth H_2O After Drilling (ft): **91.00**	Date / Time: **04-17-2001 12:30**	Driller's Name: **J. CHAVEZ**	
Comments:		Well Comp. Date: **04-18-2001**	Completion Time:
Samplers:		Soil Backfill Date: **N/A**	Backfill Time: **N/A**

Well Completion	Depth (feet)	Graphic Log	USCS Soil Classification	Description Surface Elevation: 90.624	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
9.63" diameter borehole. 0-75': Cement/Bentonite Grout 0-90': Blank PVC Casing, Sch 80, 4" diameter	0		ML	Silt With Gravel, yellowish red (5YR 5/6), soft, moist, weak, nonplastic with mostly subrounded GRAVELS 0.5" diameter.	10	0	0	15	75
	5		ML	Gravelly Silt With Sand, olive (5Y 5/6), soft, dry, weak, dry to slightly moist, medium plastic with subrounded and subangular GRAVELS, 0.5" - 2" diameter.	30	0	0	20	50
	10		GP-GC	Poorly Graded Gravel, well-sorted GRAVEL with SILT and CLAY nodules.	75	0	0	5	20
			GW	Well Graded Gravel, dark reddish brown (5YR 3/4), loose, dry, moderate, multicolored GRAVELS, SILT/CLAY nodules and skins, 0.4" - 3" diameter, dry to slightly moist; medium plasticity.					
			SP		20	10	60	10	
	15		CL-ML	Poorly Graded Sand With Gravel, brown (7.5YR 4/4), loose, moist, noncemented, SAND with subangular or subrounded GRAVELS 0.4" to 2" diameter, nonplastic.	30	15	10	5	40
			GP-GC	Silty Clay, yellowish brown (10YR 5/6), soft, moderate, subrounded GRAVELS 0.4" to 1" diameter; moderately plastic; increased GRAVEL at interval sample 15' to 16.5' 10YR 5/6 65% Gravel, 5% Coarse sand, 30% Silt/Clay.	50			10	40
	20		SW	Poorly Graded Gravel With Clay, yellowish brown (10YR 5/4), soft, moist, weak, SILT skins and nodules; large(2"+) subrounded GRAVELS, mostly grey with yellowish brown SILT and CLAY; very plastic.	7	18	70	5	
	25			Poorly Graded Sand With Gravel, dark yellowish brown (10YR 4/6), loose, moist, noncemented, nonplastic.					
			GP	Poorly Graded Gravel With Sand, dark yellowish brown (10YR 3/4), loose, dry, noncemented, mostly subangular GRAVELS 0.4" - 2" diameter; dry to slightly moist; nonplastic.	50	15	20	10	5
	30								
	35								
			GW	Well Graded Gravel With Sand, dark yellowish brown (10YR 4/4), loose, moist, noncemented, mostly subrounded and rounded GRAVELS 1.0" diameter, nonplastic.	50	5	20	15	10
	40								
			CL-ML	Silty Clay, yellowish brown (10YR 5/4), medium stiff, moist, weak, lense, medium plasticity.				20	80
	45								

Log Continued on Next Page

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LOG OF BORING MATHER.GPJ MWH WC.GDT 6/20/03

MWH

Boring ID: **MAFB-390**		Well ID: **MAFB-390**	
Borehole Diam. (in.): **9.63**	Total Depth (ft): **120.0**	Project: **MATHER**	
Northing (ft): **1964569.28**	Easting (ft): **6766530.63**	Job Number: **1238111**	Site: **SITE 89**
Drill Start Date: **04-16-2001**	Start Time: **16:00**	Logged By: **J. ATTAK**	Reviewed By: **L. CARR**
Drill Finish Date: **04-17-2001**	Finish Time: **13:45**	Drilling Contractor: **Water Development**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **100.00** ▽	Date / Time: **04-17-2001 12:10**	Drill Rig Type/Method: **ARCH**	
Depth H_2O After Drilling (ft): **91.00** ▼	Date / Time: **04-17-2001 12:30**	Driller's Name: **J. CHAVEZ**	
Comments:		Well Comp. Date: **04-18-2001**	Completion Time:
Samplers:		Soil Backfill Date: **N/A**	Backfill Time: **N/A**

Well Completion	Sample Interval / Retained Sample Type	Recovery (%)	Blow Count/6"	PID (ppm)	Water Level	Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
						45		SP	Poorly Graded Sand, dark yellowish brown (10YR 4/4), loose, moist, noncemented, with SILT/CLAY lenses (weakly cemented), nonplastic.			60	30	10
						50		GP	Poorly Graded Gravel With Sand, yellowish brown (10YR 5/4), loose, dry, noncemented, mostly subrounded and subangular grey GRAVELS, 0.3" - 1.5" diameter with multicolered coarse SANDS, nonplastic.	65	15	10	10	
						55			At 56' SILT increases on GRAVEL SURFACES, orange and yellow iron redox spots on GRAVEL SURFACES.	60	15	5	10	10
						60			At 60' coarse SANDS increase.	50	25	10	10	5
						65								
						70			At 68' FINES increase; SILTY COATING on GRAVEL SURFACES, slightly moist.	55	10	5	15	15
								GM	Silty Gravel, dark yellowish brown (10YR 4/6), soft, moist, weak, subrounded GRAVELS 1-2" diameter covered with SILT and fine SAND, SILT is soft, moist, weakly cemented, low plasticity.	50	0	0	20	30
						75								
								GP	Poorly Graded Gravel With Sand, yellowish brown (10YR 5/6), loose, moist, noncemented, nonplastic.	60	20	5	5	10
75'-85': Bentonite Seal						80			At 83' increasing FINES.	50	25	5	5	15
85'-87': #60 Transition Sand						85								
87'-120': Filter Pack, #3 Sand						90		GW	Well Graded Gravel With Sand, dark yellowish	45	5	15	20	15

LOG OF BORING MATHER.GPJ MWH WC.GDT 6/20/03

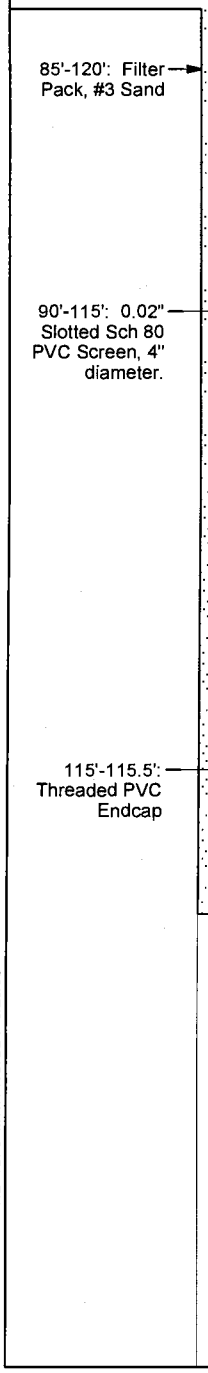
Log Continued on Next Page

Sheet 2 of 3

MWH

Boring ID: **MAFB-390** Well ID: **MAFB-390**

Borehole Diam. (in.): **9.63**	Total Depth (ft): **120.0**	Project: **MATHER**	
Northing (ft): **1964569.28**	Easting (ft): **6766530.63**	Job Number: **1238111**	Site: **SITE 89**
Drill Start Date: **04-16-2001**	Start Time: **16:00**	Logged By: **J. ATTAK**	Reviewed By: **L. CARR**
Drill Finish Date: **04-17-2001**	Finish Time: **13:45**	Drilling Contractor: **Water Development**	Field Instrumentation: **PID**
Depth 1st H_2O (ft): **100.00** ▽	Date / Time: **04-17-2001 12:10**	Drill Rig Type/Method: **ARCH**	
Depth H_2O After Drilling (ft): **91.00** ▼	Date / Time: **04-17-2001 12:30**	Driller's Name: **J. CHAVEZ**	
Comments:		Well Comp. Date: **04-18-2001**	Completion Time:
Samplers:		Soil Backfill Date: **N/A**	Backfill Time: **N/A**



