



U.S. Army Corps of Engineers



**Ordnance and Explosives
Remedial Investigation/Feasibility Study Work Plan
Former Fort Ord, Monterey County, California**

May 15, 2000

Draft Final

Prepared by:

U.S. Army Corps of Engineers, Sacramento District

**DRAFT FINAL
ORDNANCE AND EXPLOSIVES
REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
FORMER FORT ORD, MONTEREY COUNTY, CALIFORNIA**

May 15, 2000

Prepared by:

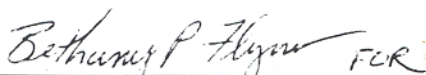
**DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922**

Prepared with assistance from:

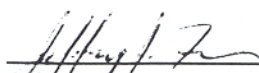
**Harding Lawson Associates
90 Digital Drive
Novato, California 94949
(415) 883-0112**

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Former Fort Ord, Monterey County, California

HLA Project No. 46310 001133



Margaret L. Stemper
Senior Engineer



Jeffrey J. Fenton
Senior Geologist



Bruce L. Wilcer
Associate Geologist

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CONTENTS

GLOSSARY	vi
ACRONYM LIST	ix
1.0 INTRODUCTION	1
1.1 OE RI/FS Background	1
1.2 Work Plan Objectives	2
1.3 Decision Criteria for Site/Area Characterization	2
1.3.1 Track 0	2
1.3.2 Track 1	3
1.3.3 Track 2	3
1.3.4 Track 3	3
1.4 Work Plan Organization	3
2.0 FORT ORD OE-RELATED HISTORY AND PHYSICAL SETTING	5
2.1 OE-Related History	5
2.1.1 Historical Use	5
2.1.2 History of OE Use	5
2.1.3 Summary of Existing OE Program	5
2.2 Physical Setting	7
2.2.1 Location	7
2.3 General History and Land Use	7
2.3.1 General History	7
2.3.2 Land Use	7
2.3.2.1 Developed Land	7
2.3.2.2 Undeveloped Land	8
2.3.3 Future Land Use	8
2.3.4 OE Site Categories	9
2.4 Site Features	10
2.4.1 Climate	10
2.4.2 Ecological Setting	10
2.4.3 Topography and Surface Waters	11
2.4.4 Subsurface Conditions	11
2.4.4.1 Geology	11
2.4.4.2 Hydrogeology	12
3.0 INITIAL EVALUATION	13
3.1 Summary of Previous Investigations	13
3.2 Conceptual Site Models	14
3.2.1 Training Sites	14
3.2.2 Firing Ranges	14
3.2.3 Non-Firing Ranges	14
3.2.4 Burial Pits	14
3.2.5 Open Detonation Areas	15

3.3	Project Data Quality Objectives	15
4.0	WORK PLAN RATIONALE.....	20
4.1	Literature Review	20
4.2	Summary of Ordnance Detection and Discrimination Study	21
4.3	Summary of Vegetation Clearance Study.....	21
	4.3.1 Vegetation Removal Alternatives.....	22
	4.3.2 Summary of Current Vegetation Removal Methods	22
	4.3.3 Monitoring Practices.....	23
4.4	Reconnaissance and Sampling.....	23
	4.4.1 Reconnaissance and Sampling DQOs	23
	4.4.2 Reconnaissance Procedures.....	24
	4.4.2.1 Reconnaissance Guidance	24
	4.4.2.2 Reconnaissance Evaluation in the OE RI/FS	25
	4.4.2.3 Review of Previous Reconnaissance Work.....	25
	4.4.2.4 Development and Implementation of Reconnaissance Procedures	25
	4.4.2.5 Evaluation of Past Reconnaissance Actions.....	25
	4.4.2.6 Reconnaissance Decision / Recommendation Process.....	26
	4.4.3 OE Sampling.....	26
	4.4.3.1 Evaluation of Past Sampling.....	26
	4.4.3.2 Site Preparation	26
	4.4.3.3 Vegetation Clearance.....	26
	4.4.3.4 Survey Procedures	27
	4.4.3.5 Sampling Procedures	27
4.5	Evaluation of Removal Activities.....	27
	4.5.1 Previous and Ongoing Investigations	28
4.6	Identification of ARARs and Regulatory Requirements	28
	4.6.1 Solicitation of ARARs for the OE RI/FS	28
	4.6.2 Current OE Site Removal Action ARARs.....	29
	4.6.3 Definition of ARARs.....	29
4.7	Long-Term Risk Management.....	30
	4.7.1 Long Term Risk Management Measures.....	31
	4.7.2 Long Term Risk Management Actions for All Sites	31
	4.7.3 Public Education.....	31
4.8	Risk Evaluation.....	32
	4.8.1 Risk Evaluation Methodology	32
	4.8.2 Previous Actions to Reduce Risks.....	33
	4.8.2.1 Public Health	34
	4.8.2.2 The Environment	35
4.9	Community Relations	35
	4.9.1 Community Involvement	36
	4.9.2 Community Relations Strategy	36
	4.9.3 Implementation of Community Relations Activities.....	36
	4.9.4 State and Local Authorities' Roles.....	37
	4.9.5 Public Education.....	37
4.10	Health and Safety.....	38
	4.10.1 Public Health and Safety	38

4.10.2	OE Worker Safety.....	38
4.10.3	Safety of Other Workers Performing OE RI/FS-Related Tasks	38
5.0	OE RI/FS TASKS	39
5.1	Task 1 Project Planning	39
5.2	Task 2 Community Relations	39
5.3	Task 3 Field Investigation	39
5.4	Task 4 Sample Analysis/Validation	39
5.5	Task 5 Data Evaluation.....	39
5.6	Task 6 Risk Assessment	39
5.7	Task 7 Treatability Studies	40
5.8	Task 8 Remedial Investigation Reports	40
5.9	Tasks 9, 10, and 11 Feasibility Study	40
5.9.1	Task 9 Remedial Alternatives Screening.....	40
5.9.2	Task 10 Remedial Alternatives Evaluation	40
5.9.3	Task 11 Feasibility Study Reports.....	41
6.0	SCHEDULING AND REPORTING	42
7.0	REFERENCES	43

PLATES

1	Location Map - Former Fort Ord
2	Previously Identified, Known, or Suspected OE Sites
3	Decision Criteria Flow Chart
4	OE Site Status
5	Land Reuse (HMP)
6	Plant Communities
7	Topographic Map
8	Generalized Soil Types
9	Conceptual Site Model - Training Sites
10	Conceptual Site Model - Firing Ranges
11	Conceptual Site Model - Non-Firing Ranges
12	Conceptual Site Model - Burial Pits
13	Conceptual Site Model - Open Detonation

APPENDIXES

A	RESPONSE TO REGULATORY AGENCY COMMENTS
B	RESPONSE TO PUBLIC COMMENTS

DISTRIBUTION

GLOSSARY

Closed Range:	A military range that has been taken out of service and either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DOD component.
Engineering Control (EC):	A variety of engineered remedies to contain and/or reduce contamination, and/or physical barriers intended to limit access to property. Some examples of ECs include fences, signs, guards, landfill caps, soil covers, provision of potable water, slurry walls, sheet pile (vertical caps), pumping and treatment of groundwater, monitoring wells, and vapor extraction systems.
Expended:	The state of an OE item in which the main charge has been expended leaving the inert carrier.
Institutional Control (IC):	A legal or institutional mechanism that limits access to or use of property, or warns of a hazard. An IC can be imposed by the property owner, such as use restrictions contained in a deed or by a government, such as a zoning restriction.
Land Use Controls:	A combination of engineering and institutional controls intended to protect human health and the environment.
Magnetometer:	An instrument for measuring magnetic field strength, used in the field to detect buried ferromagnetic objects. Ground magnetometers sometimes measure the vertical component of the magnetic field, sometimes a horizontal component, sometimes the total field.
Mortar:	Muzzle-loading weapon used to fire projectiles with low muzzle velocities at high angles; also, ordnance fired from such weapons.
Multi-Range Area (MRA):	The MRA consists of approximately 8,000 acres in the southwestern portion of former Fort Ord, bordered by Eucalyptus road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and North-South Road to the west.
Non-OE Related Scrap:	Non-munitions material found at ordnance sites. This can be banding, wire, trash, auto parts, shipping boxes or any kind of material that has been abandoned or discarded at an OE site that was never a component of military munitions. (Ferrous rocks that activate geophysical instruments during investigations, which are removed from the site, are classified as “other”).
OE Sampling:	Performing OE searches within a site to determine the presence of OE.

- Ordnance and Explosives (OE):** OE is anything related to munitions designed to cause damage to personnel or material through explosive force or incendiary action including bombs, warheads, missiles, projectiles, rockets, antipersonnel and antitank mines, demolition charges, pyrotechnics, grenades, torpedoes and depth charges, high explosives and propellants, and all similar and related items or components explosive in nature or otherwise designed to cause damage to personnel or material.
- Operating Grids:** Typically, 100 foot x 100 foot parcels of land as determined by survey and recorded by GPS, marked at each corner with wooden stakes. Sites are divided into operating grids prior to the commencement of work by brush removal or OE sweep teams. A single grid may be occupied by only one team at any time, and the grid system facilitates the maintenance of safe distances between teams. They are identified sequentially using an alpha-numeric system (e.g., E-5).
- Ordnance Scrap:** A military munition or components thereof which contain no energetic material. These can be, but are not limited to, practice munitions without spotting charges, drill rounds, inert training munitions, or expended ejection munitions. Fragments of military munitions, which have functioned as designed or were recovered from areas where munitions were intentionally destroyed, are ordnance scrap if they have no explosive, pyrotechnic, or chemical filler. These items pose no imminent threat to public safety, but may require venting or some other action prior to release from government control.
- Projectile:** Ordnance fired from a barrel, such as a rifle, cannon, or artillery.
- Removal Depth:** The depth below ground surface to which all ordnance and other detected items are removed.
- SiteStats/GridStats:** An element of the OE cost-effectiveness risk tool developed by QuantiTech for the Huntsville Corps of Engineers to characterize a site for OE. It is a statistical computer program for sampling a site to assess the presence of OE and the associated risks/costs of action alternatives.
- Surface Removal:** Removal of OE from the ground surface by UXO teams using visual identification aided by magnetometers.
- Transferred Range:** A military range that has been released from military control. The transfer may have been by deed or lease, or by return under the terms of a withdrawal, special-use permit or authorization, right-of-way, public land order, or other instrument under which DOD used the property.

Transferring Range:

A military range that is proposed to be leased, transferred, or returned from the DOD to another entity, including Federal entities. Transfer may be by deed or lease, or by return under the terms of a withdrawal, special-use permit or authorization, right-of-way, public land order, or other instrument under which DOD used the property. An active range will not be considered to be a “transferring range” until the transfer is imminent.

Unexploded Ordnance (UXO):

A military munition that contains an explosive or pyrotechnic charge and has been primed, fuzed, armed or otherwise prepared for action, and which has been fired, placed, dropped, launched, projected, and remains unexploded by design or malfunction. These can be, but are not limited to, high-explosive warheads, rocket motors, practice munitions with spotting charges, torpedoes, artillery and mortar ammunition, grenades, incendiary munitions, electroexplosive devices, and propellant-actuated devices. Fuzes with live explosive boosters or dets are classified as UXO. Some kick-outs from open detonation or open burn operations may be UXO. All UXO are potentially dangerous and cannot be released for public use without being rendered safe (neutralized, vented, detonated, decontaminated, or demilitarized).

ACRONYM LIST

OE	Ordnance and explosives
AMPI	Action Memorandum Plug-In (Phase 2 EE/CA Action Memorandum)
ARAR	Applicable or Relevant and Appropriate Requirements
ASR	Archive Search Report
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
Cal-EPA	California Environmental Protection Agency
CDFG	California Department of Fish and Game
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CNCC	California Natural Coordinating Council
Council	Advisory Council on Historic Preservation
CRP	Community Relations Plan
CSM	Conceptual Site Model
CX	Center of Expertise
DDESB	Department of Defense Explosive Safety Board
DENR	Directorate of Environmental and Natural Resources
DOD	Department of Defense
DQO	Data Quality Objectives
DTSC	Department of Toxic Substance Control
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESS	Explosive safety submissions
F	Fahrenheit
FAAF	Fritzsche Army Airfield
FORA	Fort Ord Reuse Authority
FS	Feasibility Study
GIS	Geographical Information System
GPS	Global Positioning System
GTC	Geotechnical Consultants, Inc.
HCRS	Heritage Conservation and Recreation Service
HFAI	Human Factors Applications, Inc.
HLA	Harding Lawson Associates
HMP	Habitat Management Plan
LDSP	Land Disposal Site Plan
LTRM	Long term risk management
MCPD	Monterey County Planning Department
MRA	Multi-Range Area
MSL	Mean sea level
NCP	National Contingency Plan
OD	Open detonation
ODDS	Ordnance Detection and Discrimination Study

OE <i>Cert</i>	Ordnance and Explosives Cost-Effective Risk Tool
PA	Programmatic Agreement
POM	Presidio of Monterey
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SGD	Stall, Gardner & Dunne, Inc.
SHPO	State Historic Preservation Officer
SOW	Scope of Work
SUMP	Site Use Management Plan
TBC	To be considered
TCRA	Time Critical Removal Action
TLC	Track-less land clearance
USACE	U.S. Army Corps of Engineers
USAESCH	U.S. Army Corps of Engineers, Huntsville
USFWS	U.S. Department of Fish and Wildlife Services
UXB	UXB International
UXO	Unexploded Ordnance

1.0 INTRODUCTION

The former Fort Ord (Fort Ord) is located near Monterey Bay in northwestern Monterey County, California. Since 1917, portions of Fort Ord were used by infantry units for maneuvers, target ranges, and other purposes. Ordnance and explosives (OE) were fired into, fired upon, or used on the facility in the form of artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials. OE is present at Fort Ord as either unexploded ordnance (UXO) or ordnance scrap.

On behalf of the U.S. Army Corps of Engineers (USACE), Sacramento District, Harding Lawson Associates (HLA) has assisted in the preparation of this Ordnance and Explosives Remedial Investigation/Feasibility Study (OE RI/FS) Work Plan to address OE at Fort Ord, California (Plate 1). This report has been prepared in accordance with USACE Scope of Work (SOW) dated March 23, 1999, Delivery Order 0056, Contract DACA05-96-D-0007.

1.1 OE RI/FS Background

Since the base was selected in 1991 for base realignment and closure (BRAC) and was officially closed in September 1994, OE removal actions have been performed and documented in preparation for transfer and reuse of Fort Ord property. The Presidio of Monterey (POM) Annex, located within the Main Garrison portion of Fort Ord, will be retained by the Army. Since base closure in September 1994, lands outside the POM Annex have been subject to the reuse process. Some of the property on the installation has been transferred. A large portion of the Inland Training Ranges was assigned to the Bureau of Land Management (BLM). Other areas on the installation have been or will be disposed to federal, state, local, and private entities through economic development conveyance, public

benefit conveyance, negotiated sale, or other means.

The expanded reuse of Fort Ord increases the possibility of the public being exposed to explosive hazards. In November 1998, the Army agreed to evaluate OE at Fort Ord in an OE RI/FS consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Army is preparing the OE RI/FS to address OE-related hazards on Fort Ord, which will include input from the community and will require regulatory agency review and approval. The OE RI/FS will evaluate past removal actions as well as recommend future remedial actions deemed necessary to protect human health and the environment under future uses.

The Army has been conducting OE sampling and removal actions at identified OE sites (Plate 2) and will continue these actions to mitigate imminent explosive hazards to the public while gathering data about the type of OE and level of explosive hazard at each of the sites for use in the OE RI/FS. The Army is the lead agency for OE removal activities at Fort Ord. However, the regulatory agencies (the United States Environmental Protection Agency [EPA] and the California Department of Health Services [now known as the Department of Toxic Substances Control DTSC, or Cal-EPA]) have been and will continue to be involved and provide input during OE removal activities. The Army is performing its activities in compliance with the detailed process described in the National Contingency Plan (NCP) for conducting a CERCLA removal action. The OE RI/FS will contain a comprehensive evaluation of all OE-related data for the entire Fort Ord and will evaluate long-term response alternatives for cleanup and risk management of OE.

1.2 Work Plan Objectives

The objectives of this OE RI/FS Work Plan are to:

- Describe the overall OE RI/FS process for Fort Ord
- Provide background information on Fort Ord specifically as it relates to OE
- Summarize previous and ongoing OE investigations, sampling, and/or removal actions at the base
- Describe the nature and extent of OE in the environment at Fort Ord and identify the potential receptors and routes of exposure
- Identify a process for evaluating applicable OE detection and removal technologies and vegetation removal alternatives necessary to access and remove OE
- Document data requirements for risk and response alternative evaluations
- Describe the investigative approaches to address data gaps concerning the nature and extent of OE.

1.3 Decision Criteria for Site/Area Characterization

A literature review (Section 4.1) will be conducted to locate and retrieve documents for identification of areas at Fort Ord where OE-related activities occurred or are suspected to have occurred. The literature review will include all lands at Fort Ord. Community Environmental Response Facilitation Act (CERFA) parcels deemed to meet CERCLA Section 120(h)4 will not be addressed further in the OE RI/FS if information gathered in the literature review verifies there was never any use of OE suspected on these parcels.

The information gathered and evaluated during the literature review and OE RI/FS will be used

to categorize all other areas of Fort Ord according to actions that have been taken or that are identified as necessary to mitigate imminent explosive safety hazards associated with OE. The information that will be evaluated to form decisions will include, but not be limited to, the knowledge of the site, the quality of the available information, work completed, and intended future land uses. Areas will be managed during the OE RI/FS process within one of four proposed “tracks” (Tracks 0 through 3), which identify their status based on the decision criteria presented on Plate 3. The decision criteria will undergo regulatory and public review and will be finalized in a Record of Decision (ROD).

The final decision for managing areas within a given track will be based on the results of the RI tasks proposed in this Work Plan. After comprehensive OE information for the entire base have been collected during the OE RI/FS, areas and sites will be managed and appropriate remedial actions documented separately for each assigned process track. The four proposed tracks are described below and summarized on Plate 3.

1.3.1 Track 0

Track 0 areas are those that contain no evidence of OE and are not suspected as having been used for OE-related activities of any kind. These areas consist largely of land that has been developed for commercial or residential uses throughout Fort Ord’s history and areas that have no physical or documented evidence of OE-related training. The basis for entering areas into the Track 0 process will be made utilizing the results of the literature review and the documents referenced therein. Areas not identified as suspect OE sites will be candidates for no further investigation or action. An evaluation of the Track 0 candidate areas will be provided in a technical memorandum. The candidate areas will undergo regulatory review and approval before receiving concurrence on their non-ordnance status.

1.3.2 Track 1

Track 1 sites are those where OE was suspected to have been used but was not found. Track 1 sites may be categorized following reconnaissance or sampling activities. As part of the OE RI/FS, the field work and data evaluation procedures implemented for Track 1 sites will be examined to verify that procedures were appropriate and satisfy data quality objectives (DQOs). Track 1 sites will not have any land use controls based on future identified reuses.

1.3.3 Track 2

Track 2 sites are those where OE was found, and a removal action has been completed. These sites will be evaluated in the OE RI/FS to verify that procedures were appropriate and satisfy DQOs. Track 2 sites differ from Track 1 sites in that a removal action has occurred. Land use controls may be applicable based on future identified reuses and results of the removal actions.

1.3.4 Track 3

Track 3 sites are: (1) those areas where OE is suspected or known to exist, but investigations are not yet complete or need to be initiated, or (2) any areas identified in the future. Once reconnaissance, sampling, or removal data is collected for these sites, they will be evaluated in relation to the cleanup goals, selection of response alternatives, and appropriate cleanup methods that will be identified in the OE RI/FS. Track 3 will provide a plug-in mechanism for managing existing and potential future sites, and is anticipated to consist of several different categories of sites that will be evaluated and assigned appropriate remedial actions in the OE RI/FS, e.g., sites where:

- No further OE related actions are required, or
- A remedial action with or without land use controls is required.

- In addition, all sites considered under Tracks 0, 1, and 2 could potentially become Track 3 sites if they do not meet the criteria of the other tracks at any point in the OE RI/FS or long term management process.

1.4 Work Plan Organization

This OE RI/FS Work Plan was prepared in accordance with the U.S. Environmental Protection Agency (EPA) document Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (1988). This Work Plan is organized as follows:

- **Section 1 – Introduction.** This section provides background information on the OE RI/FS process, identifies Work Plan objectives, and presents the decision criteria for proposed tracking or managing of areas at Fort Ord related to OE.
- **Section 2 – Fort Ord OE-Related History and Physical Setting.** This section summarizes a history of the OE program and related documents and the physical setting of Fort Ord.
- **Section 3 – Initial Evaluation.** This section summarizes previous OE investigations; presents conceptual site models; and outlines project DQOs.
- **Section 4 – Work Plan Rationale.** This section presents the Work Plan rationale, including summaries of the following companion documents to the OE RI/FS currently under preparation:
 - The Literature Review Work Plan and Report
 - The Ordnance Detection and Discrimination Study Work Plan, and
 - The Vegetation Clearance Study Work Plan.

- **Section 4 also:**
 - Summarizes OE-related site reconnaissance and sampling methodology
 - Describes the approach for evaluating removal activities, and
 - Outlines the process for identifying applicable or relevant and appropriate requirements (ARARs) and other key components of the OE RI/FS, including long term risk management; risk evaluation; community relations; and health and safety.
- **Section 5 – OE RI/FS Tasks.** This section summarizes the 11 OE RI/FS tasks from planning to reporting.
- **Section 6 – Scheduling and Reporting.** Scheduling and reporting requirements will be presented in a separate submittal.
- **Section 7 – References.** This section provides a list of references to pertinent documents cited in the report.

2.0 FORT ORD OE-RELATED HISTORY AND PHYSICAL SETTING

This section provides a summary of the history and associated documents related to OE at Fort Ord, and a description of its physical setting.

2.1 OE-Related History

2.1.1 Historical Use

Military training on Fort Ord began in approximately 1917 and continued until base closure in 1994. At its founding in 1917, Fort Ord served primarily as training and staging facility for infantry troops. From 1947 to 1974, the installation was a basic training center. After 1974, the 7th Infantry Division occupied the installation. The 7th Infantry Division was converted to a light division in 1983; light infantry troops operate without heavy tanks, or armor. Fort Ord was selected in 1991 for base realignment and closure (BRAC), and the base was officially closed in September 1994.