Depth (feet)	Graphic Log	USCS Soil Classification	Description	Est. % of Soil: Gravel	Coarse Sand	Med. Sand	Fine Sand	Silt/Clay
90		GM	brown (10YR 4/4), loose, moist, noncemented, subangular GRAVELS mostly 1" diameter with SILT and fine SANDS on GRAVEL surfaces, nonplastic.	55	5	5	10	25
95			Silty Gravel, dark yellowish brown (10YR 3/4), stiff, moist, SILTS on surface of subrounded grey GRAVELS 0.3"- 2" diameter, weak cementation of SILTS, nonplastic.					
100		ML	Gravelly Silt With Sand, dark yellowish brown (10YR 3/4), soft, wet, weak, nonplastic.	30	5	5	10	50
105		SW	Well Graded Sand, dark yellowish brown (10YR 3/4), loose, wet, noncemented, nonplastic.	0	60	10	20	10
110								
115								
120			Total Depth: 120'					
125								
130								
135								

LOG OF BORING MATHER.GPJ MWH WC.GDT 6/20/03

Sheet 3 of 3

Appendix D
Community Meeting Transcript
(October 10, 2000)

PUBLIC HEARING

UNITED STATES OF AMERICA

DEPARTMENT OF THE AIR FORCE

BASE REALIGNMENT AND CLOSURE

IN THE MATTER OF:	)
	)
THE PROPOSED PLAN FOR	)
THE SUPPLEMENTAL	)
BASEWIDE OPERABLE	)
UNIT	)
	)

MATHER FIELD

10503 ARMSTRONG AVENUE

CONFERENCE ROOM

MATHER, CALIFORNIA

TUESDAY, OCTOBER 10, 2000

7:00 P.M.

JAMES F. PETERS, CSR, RPR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

APPEARANCES

HEARING OFFICER

Mr. Anthony Wong, BRAC Environmental Coordinator
Air Force Base Conversion Agency
3237 Peacekeeper Way, Suite 114
McClellan AFB, CA 95652

ALSO PRESENT

Ms. Karen Bessette, Central Valley Regional Water Quality Control Board

Ms. Debbie Lowe, U.S. Environmental Protection Agency, Region 9

Ms. Tami Trearse, California Department of Toxic Substances Control

INDEX

PROCEEDINGS

BRAC ENVIRONMENTAL COORDINATOR WONG: Why don't we go ahead and get started. We gave the customary five minutes for all the late people.

(Thereupon an overhead presentation was presented as follows.)

BRAC ENVIRONMENTAL COORDINATOR WONG: Just as a brief introduction before I introduce some of the other people here, my name is Tony Wong. I'm with the Air Force Base Conversion Agency. I'm the BRAC Environmental Coordinator here for Mather.

--o0o--

BRAC ENVIRONMENTAL COORDINATOR WONG: And our purpose tonight is to present our Proposed Plan for the Supplemental Basewide Operable Unit. And, again, I'll get into the details later. There's an agenda available if you want to pass this around. There's also a more detailed one in your handout.

--o0o--

BRAC ENVIRONMENTAL COORDINATOR WONG: Basically, we'll start with introductions and the purpose of the meeting. Debbie Lowe from the EPA will be presenting the CERCLA process. And I'll be presenting the Proposed Plan. After we do the presentation, we'll have a questions and answer period. And after that, we'll have the comments

from the public and that will be the formal part of the meeting, where if there's comments from the public that they make them at that time orally. And also there's an opportunity to provide written comments on the yellow form. And that should -- so you can either turn that in at the end of this meeting or you can go ahead and mail it in to the address at the bottom.

Also, if you want, you can be on our mailing list if you're not already on it, and just check that box on the form.

Then after that we'll have our adjournment and then informal discussions. We have a lot of poster boards here that show some of the work we've done here at Mather leading up prior to this operable unit. So we can talk about those after the meeting. Again, this meeting is focused on our last operable unit, it's the Supplemental Basewide Operable Unit.

--o0o--

BRAC ENVIRONMENTAL COORDINATOR WONG: We have introductions. I am Anthony Wong, I already mentioned that. We have Debbie Lowe here from US EPA, Region 9. Tami Trearse from DTSC, who's our State representative. We have Karen Bessette from the Water Board.

--o0o--

BRAC ENVIRONMENTAL COORDINATOR WONG: And then

quickly to rehash, the purpose of the meeting is to present the Proposed Plan for the four sites and one area of concern, as part of our supplemental basewide operable unit. We're also going to discuss some plans to do some early cleanup at some of these sites.

And, again, our Proposed Plan is out for public comments right now. And the period is between September 26 through October 26, 2000. And, again, they can be done either orally tonight, in writing on the comment form, both either submitted tonight or in by the mail to that address.

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BRAC ENVIRONMENTAL COORDINATOR WONG: Some of the supporting documents for this Proposed Plan is one, obviously, the Proposed Plan. And I think most of you are on the mailing list. This is what it looks like. We also have a fact sheet that was sent out that discusses this and that was also sent out to the mailing list.

We have a Focused Feasibility Study for the Supplemental Basewide Operable Unit. I don't see it around here, but we do have copies of that available. And, again, that's the document that provides all the background information to lead up to this Proposed Plan. We have some site characterization reports that are also available and some other reports on the earlier removal

actions that we've done.

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BRAC ENVIRONMENTAL COORDINATOR WONG: I'll hand it over to Debbie Lowe who will discuss the CERCLA process.

US EPA ENVIRONMENTAL ENGINEER LOWE: I'm just going to give you guys a brief overview of the CERCLA process and how it applies to the Superfund cleanup here at Mather Air Force Base.

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US EPA ENVIRONMENTAL ENGINEER LOWE: These are the basic laws and regulations that we use. In 1980 CERCLA was passed, which is a long word, but it stands for Comprehensive Environmental Response Compensation and Liability Act. And it's commonly referred to as the Superfund Law.

In 1986, Superfund was amended by SARA, which is the Superfund Amendments and Reauthorization Act. There's also -- and I'll have following slides that go into more detail on each of these. In 1990, the National Oil and Hazardous Substances Contingency Plan was developed, which is commonly referred to as the NCP, and there's also various guidance documents that have been developed by EPA to better define the Superfund program and how it should be implemented.

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US EPA ENVIRONMENTAL ENGINEER LOWE: SARA is the one that talks specifically about federal facilities. It discusses that federal facilities will be held to the same standards as other potentially responsible parties. It specifies that State regulations apply to federal facilities, such as the Air Force. It gives an oversight rule to the EPA, and EPA concurs on the remedy selection for sites that are on the national priorities list.

It discusses requirements for remedial and removal processes, and also requires that no Superfund money is spent on cleanup of federal facilities. So here at Mather, the Air Force and DOD are spending their money rather than using money from the Fund.

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US EPA ENVIRONMENTAL ENGINEER LOWE: The NCP is the regulation that implements CERCLA. It discusses the removal or remedial action process and further defines the roles of the Air Force, the State of California and EPA. It also ensures that the public is involved in the process and that their concerns are heard.

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US EPA ENVIRONMENTAL ENGINEER LOWE: This is -- I know it's hard to see, but this is how the Superfund process works. The first step is the Remedial

Investigation, and that's where you define the nature and the extent of the problem. The Feasibility Study looks at ways to address that problem and different cleanup alternatives. And the third step is the Proposed Plan where we're at tonight. And that's where the Air Force goes out with their proposal for how to clean up these sites and solicits public comment.

After public comment is received and responded to, the remedy is selected in what is called a Record Of Decision. And after that, we move into doing remedial design, remedial action, site completion and eventually deleting the site off of the national priorities list.