In 1917, the U.S. Army bought a portion of the present-day Main Garrison and East Garrison, and nearby lands on the east south central side of Fort Ord to use as a maneuver and training ground for field artillery and cavalry troops stationed at the Presidio of Monterey. Before the Army's acquisition of the property, the area was agricultural, as is much of the surrounding land today. No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed.

In 1940, additional agricultural property was purchased for further development of the Main Garrison. At the same time, the beachfront property was donated to the Army. Building construction in the Main Garrison began in 1940 and continued into the 1960s, starting in the northwest corner of the base and expanding southward and eastward. During the 1940s

and 1950s, a small airfield within the Main Garrison was present in what is now the South Parade Ground. In the early 1960s, Fritzsche Army Airfield was completed. The Main Garrison airfield was then decommissioned and its facilities were redeveloped as motor pools and other facilities.

2.1.2 History of OE Use

Since 1917, portions of the installation were used by infantry units for maneuvers, target ranges, and other purposes. OE that have been fired into, fired upon, or used on the facility include artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials. OE is present at Fort Ord as either UXO or ordnance scrap. A wide variety of conventional UXO items have been located at sites throughout Fort Ord, including pyrotechnics and explosives.

The OE RI/FS will contain a comprehensive summary of the use of OE at Fort Ord based on the Literature Review Work Plan currently under preparation and other OE documents as described below.

2.1.3 Summary of Existing OE Program

Before beginning the OE RI/FS, the Army has been conducting an OE program that consists of implementing and documenting OE removal actions in areas with imminent explosive safety hazards. Removal actions have not only reduced imminent explosive hazards but have provided information about the type of UXO and level of explosive hazard at each of the sites for use in the OE RI/FS.

Work for the existing OE program has been conducted in accordance with the following documents:

- Time-critical removal actions have been implemented as described in the *Fort Ord Ordnance and Explosive Waste Time-Critical Removal Action Memorandum* (Army, 1994b).
- Non time-critical removal actions are being addressed in the *Action Memorandum, Phase 2 Engineering Evaluation/Cost Analysis, Ordnance and Explosives Sites, Former Fort Ord, Monterey County, California* (Army, 1999a). The Action Memorandum, Phase 2 EE/CA identifies and describes the rationale for continuing with UXO removal actions at OE sites while the OE RI/FS is being conducted and addresses recommendations for future UXO removal actions.
- All removal actions have been implemented in accordance with the Land Disposal Site Plan (LDSP), LDSP amendments, and explosive safety submissions, which have been approved by the Department of Defense Explosive Safety Board (DDESB) as described in Section 4.5. These plans are required to state the nature, extent, and types of known or suspected UXO contamination, the proposed use of each area, and procedures for mitigating the UXO hazards in a manner compatible with the proposed land reuse and in accordance with Department of Defense (DOD) safety standards.
- Known or suspected OE sites have been identified and listed in the 1997 Draft Revised Archive Search Report (ASR; USAEDH, 1997b), an update of previous ASRs (USAEDH, 1993, 1994). Refer to Plate 2 for previously identified, known, or suspected OE sites, documented from the most recent data available.
- Previously identified, known, or suspected OE sites from the time of past report issue were listed in the Phase 1 Engineering Evaluation/Cost Analysis (Phase I EE/CA; USAEDH, 1997a) and the Phase 2 Engineering Evaluation/Cost Analysis (Phase 2 EE/CA; USAEDH, 1998). Because past military training activities resulted in the deposition of UXO in some areas on Fort Ord, the Phase 1 and Phase 2 EE/CAs were developed to describe the UXO removal and management activities for sites known or suspected to contain UXO. The Phase 1 EE/CA addressed 29 OE sites and subsites. The Phase 2 EE/CA addressed the remaining OE sites, including future sites. Sites for which no further removal actions were recommended in the Phase 1 EE/CA were addressed in the *Action Memorandum 1, Phase 1 EE/CA, Twelve Ordnance and Explosives Sites* (Army, 1998c). The Phase 2 EE/CA established a “plug-in” evaluation process designed to address any UXO situation on Fort Ord; the Action Memorandum, Phase 2 EE/CA documents the process (Army, 1999a).
- The Phase 2 EE/CA process addressed additional known or suspected OE sites not evaluated in Action Memorandum 1 by developing categories for each site based on: (1) expected type of UXO present, (2) soil type, and (3) future land use of the site. Five removal alternatives were developed to address each category of site. UXO data was obtained from the Archives Search Report (ASR) prepared in December 1993, the ASR Supplement prepared in November 1994, and the Revised Draft ASR completed in 1997 (USAEDH, 1993, 1994a, 1997a). A preliminary site reconnaissance was conducted as part of the ASR to further identify/characterize potential OE sites; the results are contained in the 1997 ASR. The Phase 2 EE/CA provided a summary of the number and types of UXO and ordnance scrap found during removal actions at OE sites on Fort Ord at the time the EE/CA was prepared. Data on UXO and ordnance scrap identified since that time and on an ongoing basis as removal actions are performed will be provided in After Action Reports and in the OE RI/FS.

2.2 Physical Setting

The following sections summarize the location and general physical setting of the base, including intended land uses.

2.2.1 Location

Fort Ord is adjacent to Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The base consists of approximately 28,000 acres adjacent to the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Southern Pacific Railroad and Highway 1 pass through the western part of Fort Ord, separating the beachfront portions from the rest of the base. The south and southeast of Fort Ord are bordered by unincorporated portions of Monterey County, and include several communities as well as the Laguna Seca Recreation Area and Toro Regional Park. Land use immediately east of Fort Ord is primarily agricultural.

2.3 General History and Land Use

This section provides a summary of Fort Ord's general history and land use.

2.3.1 General History

Beginning with its founding in 1917, Fort Ord served primarily as a training and staging facility for infantry troops. From 1947 to 1974, Fort Ord was a basic training center. After 1974, the 7th Infantry Division occupied Fort Ord. Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993. Although Army personnel still operate the base, no active Army division is stationed at Fort Ord.

2.3.2 Land Use

Fort Ord consists of both developed and undeveloped land. The three principal

developed areas are the East Garrison, the Fritzsche Army Airfield (FAAF), and the Main Garrison; these areas collectively comprise approximately 8,000 acres. The remaining 20,000 acres are largely undeveloped areas. Land uses in both the developed and undeveloped areas when Fort Ord was active are described below.

2.3.2.1 Developed Land

With up to 15,000 active duty military personnel and 5,100 civilians during its active history, developed areas at Fort Ord resembled a medium-sized city, with family housing, medical facilities, warehouses, office buildings, industrial complexes, and gas stations. Individual land-use categories were as follows:

- Residential areas included military housing, such as training and temporary personnel barracks, enlisted housing, and officer housing.
- Local services/commercial areas provided retail or other commercial services, such as gas stations, minimarkets, and fast-food facilities.
- Military support/industrial areas included industrial operations, such as motor pools, machine shops, a cannibalization yard (area where serviceable parts are removed from damaged vehicles), and the FAAF.
- Mixed land-use areas combined residential, local services/commercial, and military support operations.
- Schools included the Thomas Hayes Elementary, Roger S. Fitch Junior High, General George S. Patton Elementary, and Gladys Stone schools. High-school students attended Seaside High, outside Fort Ord's southwest boundary.
- Hospital facilities included the Silas B. Hayes Army Hospital, medical and dental facilities, and a helipad.

- Training areas included a central track and field, firing ranges, and obstacle courses.
- Recreational areas included a golf course and club house, baseball diamonds, tennis courts, and playgrounds.

The three principal developed areas are described below.

- East Garrison: The East Garrison is on the northeast side of the base, adjacent to undeveloped training areas. Military/industrial support areas at the East Garrison included tactical vehicle storage facilities, defense recycling and disposal areas, a sewage treatment plant, and small arms ranges. The East Garrison also included recreational open space, with primitive camping facilities, baseball diamonds, a skeet range, and tennis courts. Recreational open space comprised 25 of the approximately 350 acres of the East Garrison.
- Fritzsche Army Airfield: The former FAAF is in the northern portion of Fort Ord, on the north side of Reservation Road and adjacent to the city limits of Marina. The primary land use was military/industrial support operations; facilities included airstrips, a motor park, aircraft fuel facilities, a sewage treatment plant, aircraft maintenance facilities, an air control tower, a fire and rescue station, and aircraft hangars.
- Main Garrison: The Southern Pacific Railroad right-of-way and Highway 1 separate the coastal zone (see Section 2.3.2.2) from Fort Ord's Main Garrison. The Main Garrison consisted of a complex combination of the various land-use categories. Facilities included schools; a hospital; housing; commercial facilities, including a dry cleaner and a gasoline service station; and industrial operations, including motor pools and machine shops.

2.3.2.2 Undeveloped Land

The two principal undeveloped areas are described below:

Coastal zone: A system of sand dunes lies between Highway 1 and the shoreline. The western edge of the dunes has an abrupt drop of 40 to 70 feet, and the dunes reach an elevation of 140 feet above mean sea level on the gentler, eastern slopes. The dunes provided a buffer zone that isolated the Beach Trainfire Ranges from the shoreline to the west. Stilwell Hall (a former recreation center), numerous former target ranges, former ammunition storage facilities, and two inactive sewage treatment facilities lie east of the dunes.

Because of the presence of rare and/or endangered species and because of its visual attributes, Monterey County has designated Fort Ord's coastal zone an environmentally sensitive area. The California Natural Coordinating Council (CNCC) and the Heritage Conservation and Recreation Service (HCRS) have identified the dunes at Fort Ord as among the best coastal dunes in California because of significant features including coastal strand vegetation and the habitat of the black legless lizard (*Monterey County Planning Department [MCPD], 1984*).

Inland areas: Undeveloped land in the inland portions of Fort Ord includes the Multi Range Area (MRA) and infantry training areas, portions of which were used for livestock grazing and recreational activities such as hunting, fishing, and camping. These undeveloped areas are primarily left in their natural state, minor development of facilities.

2.3.3 Future Land Use

The future land uses presented in this section are primarily based upon the Fort Ord Reuse Authority (FORA) March 1997 Fort Ord Base Reuse Plan (*FORA, 1997*) and the July 1995 SUMP (*U.S. Army Corps of Engineers and BLM, 1995*). Other sources of future land use

include public benefit conveyance, negotiated sale requests, transfer documents, and the Installation-Wide Multispecies Habitat Management Plan (HMP; *USACE, 1997*). The Reuse Plan identified approximately 20 land-use categories at Fort Ord (*FORA, 1997*) including habitat management, open space/recreation, institutional/public facilities, commercial, industrial/business park, residential, tourism, mixed use, and others. The SUMP identified four unique future reuse designations, accounting for the entire MRA. These designations include unrestricted areas, unrestricted/BLM areas, limited-access areas, and restricted/administration areas. Anticipated future uses within each designation are described below:

- Unrestricted areas - Urban development, recreation development, and transportation
- Unrestricted/BLM areas - Construction of facilities, habitat restoration, and maintenance of access routes
- Limited-access areas - Recreation access, notification uses, and habitat restoration
- Restricted/administration areas - Habitat monitoring and habitat enhancement.

Limited-access areas include areas that are within the core of the MRA but outside of high-impact areas. These areas will be cleared of UXO sufficient to support recreational uses including mountain biking, equestrian uses, and pedestrian uses (to occur on established trail systems). Existing firebreaks will also be cleared of OE sufficiently to allow heavy equipment to travel over fire roads for annual maintenance. Limited-access areas will be transferred with use controls for any surface disturbance or subsurface excavation outside of established roads, trails, and firebreaks (*USACE and BLM, 1995*).

The HMP (*USACE, 1997*) presents the revised boundaries of the habitat reserve areas and describes special land use controls and habitat monitoring requirements for habitat

monitoring target species within the HMP Reserve and Development Areas. The HMP confirms locations of low-intensity uses, such as the HMP reserve areas; it also specifies an allowance for development within the reserve areas for public access support facilities in as much as 2 percent of the area. The HMP also confirms locations of high-intensity uses (e.g., development) outside of the MRA and reserve areas. The land-use areas adapted from the HMP are shown on Plate 5.

2.3.4 OE Site Categories

The Phase 2 EE/CA provided a mechanism to assign the remaining OE sites to one of four categories. The four categories are based on maximum UXO penetration depth, UXO detection limits, and future land use requirements. Future land-use requirements were considered in the Phase 2 EE/CA for categorizing sites. The Phase 2 EE/CA OE site categories are described as follows and will be further evaluated in the OE RI/FS:

- Category A sites are sites where no UXO was found during sampling
- Category B sites are sites where UXO was found during sampling or is suspected to be on the site. The UXO detection limit is at least as deep as the maximum UXO penetration depth. Maximum UXO penetration depth is not deeper than the removal depth required to support future land use
- Category C sites are sites where UXO was found during sampling or is suspected to be on site. The UXO detection limit is not as deep as the maximum UXO penetration depth, nor is the detection limit as deep as the removal depth required to support future land use
- Category D sites are sites where UXO was found during sampling or is suspected to be on site. The UXO detection limit is at least

as deep as the removal depth required to support future land use. Maximum UXO penetration depth is deeper than the removal depth required to support future land use.

2.4 Site Features

2.4.1 Climate

The area's climate is characterized by warm, dry summers and cool, rainy winters. The Pacific Ocean is the principal influence on the climate at Fort Ord, causing fog and onshore winds that moderate temperature extremes. Daily ambient air temperatures typically range from 40 to 70 degrees Fahrenheit (F), but temperatures in the low 100s have occurred. Thick fog is common in the morning throughout the year. Winds are generally from the west.

The average annual rainfall of 14 inches occurs almost entirely between November and April. Because the predominant soil is permeable sand, runoff is limited and streamflow occurs only intermittently and within the very steep canyons in the eastern portion of Fort Ord.

2.4.2 Ecological Setting

Fort Ord is located on California's central coast, a biologically diverse and unique region. The range and combination of climactic, topographic, and soil conditions at the former Fort Ord support many biological communities. Field surveys were conducted from 1991 through 1994 to provide detailed site-specific, as well as basewide information regarding plant communities, botanical resources, observed and expected wildlife, and biological resources of concern. Plant communities were mapped for the whole base as described in the *Draft Basewide Biological Inventory, Fort Ord, California, dated December 8, 1992*.

Several of the Fort Ord plant communities have been combined for simplification. The 12 plant communities described at former Fort Ord sites include: coast live oak woodland (coastal and inland); central maritime chaparral; central

coastal scrub; grassland; developed/landscaped and disturbed dunes; dune scrub; iceplant mats; riparian forest; wetlands (including vernal pools and freshwater marsh); and coastal strand (Plate 6). Central maritime chaparral is the most extensive natural community at Fort Ord, occupying approximately 12,500 acres in the south-central portion of the base. Oak woodlands are widespread at Fort Ord and occupy the next largest area, about 5,000 acres. Grasslands, primarily in the southeastern and northern portions of the base, occupy approximately 4,500 acres. The other community types generally occupy less than 500 acres each. The remaining approximately 4,000 acres of the base are considered fully developed and not defined as ecological communities.

Special-status biological resources are those resources, including plant and wildlife taxa and native biological communities that receive various levels of protection under local, state, or federal laws, regulations, or policies. The closure and disposal of former Fort Ord is considered a major federal action that could affect several species proposed for listing or listed as threatened or endangered under the federal Endangered Species Act (ESA). The U.S. Department of Fish and Wildlife Services (USFWS) final Biological Conference Opinion for the Disposal and Reuse of Fort Ord (USFWS, 1993) required that a habitat management plan be developed and implemented to reduce the incidental take of listed species and loss of habitat that supports these species. The HMP for former Fort Ord complies with the USFWS biological opinion and establishes the guidelines for the conservation and management of wildlife and plant species and habitats that largely depend on former Fort Ord land for survival (USACE, 1997). Of the 12 plant communities identified at Fort Ord, two are considered rare or declining and of highest inventory priority by the California Department of Fish and Game (CDFG, 1997): central maritime chaparral and valley needlegrass grassland. Special-status taxa that occur or potentially occur in the plant

communities at Fort Ord include 22 vascular plants, 1 invertebrate, 4 reptiles, 1 amphibian, 9 birds, and 2 mammals. The Vegetation Removal Study Work Plan will contain a list of the special-status species potentially affected by OE removal.

From 1994 to the present, as required by the HMP, baseline and follow-up surveys have been conducted for habitats potentially affected by OE removal activities. These data are presented in annual monitoring reports including; *Fort Ord 1994 Annual Monitoring report for Biological Baseline Studies at Unexploded Ordnance Sites (USACE, 1994)*; *1995 Annual Biological Monitoring Report for Unexploded Ordnance Removal Sites at Former Fort Ord, (USACE 1995)*; *1996 Annual Monitoring Report Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites 10 East, 10 West, 11, 12 and 16 Presidio of Monterey Annex (USACE, 1996)*; *1997 Annual Monitoring Report Former Fort Ord, (USACE, 1997)*; *1998 Annual Monitoring Report Biological Baseline Studies and Follow-up Monitoring at Unexploded Ordnance Sites at Former Fort Ord, Presidio of Monterey Annex, Monterey, California, (USACE, 1998)*.

2.4.3 Topography and Surface Waters

Elevations at Fort Ord range from approximately 900 feet above mean sea level (MSL) near Impossible Ridge, on the east side of the base, to sea level at the beach (Plate 7). The predominant topography of the area reflects a morphology typical of the dune sand deposits that underlie the western and northern portions of the base. In these areas, the ground surface slopes gently west and northwest, draining toward Monterey Bay. Runoff is minimal due to the high rate of surface-water infiltration into the permeable dune sand; consequently, well-developed natural drainages are absent throughout much of this area. Closed drainage depressions typical of dune topography are common.

The topography in the southeastern third of the base is notably different from the rest of the base. This area has relatively well-defined, eastward-flowing drainage channels within narrow, moderately to steeply sloping canyons. Runoff is into the Salinas Valley.

2.4.4 Subsurface Conditions

2.4.4.1 Geology

Fort Ord is within the Coast Ranges Geomorphic Province. The region consists of northwest-trending mountain ranges, broad basins, and elongated valleys generally paralleling the major geologic structures. In the Coast Ranges, older, consolidated rocks are characteristically exposed in the mountains but are buried beneath younger, unconsolidated alluvial fan and fluvial sediments in the valleys and lowlands. In the coastal lowlands, these younger sediments commonly interfinger with marine deposits.

Fort Ord is at the transition between the mountains of the Santa Lucia Range and the Sierra de la Salinas to the south and southeast, respectively, and the lowlands of the Salinas River Valley to the north. The geology of Fort Ord generally reflects this transitional condition; older, consolidated rock is exposed at the ground surface near the southern base boundary and becomes buried under a northward-thickening sequence of poorly consolidated deposits to the north. Fort Ord and the adjacent areas are underlain, from depth to ground surface, by one or more of the following older, consolidated units:

- Mesozoic granitic and metamorphic rocks
- Miocene marine sedimentary rocks of the Monterey Formation
- Upper Miocene to lower Pliocene marine sandstone of the Santa Margarita Formation (and possibly the Pancho Rico and/or Purisima Formations).

Locally, these units are overlain and obscured by geologically younger sediments, including:

- Plio-Pleistocene alluvial fan, lake, and fluvial deposits of the Paso Robles Formation
- Pleistocene eolian and fluvial sands of the Aromas Sand
- Pleistocene to Holocene valley fill deposits consisting of poorly consolidated gravel, sand, silt, and clay
- Pleistocene and Holocene dune sands
- Recent beach sand
- Recent alluvium.

The geology of Fort Ord is described in detail in Volume II of the Basewide RI, Basewide Hydrogeologic Characterization (*HLA, 1995*). Generalized soil types for Fort Ord are presented on Plate 8.

2.4.4.2 Hydrogeology

Recent studies of Fort Ord hydrogeology concluded that the base straddles two distinct groundwater basins, the Salinas and Seaside basins (*GTC, 1984; SGD, 1987a*). Fort Ord includes the southwestern edge of the Salinas basin and the eastern portion of the smaller Seaside basin. The Salinas basin underlies the northern and southeastern portions of the base,

and the Seaside basin underlies the southern and southwestern areas. Basewide RI/FS sites with recognized groundwater contamination are limited to the Salinas groundwater basin at Fort Ord; therefore, only the Salinas basin is described in detail in this Work Plan.

The Salinas groundwater basin is relatively large and extends well beyond the boundaries of Fort Ord. At Fort Ord, the Salinas basin is composed of relatively flat-lying to gently dipping, poorly consolidated sediments. Although relatively simple structurally, the sediments are stratigraphically complex, reflecting a variety of depositional environments. Aquifers within the Salinas basin at Fort Ord, from top to bottom, include the unconfined A-aquifer, the confined Upper 180-foot aquifer, the confined and unconfined Lower 180-foot aquifer, and the confined 400-foot and 900-foot aquifers. These aquifer names reflect local historical water levels and are not directly correlated to present water levels at Fort Ord.

Groundwater extraction by the City of Marina, by Fort Ord, and by irrigation wells in the Salinas Valley have historically induced seawater intrusion into the Lower 180-foot and the 400-foot aquifers. Seawater intrusion continues to affect these aquifers. Intrusion into the Upper 180-foot aquifer appears to be limited to the vicinity of the beach at Fort Ord (*HLA, 1999b*).

3.0 INITIAL EVALUATION

This section provides an initial evaluation of existing information related to OE investigations, sampling and/or removal actions; conceptual site models based on different types of training ranges and their associated OE-related uses; and a summary of DQOs leading up to the Work Plan rationale outlined in Section 4.0.

3.1 Summary of Previous Investigations

The following previous investigation reports include historical information on base development, as well as information on ordnance use and cleanup on Fort Ord:

- The Community Environmental Response Facilitation Act (CERFA) Report (*Little, 1994*) identified property through literature review, site visits, and interviews, where hazardous substances were stored, released, and disposed. The CERFA also identified property where UXO was present or had been previously used
- The ASRs (*USAEDH, 1993, 1994, 1997*) detailed historical literature reviews, as well as interviews with former Fort Ord personnel to determine types of munitions used at each site, identify possible disposal areas, and identify any previously unknown training areas
- The ordnance removal contractor's After-Action Reports document the type, disposition, and location of UXO found at each site where sampling or removals have occurred
- The Data Summary and Work Plan, Site 39 – Inland Ranges (*HLA, 1994*) gathered information regarding past and present uses of the MRA
- The *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California, January 13, 1997*, addressed hazardous waste contamination at a number of the OE sites, among other issues.
- The Engineering Evaluation/Cost Analysis (EE/CA) – Phases 1 and 2 (*Army, 1997, 1998*), evaluated proposed methods and levels of ordnance cleanup, devised a list of alternatives with a cost analysis. Additionally, the EE/CA documented previously completed OE removals, calculated the remaining risk, and determined whether the removal action was adequate or not. The Phase 2 EE/CA covered all OE sites not included in the Phase 1 EE/CA.
- The *Action Memorandum 1, Phase 1 EE/CA, Twelve Ordnance and Explosives Sites (Army, 1998c)* addressed 12 Phase 1 EE/CA sites for which no further removal and/or sampling action was required. Action Memorandum 1 describes the rationale for no further action at each of the 12 sites.
- The *Action Memorandum, Phase 2 EE/CA, Ordnance and Explosives Sites (Army, 1999a)*, addresses the remaining OE sites identified in the Phase 2 EE/CA, as well as any other OE site which may be identified at Fort Ord in the future. The Phase 2 EE/CA established a “plug-in” evaluation process designed to address any UXO situation on Fort Ord.
- Volume 1 of the Literature Review and Base Inventory Report (*EA, 1991*) and Volume 1 of the Enhanced Preliminary Assessment (*Weston, 1980*) included some information on range use within the MRA and Beach Ranges and a discussion of other training areas.

The ASR contains the greatest amount of historical information on ordnance use at the facility. Various sources of information including records at several National Archives centers were researched and reviewed as part of the effort to complete the Fort Ord ASR. The contractor After-Action Reports provide the greatest source of information on the type of ordnance used at each of the OE sites over time because they document the discovery, identification, removal, and disposal of the actual UXO items present. Other sources of historical information that may provide useful information include the Basewide RI/FS and Site-Specific RI Characterization Reports.

3.2 Conceptual Site Models

The following conceptual site models have been developed to illustrate the types of areas that may contain OE and to identify the known or suspected activities that resulted in their consideration as potential OE sites. The five models consist of training sites; firing ranges; non-firing ranges; burial pits; and open detonation (OD) areas as shown on Plates 9 through 13. As the OE RI/FS progresses, a refinement of the conceptual site models may be necessary to include specific conditions observed at Fort Ord.

3.2.1 Training Sites

Training sites are areas identified on training maps that were not specifically identified as OE sites (Plate 9). Additional investigation is required for the training sites. Each of these sites was subjected to (at a minimum) a site walk and preliminary risk evaluation based on the results of the site walk. These sites typically served as maneuver, instruction, and bivouac areas and may contain live and/or expended small-arms and live and/or expended pyrotechnics that may present some level of safety hazard to the public. The danger level at training sites is directly influenced by the type of UXO, the proximity of the UXO to the surface, and accessibility of the site

to the public. Property identified as containing training sites will undergo further evaluation through the OE RI/FS process (Track 1, 2, and 3).

3.2.2 Firing Ranges

Firing ranges are areas that were intentionally constructed and/or were used for training personnel in the use of live ordnance and small arms (Plate 10). Firing ranges consist of a firing line, firing points, and the target area. The firing line is the line from which weapons are fired and forward of which no one is permitted during firing. The firing points are numbered positions to which personnel are assigned. The target area is the point or location at which the weapon is fired. Depending on the historical use of the firing range, it may contain surface and subsurface UXO (including high explosives and pyrotechnics) that may present some level of safety hazard to the public. The danger level would be influenced directly by the type of UXO, the proximity of the UXO to the surface, and the accessibility of the site to the public. Property identified as containing firing ranges will undergo further evaluation through the OE RI/FS process (Tracks 1, 2, and 3).

3.2.3 Non-Firing Ranges

Areas used for training personnel in the set-up, use, and handling of weapons where no live ordnance use was permitted are identified as non-firing or dry fire ranges. If sites of this type can be determined, through historical review, to have been used only for dry-fire training, the site would not present a danger to the public. A site of this type would be a candidate for no further investigation or action (Track 0).

3.2.4 Burial Pits

During training activities, it was not uncommon for soldiers to bury trash such as ration containers and other debris; although unauthorized, burial pits were occasionally used to discard or dispose of unused or expended ordnance items at the completion of training

activities (Plate 12). The types of items located to date in burial pits include various UXO items. Because the items are beneath the ground surface, burial pits present a less-imminent explosive safety hazard danger to the public than surface items. Property identified as containing burial pits will undergo further evaluation through the OE RI/FS process (OE RI/FS Tracks 1, 2, and 3).

3.2.5 Open Detonation Areas

Open detonation (OD) areas are areas that are used for the purpose of disposing of OE (Plate 13). OD areas are constructed by OE safety specialists in compliance with applicable safety rules and engineering control requirements so that OE disposal can be accomplished in the safest possible manner. Range 36A within the MRA is a former OD area that is currently proceeding through a Resource Conservation and Recovery Act (RCRA) closure process. During ongoing removal actions, open detonations are performed at the OE site where the item is found, or in a nearby central area to minimize movement of UXO. Disposal activities at OD areas may be performed using dug pits, bermed pits with sandbags or other types of engineered barriers, with cover material usually consisting of soil or additional sandbags. Items to be disposed are detonated in the pit using detonation charges such as C-4 or TNT, or shaped charges which are designed to penetrate certain types of munitions. OE may remain at an OD area as a result of incomplete detonation leaving explosive residues, fuzes, kickouts (items thrown clear of the pit) or other pieces that could present some level of safety hazard to the public. After the detonation, the OE safety specialist inspects the area to recover any residual items or kickouts for proper disposal. Areas where OD activities are known or suspected to occur will undergo further evaluation in the OE RI/FS.

3.3 Project Data Quality Objectives

The OE RI/FS process will require the collection of OE data for regulatory compliance and decision-making purposes. The data collected must have sufficient quality and quantity to support decision making.

The DQO process developed by EPA will be employed by the Fort Ord OE team as a systematic planning tool to establish criteria for data quality and for developing data collection designs.

The DQO process consists of seven steps. By design, the DQO process is an iterative process. The outputs of one step may lead to reconsideration of prior steps. The DQO process is a flexible planning tool that will be used more or less intensively as the project-specific situation requires. The OE RI/FS project will have multiple decisions; the resolution of one decision will lead to the evaluation of subsequent decisions and as such the DQO process will be used throughout the life cycle of the OE RI/FS project.

Each of the seven steps is described briefly below. A detailed description will be presented in the subsequent Technical Memorandums developed during the OE RI/FS process.

- Step 1: State the Problem
- Step 2: Identify the Decision
- Step 3: Identify the Inputs to the Decision
- Step 4: Define the Study Boundaries
- Step 5: Develop a Decision Rule
- Step 6: Specify Tolerable Limits on Decision Errors
- Step 7: Optimize the Design

The DQO process will also be used to assess existing data supporting past decisions. The existing data may provide valuable information including data variability that can be used in the development of subsequent data collection design or confirming existing data collection design.

The use of the DQO process does not always result in statistical or probabilistic sampling methods to collect data. The EPA guidance recognizes that not every problem can be evaluated using statistical techniques. However, the DQO process will be employed as a planning tool for all applicable aspects of the OE RI/FS project even when a statistical data collection design is not used as in the case presented herein for initial DQOs for the OE RI/FS.

The following are the initial, or global, DQOs for the OE RI/FS process. The initial DQOs are designed to identify the primary decisions that the project will encounter and the quality of data needed to establish a decision.

Step 1: State The Problem

OE site problems are very complex. The DQO process will gradually narrow, focus, and divide the problem into manageable pieces. DQOs will then be developed for each individual piece. OE Conceptual Site Models (CSMs) (Section 3.2 and Plates 9 through 12) will be developed using the DQO process. Data gaps identified in the CSMs will be addressed by listing them as inputs to the decisions, which is the third step in the DQO process.

1. Identify the members of the planning team - The members of the planning team will include the Army, EPA, State of California (Cal-EPA), USACE, statisticians, chemists, engineers, OE specialists and public stakeholders.
2. Identify the primary decision maker - There will not be a primary decision maker; decisions will be made by consensus among

the Army, EPA, and Cal-EPA and will consider public input.

3. Develop a concise description of the problem - The problem is to determine whether OE is known or suspected at a given area; assess any UXO-related risk; and evaluate alternatives under the OE RI/FS process to reduce the potential OE risk to current and future property owners and the general public.
4. Specify available resources and relevant deadlines for the study - Considering the potential impacts to human health and the environment, the project will not be constrained by cost. However, the project does recognize possible constraints that may be encountered due to Congressional budget decisions.

Step 2: Identify the Decision

1. Identify the Principal Study Question: Is there UXO-related risk above goals established in the OE RI/FS, and what are the alternatives to reduce any potential risks?
2. Define alternative actions that could result from resolution of the principal study question. Risk management alternatives will be evaluated in terms of OE density and intended land use. Likely alternatives include:
 - No further action
 - Land use controls (e.g., administrative and engineering controls as described in Section 4.7)
 - Surface clearance
 - OE clearance to depths as required by future land-use or other applicable standard
 - Construction support.

3. Decision statement(s) - Decide whether or not a significant risk exists at OE sites and determine the most appropriate response alternative.
4. Organize multiple decisions - Many other decisions will be addressed under the OE RI/FS, including but not limited to:
 - Deciding whether or not sampling density is appropriate for the intended land use
 - Deciding whether or not an alternative response is appropriate knowing the intended land use
 - Deciding whether or not the geophysical instruments used to detect OE are appropriate under Fort Ord OE and site specific conditions
 - Deciding whether or not removal activities are appropriate for the intended land use.

Detailed DQOs will be developed and presented in a subsequent Technical Memorandum developed during the OE RI/FS process.

Step 3: Identify the Inputs to the Decision

1. Identify the informational inputs needed to resolve the decision - To resolve the decision statement(s), the OE planning team will need to obtain information on, or measurement of the following:
 - Historical records that will indicate the type of OE that might be found at a site
 - Instrument detection capabilities under Fort Ord site- and OE-specific conditions
 - Vegetation density, type, and clearance methodologies
 - OE Reconnaissance and sampling protocols

- Removal and remedial technologies
 - ARARs and regulatory requirements; risk; long-term risk management alternatives; community relations; health and safety
 - Physical site characteristics
 - OE types and distribution
 - OE penetration depths
 - Cleanup standards that will be developed in the OE RI/FS
 - Intended land use
 - Receptors (types/subpopulations, sensitivities, numbers/density, locations, activity levels/patterns).
2. Identify sources for each informational input - Sources of information include but are not limited to: the Phase I and Phase II EE/CA, OE After-Action Reports, and technical memoranda.
 3. Identify the information that is needed to establish the action level - OE RI/FS will focus on developing applicable action levels or standards.
 4. Identify potential sampling techniques and appropriate instruments - The general family of proven instruments that will be assessed include magnetometers and electro-magnetometers. Grid sampling techniques and other statistically based sampling designs.

Step 4: Define the Boundaries of the Study

This section will focus on defining spatial and temporal boundaries and scales of decision making for the media of concern.

Risk Based Scales of Decision Making - To develop risk-based scales of decision making, the OE RI/FS will evaluate: (a) the daily activity and behavior pattern of the most sensitive receptor; (b) exposure pathways and routes; (c) the current and future land use designation; and (d) incident probability values. The DQO process will be employed to ensure the sampling data used to make a risk based decision will be representative of defined areas, or volumes and time periods a receptor could be exposed given the anticipated end use of the site. As an example, surface soil with OE items is an exposure unit defined by area and depth of the surface soil layer.

Technology Based Scales of Decision Making - Once a removal or remedial technology has been chosen to remediate an area, the OE RI/FS may define a scale of decision making based on the selected technology. Scales of decision making corresponding to these areas will be identified as Remediation Units. The Remediation Units will be defined as the subset of a medium that could reasonably be remediated with the selected removal or remedial technology. Remediation Units will be defined during the OE RI/FS in order to design the most cost-effective removal or remedial design. For each medium, the optimal size of the remediation unit will be determined by using a relative cost analysis and an estimate of the variability and distribution of OE items in the media of concern. When the variability is considered low, the optimal size of the remediation unit may be the same as the exposure unit. As an example, the remediation unit may be surface soil with OE items defined by area and depth, that may be the same as the exposure unit.

1. Define the spatial boundary of the decision statement - The boundaries of the study may be limited to the boundaries identified and established for each suspected OE area during the historical records search.

2. Specify the characteristics that define the population of interest - OE items located in surface and near surface soils (0 to 1 foot bgs) and subsurface soils (1 to 10 feet bgs)
3. Define the temporal boundary of the decision statement -
 - Determine the time frame to which the decision statement applies - It will be assumed that the sampling data will be assessed on a case by case basis using the DQO process to determine if the data is representative of both current and future situations.
 - Determine when to collect data - Seasonal considerations regarding soil erosion and deposition (e.g., burial and exposure of UXO items) will be addressed in the OE RI/FS and/or other technical documents.

Step 5: Develop a Decision Rule

The initial step when developing a decision rule is selecting the parameter to characterize the population of interest. The OE RI/FS will select the parameter that will be employed to characterize the population of interest. Selecting the parameter of interest will involve the items discussed below.

When selecting an appropriate population parameter, the OE RI/FS will ask the following question: "What would the decision maker really like to know?" If it is the average number of OE items per acre, then this would be critical information when developing a sampling plan. If however, the decision maker would like to know the maximum number of OE items per acre for a five acre site, then the sampling plan would be quite different. The density of anomalies versus actual OE items per acre would require yet another sampling design.

Step 6: Specify Limits on Decision Errors

This section will discuss how probability limits on decision errors will be established under the OE RI/FS program.

When acceptable probabilities for decision errors are not established by regulation, which will be the case for some aspects of the OE RI/FS, the OE team will establish them by consensus. Two major factors will be considered when establishing acceptable probabilities for decision errors including:

- (a) the consequences of the decision error and
- (b) the cost of attaining the decision error rates.

A criteria that will be employed during the OE RI/FS process is that the cost of attaining the decision error rates will not exceed the consequences of the decision error. This will require consensus agreement with all stakeholders about the likelihood of different consequences and associated costs and benefits. By using the consensus process to balance the costs and benefits of reducing the probability of decision errors versus the cost and benefits of their potential consequences, the OE team will be able to establish whether definitive or screening data with definitive confirmation will be required. Using this process the OE team will be able to restrict the decision errors that

could cause risk to human health and the environment as well as restrict the decision error that would cause unnecessary cleanup of a site.

Step 7: Optimize the Design

In this step, statistical techniques will be used to develop data collection methods (e.g., OE field sampling) and evaluate their efficiency in meeting the objectives of the project. Throughout the project, the data quality objectives will be revisited, and as necessary, sampling approaches will be modified or developed to address the current understanding of site conditions and project requirements. The reevaluation will be completed by a statistician. Probability sampling design and statistical models will be discussed and presented in the DQO process. Possible sample designs that may be considered under the OE RI/FS include but are not limited to: non-probabilistic sampling and probabilistic sampling. Probabilistic sampling that will be considered includes: simple random sampling, stratified random sampling, hot spot sampling and systematic random sampling. Non-probabilistic sampling may also be utilized and is referred to as authoritative sampling. This sampling approach will be used when sufficient knowledge of the location of OE items exists to justify a non-random sampling approach.

4.0 WORK PLAN RATIONALE

The purpose of this Work Plan is to outline the steps involved in: (1) gathering data to evaluate risks associated with OE, and (2) identifying appropriate remedial actions to mitigate any risks. This section outlines the key components of the OE RI/FS that will be used to make decisions regarding risk and remedial actions, and provides a summary of the necessary studies and information gathering tools that will be used to make decisions in the OE RI/FS. In order to begin the data gathering process, a literature review must first be undertaken, and in order to assess risk and appropriate remedial actions, data must be gathered about OE detection tools and vegetation removal procedures that allow access to the ground surface for OE removal. These initial data gathering steps are described below, including summaries of the following companion documents to the OE RI/FS that are currently being prepared and are subject to modification during the review process:

- The Literature Review Work Plan and Report
- The Ordnance Detection and Discrimination Study Work Plan, and
- The Vegetation Clearance Study Work Plan.

Other companion documents to the OE RI/FS include a Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for data gathering and any field work. These documents will be prepared and submitted as part of the OE RI/FS review process once sufficient information is gathered to define their content.

This section also provides the following:

- Summarizes OE-related site reconnaissance and sampling methodology

- Describes the approach for evaluating removal activities
- Outlines the process for identifying applicable or relevant and appropriate requirements (ARARs) and other key components of the OE RI/FS, including long term risk management; risk evaluation; community relations; and health and safety.

4.1 Literature Review

The Literature Review Work Plan (*HLA, 1999a*) and Report are being prepared under separate cover so the review process can be initiated while this Work Plan is being developed. The purpose of the literature review is to locate and retrieve appropriate documents to use in identification of locations at Fort Ord where OE-related activities occurred or were suspected to have occurred. Data gathered through the literature review will be utilized in the OE RI/FS to document the history of each OE site through time. This documentation process is necessary in order to satisfy OE RI/FS requirements under CERCLA. This information will be used to identify potential areas where physical hazards related to the presence of OE may be expected. Those areas identified as suspect will undergo further evaluation in the OE RI/FS under Tracks 1 through 3 (Section 1.3). Based on literature review results, areas not identified as suspected OE sites will be identified as a candidate for no further investigation or action (Track 0). This documentation will be used to support property transfer decisions.

Additionally, the literature review will be used to create a master record of all former Fort Ord OE-related documentation and will be included in an update to the Fort Ord Geographical Information System (GIS). The literature review findings will also support the development of all future Fort Ord

informational decision documentation including completion of the OE RI/FS. The results of the literature review including a list of all reviewed documents, reports, and interviews will be reported in the Literature Review Data Summary and will be included in the OE RI/FS.

4.2 Summary of Ordnance Detection and Discrimination Study

This section provides a summary of the Ordnance Detection and Discrimination Study (ODDS, in preparation). A series of tests using geophysical detection instruments will be performed to evaluate potential alternative methods for future sampling and remedial actions. The ODDS will include an evaluation of equipment currently in use and alternative detection technologies and discrimination protocols under a range of field conditions at Fort Ord. The tasks included in the ODDS are summarized below.

The objectives of the ODDS are to:

- Identify minimum and maximum ranges of magnetic and electromagnetic signals of various OE items placed at various depths and orientations
- Identify the range of maximum detection depths for a variety of OE items using various detection instruments, including instruments used in the past
- Identify the appropriate instrument or instruments for a variety of site conditions at Fort Ord.

The ODDS will consist of a Static Test, a Seeded Site Test, and a Field Trial.

The static test will be performed to evaluate the signal character and strength from a variety of geophysical detection devices including flux gate magnetometers, cesium vapor digital magnetometers, and time-domain electromagnetometers. Approximately five

groups of unburied OE items will be evaluated in the static test. The purpose of using unburied items is to establish a series of baseline signals for various items and instruments without influences from surface debris or soil conditions. Readings from each sensor will be taken on each unburied item by holding the sensor over the item at increasing separation distances until the maximum penetration depth for the item plus one foot is reached, or when the signal strength becomes too weak to be considered reliable.

The seeded site test will be performed to test the performance of above-mentioned geophysical tools on representative buried items under several site-specific conditions and to further refine the estimated detection capabilities for each of those tools. The types of OE to be buried and test areas will be selected to represent the actual field conditions at Fort Ord. Each site will be swept to identify and remove anomalies prior to the placement of the test items.

The field trials will be performed at portions of selected OE sites to compare the results of the static and seeded tests to actual field conditions at Fort Ord. The tests will include geophysical sweeps of the sites using single and/or multiple detectors and the results will be used to evaluate past methods and develop possible alternatives for future reconnaissance, sampling, and remedial actions as appropriate.

The results of the ODDS will be presented in a separate report and will also be included in the OE RI/FS report.

4.3 Summary of Vegetation Clearance Study

This section provides a summary of the Vegetation Clearance Study. Vegetation clearance techniques must be employed in order to access the ground surface for OE sampling and removal activities. These activities will have impacts on flora and fauna, cultural resources, and air quality. Mechanical and

manual methods as well as prescribed burning (HLA, 1997b) have been used in the past to clear vegetation so OE can be accessed for detection and removal. Vegetation burning may be necessary in those areas where mechanical or manual vegetation removal is not safe due to explosive hazards, or where mechanical or manual techniques would have negative impacts on sensitive ecological species. As outlined in the HMP, annual habitat monitoring will be performed at OE sites that have undergone vegetation removal in support of OE removal actions. Guidance relevant to vegetation removal at Fort Ord (USFWS, 1993, 1999) will also be used in developing vegetation removal alternatives.

The following sections summarize the study of different vegetation removal techniques that will be undertaken as part of the OE RI/FS.

4.3.1 Vegetation Removal Alternatives

Several alternative vegetation removal processes will be evaluated as part of the OE RI/FS. Potential methods of vegetation removal to be evaluated include prescribed burning, mechanical removal (including remotely operated vehicles), manual removal, the utilization of grazing animals (e.g., goats), and herbicides. Other alternative methods of vegetation removal will be evaluated if identified. Vegetation removal practices currently being implemented at Fort Ord are discussed below.

Factors which will be considered include potential human health impacts, worker safety issues, species and habitats of concern, terrain, site accessibility, potential impact from erosion, weather, property reuse needs, and cost. Other factors that will be considered include compliance with various regulatory requirements and issues as discussed in Section 4.6. At times, certain concerns or conditions may dictate decisions on the type of vegetation

removal to be implemented at a particular OE site.

4.3.2 Summary of Current Vegetation Removal Methods

Currently three methods of vegetation removal are in use at Fort Ord. Prescribed burning is utilized where: (1) vegetation removal methods are significantly limited because of worker safety issues, (2) the area is environmentally sensitive (requires burning), or (3) in areas where surface UXO prevents manual and mechanical methods. Burning is the preferred method of vegetation removal in designated maritime chaparral natural resource management areas. Maritime chaparral is a fire-adapted community and requires periodic burning to maintain species diversity and ecosystem health. Mechanical vegetation removal is utilized where impact to habit allows and terrain will permit. Due to the danger to ordnance removal personnel, mechanical methods cannot be used in areas where surface UXO is present. Mechanical methods may include one or more of the following pieces of equipment: brush hog, Hydro-Ax, track-less land clearance (TLC) machines, modified Bob Cat, Brontosaurus, and track hoes. Mechanical/manual vegetation removal may also be utilized as a follow up to prescribed burning or when prescribed burning cannot be performed. As with mechanical vegetation removal methods, manual vegetation removal cannot be performed in areas where surface UXO is present. Manual methods include chain saws, push mowers, loppers, power chippers, and powered weed cutters (USA, 1999). To date, the use of herbicides and grazing animals as forms of vegetation removal have not been implemented at Fort Ord. However, these methods (as well as other methods if identified) will be evaluated as part of the OE RI/FS.