The next couple of slides are going to give a little bit more detail on each of these steps.

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US EPA ENVIRONMENTAL ENGINEER LOWE: The Remedial Investigation, like I said, defines the nature and extent of the problem. We go through scoping and preparing work plans, collect data to characterize the site, look at data validation to make sure that the data is of good quality, and then start looking at possible remedial or removal actions.

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US EPA ENVIRONMENTAL ENGINEER LOWE: The Feasibility Study is where we look at different cleanup

alternatives and then screen these alternatives to see which ones work for the specific sites at Mather and also do a detailed evaluation of the alternatives against the nine criteria.

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US EPA ENVIRONMENTAL ENGINEER LOWE: And that's the next slide. In selecting a remedy, there are nine criteria that we look at to compare and see which alternative is the best. The first two criteria are threshold criteria, which means that they absolutely must be met in order for a remedy to be selected.

The remedy must be protective of public health and the environment. It also must comply with ARARs, which stands for Applicable, or Relevant and Appropriate Requirements. Basically, it just means that the remedy must comply with all State and federal requirements.

The next five criteria are balancing criteria. And they are long-term effectiveness; reduction of volume, mobility or toxicity through treatment; short-term effectiveness; implementability; and cost.

And then the last two criteria are modifying criteria that we look at after the public comment period. And those are State acceptance and community acceptance.

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US EPA ENVIRONMENTAL ENGINEER LOWE: The proposed

plan, which Tony showed you earlier, there are copies of it over here on the table, is a summary of what has gone on. And it gives a brief analysis of the different alternatives that were looked at and explains the rationale for the preferred alternative. It also is the tool used to solicit public comment on all of the alternatives that have been considered.

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US EPA ENVIRONMENTAL ENGINEER LOWE: The last thing I think I wanted to talk about just briefly is removal actions. And there is something that you can do -- you take removal actions either because there's an immediate threat to human health or because you want to speed up the process. And non-time-critical removal actions are used to take early actions. A 30-day public comment period is required before taking this sort of action. And the decision to take this action gets documented in a Removal Action Memorandum rather than a Record Of Decision on the previous slides I showed you. And the final remedy and cleanup standards would then be selected in the Record Of Decision.

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US EPA ENVIRONMENTAL ENGINEER LOWE: Back to Tony.

BRAC ENVIRONMENTAL COORDINATOR WONG: Thanks.

I'll just briefly go over some of the background of some of the activity that's been done here at Mather that led us up to this last operable unit.

As Debbie explained the CERCLA process, there's, you know, certain steps that need to be taken that leads us up to decisions that, again, we decide with the regulators, with their concurrence, what kind of cleanup activity we're going to do here at Mather. And those are documented under a Record Of Decision that describes those cleanup actions that we're going to take.

And, again, at Mather we've had six operable units. Our process started in the early eighties, again after the CERCLA process was defined by law, in that we started going through our records, looking at places where, you know, activity may have occurred where there could have been an environmental situation. Based on those record searches, interviews with people who worked here and investigations by going out in the field and drilling holes, digging up, you know, trenching and sampling, we have come up with approximately 89 sites, we call them IRP sites or Installation Restoration Program sites, throughout the base. And on this map it's all those blue areas.

Once we've got the sites somewhat defined, we tried to group them together into operable units. And

operable units can be defined either geographically or by medium, such as groundwater or soil.

So our first operable unit we call the Aircraft Control and Warning Site, is this area in the middle of the base. And the contamination emanated from this area here under some maintenance -- it's a solvent plume. And you can better see it on this drawing back here. And this is the right plume right there. And, again, that's our first operable unit. It's our AC&W site. That Record Of Decision was signed in December of 1993, and that remedy is a pump and treat system, and there's a picture of it on that poster board right there in the upper left-hand corner.

Our second operable unit is our Landfill Operable Unit. It consisted of six landfills throughout the base, one, that's right there, two, three, four, five is right here and six is down here, so the eastern portion of the base. And that Record Of Decision was signed in July of 1995. And that allowed us to actually dig up this landfill down here in landfill six, dig up landfill five and landfill two and consolidate them in landfill four. And, again, the three pictures in the back show some of that work.

I think we were one of the first bases in California to actually dig a landfill up and move it to

another one. So this allowed this property down here to be free and unrestricted for development. And that left us with just two landfills with engineered caps on them. And, again, there's pictures in the back showing what those engineered caps look like.

Our second and third operable unit are Groundwater and Soil operable units. And they're the ones defined by medium. They were both signed at the same time in June of 1996. We don't have a picture of the treatment facility, but our groundwater operable unit has a pump and treat system. It's called our main base pump and treat system. It's over by our fuel tanks you may have seen. And that's ongoing.

Our Soil Operable Unit has various sites, again, spread out throughout the base. A lot of those sites are being taken care of right now under soil vapor extraction. And I think there's one close to here over by the credit union. But, again, that ROD was signed in 1996. And I think all remedial actions for that operable unit are ongoing right now.

Our Basewide Operable Unit was signed in 1998. And, again, that picked up some of our remaining sites that haven't been captured under the soil or groundwater or landfill or AC&W. And the operable unit we're going to talk about tonight, it was basically a fallout of that.

That's why it's called a Supplemental Basewide Operable Unit. We had some ditch sites that, because we weren't -- we didn't get concurrence on the cleanup levels of what those ditch sites should be, we took those out of that Record Of Decision and just moved forward with the rest of it.

And, again, that was signed in 1998. And that leads us up to the Supplemental Basewide Operable Unit, which consists of four sites and an area of concern.

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BRAC ENVIRONMENTAL COORDINATOR WONG: And those four sites are Site 80, which is the Golf Course Maintenance Ditch, which is this one right here; Site 85, which we call the South Ditch, which is this area right here, and again that's just south of the runway and you might be able to see the runway on that photograph there; Site 88, which is over here that drains off the lake, Site 89 which is an old trap range, it's over in this area, and, again, that's just southeast of the runway between this facility and the runway.

And we have what's called an area of concern. It's a suspected ordnance burial site. And, again, before a site becomes an actual installation restoration program site, where we do further investigation and do clean up, they usually start out as area of concerns where

we suspect there might be something there and it takes further investigation to prove that it's either there or not, and we'll discuss some of the details later on. But that's in the area right here just south of the weapons storage facility. You might be able to see it on this photograph. It's just south of this area right here.

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BRAC ENVIRONMENTAL COORDINATOR WONG: And, again, as Debbie was explaining the process allows us to look at various technologies to try to meet the criterion that she defined, those nine criteria. Actually, the first two, you know, we need to meet. So basically we look at what's out there, we look at the technologies available to us to clean it up, again, based on what's out there, and then make the choice, or at least our preferred choice, that we would like to do using some of these technologies.

Excavation is your backhoe bulldozer type activity, where you just go in and you remove the soil. And that usually entails either off-base disposal or on-base disposal. At certain times that when we were doing activity here at Mather, we had some sites, particularly landfill four, when we were consolidating that we needed some of the soil; also to cap landfill seven. So we were able to dispose of this soil on the base. And, again, prior to that disposal of the soil, as

characterized, to verify, you know, what's in there, if it's hazardous or not to make sure it meets the criteria for the cap or wherever you're disposing it.

Surface water monitoring is a method of just monitoring of the surface to see if there's any changes that may occur over time in that water quality. And, again, if something does change, we would investigate it to see, you know, what the cause of it was and take action if it's something that we need to take action on.

Groundwater well installation and monitoring is similar to the surface water in that it's an ongoing monitoring program, except this time we're testing the groundwater to see if it's been impacted by anything through the soil.

Institutional controls is a non-engineering method, usually legal measures, where you have lease or land use restrictions defined, you know, in deeds, things like that or processes like well-drilling processes where you can put statements in there that tells, you know, where certain areas are restricted. And that's another form of cleanup technologies that we can use. And lastly is stabilization, and typically that is going into the soil and just immobilizing the constituent so it doesn't go anywhere.

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BRAC ENVIRONMENTAL COORDINATOR WONG: And, again, these are just some of the technologies that we look at when we come up with solutions of cleanup. And, again, the site names, I briefly mentioned the Golf Course Maintenance Area Ditch, this area here. It's a man-made unlined ditch anywhere from 10 to 25 feet wide. And the contamination that we found are mostly pesticides emanating either from the pesticide storage area here or from the golf course. This does drain from the golf course.

Site 85 is the South Dditch. And, again, this is storm drainage. It actually comes across the runway and enters right here, goes parallel to the runway and eventually goes off the base and feeds into Morrison Creek. I think there's another way across the base here. So, again, it takes drainage from the northern part of the base, caries it underneath the runway through this area of the south ditch and then eventually off base. And, again, the same type of contamination determines that pesticides were found.

Site 88 is Morrison Creek, and that's in this area here. And, again, that takes drainage off the lake, across the road, eventually winds through housing right through here, and meets back up with Site 80 and, again, eventually goes off the base and, you know, is a tributary

to Morrison Creek. And, again, it's pesticides, that's the chemical of concern there.

The Old Trap Range is right here. And, again, that chemical of concern there is lead. And what happens with the lead when it sits in the ground and can possibly be leached out through rain or just the drainage ditches. So, again, lead is what we're concerned about right there.

And the area of concern is again down here for a potential ordnance burial site. And I will describe how we investigated that and what our alternatives were for that.

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BRAC ENVIRONMENTAL COORDINATOR WONG: Again, because these three ditch sites are very similar and we're looking at a similar contamination, when we did our evaluations we only had two choices basically. We had no action, which is always considered for all your remedies, and then the excavation with off-base disposal.

And, again, if you look at the Proposed Plan, there are some costs associated with each one of these activities.

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BRAC ENVIRONMENTAL COORDINATOR WONG: For our old trap range, we had four alternatives. Again, no action is one of them; excavation and off-base disposal is one;

excavation with institutional controls, off-base disposal, surface water monitoring and groundwater well installation and monitoring, and then the same thing down here except with the addition of stabilization of the soil.

And these are all the alternatives that we're looking at. I'll talk a little bit more about it later, but the bolded one is our preferred alternative for that site.

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BRAC ENVIRONMENTAL COORDINATOR WONG: Our ordnance burial site or suspected ordnance burial site, again, was in this area. What we did was we hired a contractor to go out and use what's called a magnetometer. He basically ran -- it was like mounted on a four-wheel drive Jeep type vehicle. And he just took passes around the whole area and just looked in the ground basically for anything that was metal and mapped the whole area. There were four anomalies that were found. One of them was a sign post that was cutoff at the ground level, another one was a sign laying on its side, there was a piece of rebar about four feet long, and then there was a ten-foot long anomaly that was about -- it looks like a utility cable line.

So, again, all these objects that were identified with the magnetometer were dug up and verified that there

was no ordnance there. So because of that study, we determined that there's going to be no further action there, and that site is suited for closure, basically, based on that study. We did not find anything.

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BRAC ENVIRONMENTAL COORDINATOR WONG: And, again, as highlighted before, our preferred alternative for these three sites are excavation with off-base disposal for sites 80, 85 and 88. And, again, we did some prior work in the -- you know, after the meeting we can have you come up and look at it. But we did do some prior work with some excavation. They did not meet -- or some of the areas in red did not meet the cleanup goals that we agreed upon. So we would like to go out and further excavate those areas to meet those cleanup goals.

And, again, Debbie mentioned that we can do a Removal Action Memorandum that allows us to go out there earlier. Again, we're asking for a public comment on this situation. You know, there's two ways to get there. We can get there under a ROD, which we're doing right now in the formal process. At the same time, since we know what our cleanup levels are going to be and we'd like to take action as soon as we can, we also want to do a Removal Action Memorandum that allows us to get out in the field earlier.

Now, due to some recent rain, and we'll see what the weather is going to be like in the next 30 days, we may have to put that off until next spring. But our plan under our Record Of Decision, to be signed next spring, will allow us to formally go into the field probably next summer. So, again, this is just buying us a little more time by going after this a little sooner.

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BRAC ENVIRONMENTAL COORDINATOR WONG: The preferred alternative for Site 89 is excavation with off-base disposal, institutional controls, which I mentioned those non-engineering legal controls that we can put in place, surface water monitoring and groundwater well installation monitoring.

We don't have any groundwater monitoring wells in this area. And I can't really tell from the picture, but some of this area in the southern part when they built the runway, they covered it over with about eight to ten feet of dirt, so, you know, certain areas we know where that lead exists. You know, we've gone after and cleaned that up.

There's still one area we want to go after with just some additional excavation. But because that condition still exists, being under eight to ten feet of soil, we want to put some use restrictions in there

knowing that, you know, this is going to be an airfield. There's not going to be a whole lot that can be done this close to the airfield. We still want some of those use restrictions in place. We also want, you know, notification in there that if they do come back in the future for whatever reason they wanted to move some dirt around there and they expose some of that lead, that we're notified and we can take action accordingly, if we need to. And, again, this is our preferred alternative to Site 89.

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BRAC ENVIRONMENTAL COORDINATOR WONG: As we're winding down here just some phone numbers and our points of contact. Again, I introduced everyone earlier. This is where we can be reached. Again, Debbie is in San Francisco. And, again, myself I'm at McClellan right now. Tami is here just across the freeway and Karen is pretty close, too.

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MR. HUGHES: You might want to mention that we have a poster explaining the Restoration Advisory Board Public Oversight Committee that stays in touch with the cleanup. And we have three of the members here today. And then in addition, we have public participation specialists from the Department of Toxic Substances, Diane

Fowler and from EPA, Viola Cooper. So there's plenty of opportunity for continued public involvement in the process of staying abreast of what's happening.

BRAC ENVIRONMENTAL COORDINATOR WONG: Right, thanks, Bill. Again, this is something that's a concerted effort with the regulators and their involvement. We can't do this, you know, without their help and without their approval. So we make sure that everyone is involved in our decision making. And we're just reaching that point now where we're asking for public comment on some of our decisions on the cleanups at these sites.

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BRAC ENVIRONMENTAL COORDINATOR WONG: Again, just in summary, the public comment period is from September 26 through October 26 of 2000. Written comments should be posted no later than October 26. You can send them to this address. And, again, it's also posted on this yellow sheet in written form. It's also posted on the proposed plan.

And I'd like to again remind everyone that the next part of the presentation or the meeting will be just questions and answers. So if there are any questions from the public, we can answer them. When we get into the formal comment period, again, either oral comments or written comments, those comments will be addressed in our

Record Of Decision. So if you have comments submitted to us, we would respond to those comments in our Record Of Decision.

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BRAC ENVIRONMENTAL COORDINATOR WONG: I'd like to open it up for any questions and answers.

One thing you need to do is state your name for the court reporter.

MR. SAMPE: Arne Sampe. That contraption that looked for the metal, how deep down can it search?

MR. SHACKELFORD: Eighteen feet.

MR. HUGHES: It actually has to do with how big an object is buried. It can see a 500-pound bomb down to 18 or 20 feet, but if you look, for instance, for a paper clip, it's probably not going to see it, unless it's very shallow, because the deeper that buried object is, the more attenuated the signal is.

But this contraption had six magnetometers in a row. And by looking at the relative strength of the signals from each of the instruments an estimate can be made of the depth. It's kind of how they look for oil. They set off a number of blasts and look for a number of reflections and refractions from several different sources.

So they are able to make a guess at how deep

these anomalies were. And they did get a signal they thought was about 18 feet deep. And they dug a trench there and found nothing. It wasn't certain why that signal had been received, but they felt, you know, it did pick up the signposts and things that were shallow pretty successfully. I felt it did a pretty good job. They drove about every 20 feet.