The decision criteria which will be used to decide appropriate vegetation removal

alternatives will be included in the Vegetation Clearance Study Work Plan.

4.3.3 Monitoring Practices

To maintain compliance with habitat monitoring requirements presented in the HMP (*USACE, 1997*), biological resources will be monitored before and after OE removal activities are completed. The HMP identifies species and habitats of concern on the installation, outlines mitigation measures, and provides a framework for monitoring the successful regeneration of species and habitat following removal of OE. Mitigation required by the HMP includes conducting follow-up monitoring for a period of 5 years following OE removal to document effects of the action. Annual habitat monitoring at OE sites which have undergone removal actions have been implemented. The results of the monitoring are reported annually (*HLA, 1996, 1997c, 1998*), and a summary of the monitoring results will be included in the OE RI/FS.

4.4 Reconnaissance and Sampling

This section summarizes OE reconnaissance and sampling procedures (i.e., investigative measures) that are used to gather specific information necessary to evaluate the need for further investigation or OE removals at known or suspected OE sites. The purpose of this section is to describe how past and current area reconnaissance and site sampling activities will be evaluated in the OE RI/FS, and to describe future anticipated tasks.

4.4.1 Reconnaissance and Sampling DQOs

The following DQOs apply to reconnaissance and sampling for OE.

1. State the Problem

To satisfy the OE RI/FS process and objectives, it is necessary to evaluate previous work and

develop a process to evaluate areas potentially containing UXO where additional information is required.

2. Identify the Decisions

Information generated during the reconnaissance and sampling processes will be used to identify areas potentially containing UXO. Decisions may include but are not limited to the following:

- Is the historical information (e.g., interview records, field notes, aerial photos, maps) regarding potential OE areas reliable?
- Are established/previous methods for estimating representative study areas adequate?
- Are existing equipment and procedures used to identify OE hazards adequate? or
- What equipment specifications and sampling procedures are needed to identify potential hazard areas at the desired confidence level?

3. Identify Inputs to the Decision

- Historical records that will supplement the site data set and may indicate whether or not a site contains potential OE hazards
- Results of the Ordnance Detection and Discrimination Study which will provide information necessary to evaluate the use of detection equipment in past actions and to provide input into the development of alternative methods
- Evaluation of the appropriate amount of site to be subjected to investigation.

4. Define the Boundaries of the Study

- Define the spatial boundaries of the decision:

The preliminary boundary of the site will be established based on information from document searches and interviews

- Specify the characteristics that define the population of interest:
OE items in surface (up to 6 inches bgs) and subsurface (6 inches to 10 feet bgs) soil
- Define the temporal boundary of the decision statement
 - Data will be evaluated on a site specific basis to determine if it is representative of current and future conditions
 - Except for conditions that make collection of OE data hazardous, there are no limitations on when data can be collected.

5. Develop a Decision Rule

- If a statistically significant portion of an area (to be determined later and documented in a technical memorandum) is subjected to reconnaissance and no evidence of OE use is found, then recommend that no further field investigation be performed
- If a statistically significant portion of an area (to be determined later) is subjected to reconnaissance and evidence suggesting OE use is found, then recommend sampling to further characterize the site. Document in a technical memorandum
- If the Ordnance Detection and Discrimination Study indicates that the instruments used in past investigations does not satisfy project DQOs, then recommend further evaluation and investigation (if warranted) of the site.

6. Specify Limits on Decision Errors

A discussion of limits on decision errors is presented in the project DQOs. In general, these decision errors indicate that when acceptable probabilities for decision errors are not established by regulation, the OE team will establish them by consensus, e.g., establishing a statistically significant area to represent a site for reconnaissance and sampling purposes.

7. Optimize the Design

Procedures for optimizing the design have not been evaluated at this time but statistical techniques will be used to evaluate or develop alternative data collection designs and to evaluate their efficiency in meeting project DQOs. These alternatives will be described in detail in the technical memorandum.

4.4.2 Reconnaissance Procedures

Reconnaissance has been and will be performed when information indicates that an area may contain UXO. These areas may include suspected firing ranges, training sites, bivouac areas, and burial pits. The objective of reconnaissance is to determine if an area contains ordnance-related hazards and, if hazards are present, to collect enough information regarding the nature and extent of the hazard to develop an investigation process. The Literature Review will evaluate the types of information that are commonly used and may include historical maps, range control records, interview records, and aerial photographs. A field investigation is then performed to verify archived information and evaluate site conditions.

4.4.2.1 Reconnaissance Guidance

Reconnaissance activities at Fort Ord will be conducted in accordance with U.S. Army Engineering and Support Center (Huntsville) Interim Guidance (*Draft ETL 1110-1-165 Procedures for Conducting Preliminary Assessments at Potential Ordnance Response Sites (USAEDH, 1995)*), and appropriate provisions of U.S. EPA's *Guidance for Performing Preliminary Assessments Under CERCLA (EPA, 1991)*.

4.4.2.2 Reconnaissance Evaluation in the OE RI/FS

Several tasks will be completed for the evaluation of site reconnaissance procedures already performed, as well as the development of additional reconnaissance procedures, as necessary, to be implemented throughout the duration of the OE cleanup program at Fort Ord. These efforts will include:

- Review previous work
- Development and implementation of procedures
- Evaluation of past actions
- Development of decision and recommendation criteria.

Task-specific approaches, objectives, and data requirements for evaluating and implementing site reconnaissance activities will be presented in a detailed technical memorandum to be submitted under separate cover.

4.4.2.3 Review of Previous Reconnaissance Work

Records from reconnaissance activities that were performed on suspected OE sites prior to the RI will be reviewed to identify the areas investigated, techniques and equipment used, and conclusions and recommendations about the areas. Sources to be reviewed include, but are not limited to, site visit notes recorded as part of the Archives Search, OE contractor records, and documentation of area reconnaissance performed by the Sacramento District OE Safety Specialist. If no OE was found at a given area during reconnaissance activities, and the reconnaissance conforms with DQOs, it is anticipated the area will be managed within the Track 0 process.

4.4.2.4 Development and Implementation of Reconnaissance Procedures

Reconnaissance activities will be implemented whenever a potential site is identified, which may be during or after the completion of the RI. These procedures will be presented in detail in the above-mentioned technical memorandum. The memorandum will describe:

- The types and sources of information that will be considered when initiating a reconnaissance effort
- The procedure for determining the appropriate amount and location of area to be investigated
- The equipment to be used (i.e., detection devices and GPS equipment)
- Procedures for limited intrusive investigations, if necessary, to identify selected anomalies
- Method(s) to determine the appropriate quantity and quality of data to support the decision making process.

4.4.2.5 Evaluation of Past Reconnaissance Actions

Results from previous reconnaissance activities will be evaluated to determine their completeness, accuracy, and compliance with the above-mentioned guidance and DQOs. The results from past actions will also be compared to the approach described above to determine if additional actions are necessary to complete a reconnaissance for any area.

The evaluation will include a review of area coverage and locating techniques, documentation of area features and anomalies, and data evaluations and recommendations.

4.4.2.6 Reconnaissance Decision / Recommendation Process

After reconnaissance has been completed for an area, the data will be evaluated to determine if a UXO hazard exists. As described above, data from previous reconnaissance efforts will be also evaluated in the same manner. Based on the results of the reconnaissance, the area(s) will either require additional investigation or no further investigation will be recommended. Additional investigation may include further reconnaissance or the initiation of sampling activities, depending on the knowledge of the area. No further action would be recommended for an area if no evidence of UXO hazard is associated with the area. As stated above, specific details regarding reconnaissance procedures, data evaluation, and the decision and recommendation process will be presented in a subsequent technical memorandum.

4.4.3 OE Sampling

Sampling has been performed at OE sites to evaluate the presence of surface and subsurface UXO, and to identify the types of UXO, their distribution, and density. Sampling is performed at areas where information on these evaluation parameters is not adequate to determine if a removal action is required. The OE RI/FS will evaluate existing and past sampling procedures and protocols described herein, and will develop sampling criteria that will be compared to past and existing criteria and will be used for future actions.

Details regarding OE sampling and removal procedures are presented in work plans written by the OE removal contractors. These plans incorporate current DOD, Army, USACE, and regulatory guidance and serve as comprehensive project documents that describe procedures to be implemented for all aspects of sampling, removal, and disposal of OE at Fort Ord. The work plans include descriptions of site

conditions, UXO treatment methods, field procedures, data collection procedures, quality control requirements, health and safety procedures, and environmental protection plans.

4.4.3.1 Evaluation of Past Sampling

Several tasks will be completed for the evaluation of site sampling procedures already performed, as well as the development of additional sampling procedures to be implemented throughout the duration of the OE cleanup program at Fort Ord. These efforts will include:

- Review previous work
- Development and implementation of procedures
- Evaluation of past actions
- Development of decision and recommendation criteria.

Task-specific approaches, objectives, and data requirements for evaluating and implementing site sampling activities will be presented in a detailed technical memorandum to be submitted under separate cover.

A summary of sampling procedures and previous and current OE sampling efforts is presented below.

4.4.3.2 Site Preparation

Before sampling actions begin, the site must be prepared for investigation. This includes clearing vegetation for access, safety, and investigation purposes, and performing surveying procedures prior to data collection.

4.4.3.3 Vegetation Clearance

OE sampling and removals require the use of geophysical sensing devices such as magnetometers that need to be swept over the ground close to the surface. These sensors are

limited from effectively detecting UXO in many areas at Fort Ord because of dense vegetation such as central maritime chaparral, which is the dominant plant community. Also, the visibility of potential OE items on the ground is blocked by dense vegetation, increasing the hazard to which ordnance removal crews are exposed. Removal of vegetation is therefore required to safely and effectively remove UXO from sites at Fort Ord. Vegetation clearance at OE sites is currently accomplished by several methods including prescribed burning, cutting and pruning, and using mechanical methods.

Additional factors regarding the selection and implementation of vegetation clearance methods will be presented in the Vegetation Clearance Study Work Plan. A technical memorandum will also be produced in the future that will describe in detail the criteria and results of the evaluation and selection of site- or area-specific vegetation clearance methods and consideration of related human health, environmental, and habitat protection issues.

4.4.3.4 Survey Procedures

Surveying procedures are necessary to allow for comprehensive and accurate data collection at a given OE site. These procedures include:

- Creation of a base map of the area
- Division of the area into operational grids (commonly 100'x100' or 100'x200')
- Location of the site boundary and grid areas using Global Positioning System (GPS) techniques
- Performing a site environmental survey.

Specific requirements, goals, and objectives for surveying are presented in OE contractor work plans.

4.4.3.5 Sampling Procedures

Grid sampling techniques have been typically employed at Fort Ord for OE sampling by

Human Factors Applications, Inc. (HFAI) and UXB International (UXB), and they continue to be used by USA Environmental (formerly CMS Environmental). Currently, grid sampling is used in areas of 50 acres or less. Sites greater than 50 acres are currently sampled using SiteStats/GridStats, a program developed by QuantiTech and approved by USAEDH. SiteStats/GridStats is a computer program that utilizes results from the excavation of OE anomalies to statistically determine the number and location of additional excavation sites and necessary to characterize a site.

Use of the SiteStats/GridStats program at Fort Ord will be reevaluated in the OE RI/FS. Site sampling activities covering less than ten percent of the site are common using this program. Additional details regarding the SiteStats/GridStats program are presented in the Phase 2 EE/CA (*USAEDH, 1998*).

4.5 Evaluation of Removal Activities

Removal actions are implemented based on the discovery of OE related hazards identified during the area reconnaissance and/or site sampling phases (Section 4.4). Removal actions have been performed and continue to be performed at Fort Ord to remove the imminent safety hazards associated with exposure to UXO. These removal actions have been conducted as Time Critical Removal Actions (TCRAs) as described in the *Fort Ord Ordnance and Explosive Waste Time-Critical Removal Action Memorandum (Army, 1994b)*. The Action Memorandum, Phase 2 EE/CA (*Army, 1999a*), is intended to provide a non-time critical mechanism for continuing with removal actions at OE sites. The OE RI/FS will evaluate past, ongoing, and future criteria used in making decisions related to removal activities. Once the OE RI/FS is completed and any future actions determined as necessary at OE sites are defined, the Army will transition from use of "removal" actions to use of "remedial" or future OE-related actions for the Track 3 sites.

Previous and ongoing removal actions will both reduce imminent explosive hazards and provide a means for gathering data about the type of UXO and level of explosive hazard at each of the sites addressed in the OE RI/FS. In addition to the processes implemented previously which were primarily driven by regulatory requirements, OE sampling and removal actions must also conform to specific Army and DOD safety and documentation requirements. For example, past removal actions have been implemented in accordance with the LDSP (*Army, 1994a*), the LDSP amendments (*Army, 1998b, 1998d*), and explosive safety submissions (ESS), which have been approved by the DDESB. As a requirement, these plans must clearly state the nature, extent, and types of known or suspected UXO contamination, the proposed use of the area, and procedures for mitigating the UXO hazard(s) in a manner compatible with the land reuse and in accordance with DOD safety standards.

4.5.1 Previous and Ongoing Investigations

To date, three OE removal contractors have performed ordnance sampling and removal actions at Fort Ord (Section 3.1). Human Factors Applications, Inc. (HFAI) and UXB International (UXB) completed work at Fort Ord from January through July 1994 and July 1994 through August 1995, respectively. USA Environmental (formerly CMS Environmental) began work in August 1995 and continues to perform these services. Procedures used by each of these contractors are presented in their respective work plans. Results of each contractor's work are presented in site specific After Action Reports. A summary of previous investigations is presented in the Phase 1 EE/CA.

During the OE RI/FS, past and present OE removal activities will be evaluated to determine adequacy of actions taken and the need for further investigation, if any. The OE RI/FS will evaluate:

- Previously used geophysical detection instruments
- Selection of methods of vegetation clearance prior to sampling and removals (details in Section 4.3)
- Site reconnaissance and sampling procedures (details in Section 4.4)
- Potential human health and environmental impacts from the detonation of UXO (sampling plan to be provided under separate cover)
- Conceptual site models vs. actual field conditions
- Completeness of previous removal actions relative to data quality objectives and potential residual risk.

As stated earlier, technical memoranda will be provided in addition to this Work Plan to focus on several of these issues and identify specific approaches and recommendations to be incorporated in the OE RI/FS program.

4.6 Identification of ARARs and Regulatory Requirements

This section outlines the process for identification of ARARs (applicable or relevant and appropriate requirements) that will be complied with during the OE RI/FS; summarizes the ARARs identified in the Phase 2 EE/CA that currently are being complied with during OE removal actions; and defines the ARARs.

4.6.1 Solicitation of ARARs for the OE RI/FS

Consistent with CERCLA [40 CFR 300.515(d)], "State Involvement in RI/FS Process," the Army as lead agency is soliciting and will communicate with the Department of Toxic Substances Control (DTSC) as the State of

California's point-of-contact agency for Superfund regarding the identification of state ARARs and To Be Considered requirements (TBCs) for the OE RI/FS being conducted at Fort Ord. In accordance with 40 CFR 300.400(g), the State will identify those chemical-, location-, and action-specific ARARs or TBCs that are applicable to the release or remedial action contemplated; that otherwise are relevant and appropriate; or advisories, criteria, and guidance that may be useful in developing the remedy.

In addition, the Army, as lead agency is responsible for identifying all Federal ARARs, and will obtain a review of ARARs from EPA.

The identification of ARARs or TBCs can be an iterative process; therefore, ARARs will be updated during the RI/FS process, and will become final when the ROD is signed. Determinations will be made after the initial screening of alternatives has been completed, but prior to initiation of the detailed analysis of alternatives that will be conducted as part of the feasibility study.

4.6.2 Current OE Site Removal Action ARARs

Chapter 2.0 of the Phase 2 EE/CA presented a detailed discussion of ARARs and TBCs for the OE sites for which the Army is required to comply to the extent practicable under the removal action. Responses to regulatory agency and public comments that suggested additions, deletions, and other changes to the list of ARARs were provided in a Responsiveness Summary to the EE/CA, and included in the Action Memorandum, Phase 2 EE/CA (*Army, 1999a*). OE removals at Fort Ord have been conducted and will continue to be conducted in accordance with these ARARs while the OE RI/FS is being prepared. The current list of ARARs may be altered during identification of ARARs that will be conducted as part of the OE RI/FS.

The following ARARs were identified in the Phase 2 EE/CA and the Action Memorandum, Phase 2 EE/CA for OE site removal actions:

- National Historic Preservation Act
- Archaeological Resources Protection Act
- Federal Endangered Species Act
- Clean Water Act Section 404(b)(1) and Executive Order 11990 (Protection of Wetlands)
- Hazardous Substance Transportation Regulations
- California Hazardous Waste Management Regulations
- California Clean Air Act.

4.6.3 Definition of ARARs

The OE RI/FS will contain a discussion of all ARARs and TBCs identified for UXO or OE and gathered from State, Federal, and other sources as described above. The Superfund Amendments and Reauthorization Act of 1986 (SARA; *U.S., 1986*) requires that cleanup alternatives consider and attain "legally applicable or relevant and appropriate" requirements (ARARs), which are promulgated under federal or state law. ARARs are designed to be protective of human health and the environment and to be technically achievable with existing remedial techniques. These "applicable" or "relevant and appropriate" and TBC requirements are defined as follows:

- Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a particular contaminated site.

- Whereas relevant and appropriate requirements are not “applicable” as defined above, they are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under federal or State law that address problems or situations sufficiently similar to those encountered at a particular site that their use is well suited to that site. The relevance and appropriateness of a requirement are judged by considering (1) the characteristics of the remedial action, (2) the hazardous substance(s) in question, and (3) the physical characteristics of the site.
- TBCs, the final class of requirements considered by EPA during the development of ARARs, are nonpromulgated advisories or guidance documents issued by federal or state governments. They do not have the status of ARARs but may be considered in determining the necessary cleanup levels or actions to protect human health and the environment.

Overall, three types of ARARs are defined by the U.S. EPA (*EPA, 1988*) and will be considered in the OE RI/FS:

- Chemical-specific or ambient ARARs are health- or risk-based numerical values for specific hazardous substances or contaminants.
- Action-specific ARARs are technology-based requirements triggered by the type of remedial action under consideration. This category also includes performance- and design-specific requirements, such as restrictions on the appearance of or noise from a remedial system.
- Location-specific ARARs impose restrictions on certain types of activities or contaminant concentrations in certain environmentally sensitive areas such as wetlands, flood plains, and historic sites.

4.7 Long-Term Risk Management

Long-term risk management (LTRM) employs controls to reduce potential exposures to UXO at former OE areas in the long term. The LTRM measures described in the Phase 2 EE/CA will be evaluated in the OE RI/FS along with other pertinent guidance or ARARs. Appropriate LTRM measures will be assigned based on a final risk evaluation for each site which will consider previous removal actions, existing data, remedial actions identified through the OE RI/FS and future land use, and will identify the level of control needed at a given site. These measures will be essential in managing residual risks associated with the potential presence of UXO either: (1) after a removal action has been performed, or (2) in lieu of a removal action in areas where a removal action was not necessary, but the potential for UXO to be present still exists.

An evaluation of the future potential for exposure to UXO at a given site will be conducted in the OE RI/FS based on a risk evaluation approach that will be developed as outlined in Section 4.8. Removal actions have been or are being conducted at OE sites at Fort Ord, and are necessary to mitigate the immediate risk of an OE exposure to the public. Despite these actions, and in any area at Fort Ord it is conceivable that UXO could remain. UXO could be encountered during site access or soil disturbance activities, or could be exposed through soil erosion, flooding, or other natural phenomena. Title 10 U.S.C. Section 172 and Department of Defense (DOD) 6055.9-STD (DOD Ammunition and Explosive Safety Standards) state that it is DOD policy to provide the maximum possible protection to personnel and property from potential damaging effects of accidents involving DOD ammunition and explosives. Therefore, the Army will implement LTRM measures at Fort Ord as outlined below. These measures will be described further in the OE RI/FS in

conjunction with other remedial actions as appropriate for each site.

4.7.1 Long Term Risk Management Measures

LTRM measures include institutional and engineering controls such as deed notifications and land use controls, signs, fencing, public education, and access control measures. In addition, the Army intends to evaluate the Proposed Range Rule that outlines a process for identifying appropriate clean-up actions on Closed, Transferred, and Transferring Military Ranges. Although the Proposed Range Rule is not promulgated, it does set forth a thorough protocol for managing risk. Therefore, LTRM measures at Fort Ord will also include recurring reviews by the Army to determine whether the responses taken at an OE site continue to minimize risk, and whether closeout reports documenting the responses have effectively addressed any site risks, as outlined in the Proposed Range Rule.

In addition to the LTRM measures listed above, certain sites will require indefinite construction support, i.e., the presence of a UXO expert during intrusive activities. Although construction support is, in and of itself, considered to be a remedial action and will be evaluated for inclusion in the remedial alternatives for a given OE site in the FS, it is mentioned here as it falls under LTRM. Other LTRM considerations will include applicable elements of 32 CFR 644 (Clearance of Explosive Hazards and Other Contamination From Proposed Excess Land and Improvements).

4.7.2 Long Term Risk Management Actions for All Sites

As described above, different types of LTRM measures will apply to various sites depending on the type and depth of OE removals performed, the intended land use, and the results of the risk evaluation. However, regardless of a

site's removal and risk evaluation status, the following components of the Proposed Range Rule will be applied to all OE sites at Fort Ord. These measures will be defined further in the OE RI/FS.

The Army will perform recurring reviews at each of the OE sites after remedial actions have been completed to determine if the responses taken at a site continue to appropriately minimize explosive risks and protect human health and the environment. The recurring review process will be performed in cooperation with regulatory agencies and the public and will encourage input from them at various stages throughout the process. The reviews will evaluate changes in physical conditions, changes in public accessibility, applicability of new technology, and continued effectiveness of the response.