MR. SAMPE: Are there limitations on what kind of metal they can find?

MR. HUGHES: It wouldn't pick things like aluminum necessarily. It picks up anything that's ferrous or anything that had current running through it, potentially that would induce a magnetic field. It wouldn't pick up plastics, explosives or anything.

MR. SAMPE: Brass?

MR. SHACKELFORD: Brass, yes.

MR. SAMPE: It will pick up brass.

Copper?

MR. HUGHES: It shouldn't pick up copper, unless there's an electric current flowing through it, but it will pick up anything that's generally iron bearing.

BRAC ENVIRONMENTAL COORDINATOR WONG: Again, we have the report available if you need to see it.

MR. SAMPE: I'm just curious, one day there were two fellas out here with their little, you know -- now

those aren't very accurate. And they went out to my garden for me, but they could not find my water spigots.

BRAC ENVIRONMENTAL COORDINATOR WONG: I don't know what to say.

MR. SAMPE: So that's why I'm wondering how good these things are.

BRAC ENVIRONMENTAL COORDINATOR WONG: This thing was trucked in from Alabama.

MR. HUGHES: The Army Corps of Engineers contractor does this. You know, they just aren't looking for metal objects, they look for ordnance. And what they are really looking for is any sign of a large burial site. And the reason it was thought there were objects buried were two fold, that we heard from a retiree that he witnessed some trenching in the area and we'd also seen an Air Force map of an area that was marked as a landfill.

And this was something that occurred in the 1970s I believe. And the concern was that, as it was old ordnance, potentially in that weapons storage area, that may be what might have been buried might have been ordnance. What we're really looking for, you know, was large stashes of bombs or what have you.

MR. SAMPE: This detector would find batteries, wouldn't it?

MR. HUGHES: Probably. If the battery has only

got lead and acid, it may not. It depends on what it's cased in.

MR. SAMPE: I'm aware that there's a lot of myths at all three bases about what was buried, and they may or may not be true. I have never spoke to anybody who actually knew that something was buried.

MR. HUGHES: I think it was small arms munitions. It wouldn't be normally the concern as if it were large explosive devices that somebody might dig into by accident. And, in fact, this site, I believe, we still have to be cleared by the Department of Defense and certified, in addition -- this is more of a hazardous waste investigation, but I believe it's certified by the Department of Defense before it would be reused or unrestricted. You know, we have a number of requirements.

BRAC ENVIRONMENTAL COORDINATOR WONG: Thanks.

Are there any other questions?

MR. SAMPE: I have to ask one more. The Metropolitan Church is very concerned about there was a old cleaning establishment, you know, dry-cleaning. Where do we stand on that?

BRAC ENVIRONMENTAL COORDINATOR WONG: Again, that's not part of this operable unit, but that's Site 23. That's over -- that's the one I mentioned to you by the credit union. That's being treated right now with an SVE,

Soil Vapor Extraction, unit. So that unit is taking care of that cleaner's past.

MR. SAMPE: Was there another one possibly down by the hospital?

BRAC ENVIRONMENTAL COORDINATOR WONG: That hospital?

MR. SAMPE: By the front gate.

BRAC ENVIRONMENTAL COORDINATOR WONG: That may have been off site in terms of a non-Air Force site. I can't verify that. But I do know that we are cleaning up this site. Again, it was a former dry-cleaner for the base and it was located just south of this building. But the treatment facility is actually southeast of this building and it's right by the credit union.

MR. SAMPE: Our responsibilities stop at the border, is that what you're saying?

BRAC ENVIRONMENTAL COORDINATOR WONG: Again, we're not -- based on our cleanup and our investigation, we do go off site to find out what else is round there. I'm not aware of any off-site --

MR. HUGHES: Arne, when we looked at the possible sources for contamination that was found on the base, we did look up the dry-cleaners located on Mather Field. That was a Swanson's Cleaner. And it's shut down over the last decade, but they assured me that all their

dry-cleaning was sent off-site for cleaning, so they didn't actually use chemicals in that location.

There's another dry-cleaner that's currently operating and that's just along Rockingham in the shopping center up here where the Grapevine is. And I'm not sure whether they do anything on site or not, but that's far removed from the contamination. It's now better defined and it doesn't appear that that's a likely source.

Whereas, the old dry-cleaners here, that's just across the street, was definitely a source for the bulk of this contamination. And that's the reason they're cleaning that up to try to limit the amount of time that that contamination that's in the soil will continue to contribute to groundwater to help speed up the overall cleanup of groundwater contamination.

MR. SAMPE: That stuff doesn't break down, does it?

MR. HUGHES: It can, but there's not a lot of evidence that it is breaking down, and at least not fast enough that we can avoid taking active measures.

BRAC ENVIRONMENTAL COORDINATOR WONG: Are there any other questions that we can answer?

MR. MATHES: What about this Aerojet, Charles Mathes, Aerojet pollution, that PCE or --

BRAC ENVIRONMENTAL COORDINATOR WONG: That's

perchlorate. Again, they're going through their investigation right now. They have impacted Mather, again, based on -- obviously, you're a RAB member, so you're aware of the situation here, but they have impacted some of our drinking water wells. They have been shut down since then. They're investigating to find out what the extent of that perchlorate plume is.

Again, I think they're working with Boeing, which is south of Aerojet, again, doing their monitoring. So, again, this is an ongoing program. We're involved in that. We have been impacted by them, but it is their program, so we just get informed on their data as they become available.

MR. MATHES: They've got a cleaning machine or something?

BRAC ENVIRONMENTAL COORDINATOR WONG: They are currently treating perchlorate back at Aerojet for the situation that's at Aerojet right now. Again, that's all I'm aware of in terms of treatment for perchlorate. They're investigating it.

They need to find out the extent of that plume before they go after it. And we have been informed that they would like to stick a treatment facility somewhere on Mather. And, again, until they find out exactly where it's at, so they know how to deal with it, you know, this

is just the plans right now.

MR. SAMPE: As long as you're on plumes -- this is Arne again -- do we have ideas of where the plumes are moving toward?

MR. SHACKELFORD: Down hill.

BRAC ENVIRONMENTAL COORDINATOR WONG: The groundwater direction is typically from northeast to southwest, parallel to our runway. So, again, all our plumes migrate in this direction, basically. So all those originate from here, along here, and moving off base. We have a plume coming off Site 7, moving off base. We have AC&W plume, which starts up in this area and it goes towards housing.

MR. SAMPE: Toward the river?

BRAC ENVIRONMENTAL COORDINATOR WONG: The river I think is up here, north of us. So it was away from the river.

MR. HUGHES: It actually, Arne, goes towards the Sacramento River, which is sort of the axis of the valley that we're in. And it goes parallel to the American River, which is also flowing downhill towards the Sacramento River.

MR. SAMPE: That's logical.

MR. HUGHES: So you can look at all these plumes on this particular poster and see that they're all

elongated. That stems from the fact that there are sources up at the northeast end of each one of these and the movement has been to the southwest.

There's also a source area here, which is responsible for this plume and that moves a little more southerly. But in some cases, these are influenced a little bit by pumping wells and so on. In other cases, they're not so influenced.

MR. SAMPE: If they kept going, where would they hit the Sacramento River at?

MR. HUGHES: Well, if they kept going, they probably would never be detectable at the Sacramento River, but it would be somewhere south of where the American River flows in probably in the Pocket area or south of that.

The reason I say they probably wouldn't reach there is these plumes have been -- the contamination in the groundwater for probably 20 or 30 or maybe 40 years. Right now, the downgradient edges are very low concentration as that groundwater continues to move. The contaminants diffuse a little bit. They spread out, and they fall below the detection limit, so that front edge of these plumes is really not moving in terms of ways we can detect.

If you put a well here, chances are it will still

not detect, even though the groundwater is flowing and the contamination is growing weaker and weaker as it moves further and further from Mather. We still have wells there, because although I can say that, we want to be sure and we want to have proof, so we want to continue to monitor.

MR. SAMPE: The wells do alter how it goes.

MR. HUGHES: The pumping wells, drinking water supply wells, agricultural wells continue to pull on the plume and make the groundwater flow more quickly towards those wells. Our groundwater monitoring wells don't generally pump. We only draw samples once every three months. Those don't affect the direction of the groundwater flow significantly. Out of only about 450 monitoring wells, it's only about a dozen or so wells that really pull a lot of water and affect the plume migration of groundwater flow.

BRAC ENVIRONMENTAL COORDINATOR WONG: Again, I'd like to focus the questions on this specific operable unit. We'll be willing to stay after the meeting to discuss, you know, informally any questions or concerns you might have. But are there any more questions that we can answer concerning, you know, the Supplemental Basewide Operable unit and these four sites?

MR. SHACKELFORD: Tony, I have a question. Joe Shackelford, member of the RAB Board.

Have we published something in the Grapevine, recently in the Sacramento Bee, that we're in the comment period?

BRAC ENVIRONMENTAL COORDINATOR WONG: We have. Actually, we made an announcement in the Bee, too.

MR. SHACKELFORD: Okay, I think we have some copies of the Grapevine.

BRAC ENVIRONMENTAL COORDINATOR WONG: The Bee and the Grapevine also.

MR. SHACKELFORD: The last two weeks. And we'll have a new one tomorrow. So if you need to, give it to me and I'll take it and have it in, not tomorrow's paper, but next Wednesday's paper.

BRAC ENVIRONMENTAL COORDINATOR WONG: Okay. All right. That will give us another couple of more weeks.

MR. SHACKELFORD: The public might want to make some comments. We don't see many people here from the public.

MR. SAMPE: Let me ask one more question on Morrison Creek. We'll actually determine no contamination in the creek itself; is that correct?

BRAC ENVIRONMENTAL COORDINATOR WONG: Morrison Creek down here. Again, we're sampling those sites that are on the base, so what's off the base, we don't know. These are actually tributaries to Morrison Creek. I don't

know how far back the line goes for, you know, actually being Morrison Creek. I mean these are all just drainage patterns that takes water from, you know, this side of the base and feeds it down this way.

MR. HUGHES: I think you can consider them all Morrison Creek. I think the USGS map probably designates one of those tributaries -- I can't remember if it's the one going through Mather Lake or the one that goes on the south of the base through Landfill 6, Tony, if you can point that out right down there.

I think it's the one through Landfill 6, which flows off base, comes back on base, then off base again. The southern part of that or the downgradient part below Mather has actually been -- part of it has been excavated. And another portion that's due to be excavated is part of the gravel mining plans. And that will be relocated in a man-made channel about two miles south of the base before it rejoins the more natural channel on Bradshaw.

So you can consider it -- some of this pesticide contamination is in portions of Morrison Creek or at least its major tributaries.

BRAC ENVIRONMENTAL COORDINATOR WONG: Any other questions?

All right, I'd like to move on to the next phase in terms of public comments. If there's any public

comments, orally you can give them to us now and the court reporter will record them, and, again, we'll address them in the Record Of Decision or you can write them down on the yellow form and submit them tonight or mail them to my address.

MR. HUGHES: I think it's also important to point out that we also have a Removal Action Plan, which is in the fact sheet that was mailed out, that summarizes the Proposed Plan and that is the plan that says the Air Force would like to take this early action. And so it's important that we make it clear that the Air Force is soliciting comment, not only on the Proposed Plan for how the sites are cleaned up, but also there's a proposal to do the early action, because public comment will determine whether or not that occurs. It will also respond to public comment as to a Removal Action Plan and try to accommodate any comments in that plan.

Of course, if the rains come and prevents us from doing the work, it won't matter, because it will then become part of the problem of the Record Of Decision, which will also incorporate public comments.

BRAC ENVIRONMENTAL COORDINATOR WONG: So if there's no oral comments, then, again, you know, you can provide written comments prior to October 26th.

And if there --

MR. SHACKELFORD: Could I make a comment as a community?

BRAC ENVIRONMENTAL COORDINATOR WONG: Um-hmm.

MR. SHACKELFORD: My comment is this, that you've done a wonderful job of evaluating the problems at Mather Air Force Base back to the eighty years when it started. And all of the things that you've found, you've concentrated on cleaning it up in a timely manner. It may have been more expensive than we ever anticipated, but you've certainly done a good job of pointing out everything that could possibly be a contaminant that you could remove has been removed or is in the process. And I've been here 41 years and I've seen great progress.

Thank you.

BRAC ENVIRONMENTAL COORDINATOR WONG: Thank you for the comment.

Any others?

Okay, I'd like to conclude this portion of our meeting. And if anyone has any questions that we want to -- that you have concerns about, we'll go ahead and answer them.

Thank you.

(Thereupon the hearing was adjourned at 7:50 p.m.)

CERTIFICATE OF REPORTER

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, and Registered Professional Reporter, do hereby certify:

That I am a disinterested person herein; that the foregoing public hearing was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said hearing nor in any way interested in the outcome of said hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 22nd day of October, 2000.

JAMES F. PETERS, CSR, RPR
Certified Shorthand Reporter
License No. 10063

Appendix E
Response to RAB Comments

(letter received August 29, 2006)

Sandra Lunceford
RAB Co-Chair
121 Kennar Way
Folsom, CA 95630

August 29, 2006

Steve Hamilton
Mather RAB Co-Chair

Dear Mr. Hamilton,

Thanks so much for your work and accepting the RAB's comments on the Supplemental Basewide OU Sites ROD. We, once again, are concerned about DoD's long term responsibilities over the remediation systems on the base and institutional controls. We would like to see a formal report on the long term handling of the State and Federal responsibilities of institutional controls and don't believe the ROD should go final until such a plan is written and finalized.

We appreciate the opportunity to submit the following additional comments on the ROD:

Specific Comment:

1) Section 2.5.2.1, Site Description, page 2-12, first paragraph describes "A small ditch (Site 85 tributary ditch) approximately 390 feet long that once connected the former wastewater plant to the South Ditch" that is now considered to be part of Site 85. The third paragraph of the same section mentions high manganese in the surface water of the tributary. Has there been any sediment sampling of the tributary ditch? If there has, please include that information and other characterization results.

Air Force response: Both sediment and surface water were sampled from the tributary ditch. Sediment was excavated during the removal actions, and then the ditch was filled in to prevent this area from being aquatic habitat (see Section 2.5.2.3). This location is no longer a ditch and no longer collects surface water. Details are documented in the ROD references listed on page 3-3, Montgomery Watson 1999b and 2002a.

2) Section 2.5.2.2, Site Characterization, page 2-12 there is reference to a Montgomery Watson document "not sure which one" that appears to be a writer's note.

Air Force response: This note was in a placeholder for a figure in the Word version of the review copy of the ROD. The figures replace these pages in the final ROD.

3) Section 2.5.2.3, Removal Action, page 2-14, does not specifically mention the tributary ditch. Please clarify whether it was included in the RA.

Air Force response: The tributary ditch is discussed later in Section 2.5.2.3, in the third paragraph from the end of the section.

4) Figure 4, Site 85 Site Plan, Page 2-13 refers to Nos. 1 – 4. What do those designations refer to?

Air Force response: The former oxidation ponds were numbered in the figure; these are unrelated to the South Ditch, Site 85.

5) Section 2.5.3.3, Removal Action, first paragraph, last sentence, Page 2-20 is an incomplete sentence. Please revise as appropriate.

Air Force response: The text was reviewed and no incomplete sentences were found.