The Army will initiate a review of each of the OE sites within 3 years after the completion of the response. However, if OE should be found at any of the sites prior to the 3-year review period, the review would be initiated following discovery and removal of the item(s). If the 3-year review indicates that no evidence of OE has been discovered or that no OE-related incident has occurred, then the recurring review report would state that the response was appropriate and may serve as the close-out report and final document for the site. Subsequent reviews may be repeated in the seventh year after completion of the response and on a five-year interval thereafter, for as long as needed. The Army will obtain the concurrence of the EPA and DTSC concerning: (1) the status of the site in regards to protectiveness of human health and the environment, and (2) the adequacy, term, and report content of the recurring reviews and close-out report.

4.7.3 Public Education

A plan outlining the elements of the public education program and procedures for its

implementation will be developed separately and summarized in the OE RI/FS; in general, it will include annual public informational meetings and annual distribution of packages to property owners. These targeted notifications will also include a request to forward the information to all property users. Packages sent to property owners annually will include two separate components: (1) site-specific information on the history and current status of the property related to OE, and (2) general information regarding the hazards associated with OE as well as notifications of public meetings. The site-specific package will continue to be sent to property owners annually until the site is closed and the close-out report is completed. The general information annual package will continue to be sent to property owners until all the OE sites are closed and the close-out reports are completed. Deed notifications will also inform property owners of the site's status related to OE.

The deed notification will include the following: "Ordnance and explosives (OE) investigations indicate that OE is not likely on this Property. However, because this is a former military installation with a history of OE use there is a potential for OE to be present on the property. In the event Grantee or its successors and assigns should discover any ordnance on the Property, they shall not attempt to remove or destroy it, but shall immediately notify the local Police Department or the Directorate of Law Enforcement at the Presidio of Monterey. Competent U.S. Army Explosive Ordnance Disposal personnel will be dispatched promptly to dispose of such ordnance properly at no expense to the Grantee. The Grantee hereby acknowledges receipt of the 'Ordnance and Explosives Safety' pamphlet."

4.8 Risk Evaluation

The main purpose of the risk evaluation portion of the OE RI/FS is to provide an estimate of the risks posed by site conditions, and assess whether a past or planned removal or remedial

action at a site was or will be effective in reducing those risks. The risk evaluation will be used to gauge a site's status in terms of public safety during future reuse of Fort Ord lands, and will:

- Estimate the public's exposure to and interaction with UXO in terms of possible injury or death to humans, and
- Consider risks to the environment due to the presence of UXO and methods employed in its removal.

The estimated risk posed by a site is only one element in making an informed risk management decision regarding site-specific remedial actions. Long term risk management measures (Section 4.7) and reevaluation of intended land use are some of the other factors to be considered in making risk management decisions.

4.8.1 Risk Evaluation Methodology

The risk evaluation portion of the OE RI/FS will consider the risk assessment model parameters outlined in the Proposed Range Rule and summarized below in the context of any qualitative, quantitative, and statistical methods that may be available. As described in the Proposed Range Rule (*DOD, 1997*), "The Department of Defense (DOD) recognizes there is an urgent need to develop a risk assessment model for military range. Although there are already several risk assessment models for ranges under various stages of development, none comprehensively address the risks posed by both military munitions and other constituents." *The Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California, January 13, 1997*, addressed chemical contamination at a number of the OE sites, among other issues.

While risk models are being developed for UXO, removal actions to reduce risks (imminent explosive hazards) must continue to

be conducted. As described in the Action Memorandum, Phase 2 EE/CA (*Army, 1999a*), in general, prioritization of OE sites for removal action is currently based on the following criteria listed in order of importance assigned:

1. Location of UXO relative to ground surface (i.e., surface or subsurface)
2. Type of UXO found or suspected to have been used at the site (i.e., severity of explosive hazard)
3. Proximity of the site to the public (e.g., residences or businesses)

The presence of fencing and/or warning signs at a site is also considered; however, these controls cannot solely be relied upon to prevent access.

In addition, the following information requirements recommended for identification in the Proposed Range Rule will be considered in the risk evaluation portion of the OE RI/FS:

1. The source of the risk (e.g., the specific munition)
2. The receptors, pathways, and potential exposures
3. The effects of the potential exposures (e.g., the types of injuries that accidental explosion of munitions can cause).

The OE RI/FS will present the methodology for performing a risk evaluation associated with potential exposure to UXO at former OE areas for both human and environmental receptors. Areas identified that have never been suspected as having been used for ordnance-related activities of any kind (Track 0 sites; Section 1.3) will be candidates for no further investigation or action.

In general, the risk evaluation process will be applied at each OE site, and will consider among other factors to be developed during the OE RI/FS: (1) historic data, (2) data from previous sampling and/or removal actions,

(3) the intended future land use, and (4) and evaluation of geophysical detection instruments to the site-specific data and site classification (tracking) described in Section 1.0. The following parameters (described in the Proposed Range Rule) will be considered for each site:

1. The specific type(s) of military munitions employed on the range
2. The fuze types used
3. The density (i.e., spatial distribution) of UXO on the range
4. The anticipated and/or observed depth of the munitions
5. Public access to the range (i.e., the likelihood of exposure to the public)
6. The terrain, vegetation, soil type, and climate
7. Current and anticipated land use (Group or Category assigned in the EE/CAs).

Title 10 U.S.C. Section 172 and DOD 6055.9-STD (DOD Ammunition and Explosive Safety Standards) state that it is DOD policy to provide the maximum possible protection to personnel and property from potential damaging effects of accidents involving DOD ammunition and explosives. As described in Section 4.7, it is conceivable that UXO and/or small arms could remain on the sites and be exposed at or near the ground surface due to soil erosion, flooding, or other natural phenomena, or during future site access or soil disturbance activities. These issues will be addressed in the risk evaluation and long term risk management portions of the OE RI/FS.

4.8.2 Previous Actions to Reduce Risks

The presence of UXO at the base was evaluated by the USACE, St. Louis District, in the December 1993 Archives Search Report, the November 1994 ASR Supplement, and the 1997

Draft Revised ASR (*USAEDH, 1993, 1994a, 1997a*). Based on historical research at archives and records holding facilities, personal interviews, and site visits, the ASR provides a historical summary of OE activities and site-specific evaluations and recommendations for known and suspected OE sites.

Using this information, the Army identified areas within Fort Ord having significant risk of encountering UXO. Ordnance removal contractors that have performed work in these areas include Human Factors Applications, Inc. (HFAI), UXB International, Inc. (UXB), and the current contractor, USA Environmental (formerly CMS Environmental). HFAI and UXB conducted removal activities primarily between January 1994 and August 1995. USA's activities began in August 1995 and are ongoing. These ordnance removal contractors have prepared after-action reports that document areas subjected to OE removal actions.

Removal actions to reduce imminent explosive hazards associated with UXO are ongoing at Fort Ord. These removal actions have been conducted as Time Critical Removal Actions (TCRAs) as described in the *Fort Ord Ordnance and Explosive Waste Time-Critical Removal Action Memorandum (Army, 1994b)*. The Action Memorandum, Phase 2 EE/CA (*Army, 1999a*), is intended to provide a non-time critical mechanism for continuing with removal actions at OE sites, both to reduce imminent explosive hazards and provide a means for gathering data about the type of UXO and level of explosive hazard at each of the sites for use in the OE RI/FS.

In addition, information in the following reports were used in the selection of the removal and/or sampling action alternatives for these sites: *Army Environmental Impact Statement (EIS) (June 1993)*; the *Supplemental EIS (December 1995)*; the *Fort Ord Reuse Authority Base Reuse Plan (May 1996)*; the *Installation-Wide Multispecies Habitat Management Plan (HMP) (April 1997)*; and *Penetration of Projectiles into the Ground: An Analysis of*

UXO Clearance Depths at Fort Ord, Revision 3 (April 1997).

Of the numerous OE sites, the Phase 1 EE/CA addressed 29 OE sites, and the Phase 2 EE/CA addressed the remaining known, suspected, potential, and any future sites. The *Record of Decision, Basewide Remedial Investigation Sites, Fort Ord, California, January 13, 1997*, addressed chemical contamination at a number of the OE sites, among other issues.

4.8.2.1 Public Health

Removal activities have been and are being performed at many of the sites addressed in the Phase 2 EE/CA to mitigate significant explosive safety hazards to the public. For the purpose of performing past and ongoing removal actions, the probability of exposure to UXO and hazard severity for the OE sites addressed in the EE/CAs were evaluated using the Ordnance and Explosives Cost-Effectiveness Risk Tool (OECert) model as described in the EE/CAs. It was developed as a risk evaluation model by the U.S. Army Engineering Division, Huntsville, Ordnance and Explosive (OE) Center of Expertise (CX) and Design Center.

The OECert model as well as other types of risk evaluation methods will be considered in the risk evaluation portion of the OE RI/FS. A risk evaluation will be performed for all OE sites, either: (1) after the removal action has been performed under TCRA or the Action Memorandum, Phase 2 EE/CA and (2) at OE sites that did not require a removal action to address imminent safety hazards associated with UXO, but the potential for UXO to be present still exists (See Section 1.3 regarding tracking of OE sites). Areas identified that have never been suspected as having been used for ordnance-related activities of any kind (Track 0 sites; Section 1.3) will be candidates for no further investigation or action. Once the residual or existing risk is evaluated at a site, remedial action alternatives will be evaluated against the nine CERCLA criteria in the FS to identify whether further actions and long term

risk management measures (Section 4.7) will be necessary to mitigate any unacceptable risks.

4.8.2.2 The Environment

As discussed in the Action Memorandum, Phase 2 EE/CA and Section 4.6.2, removal actions at the OE sites have been or will be conducted in compliance with ARARs and the HMP, PA, and Prescribed Burn Work Plan, and no unacceptable risks to the environment have been identified. The OE RI/FS will reevaluate environmental risks associated with the presence of UXO, its removal, and impacts from vegetation removal techniques such as burning that are required in order to access and remove UXO in certain areas of Fort Ord.

Chapters 2 and 4 of the Phase 2 EE/CA address potential environmental resources and risks associated with existing UXO and OE sampling and removal actions at the former Fort Ord. Areas discussed include biological resources, cultural resources, and air quality.

Vegetation removal techniques and UXO sampling and removal activities will have impacts on flora and fauna, cultural resources, and air quality. In order to access the ground surface for OE sampling and removal activities, mechanical, manual methods, and prescribed burning of designated natural resource management areas will be implemented to mitigate negative impacts to protected species. Vegetation burning may also be necessary in those areas where mechanical or manual vegetation removal is not safe. UXO identified during removal activities throughout Fort Ord will be handled using approved practices and procedures; some UXO will be detonated in place due to its extremely explosive hazard.

The Phase 2 EE/CA describes how risks to the environment will be reduced during sampling and removal actions. The HMP describes measures to be implemented to protect biological resources including sensitive plant and animal species and other natural communities when implementing UXO

sampling and removal actions (*USACE, 1997b*). For cultural resources, a Programmatic Agreement (PA) was executed in May 1994 between the Army, the California State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (Council) (*Army, et al., 1994*) which allows the Army to proceed with OE sampling and removal actions if specified measures are implemented. Potential air quality impacts from prescribed burning activities were estimated in the Prescribed Burn Work Plan (*HLA, 1997a*) which also describes required measures to minimize impacts on sensitive receptors. Issues regarding potential impacts to air quality are also addressed in the Responsiveness Summary to the Phase 2 EE/CA provided in the Action Memorandum, Phase 2 EE/CA.

4.9 Community Relations

Community relations activities for the OE RI/FS are intended to keep communities informed of OE-related activities at Fort Ord, and help supporting agencies respond to community concerns. Community relations activities for the overall OE program are described in the *Community Relations Plan, Ordnance and Explosives Program, Fort Ord, California (Army, 1998)* (CRP) and the *Community Relations Plan Update Number 1, Fort Ord, California (Army, 1999b)*. In November 1998, the Army agreed to evaluate UXO at Fort Ord in an OE RI/FS. Although the CRP was created to address community relations for the overall OE program prior to the initiation of the OE RI/FS, the content of the CRP is still applicable and valid for OE RI/FS activities and is updated on an annual basis.

The CRP outlines communication techniques that will be used to keep the affected community informed throughout the OE removal and OE RI/FS process. The OE RI/FS will include a summary of community relations activities conducted during the planning and document preparation phases of the OE RI/FS process; these activities will be conducted in

keeping with the process outlined in the CRP for the overall OE program at Fort Ord.

Public participation activities, including educational programs and brochures, fact sheets, public notices and press releases to date related to OE sites at Fort Ord have been conducted in accordance with CERCLA.

The following sections summarize the approach outlined for community relations activities in the CRP that will be used during the OE RI/FS process.

4.9.1 Community Involvement

Community includes elected officials and public agencies; on-base and nearby businesses and residents; employees of the installation; environmental and special interest groups; those with an interest in the activities associated with the installation in the past; and those who are interested in future uses of the area. The CRP describes the community profile surrounding Fort Ord, a chronology of community involvement, and continuing involvement in the planning and implementation of the OE Program.

Continuing community involvement will be achieved through a combination of newspaper notices, articles, fact sheets, presentations, community information work shops, public meetings, and tours.

4.9.2 Community Relations Strategy

Implementation of community relations for the OE RI/FS will focus on providing information regarding the types of UXO on Fort Ord, the timeline and reporting and scheduling of OE RI/FS activities, and potential hazards associated with the presence of OE. As outlined in the CRP, there are several objectives of the community relations program in general that also apply to the OE RI/FS. The Army will endeavor to provide the following in

conjunction with the regulatory agencies involved in the OE RI/FS process:

1. Enlist support of neighborhood representatives and local officials
2. Ensure a steady flow of information to and from stakeholders (i.e., local communities and their members affected by the base closure and OE RI/FS process)
3. Provide timely and accurate information concerning OE actions to the community
4. Keep the media informed about OE RI/FS activities
5. Provide regular updates to interested community members
6. Maintain the availability of information to community members through accessible information repositories
7. Implement Environmental Justice Executive Order 12898. Provide announcements, fact sheets, and convenient information locations to inform minority community groups based on an evaluation of the ethnic makeup and predominant language used within significantly represented minority groups. Provide translation of cleanup information upon request.

4.9.3 Implementation of Community Relations Activities

The CRP contains a detailed description of the responsibilities of various parties in implementing community relations activities. The Army is committed to providing information about the OE RI/FS on a continuing basis to interested community members and groups under the framework described in the CRP.

Specific community relations activities related to conducting the OE RI/FS include:

- Providing orientation for organizations, agencies, and groups
- Coordinating with the local Housing Authorities, schools, and businesses on the Former Fort Ord
- Conducting meetings for post residents as necessary
- Mailing fact sheets to community members who have requested to be on the community relations mailing list, regarding significant OE RI/FS milestones
- Publishing public notices in local newspapers, and providing press releases to radio and television media announcing the availability of OE RI/FS-related documents and opportunities for public comment
- Responding to comments and inquiries from the community on OE RI/FS-related documents
- Soliciting media coverage, providing updates, and publishing advertisements related to OE RI/FS activities
- Reviewing and updating the CRP on an annual basis
- Publishing the *Advance*, a quarterly newsletter that addresses environmental and OE-related issues at Fort Ord
- Updating local officials and neighborhood associations on the OE RI/FS process
- Providing a technical point of contact for all community inquiries regarding the OE RI/FS
- Maintaining the information repositories and Administrative Record to include OE RI/FS-related documents

- Conducting public meetings at appropriate milestones in the OE RI/FS process.

4.9.4 State and Local Authorities' Roles

State and local government cooperation has included regulatory agency involvement during the development of the EE/CAs, Action Memoranda, and the OE RI/FS for OE at Fort Ord. The Army continues to conduct the OE response, inform state and local agencies of progress related to OE sampling and/or removal actions, and accept and respond to state and local agency input regarding implementation of those actions and conducting the OE RI/FS.

4.9.5 Public Education

The public education program will be defined in the OE RI/FS; in general, it will include annual public informational meetings and annual distribution of packages to property owners. These targeted notifications will also include a request to forward the information to all property users. Packages sent to property owners annually will include two separate components: (1) site-specific information on the history and current status of the property related to OE, and (2) general information regarding the hazards associated with OE as well as notifications of public meetings. The site-specific package will continue to be sent to property owners annually until the site is closed and the close-out report is completed. The general information annual package will continue to be sent to property owners until all the OE sites are closed and the close-out reports are completed. Deed notifications will also inform property owners of the site's status related to OE.

In response to concerns expressed by local parents and schools, an OE school safety program was developed in 1997 by the Army Corps of Engineers and offered to all Seaside elementary and middle schools. The school safety program was expanded in February 1999 to include students in all local community

elementary, middle, and high schools. Army ordnance specialists provided presentations to 1,392 local students during the 98-99 school year (*Army, 1999b*).

4.10 Health and Safety

This section discusses various health and safety issues that are currently being addressed and will continue to be addressed during and after the OE RI/FS process. In general, health and safety concerns are associated with potential OE-related exposures to the public, the OE removal contractors, and other workers performing OE RI/FS related investigations. Several planning documents are being implemented or are in preparation to address these concerns.

4.10.1 Public Health and Safety

It is critical that health and safety measures to protect the public during and after OE sampling and removal activities are clearly addressed and implemented. The approved OE contractors work plan (currently USA, 1999) contains procedures to isolate and secure OE sites while sampling and removal activities are in progress. These procedures were developed in accordance with Army and DOD safety requirements for UXO operations. Various measures are already in place to prevent unauthorized access into known and suspected OE areas. These measures have been developed based on Army and DOD safety requirements and standards, and will be evaluated in conjunction with cleanup alternatives under the OE RI/FS. The CRP (*Army, 1998*) and the CRP Update

Number 1 (*Army, 1999b*) identify procedures for providing graphical and written information to the public concerning the hazards of OE and describe procedures for notifying officials when OE is found. The community relations program includes strategy for long-term programs for informing the community and property recipients of ordnance-related issues at Fort Ord. Additional discussion of the community relations program for Fort Ord is presented in Section 4.9.

4.10.2 OE Worker Safety

A contract-specific health and safety plan to protect OE team personnel during surveying, sampling, and removal actions has been prepared and approved (*USA, 1999*). This plan addresses potential hazardous operations that may be performed by the OE Team such as vegetation removal, OE sweep efforts, and removal operations.

4.10.3 Safety of Other Workers Performing OE RI/FS-Related Tasks

During the OE RI/FS process, it is likely that non-OE Team individuals will need to visit or perform work in known or suspected OE areas. The OE contractors work plan (*USA, 1999*) identifies procedures for escorting and monitoring workers in areas of potential concern. In addition, other pertinent documents that will be summarized in the OE/RI/FS contain OE avoidance procedures as well as general health and safety procedures to be followed during investigations at Fort Ord.

5.0 OE RI/FS TASKS

This chapter describes the standard OE RI/FS tasks that have been defined to provide consistent reporting and effective monitoring of this project. The OE RI/FS tasks presented below are consistent with those provided in EPA's RI/FS guidance document (*EPA, 1988*). For each OE RI/FS task, a general definition of the task is provided, followed by a more detailed description of how the task applies to this project.

5.1 Task 1 Project Planning

This task includes efforts related to initiating the project and scoping project activities. The majority of project planning occurs during the scoping phase of the OE RI/FS and includes both site planning and project planning. However, because of the iterative nature of the OE RI/FS, the planning process continues throughout the project. The initial project planning process is documented in the following planning documents: the OE RI/FS Work Plan (this document), Draft Sampling and Analysis Plan and Draft Site Health and Safety Plan (*USA, 1999*).

5.2 Task 2 Community Relations

This task includes the efforts related to the preparation and implementation of the Fort Ord Ordnance and Explosives Community Relations Plan and is usually initiated during the scoping process. Community relations activities serve to keep communities informed of activities at Fort Ord and help the supporting agencies respond to community concerns. The ordnance related community relations programs for Fort Ord are described in the CRP (*Army, 1998*) and the CRP Update Number 1 (*Army, 1999b*).

5.3 Task 3 Field Investigation

This task incorporates efforts related to fieldwork in implementing the OE RI/FS. Section 4.2 of this Work Plan presents the investigation approach for the field work for the RI. The Field Sampling Plan (FSP) will present the specific work scopes for the fieldwork and the Quality Assurance Project Plan (QAPP) will detail the procedures to be followed when carrying out the field activities (*HLA, 1997a*).

5.4 Task 4 Sample Analysis/Validation

This task includes efforts relating to the analysis and validation of any samples obtained during field investigation, grid sampling, and OE removal activities. Sample analysis and validation is described fully in the Chemical Data Quality Management Plan (CDQMP) (*HLA, 1997a*). QA/QC procedure for OE related activities is described in OE contractor documents (*USA, 1999*).

5.5 Task 5 Data Evaluation

This task includes the evaluation of data once it has been verified. Typical data evaluation activities include data reduction, data tabulation, fate and transport modeling.

5.6 Task 6 Risk Assessment

This task includes efforts related to assessing risks to human health and the environment. In general, the objectives of a baseline risk assessment or risk evaluation will be attained by identifying and characterizing the following:

- Potential human and environmental receptors

- Potential exposure routes and extent of actual or expected exposure
- Extent and likelihood of expected impact or threat
- Level of uncertainty associated with above items.

5.7 Task 7 Treatability Studies

This task includes efforts to prepare and conduct pilot, bench, or other treatability studies. Treatability studies are conducted primarily to achieve the following:

- Provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the detailed analysis and to support the remedial design of a selected alternative
- Reduce cost and performance uncertainties for treatment alternatives to acceptable levels so that a remedy can be selected.

The necessity for treatability studies for the Fort Ord OE RI/FS has not yet been established, but such necessity will be identified as early in the OE RI/FS process as possible. If treatability studies are warranted, a work plan detailing the studies will be prepared.

5.8 Task 8 Remedial Investigation Reports

This task consists of efforts related to preparation of the RI findings once the data have been evaluated and includes all draft and final RI reports as well as task management and quality control.

5.9 Tasks 9, 10, and 11 Feasibility Study

Tasks 9, 10, and 11 described below, comprise the Feasibility Study activities. The feasibility study will be conducted in accordance with the EPA's RI/FS guidance document (*EPA, 1988*).

5.9.1 Task 9 Remedial Alternatives Screening

This task includes efforts to select and initially screen the remedial technologies and alternatives that will be subjected to detailed evaluation. This FS task is initiated during the data evaluation task when sufficient data are available to begin the screening process. Selected remedial alternatives will be screened on the basis of the effectiveness, implementability, and order-of-magnitude cost. On the basis of the results of the screening process, selected alternatives will be retained for detailed analysis.