6) Figure 6, Site 89, Old Trap Range Site Plan, contains hatch marks most likely to correspond to shotfall areas. Was metals sampling done nearer the suspected firing points, since the area may contain propellant constituents.

Air Force response: Historical air photographs revealed that the firing stations had been removed leaving bare ground shown in a 1957 image. Therefore sampling in the area of the firing points was not conducted.

7) Section 2.12.4, Site 89-Old Trap Range, bullets on page 2-57 does not contain language consistent with groundwater monitoring well protection pursuant to the preferred alternative. Is there a reason that groundwater well installation and facility protection are not included in the deed covenant language?

Air Force response: Groundwater monitoring wells MAFB-389 and MAFB-390 were installed to monitor near Site 89, and protected under the airport lease. However, groundwater monitoring has been completed for Site 89 and therefore protection of these wells is no longer required as a part of the institutional controls for the Site 89 remedy.

8) Section 2.12.4.3, Annual Evaluations/Monitoring, paragraph 2, page 2-59 gives the property owner the responsibility for annual IC monitoring. It has come to the attention of the RAB that an annual inspection of the property is probably not enough to protect monitoring wells from being covered up or from breaking ground surface. The RAB does not agree that it is in the best interest of the property owner to protect the Air Force's monitoring well system or enforce the Air Force's deed restrictions. Because the ICs were a product of the FFA, the RAB would like to see agreements between the Air Force, State, and County on how to responsibly monitor and enforce ICs. It is also the United State's responsibility to finance the process, since the nation benefited from DoD's services.

Air Force response: The property owner will accept the responsibility for complying with land-use restrictions when they accept the property and enter into a land-use covenant (SLUC) with the State. The property owner will be required to report annually that they have, indeed

complied. The responsibility for monitoring, and enforcing the Institutional Controls still rests with the Air Force, and the responsibility for monitoring, and enforcing the SLUC still rests with the State.

9) Section 2.14.1.1, Action-Specific Applicable or Relevant and Appropriate Requirements and Performance Standards, paragraph 2, page 2-63 please elaborate on how the State plans to enforce compliance with institutional controls.

Air Force response: The State will enforce land-use restrictions implementing the institutional controls in this ROD through the authority granted them to enforce State Land-Use Covenants.(SLUCs) Regulations governing implementation of the SLUCs are identified in Table 13.

General Comment:

1) Are there any MMRP sites located adjacent to Site 80? If so, have MMRP metals constituents been addressed?

Air Force response: There are no MMRP sites located adjacent to Site 80. The closest military munitions response program site to Site 80 is the weapons storage area (south of the golf course).

2) Who is responsible for enforcing and paying for enforcement of Institutional Controls at Site 89?

Air Force response: The Air Force is responsible for paying for enforcement of institutional controls in the lease and (once the property is transferred) the deed for Site 89. When the property is transferred, a State Land-Use Covenant will be required, and the property owner will be required to pay for State oversight, including enforcement if necessary, of the covenant requirements.

3) Section 2.11, Principal Waste Threat, Page 2-56 may not be complete without responses to Specific Comments #1 and 6.

Air Force response: Section 2.11 has been revised to more clearly address principal waste threat.

4) Recent events on base resulting in failure to protect Mather's environmental restoration efforts do not elicit confidence in the current IC process. The RAB would like to see an Institutional Control Implementation Plan (Plan) that includes financing, enforcement, and perpetual detailed tracking of Mather's Institutional Controls. The Plan should provide long term responsibilities for the State and Federal government. Ideally, the Plan would be part of a larger, statewide process for tracking DoD ICs. The RAB requests a final copy of the Plan before ROD finalization.

Air Force response: The RAB requests to see an institutional control implementation plan before finalization of this ROD. The Air Force believes that an institutional control plan is in place.

The ROD specifies institutional controls. DoD policy and EPA requirements that the institutional controls will be incorporated into deed covenants that are enforceable by the Air Force. In addition, the Department of Toxic Substances Control (DTSC) requires the imposition of a state land-use covenant (SLUC), which will be enforceable by DTSC.

Financial matters, enforcement, and perpetual detailed tracking of Mather's institutional controls are included in the institutional control measures discussed above. Through the use of SLUCs, the State of California has a role in the implementation and enforcement of institutional controls at Mather. When the ROD is finally signed, the Air Force anticipates that there will be full agreement between the Air Force, the State, and Sacramento County about institutional controls.

Please also see the response to the comment letter from RAB member Mayor Robert McGarvey, below.

Sincerely,

Sandra Lunceford
RAB Co-Chair

(letter received August 29, 2006)

Mr. Steve Hamilton
AFRPA/ Western REC
3411 Olson Street
McClellan CA, 95652

Good morning Mr. Hamilton,

I have been a member of Mather's Restoration Advisory Board since it was begun in 1994, and was told that when Mather as an Air Force Base closed, any contaminations that were found both above ground and/or under, it would be the responsibility of the DOD and the Air force to clean it up. I have been taught through the years on the Mather RAB that it is best to question when you are not satisfied with the answers given.

There have been five of six Records of Decision completed, but the current ROD should not go forward until the citizens affected and all organizations involved (including the new City of Rancho Cordova which incorporated on July 1, 2003) are able to agree with what is in the ROD. I believe that too many items are being passed on through, and everyone is to assume that those responsible will keep on being responsible even though it doesn't say so in the ROD.

As another member of the Mather RAB said, the RAB would like to see an **Institutional Control Implementation Plan** included in this ROD. That plan would include financial, enforcement, and perpetual detailed tracking of Mather's Institutional Controls. From what I have been told, the State of California is being worked into the process where in the past it was the Air Force and the DOD. There should be agreements between the Air Force, the DOD, the State, and Sacramento County about the plan that was mentioned above. With part of Mather Field in The City of Rancho Cordova today, and eventually the rest of Mather also in the City, all agreements and records of decisions must also be kept in the cities records since the city will be called on to answer any question about any property that is in the city in the future so the information need to be passed on to the city.

Thank you for adding this letter of concern to the current Record of Decision.

Robert J. McGarvey
Mayor
City of Rancho Cordova

(see the next page for the Air Force response letter)

September 1, 2006

AFRPA Western Region Execution Center
3411 Olson Street
McClellan, CA 95652

The Honorable Robert J. McGarvey
Mayor of Rancho Cordova
2729 Prospect Park Drive
Rancho Cordova, CA 95670

Dear Mayor McGarvey:

Thank you for your letter of 29 August to Steve Hamilton. Your letter raises several important issues with respect to institutional controls. However, we believe that the substance of your concerns has already been dealt with in either the record of decision (ROD), DoD/AF/EPA guidance, or state law relating to the conveyance of property subject to institutional controls.

You state that you would like to see an institutional control plan included in this ROD. The Air Force believes that an institutional control plan is in place. The ROD specifies institutional controls. DoD policy and EPA requirements that the institutional controls will be incorporated into deed covenants that are enforceable by the Air Force. In addition, the Department of Toxic Substances Control (DTSC) requires the imposition of a state land-use covenant (SLUC), which will be enforceable by DTSC.

Financial matters, enforcement, and perpetual detailed tracking of Mather's institutional controls are included in the institutional control measures I've discussed above. Through the use of SLUCs, the State of California has a role in the implementation and enforcement of institutional controls at Mather. When the ROD is finally signed, I anticipate that there will be full agreement between the Air Force, the State, and Sacramento County about institutional controls.

All documents of the nature you have requested are available, either on-line or at an information repository. Any such documents that you wish copies of may be downloaded or sent to you from the administrative record for Mather.

Although the time for the receipt of comments on the revised draft final ROD has passed, the Air Force is interested in receiving relevant information if it can be provided in a timely and useful fashion. If you wish to provide specific comments on specific portions of the ROD, such comments will be considered if they are received no later than 5 p.m. on Wednesday, September 6, 2006.