5.9.2 Task 10 Remedial Alternatives Evaluation

This task comprises the detailed analysis of remedial alternatives. Alternatives remaining after the screening process will undergo further analysis using the nine evaluation criteria specified by CERCLA (*EPA, 1988*) for RI/FS programs:

2. Overall protection of human health and the environment
3. Compliance with Applicable or Relevant and Appropriate Requirements
4. Long-term effectiveness and permanence
5. Reduction of toxicity, mobility, or volume
6. Short-term effectiveness
7. Implementability
8. Cost
9. State acceptance
10. Community Acceptance.

The Results of the detailed analysis of remedial alternatives will become a major factor in selecting a preferred alternative after completion of the OE RI/FS.

5.9.3 Task 11 Feasibility
Study Reports

This task consists of efforts relating to preparation of FS deliverables and includes all draft and final reports. Specific reporting requirements will be presented in a separate submittal.

6.0 SCHEDULING AND REPORTING

Scheduling and reporting requirements will be presented in a separate submittal.

7.0 REFERENCES

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PLATES



MONTEREY BAY

8th Street

Imjin Road

Inter-Garrison Road

SR 1

North-South Road

Sand City

Seaside

SR 218

Del Rey Oaks

SR 68

Boundary Road

Laguna Seca

Barloy Canyon Road

Toro Regional Park

Facility Boundary of Former Fort Ord

Marina

Reservation Road



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Location Map - Former Fort Ord
 OE/RIFS Work Plan
 Former Fort Ord
 Monterey, California

PLATE

1

DRAWN
 TJH

JOB NUMBER
 46310 001133

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DATE
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nfa apr - 2/25/00 - Location map



EXPLANATION

OE-30 OE Site Location and Number



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Previously Identified Known or Suspected OE Sites
OE RI/FS Work Plan
Former Fort Ord
Monterey, California

PLATE
2

DRAWN
TJH

JOB NUMBER
46310 001133

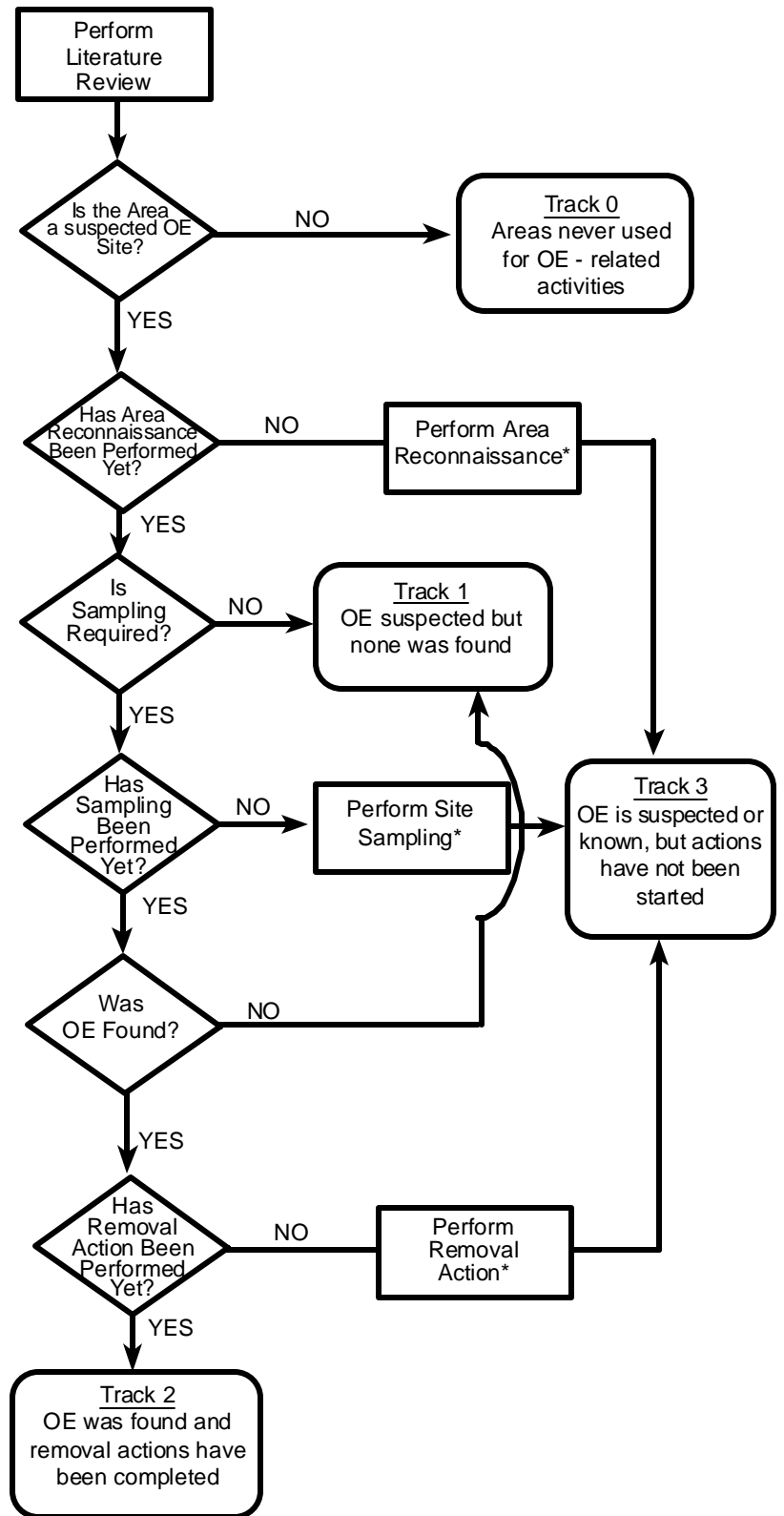
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EECA.apr - layout 1 - 2/25/00

All Tracks - 0, 1, 2, 3
Supporting Information
Proposed Plan
Record of Decision



* If the activity is completed but does not satisfy project DQOs, the site enters the Track 3 Process.



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Decision Criteria Flow Chart
Plan for Evaluation of Post Work
Former Fort Ord
Monterey, California

PLATE

3

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


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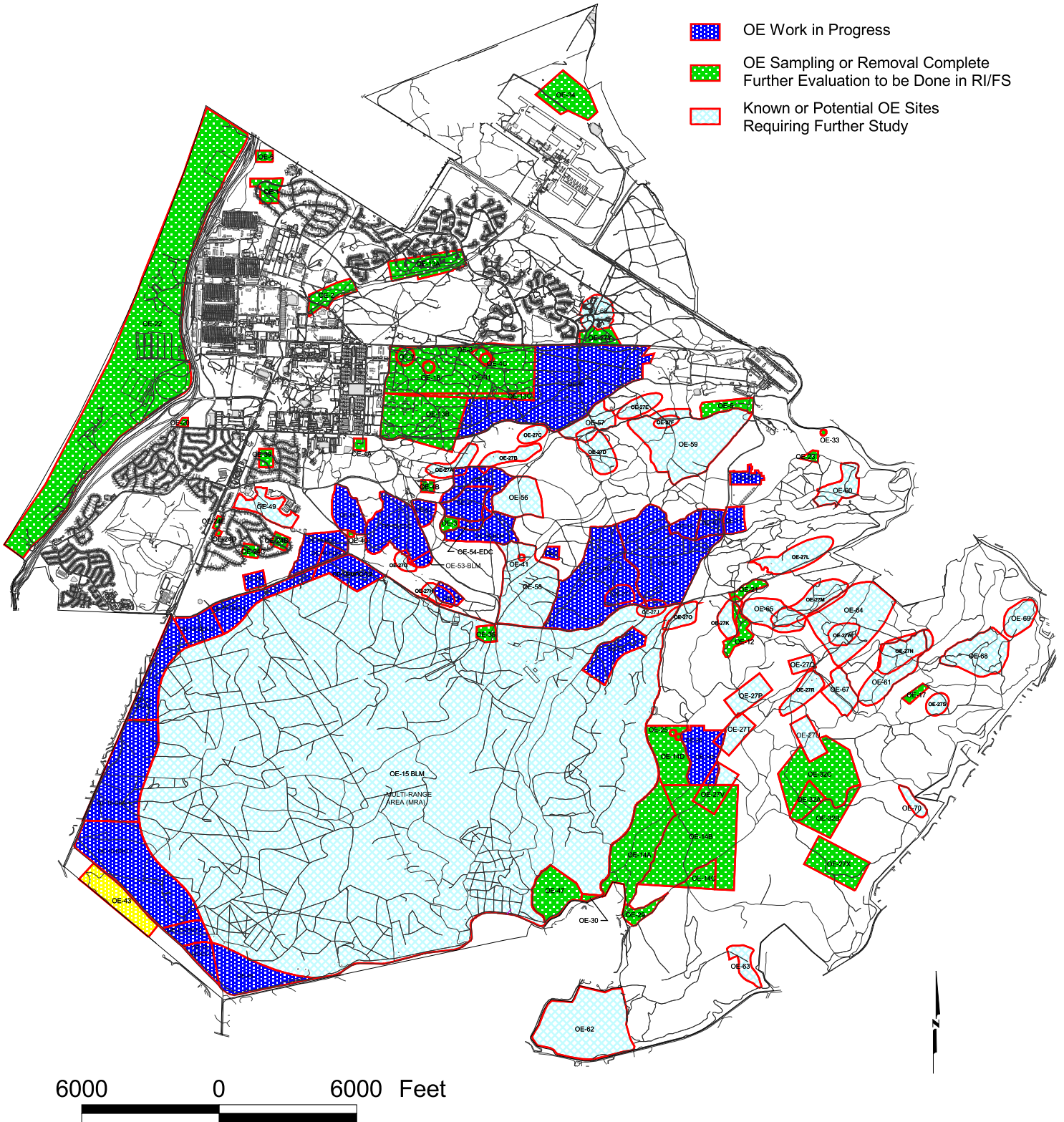
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EXPLANATION

-  OE Work in Progress
-  OE Sampling or Removal Complete
Further Evaluation to be Done in RI/FS
-  Known or Potential OE Sites
Requiring Further Study



litrev1.apr - 2/25/00- OE status




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OE Site Status
OE RI/FS Workplan
Former Fort Ord
Monterey, California

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



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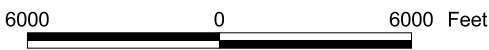
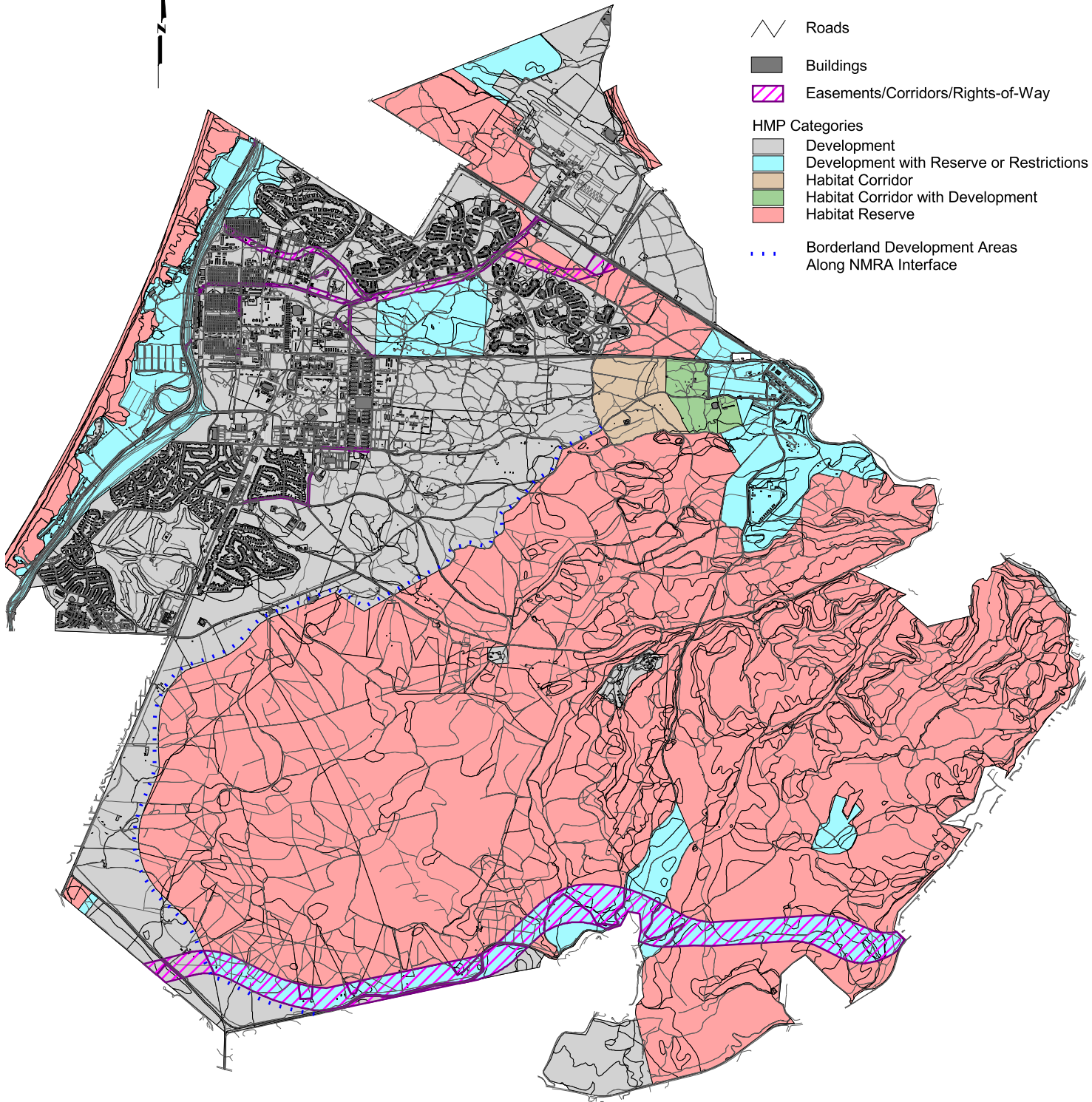
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FIGURE
4

EXPLANATION

-  Roads
-  Buildings
-  Easements/Corridors/Rights-of-Way
- HMP Categories**
 -  Development
 -  Development with Reserve or Restrictions
 -  Habitat Corridor
 -  Habitat Corridor with Development
 -  Habitat Reserve
-  Borderland Development Areas Along NMRA Interface



cerifsapr - Plate 5 - 2/25/00



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Land Reuse (HMP)
OE RI/FS Work Plan
Former Fort Ord
Monterey, California

PLATE
5

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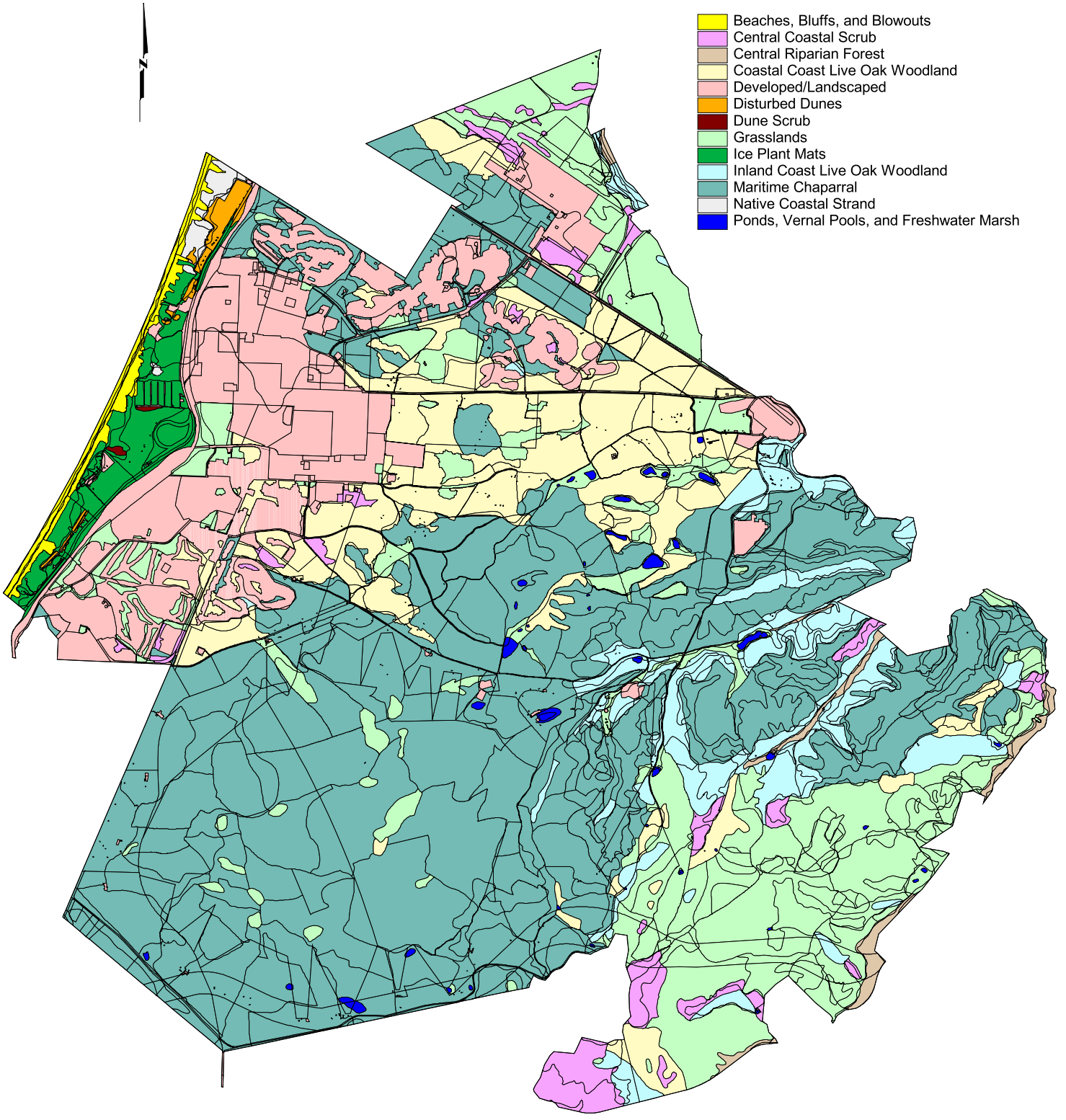
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EXPLANATION

- Beaches, Bluffs, and Blowouts
- Central Coastal Scrub
- Central Riparian Forest
- Coastal Coast Live Oak Woodland
- Developed/Landscaped
- Disturbed Dunes
- Dune Scrub
- Grasslands
- Ice Plant Mats
- Inland Coast Live Oak Woodland
- Maritime Chaparral
- Native Coastal Strand
- Ponds, Vernal Pools, and Freshwater Marsh



6000 0 6000 Feet

ceerfsapr - Plate 6 - 2/25/00



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Plant Communities
OE RI/FS Work Plan
Former Fort Ord
Monterey, California

PLATE

6

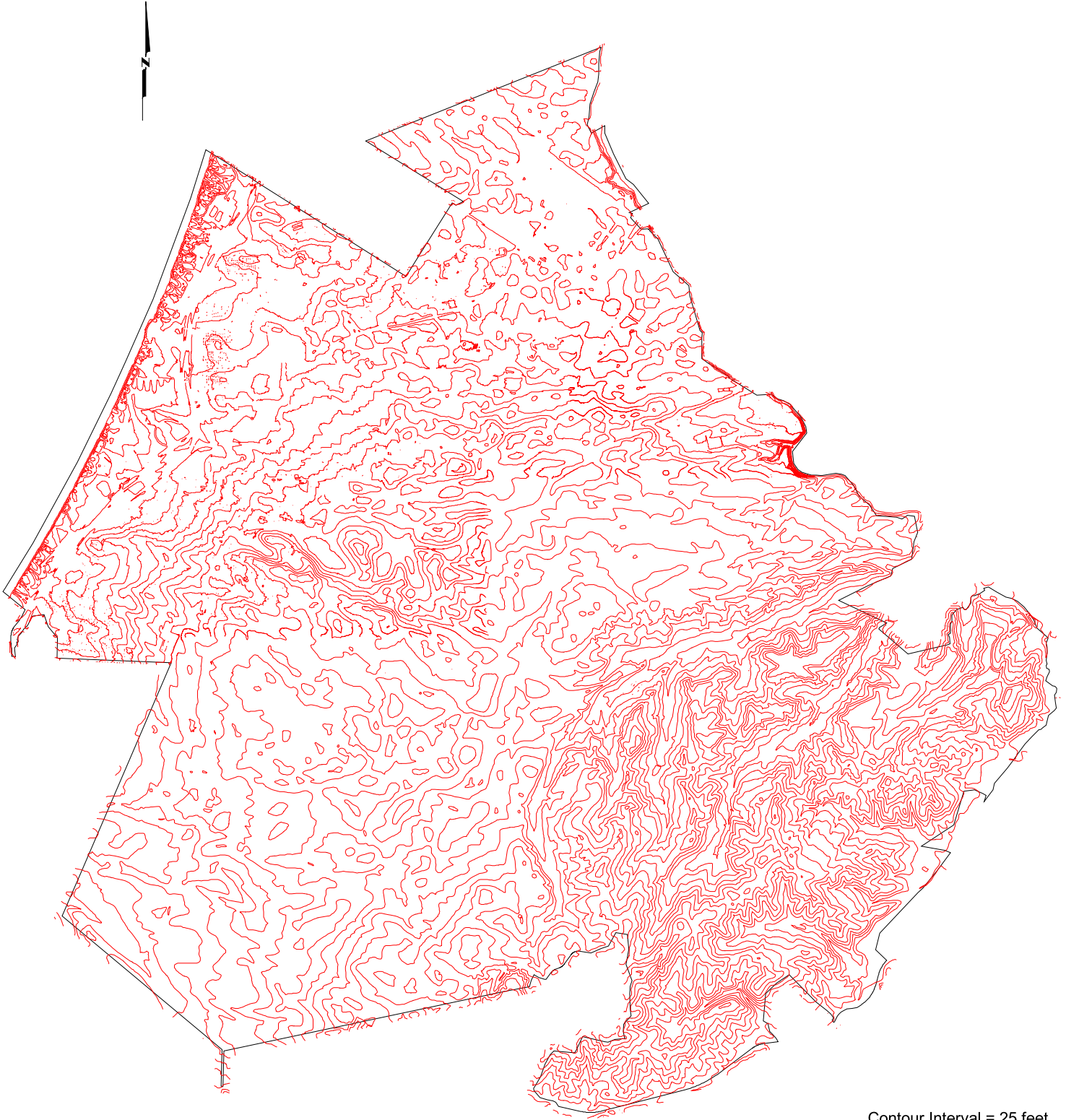
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6000 0 6000 Feet

Contour Interval = 25 feet

oeifisapr - Plate 4 - 2/25/00



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Topographic Map
OE RI/FS Work Plan
Former Fort Ord
Monterey, California

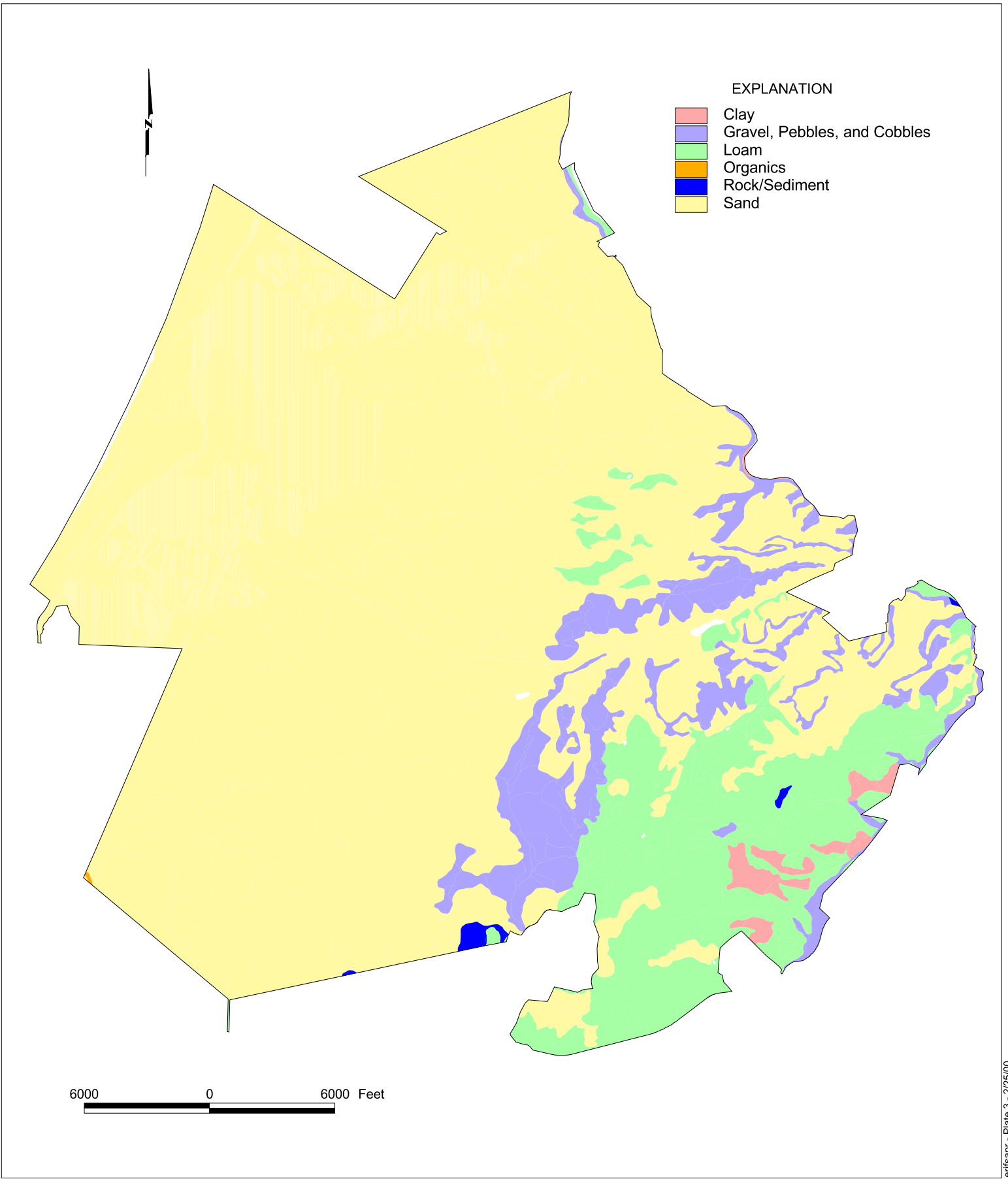
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PLATE

7



erifsapr - Plate 3 - 2/25/00



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Generalized Soil Types
 OE RI/FS Work Plan
 Former Fort Ord
 Monterey, California

PLATE

8

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Surface debris would be found at these locations. Soldier trash, expended/live small arms (bullets), expended live flares, expended/ live grenades, etc.



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Training Site
Conceptual Site Model
OE RI/FS Work Plan, Preliminary Draft
Former Fort Ord
Monterey, California

PLATE
9

DRAWN DJPC	JOB NUMBER 46310 001133	APPROVED	DATE 02/00	REVISED DATE
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Firing Ranges
 Conceptual Site Model
 OE RI/FS Work Plan, Preliminary Draft
 Former Fort Ord
 Monterey, California

PLATE

10

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Instructional/training exercises only. No live fire.



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Non-Firing Ranges
Conceptual Site Mode
OE RI/FS Work Plan, Preliminary Draft
Former Fort Ord
Monterey, California

PLATE

11

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Soldiers burying a variety of items (e.g. grenades, rockets, bullets, etc.)



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Environmental Services

Burial Pit
Conceptual Site Model
OE RI/FS Work Plan, Preliminary Draft
Former Fort Ord
Monterey, California

PLATE

12

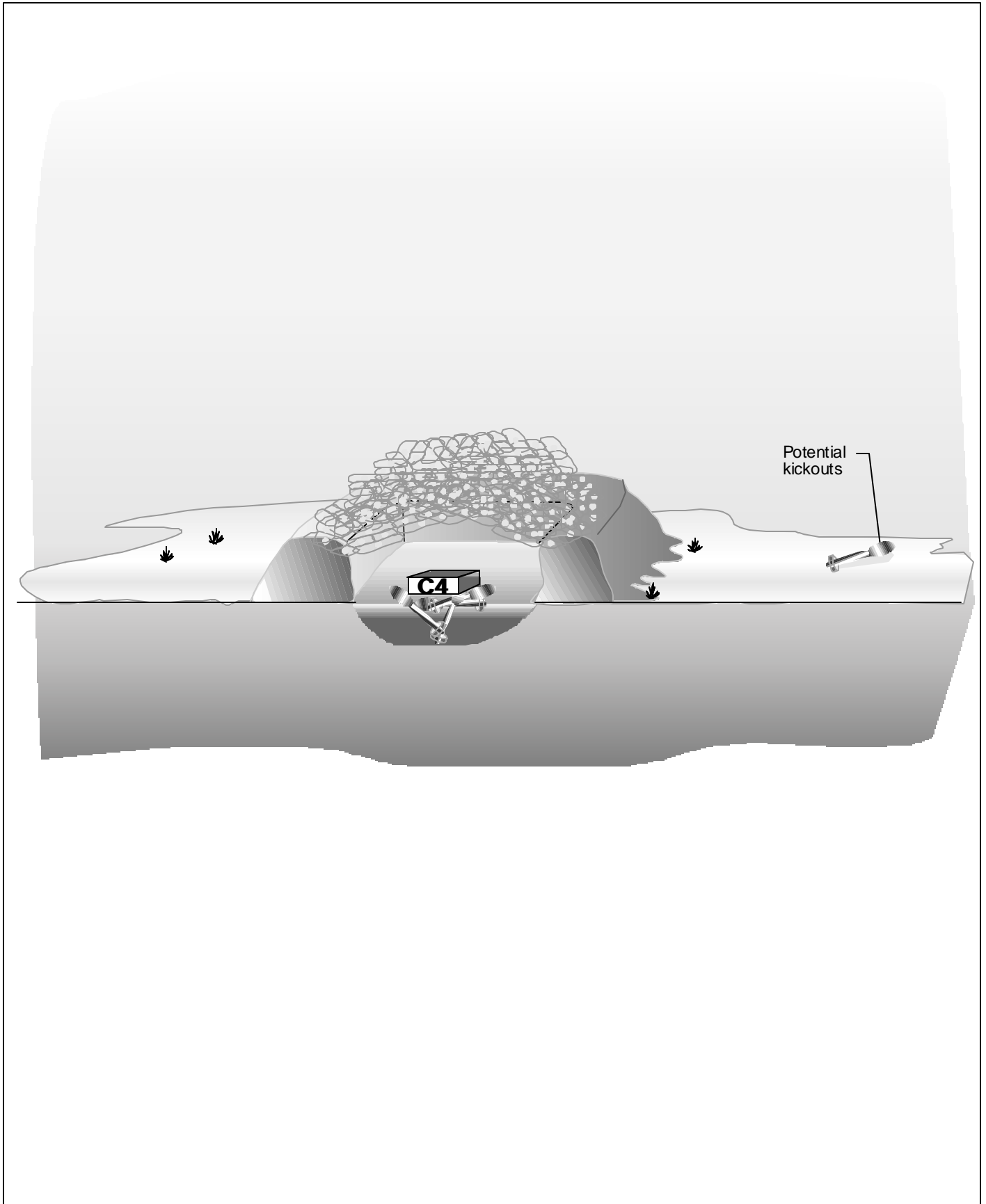
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02/00

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Open Detonation (OD) Area
Conceptual Site Model
OE RI/FS Work Plan, Preliminary Draft
Former Fort Ord
Monterey, California

PLATE

13

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46310 001133

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02/00

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APPENDIX A

RESPONSE TO COMMENTS
ON THE DRAFT ORDNANCE AND EXPLOSIVES
REMEDIAL INVESTIGATION STUDY WORK PLAN
FORMER FORT ORD, MONTEREY COUNTY, CALIFORNIA
DATED JULY 30, 1999

- I. CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY, DEPARTMENT OF TOXIC SUBSTANCES CONTROL COMMENTS, DATED NOVEMBER 10, 1999

General Comments:

This transmits our comments on the subject document. It was received in our office August 7, 1999.

Comment A: (1st paragraph): This work plan should remain draft and not be finalized until agreement is reached on the completeness of the Remedial Investigation and Feasibility Study. Provisions for augmentation of proposed studies or initiation of additional tasks or studies, if they are found necessary, should be presented in this work plan.

Response A: The work plan provides a general approach to the Ordnance and Explosives Remedial Investigation/Feasibility Study (OE RI/FS). The work plan identifies key components of the OE RI/FS as separate studies to be conducted. However, additional studies may be identified in the future as critical in supporting the decisions that will be made under this process. The Fort Ord OE RI/FS will incorporate additional studies as appropriate, upon concurrence among the Army and the regulatory agencies. Therefore, because the work plan is intended to describe general approaches to the OE RI/FS and because the Army is committed to creating detailed work plans for individual activities, it is appropriate to issue the OE RI/FS Work Plan as a Draft Final report.

Comment B: (2nd paragraph): One of the overarching goals that we believe needs additional emphasis is the establishment of investigation and response action criteria for each of the tracks. These criteria should address the requirements to be met for a parcel or site to be considered to have had an adequate response. Since the no-action or Track 0 process is very near the decision document stage we believe there is a need to establish decision criteria and a definition of the Track 0 process.

Response B: The investigation and decision criteria for the Track 0 process are described in the Track 0 Technical Memorandum and associated Proposed Plan and Record of Decision currently under review or in preparation. Similarly, specific investigation or decision criteria for other tracks will be addressed in their respective Proposed Plan and Record of Decision, with appropriate supporting documentation.

Comment C: (3rd paragraph): We believe that the Track 0 sites should have the following minimum requirements met prior to finalization of a Record of Decision or subsequent plug-in process.

1. A thorough historical records review has not shown any evidence at all that any activity that may be associated with OE use occurred in the area.
2. An adequate on-the-ground survey by a qualified Explosives and Ordnance Demolition expert is to be completed for each parcel. That survey needs to be documented and the results show that no evidence of ordnance or explosives use was found.
3. The deed for the property has, or will have, the usual notification that there is a potential for OE to be present.
4. The Army commits to yearly notification of all property owners of the information contained in the deed notice and conducting of community outreach activities that include at the least, a yearly public meeting, that reminds folks that there is the potential to find ordnance and explosives and what to do if it is found.
5. A commitment by the Army to conduct ongoing collection of information concerning evidence of Ordnance and Explosives Waste (OEW) such as incident reports, interviews with former personnel, surveys of property to determine if use is consistent with OEW cleanup activities. This information is to then be compiled, analyzed, and reported to the regulatory agencies on a periodic basis.
6. There is adequate assurance that boundaries of nearby OEW sites do not extend onto the proposed Track 0 property and that the subject property would not be affected by the detonation of ordnance on the OEW site.

Comment D: (4th paragraph): In addition to the minimum requirements listed above, it may, in specific circumstances, be appropriate to conduct some direct geophysical sampling. Situations where it may be appropriate include the confirmation of OEW site boundaries or random statistically based sampling to provide more information on a site that has some evidence it may contain OEW. We see that the use of direct sampling methods will likely occur infrequently and will be used to answer very specific questions.

The information provided here should be used to modify the definition of Track 0 in the work plan.

Response to

C & D:

Comments acknowledged. The decision criteria for the Track 0 process is described in the Track 0 Technical Memorandum and associated Proposed Plan and Record of Decision currently under review.

Specific Comments:

Comment: Section 3.2, Conceptual Site Models. The models need to be augmented to include those areas where no specific activities have been documented historically but have evidence of the use of heavier ordnance than was supposed to have been used during training activities. A site model that describes use that is a mix of those described in this section is appropriate.

Response: Text was added to Section 3.2 that states that as the OE RI/FS progresses the conceptual site models may be refined to suit the specific conditions observed at Fort Ord.

Comment: Section 3.3, Project Data Quality Objectives

1. Step 1: Problem Definition. In addition to risk reduction, the definition should include long term management of residual risk.

Response: Section 3.3, Step 1: Concern is addressed in Step 1 item 3, “. . . and evaluate alternatives under the OE RI/FS process to reduce the potential risk to current and future property owners and the general public.”

Comment: 2. Step 2: Identify the Decision. The alternative actions that result from resolution of the principle study question should be divided into risk reduction alternatives and residual risk management alternatives. When an action is developed, components can be selected from both the reduction and management alternatives. The reduction alternatives include two basic approaches, no action and clearance. The depth of clearance can be tailored to the specific circumstances of the site. The risk management alternatives may include land use controls, construction support, public education, property owner notification and others. One or more of the reduction alternatives can be applied to a specific site.

The other decisions identified under number 4 in this section often use the intended land use as a bench mark. The intended land use is just one of many factors considered when evaluating sample density, whether a response action is appropriate, or if removal actions are appropriate. The departure point for adequacy of a response or investigative action should be the complete removal or characterization. It is from this point that site specific conditions and potential future uses should be considered in arriving at an investigation or degree of cleanup decision. This section should be modified to better reflect this approach.

Response: Section 3.3, Step 2: In this section, we have identified risk management alternatives which include risk reduction and residual risk management measures.

Although complete cleanup of OE sites is ideal, there are many challenges to achieve that level of cleanup at this time. For this reason, risk management measures are identified as a component of the response alternatives to be evaluated, and the intended land use is one of the key factors in this evaluation. Nevertheless, this section is only intended to present some examples of the key decisions to be made; no change is made to the text.

Comment: 3. Step 3: Identify the Inputs to the Decision. The bullet item, *Instrument Detection capabilities under Fort Ord site specific conditions*, should be expanded. It should include collection of information on all the factors affecting the detection of ordnance. These include human factors, terrain differences, weather, etc. The goal should be to collect information to be able to arrive at the most accurate estimate of overall ordnance detection efficiency. Only then can we decide on the response and risk management actions necessary for a particular site.

Response: Section 3.3, Step 3: These issues are addressed in the Ordnance Detection and Discrimination Study Work Plan.

Comment: Section 4.4.1, Reconnaissance and Sampling DQOs. This section should be reworked so that the issues including: How much sampling or reconnaissance is necessary? What type of reconnaissance and sampling is adequate for different situations? What is considered reconnaissance. What is considered sampling? are answered. This section is very important because the data quality objectives will affect the quantity and quality of the information that has been gathered that will subsequently be the basis for decisions on the adequacy of cleanup.

Response: Section 4.4.1: Comments acknowledged. These issues will be addressed in the upcoming Ordnance and Explosives Sampling and Analysis Plan. The need for refining conceptual site models and DQOs for each of the RI/FS tracks and associated decision criteria for the tracking process will be addressed in the task specific work plans.

APPENDIX B

PUBLIC COMMENTS AND RESPONSES
ON THE DRAFT ORDNANCE AND EXPLOSIVES REMEDIAL
INVESTIGATION/FEASIBILITY STUDY WORK PLAN
FORMER FORT ORD, CALIFORNIA
DATED JULY 30, 1999

I. MS. DEBORA BAILEY, COMMENTS DATED NOVEMBER 10, 1999

General Comments:

Comment: As you know, Marina residents live in an area with a long history of environmental, health and safety issues emanating from the Army's 80 years of military training activities on the fort.

It is only through the efforts of the Fort Ord Toxics Project myself and many residents of Marina have become aware of the fact that Fort Ord is a Superfund site and in the process of a Remedial Investigation/Feasibility Study for Unexploded Ordnance and Explosive Waste.

As a resident of Marina, I am extremely concerned by the fact that my home is directly adjacent to this Superfund cleanup project and we have only recently been notified that the Army and EPA were holding public meetings and soliciting public comments on the cleanup plans. It is my intention to review and comment on each of the Army's cleanup documents, as they become available. Please include me in ALL future notices and mailings of the Army's document releases and public meetings.

My comments on the above referenced document are as follows:

Response: Since 1994, monthly community meetings have been held to inform the public of the status of the Fort Ord environmental cleanup program and respond to questions and concerns about issues related to the cleanup program. A detailed description about the past community outreach activities is provided in Section 3.7 of the *Draft Community Relations Plan, Update Number 1, Fort Ord California*.

Currently, community involvement meetings are held monthly and announced through local newspaper ads, e-mail mailing lists, and regular mailing lists, as well as on the Fort Ord Environmental Cleanup web page. Ms. Bailey is on our regular mailing list and is provided with meeting notices as well as information materials such as the quarterly newsletter, the *Advance*.

Specific Comments:

Comment 1: Pg. 1: "OE is present at Fort Ord as either unexploded ordnance or ordnance scrap." The Army fails to account for the discovery of Chemical Warfare Materials (CWM) on Fort Ord at Site 13b, Chemical weapons or "Chemical Agent Identification Sets" (CAIS) as referenced in the Non-Stockpile Chemical material Report published by the US Army.

- Response 1: The possibility of chemical warfare materiel use at Fort Ord had been researched by the Army's Non-Stockpile Chemical Warfare Materiel Program. The Non-Stockpile Chemical Warfare Materiel Program oversees the handling and disposal of all types of non-stockpile chemical materiel within Department of Defense. A comprehensive search was conducted at Fort Ord but did not uncover any evidence in records, interviews or other information sources to indicate that chemical weapons were ever stored, used, or buried at Fort Ord. The installation did, however, receive chemical warfare materiel in the form of Chemical Agent Identification Sets (CAIS). Chemical Agent Identification Sets were used on Fort Ord prior to 1974 to train soldiers in the identification of chemical warfare agents and in proper responses upon identification. In 1974, four CAIS in the inventory were removed from the installation and sent to Edgewood, Maryland. These kits were later destroyed. Since then there has been only one instance of CAIS discovery at Fort Ord, during an OE removal action at OE Site 13B in 1997. This discovery was properly handled in accordance with protocols established by the Non-Stockpile Chemical Warfare Materiel Program. Although it is unlikely, should additional CAIS be discovered at Fort Ord, the removal and remediation will follow the Non-Stockpile Chemical Warfare Materiel Program protocol.
- Comment 2: Pg. 3, sec. 1.2: It is not possible for the Army to “describe the nature and extent of OE in the environment” when the Army has such an incomplete Archive Search Report(s) and such a paucity of records and phantom reports.**
- Response 2: The Ordnance and Explosives Remedial Investigation/Feasibility Study (OE RI/FS) Work Plan provides examples of conceptual models that identify how ordnance and explosives may be present at Fort Ord, based on our best knowledge at the time the document was prepared (see Plates 9 through 12). As part of the OE RI/FS, a literature review was conducted as a follow-up to the Archives Search Reports, in order to verify existing information and identify additional information as it relates to OE at Fort Ord. The literature review element of the OE RI/FS is described in Section 4.1.
- Comment 3: Pg. 3, sec. 1.2: “. . . identify the potential receptors and routes of exposure.” The people who live downwind of the Army’s lead removal operations and OB/OD are the receptors and the route of exposure is via the dust and smoke traveling on the wind.**
- Response 3: Comment acknowledged. In order to meet the Data Quality Objectives outlined in the Work Plan, receptor information will be generated and evaluated. Sources which will be used in the identification and evaluation of receptors will include, but are not limited to the Fort Ord Phase 1 and 2 Engineering Evaluation/Cost Analysis (EE/CA), OE after action reports, the OE penetration study and the individual OE RI/FS technical memorandums. Evaluation of potential receptors and exposure pathways will include human as well as plant and animal populations living on and adjacent to Fort Ord.
- Comment 4: Pg. 3, sec. 1.3: In the sentence that begins with “The information that will be evaluated to form a decision will include . . .” The Army fails to state that there are very few records, reports or witnesses of the Army’s training operations over the 80 years of the Fort’s operation.**

Additionally, of the literally millions of soldiers who have trained at Fort Ord, the Army has only contacted twenty-three (23) of which only seven (7) have been referenced in the Army’s “Draft Literature Review Report for OE” document. The Army must conduct a much more aggressive campaign to identify and interview soldiers who have trained at Fort Ord and target especially years where there are large data gaps.

Response 4: The Literature Review was conducted as described in this work plan and the Literature Review Work Plan, as a thorough search and review of records of OE use at Fort Ord. The issue of the adequacy of the Literature Review investigation was addressed in the Summary of Public Comments and Responses on the Draft Literature Review Report, included in Appendix E of the *Draft Final Literature Review Report*, dated January 4, 2000.

Comment 5: Pg. 4, sec. 1.3.1: Track 0 – Considering all the civilian reuse plans and developments scheduled for these areas, and the above cited lack of information available to the Army, the “Track 0” areas do require further investigation. The “. . . no further investigation or action” determination is unacceptable.