Sincerely,
/signed/
DEXTER J. COCHNAUER
Senior Representative

Appendix F
Site 89 LEADSPREAD Calculations

The blood lead level predicted for the exposure scenarios is shown in the "OUTPUT" table in percentile columns. The two right-most columns are preliminary remediation goals based on 99th and 95th percentiles for comparison, which are the soil concentrations at which exposure to children would result in 99 percent and 95 percent respectively, of those children having blood lead levels no greater than 10 ug/dL.

Two calculations were done for the highest concentration in each shotfall area. One used the default drinking water concentration of 15 ug/L, and the other used the site-specific drinking water concentration on 6 ug/L.

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

Site 89, Mather

Calculation using maximum lead detection (190 mg/kg) in northern shot-fall area, and default lead (MCL of 15 ug/L) in drinking water systems

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.028
Lead in Soil/Dust (ug/g)	190.0
Lead in Water (ug/l)	15
% Home-grown Produce	7%
Respirable Dust (ug/m^3)	1.5

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	1.7	3.2	3.7	4.6	5.2	676	1063
BLOOD Pb, CHILD	3.9	7.1	8.4	10.2	11.7	146	247
BLOOD Pb, PICA CHILD	5.2	9.6	11.3	13.8	15.7	94	159
BLOOD Pb, OCCUPATION	1.2	2.2	2.7	3.2	3.7	3475	5464

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
d lead level of concern (ug/dl)		10	
Skin area, residential	cm^2	5700	2900
Skin area occupational	cm^2	2900	
Soil adherence	ug/cm^2	70	200
Dermal uptake constant	(ug/dl)/(ug/d	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/d	0.04	0.16
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/d	0.08	0.19
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	85.5	

Click here for REFERENCES

PATHWAYS						
ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.01	0%	1.4E-5	0.00	0%
Soil Ingestion	8.8E-4	0.17	10%	6.3E-4	0.12	10%
Inhalation, bkgrnd		0.05	3%		0.03	3%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.84	48%		0.84	68%
Food Ingestion, bkgrnd		0.22	13%		0.23	19%
Food Ingestion	2.4E-3	0.45	26%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.01	0%		0.01	0%
Soil Ingestion	7.0E-3	1.34	34%	1.4E-2	2.68	51%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.04	1%		0.04	1%
Water Ingestion		0.96	25%		0.96	18%
Food Ingestion, bkgrnd		0.50	13%		0.50	10%
Food Ingestion	5.5E-3	1.05	27%		1.05	20%

LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

Site 89, Mather

Calculation using maximum lead detection (190 mg/kg) in northern shot-fall area, and maximum reported lead (6 ug/L) in drinking water systems

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.028
Lead in Soil/Dust (ug/g)	190.0
Lead in Water (ug/l)	6
% Home-grown Produce	7%
Respirable Dust (ug/m^3)	1.5

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	1.2	2.2	2.7	3.2	3.7	828	1215
BLOOD Pb, CHILD	3.3	6.1	7.2	8.7	9.9	192	293
BLOOD Pb, PICA CHILD	4.7	8.5	10.1	12.2	13.9	123	188
BLOOD Pb, OCCUPATION	0.7	1.3	1.6	1.9	2.2	4258	6246

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug/dl)		10	
Skin area, residential	cm^2	5700	2900
Skin area occupational	cm^2	2900	
Soil adherence	ug/cm^2	70	200
Dermal uptake constant	(ug/dl)/(ug/d	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/d	0.04	0.16
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/d	0.08	0.19
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	85.5	

Click here for REFERENCES

PATHWAYS

ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.01	1%	1.4E-5	0.00	0%
Soil Ingestion	8.8E-4	0.17	14%	6.3E-4	0.12	16%
Inhalation, bkgrnd		0.05	4%		0.03	5%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.34	27%		0.34	46%
Food Ingestion, bkgrnd		0.22	18%		0.23	32%
Food Ingestion	2.4E-3	0.45	37%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.01	0%		0.01	0%
Soil Ingestion	7.0E-3	1.34	40%	1.4E-2	2.68	57%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.04	1%		0.04	1%
Water Ingestion		0.38	12%		0.38	8%
Food Ingestion, bkgrnd		0.50	15%		0.50	11%
Food Ingestion	5.5E-3	1.05	32%		1.05	23%

LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

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Site 89, Mather

Calculation using maximum lead detection (255 mg/kg) in southwestern shot-fall area, and default lead (MCL of 15 ug/L) in drinking water systems

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.028
Lead in Soil/Dust (ug/g)	255.0
Lead in Water (ug/l)	15
% Home-grown Produce	7%
Respirable Dust (ug/m^3)	1.5

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	1.9	3.6	4.2	5.1	5.8	676	1063
BLOOD Pb, CHILD	4.7	8.6	10.2	12.4	14.1	146	247
BLOOD Pb, PICA CHILD	6.5	11.9	14.1	17.1	19.5	94	159
BLOOD Pb, OCCUPATION	1.3	2.3	2.7	3.3	3.8	3475	5464

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
[redacted]od lead level of concern (ug/dl)		10	
Skin area, residential	cm^2	5700	2900
Skin area occupational	cm^2	2900	
Soil adherence	ug/cm^2	70	200
Dermal uptake constant	(ug/dl)/(ug/d	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/d	0.04	0.16
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/d	0.08	0.19
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	114.8	

Click here for REFERENCES

PATHWAYS						
ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.01	1%	1.4E-5	0.00	0%
Soil Ingestion	8.8E-4	0.22	12%	6.3E-4	0.16	13%
Inhalation, bkgrnd		0.05	2%		0.03	3%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.84	43%		0.84	66%
Food Ingestion, bkgrnd		0.22	11%		0.23	18%
Food Ingestion	2.4E-3	0.61	31%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.01	0%		0.01	0%
Soil Ingestion	7.0E-3	1.80	38%	1.4E-2	3.59	55%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.04	1%		0.04	1%
Water Ingestion		0.96	20%		0.96	15%
Food Ingestion, bkgrnd		0.50	11%		0.50	8%
Food Ingestion	5.5E-3	1.41	30%		1.41	22%

LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

From USER'S GUIDE to version 7

Site 89, Mather

Calculation using maximum lead detection (255 mg/kg) in southwestern shot-fall area, and maximum reported lead (6 ug/L) in drinking water systems

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.028
Lead in Soil/Dust (ug/g)	255.0
Lead in Water (ug/l)	6
% Home-grown Produce	7%
Respirable Dust (ug/m^3)	1.5

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	1.4	2.6	3.1	3.8	4.3	828	1215
BLOOD Pb, CHILD	4.1	7.6	9.0	10.9	12.4	192	293
BLOOD Pb, PICA CHILD	5.9	10.9	12.8	15.6	17.8	123	188
BLOOD Pb, OCCUPATION	0.8	1.4	1.7	2.0	2.3	4258	6246

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug/dl)		10	
Skin area, residential	cm^2	5700	2900
Skin area occupational	cm^2	2900	
Soil adherence	ug/cm^2	70	200
Dermal uptake constant	(ug/dl)/(ug/d	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/d	0.04	0.16
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/d	0.08	0.19
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	114.8	

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PATHWAYS

ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.01	1%	1.4E-5	0.00	0%
Soil Ingestion	8.8E-4	0.22	16%	6.3E-4	0.16	21%
Inhalation, bkgrnd		0.05	3%		0.03	4%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.34	23%		0.34	44%
Food Ingestion, bkgrnd		0.22	15%		0.23	30%
Food Ingestion	2.4E-3	0.61	42%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.01	0%		0.01	0%
Soil Ingestion	7.0E-3	1.80	43%	1.4E-2	3.59	60%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.04	1%		0.04	1%
Water Ingestion		0.38	9%		0.38	6%
Food Ingestion, bkgrnd		0.50	12%		0.50	8%
Food Ingestion	5.5E-3	1.41	34%		1.41	24%

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