Response 5: The main purpose of the OE RI/FS Work Plan is to lay out the framework for conducting the various studies and investigations, and describe the overall OE RI/FS process for Fort Ord. The work plan merely sets out the concept for Track 0 areas, and does not make any determination for any areas of Fort Ord. For Track 0, a Technical Memorandum and/or Approval Memorandum will be published providing a detailed description of the history and use of each transfer parcel, prior to a final decision on whether the area should be considered a Non-OE area. Please refer to the Track 0 Technical Memorandum for details about decision-making steps for Track 0.

Comment 6: Pg. 8, sec. 2.1.2: “A wide variety of conventional UXO items have been located at sites through Fort Ord, including pyrotechnics and explosives.” The Army again fails to acknowledge the need and requirements to deal with CWM.

As stated earlier: The Army fails to account for the discovery of Chemical Warfare Materials (CWM) on Fort Ord at Site 13b, Chemical weapons or “Chemical Agent Identification Sets” (CAIS) as referenced in the “Non-Stockpile Chemical Material Program Report published by the US Army.

Response 6: See response to Comment 1 above.

Comment 7: Pg. 8, sec. 2.1.3: “Before beginning the OE RI/FS, the Army had been conducting an OE program that consists of implementing and documenting OE removal actions in areas with imminent explosive safety hazards.” The Army fails to justify the need for its OEW removal actions. The Army seems to have created the “imminent and substantial endangerment” of the public by allowing access to the base.

Additionally, all “removal” actions and “remedial” actions must be documented as either “removal” actions or “remedial” actions! USA Environmental does not fill

out incident reports in response to OE scrap. OE, OEW, OE scrap and UXO must be fully documented.

Response 7: Every attempt is being made to minimize the threat to public safety through ongoing removal actions. OE removal actions are intended to address immediate explosive safety risks posed by unexploded ordnance and will continue in areas where such risks are identified, while the OE RI/FS is being prepared. The OE RI/FS will address long-term response alternatives and risk management measures related to unexploded ordnance.

All ordnance finds, whether OE scrap or live, when reported, are documented. All Army contractors are required to report OE items found. Every OE item reported whether OE scrap or live is responded to and a response is filed. The immediate area where the item was found is searched. If the item reported is determined by the responding OE contractor or the responding UXO safety specialist to be scrap, a report on the response to the incident is not always generated.

Comment 8: Pg. 11, sec. 2.2.1: Army must state that there are a number of large residential developments that are expanding around the Laguna Seca, Toro Park and Highway 68 corridor on the southern and southeast boundaries of Fort Ord. Land use is changing from agricultural to residential and business developments.

Response 8: The text has been revised to state “The south and southeast of Fort Ord are bordered by unincorporated portions of Monterey County, and include several communities as well as the Laguna Seca recreation Area and Toro Regional Park. Land use immediately east of Fort Ord is primarily agricultural.”

Comment 9: Pg. 14, sec. 2.3.3: The FORA reuse plan is unrealistic for the purpose of future land use determinations and in determining ordnance cleanup goals. The FORA Plan is unreliable for many reasons. One is there’s no water to support the developments FORA, Seaside and Marina are planning.

Response 9: Comment noted.

Comment 10: Pg. 15, sec. 2.3.3: The Army fails to state how deep ordnance and explosive waste will be removed to support recreational uses. The Army fails to state how the public’s access to unauthorized areas of the MRA, limited access areas and public lands (BLM areas) will be monitored and enforced.

Response 10: This section of the work plan is intended to provide background information about existing reuse plans for Fort Ord. The determination of final cleanup depths and the procedures for implementation of access restrictions and control will be provided in the OE RI/FS report.

Comment 11: Pg. 17, sec. 2.4.1: “The winds are generally from the west.” Yet lead contaminated sand from Army’s trainfire ranges is being or has been excavated, transported, sifted and dumped at the Fort Ord Landfills endangering Marina and CSUMB residents living and working downwind from that location. Additionally, the Army’s OB/OD method of clearing unexploded ordnance is causing severe health impacts on local residents to the east and southeast of Fort Ord.

Response 11: This section of the work plan is intended to provide general background information about the climate typically experienced at Fort Ord. The issue related to the remediation of lead contaminated soil at the Beach Trainfire Ranges is not within the scope of the Fort Ord OE RI/FS Work Plan. This issue was addressed in the Fort Ord Basewide RI/FS for chemical contamination.

Potential health impacts related to open burning and open detonation (OB/OD) will be considered later in the OE RI/FS.

Comment 12: Pg. 21, sec. 2.4.4.2: The Army fails to consider that at least five drinking water supply wells drilled to support 1980s housing construction on Fort Ord, may have contributed to the downward percolation of contaminated ground water emanating from the Fort Ord landfills. The Landfills are known to have required ordnance and explosives clearance support during excavation.

Response 12: The section referenced is provided for background purposes only. The investigation and remediation of groundwater contamination related to the Fort Ord landfill is addressed in the Fort Ord Basewide RI/FS for chemical contamination and subsequent reports.

II. FORT ORD TOXICS PROJECT, INC., DATED SEPTEMBER 9, 1999

General Comments:

Comment: FOTP concurs with the recommendations of Arc Ecology, who reviewed the above document on our behalf. We concur with Arc Ecology's findings. The Army should not conduct the OB/OD study, but rather should examine the feasibility of using closed detonation chambers at Fort Ord. Use of appropriate detonation chambers could potentially address all of our concerns: air emissions, soil contamination, accidental fires, and regulatory compliance. We request the Army supplement the Draft OE RI/FS Work Plan with a proposal describing how the Army intends to identify and demonstrate and evaluate closed detonation technologies at Fort Ord.

Furthermore, FOTP requests the Army stop all unnecessary "removal actions" until the OE RI/FS is completed and a Record of Decision (ROD) has been signed. FOTP agrees with the State of California, DTSC on this matter. Removal Actions are only necessary when ordnance and explosive waste (OEW) is visible at the surface and the center of mass of the OEW item is twelve inches or less below ground surface. In all other cases, fencing and posting around the potential OEW sites will enhance public safety. In cases where OEW must be removed, because it is visible at the surface, removal depth should be no greater than one foot below the surface. In any case, all OEW sites must be fenced and posted until "remedial actions" governed by an OEW ROD can take place.

Response: The OE RI/FS will include a study to evaluate potential emissions to soil and air resulting from open detonation practices at former Fort Ord. If the results of the study indicate that emissions to soil and/or air are at concentrations of concern, an evaluation of alternative methods of disposing of UXO (such as detonation chambers) will be performed.

OE removal actions are intended to address immediate explosive safety risks associated with unexploded ordnance, and will continue to be conducted while the OE RI/FS is prepared. Removals to depth addresses the explosive risks more thoroughly than surface removals, provides valuable information (to be evaluated in the OE RI/FS), does not add significantly to the resources required to conduct the action (based on the experience at Fort Ord), and is consistent with the National Contingency Plan. The rationale for conducting removal actions is documented in the *Action Memorandum, Phase 2 Engineering Evaluation/Cost Analysis, Ordnance and Explosives Sites, Former Fort Ord, California (Army, 1999a)*, available in the Fort Ord Administrative Record and at the local repositories. The OE RI/FS will address long-term response alternatives for OE at Fort Ord. Evaluation of the adequacy of all prior removal actions will be part of the OE RI/FS.

Specific Comments (Chris Shirley of Arc Ecology):

Comment 1: This document appears to be a rough outline describing how the Army plans to prepare the work plan for the ordnance and explosive remedial investigation and

feasibility study (OE RI/FS). It is, fundamentally, incomplete. This made it difficult to review. Nonetheless, I have a few suggestions on how the Army can improve the future drafts of the OE RI/FS work plan.

It appears that the Army intends to complete the plan bit by bit by submitting a series of technical memorandum and specific work plans. I am uncomfortable with this piecemeal approach. Past experience has taught me that such an approach rarely saves time and increases confusion for both regulatory and public reviewers. I recommend that the Army recirculate the *DRAFT* OE RI/FS work plan once the missing parts have been incorporated into a complete plan. Furthermore I recommend that the Army not attempt to complete any investigatory work and shunt areas to a “Track 0” or “no further action” Record of Decision until the OE RI/FS work plan is complete and has been reviewed and accepted.

I have prepared a table to help FOTP and the public track progress on the various parts of the proposed OE RI/FS Work Plan (Table 1). I recommend that FOTP distribute this table to the public.

Response 1: Because the Fort Ord OE RI/FS involves several issues that need detailed individual analysis, the Army, U.S. Environmental Protection Agency (USEPA), and California Department of Toxic Substances Control (DTSC), a part of California-EPA, decided to address these issues in separate studies. Additional benefits of segmenting the OE RI/FS are:

- The regulatory agencies and the public have an increased number of opportunities to review and comment on the individual components of the OE RI/FS
- The reports will be published in manageable pieces as opposed to one voluminous RI/FS report
- The regulatory agencies and the public would be able to monitor the progress of the OE RI/FS as individual studies are conducted and documents are published, as opposed to waiting 2-3 years for a draft report to be developed

The idea of distributing a table of various OE RI/FS documents to assist members of the public in reviewing these reports is very useful. Based on this idea the Army has developed a similar table and distributed them at community meetings.

Comment 2: In Chapter 1 the Army sets forth a four track (Track 0, 1, 2, 3) scheme for categorizing parcels on Fort Ord. Track 0 includes areas that based upon literature review are not identified as OE sites. Track 0 sites will be candidates for "no further action." I recommend that no site be considered for no further action based upon literature review alone. All Track 0 sites must receive a physical inspection. I recommend that the Army use the modified RAC score sheet that was submitted with FOTPs comments on the *Literature Review Work Plan* on all Track 0 areas prior to making a determination of no further action.

It appears to be the Army’s intention to circulate for public comment a “No Further Action CERCLA Proposed Plan” for ordnance as early as November 1999. My evidence for this is an entry on a sheet circulated by the Army on August 17,

1999 entitled *Documents Due on or Before October 31, 1999*. This schedule shows an entry called *Draft Final Track 0 Proposed Plan* with a due date sometime in October. I recommend that FOTP prepare the community to follow development of and comment upon this *No Further Action Proposed Plan* because it will lead to a plug-in *No Further Action Record of Decision (ROD)* for ordnance.

The ROD is a cleanup contract executed between federal and state regulators, and the Army. The term “plug-in” means that as areas are deemed ready, they can be added to the ROD. In short, the “plug-in” “no further action” ROD will set forth the conditions under which areas can be removed from the OE RI/FS process and thus become available for transfer.

Response 2: The main purpose of the OE RI/FS Work Plan is to lay out the framework for conducting the various studies and investigations, and describe the overall OE RI/FS process for Fort Ord. The work plan merely sets out the concept for Track 0 areas, and does not make any determination for any areas of Fort Ord. For Track 0, a Technical Memorandum will be published providing a detailed description of the history and use of each transfer parcel, prior to a final decision on whether the area should be considered a Non-OE area. Please refer to the Track 0 Technical Memorandum for details about decision-making steps for Track 0.

The use of plug-in process allows for streamlined decision-making. After the Record of Decision is signed for Track 0, additional areas can be proposed for no further action based on available information and further research about the condition of the area. An Approval Memorandum will be published providing a detailed description of the history and use of each transfer parcel, similar to Track 0 Technical Memorandum, prior to a final decision on whether the area should be considered a Non-OE area. Please refer to the Track 0 Technical Memorandum for details about decision-making steps for Track 0.

Comment 3: The Army intermingles the terms “removal action,” and “response action” freely in their descriptions of Track 0 through Track 3 processes, but they never use the term “remedial action.” This is either by design or because of carelessness. The terms “removal action,” and “remedial action” are defined with specificity in the National Contingency Plan, the regulations that guide CERCLA actions. The term “response action” is broadly and less specifically defined. I recommend that the Army use of the terms “removal action” and remedial action” where appropriate throughout the RI/FS work plan. The term “response action” is too vague and should be abandoned. Careful use of these terms is the only way to ensure that the public understands what actions are anticipated under this work plan.

Response 3: Removal actions as used in the OE RI/FS Work Plan refers to removal actions under the National Contingency Plan, where an imminent threat to human health or welfare or the environment is identified and must be addressed. Consistent with the National Contingency Plan, the term “remedial Action” will be used where remedial alternatives are evaluated and selected through the RI/FS process. The text has been revised accordingly.

Comment 4: The Army uses the term “reconnaissance” in Section 4.4.2 of the work plan. The term “reconnaissance” can have context-sensitive specific meanings. The American Society for Testing and Materials, in their “Standard Guide for Site Characterization for Environmental Purposes With Emphasis on Soil, Rock, the Vadose Zone and Groundwater (D 5730-96) states that a reconnaissance site investigation may include “nondestructive geophysical methods, and relatively simple field sampling and characterization methods to refine the conceptual model of the site.” This definition implies that “reconnaissance” includes field investigation. It appears from the brief description in Section 4.4.2 that the Army used the term reconnaissance in this sense. The Army plans to more completely define what they mean by “reconnaissance evaluation” in a technical memorandum to be published under a separate cover. FOTP should carefully review this upcoming technical memorandum to ensure that reconnaissance actions indeed include field investigation. FOTP should ask that this yet-to-be-published technical memorandum is included within a *recirculated Draft OE RI/FS work plan*. As mentioned earlier, a complete draft final OE RI/FS work plan needs to be circulated for review to ensure that all the parts fit together.

Response 4: Comment acknowledged; a work plan describing reconnaissance procedures will be provided under separate cover.

Comment 5: The term “site” is still vague. ASTM defines three types of site boundary: (1) land ownership, (2) current and past land use, and (3) natural site characteristics (topography, soils, geology, hydrology, biota). The third definition makes little sense for ordnance, unless the topography in a particular area suggests ideal conditions for a range (a bowl shape or prominent embankment). It appears that the Army is using the second definition. This method of defining a site is only as good as the records of past use. At Fort Ord, land use records are by the Army’s own admission known to be unreliable. For this reason, I recommend that the Army use FORA’s reuse parcel boundaries to define sites, and then use land use data to describe potential OE conditions within each site. This approach makes sense from a reuse standpoint, as well, because Findings of Suitability to Transfer (FOSTs) would conform to FORA reuse parcel boundaries. The Army needs to more fully justify its method for delineating sites.

Response 5: The OE site boundaries as delineated in the Archive Search Report, were based on our current knowledge of the limits of the area of concern at that time. However, through the OE RI/FS process these boundaries may be refined based on ongoing data collection (e.g., OE sampling and removal) and review. In some cases, specifically within areas where OE use occurred throughout a parcel (e.g., the MRA), the FORA parcel boundaries are used to define areas of potential ordnance use.

Comment 6: I am dismayed to read that removal actions will continue unabated during development of the RI/FS process. Although a mechanism for conducting removal actions is necessary, the Army has no legitimate reason to continue with removal actions unless ordnance is showing on the surface. At such sites, I recommend that the Army conduct removal actions to a depth of only one foot and then fence the site pending completion of the OE RI/FS process. Where ordnance is not showing

on the surface, fencing suspected OEW sites will control the public safety hazard, even under a trespass scenario.

Response 6: The removal actions are prioritized based on the type of OE (e.g., high explosive), surface or subsurface, and public access, so that the most dangerous areas are addressed first. The Army has the responsibility to reduce the threat to public safety where it is known to exist, as soon as possible. Removals to depth addresses the explosive risks more thoroughly than surface removals, provides valuable information (to be evaluated in the OE RI/FS), does not add significantly to the resources required to conduct the action (based on the experience at Fort Ord), and is consistent with the National Contingency Plan. The rationale for conducting removal actions is documented in the *Action Memorandum, Phase 2 Engineering Evaluation/Cost Analysis, Ordnance and Explosives Sites, Former Fort Ord, California (Army, 1999a)*, available in the Fort Ord Administrative Record and at the local repositories.

Comment 7: Risk Evaluation Methodology relies on the draft Range Rule risk Methodology. This methodology is subject to considerable controversy. I suggest that FOTP ask the Army to conduct a risk workshop with the purpose of determining what factors the community wishes to be considered in an OE risk assessment.

Response 7: The Range Rule is being considered, however, because the rule is still in development the Army is aware that methodologies may change. A work plan describing the risk assessment approaches will be presented under a separate cover. This topic may be discussed in one of the upcoming community meetings if participants are interested.

Comment 8: Community Relations, Section 4.9 places too much emphasis on informing community, not enough emphasis on community involvement. It is not enough to “keep the affected community informed throughout the OE removal and OE RI/FS process.” As required by CERCLA guidance, the Army needs to make a commitment to meaningfully involve people with an interest in cleanup of ordnance waste at Fort Ord. The Army has thus far failed to propose a program that achieves meaningful community involvement. On page 65 of the Draft OE RI/FS Work Plan, the Army describes “community involvement” as “a combination of newspaper notices, articles, fact sheets, television, community information meetings, public meetings, and tours for public officials and the media.” All of these techniques describe ONE-WAY communication between the Army and the interested public. The Army makes no mention in the OE RI/FS Work Plan of their monthly newsletter, Document Update, the web page under development, or other existing means by which the public may access documents for review.

The Army must commit to providing means by which the public can influence decision making throughout the OE RI/FS process. I recommend that the Army incorporate the following into the OE RI/FS Workplan and upcoming OE Community Relations Plan:

- **The Army must publicize the availability of documents for review along with the comment period and person to which comments should be addressed. This notice should be available at all information repositories, the web site, and at all public meetings. The Army should commit to mailing the Document Update to**

everyone on the community relations mailing list, the Technical Review Committee mailing list, local libraries for posting, the Fort Ord Reuse Authority, and each City Hall in the area.

- **All primary and secondary documents must be made available to the public for review and comment. Providing the documents on a web page and in informational repositories is helpful, but insufficient. The Army must provide a way for interested people to receive, in a timely fashion, a printed copy of any document that they wish to review.**
- **The Army must provide a means by which the public can speak directly to and ask questions of members of the BRAC Cleanup Team. In the absence of a Restoration Advisory Board, the Army's monthly meetings should be organized such that the public can talk with the BCT, and not just listen to Army presentations.**
- **FOTP's TAG program must be invited to attend all BCT meetings. So doing will provide a means by which the essence of deliberations at the BCT can be communicated to the public, and most importantly, the needs and expectations of the public can be communicated back to the BCT in an organized and productive way. FOTP's TAG program already conducts monthly meetings at which documents available for review and TAG work products are discussed and refined.**

Response 8: Section 4.9 of the Draft Final OE RI/FS Work Plan will include references to the Fort Ord Web page, Document Update and the *Community Relations Plan Update*.

- a. The Document Update is mailed to everyone on the community relations mailing list and the Technical Review Committee mailing list. The Document Update is mailed to all cities in the Association of Monterey Bay Area Governments (AMBAG) directory, Monterey Bay Region. All local libraries have been provided an opportunity to receive cleanup information including the Document Update. Some have declined to be on the mailing list, because they have another source for the information. Not all libraries post the Document Update, since the decision to post the Document Update is left to the respective library manager.
- b. As mentioned, documents are located at the information repositories and if desired, can be copied. Additionally, the documents are placed on the web page and may be viewed or downloaded.
- c. Representatives from the Army, USEPA and DTSC (BRAC Cleanup Team) are usually available at community meetings for discussions with members of the public or to answer questions. The BRAC Cleanup Team members are also available via telephone and e-mail.
- d. The USEPA's Technical Assistance Grant (TAG) technical advisor has recently had opportunities to meet and discuss issues with BRAC Cleanup Team members. The BRAC Cleanup Team intends to create similar opportunities in the future, aimed at improving communication with community members through TAG technical advisor.

Comment 9: How will SMART Initiative be integrated into OE RI/FS process?

Response 9: The mission of the Strategic Management, Analysis, Requirements and Technology (SMART) Team is to assist solving land transfer challenges through focused discussions among high-level members of the Army, USEPA and DTSC. The OE RI/FS will incorporate the recommendations made by the SMART Team as appropriate.

Comment 10: page 72: The acronym CDQMP (HLA) is undefined.

Response 10: The definition of the CDQMP acronym (Chemical Data Quality Management Plan) will be included in the Draft Final document.

III. THE HIGHWAY 68 COALITION, COMMENTS DATED SEPTEMBER 10, 1999

General Comments:

Comment 1: INTRODUCTION

1) At the beginning of the document, on page 2, it states "In November 1998, the Army decided to evaluate OE at Fort Ord in an OE RI/FS . . .". Please expand and clarify this statement to reflect that the army's decision was the result of a lawsuit against the Army. The introduction to this document needs this information for those persons and agencies that may be reviewing it.

Response 1: The Army agreed to conduct the Fort Ord OE program consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as the result of a lawsuit against the Army. The introduction states that the Army is evaluating OE consistent with the CERCLA and the introduction language has been changed to state that "the Army **agreed** to evaluate..." as opposed to "the Army **decided** to evaluate...". No further modification to the introduction was made.

Comment 2: 2) The introduction, again on page 2, states "The OE RI/FS will evaluate past removal actions as well as recommend future response actions deemed necessary to protect human health and the environment under future uses."

This statement sets out the purpose of the Draft. We wish to see included in this statement what has been asked for at numerous Community Hearings on the subject. That is . . . "and will evaluate and estimate the costs involved to the taxpayers for the clean-up. These costs will be evaluated for 1) the necessary protection of human health and 2) the increased costs involved over and above #1 for future proposed uses."

Response 2: The feasibility study portion of the OE RI/FS will include a detailed analysis of remedial alternatives. The analysis will include an evaluation of effects to human health and the environment, based on the reuse plan established for Fort Ord. As part of this analysis the remedial action costs for each alternative are developed and evaluated. Cost evaluation is from a cost-effectiveness standpoint and will look at the first part of your question with regard to protection of human health. The cost analysis will not directly evaluate the cost differential between different reuses.

Comment 3: 3) There needs to be a clear statement in the introduction that this is a REMEDIAL ACTION being taken as opposed to a removal action. The clarification needs to be made regarding the ongoing removal AT THE SAME TIME that the basewide investigation is to be conducted. There is a clear distinction under CERCLA law.

Response 3: The text referenced in Comment 2 has been changed. The revised sentence included in the introduction now reads, "the OE RI/FS will evaluate past removal actions as well as recommend future remedial actions deemed necessary to protect human health and the environment." As stated in the introduction, the Army is evaluating OE at Fort Ord consistent with the Comprehensive Environmental Response, Compensation, and

Liability Act (CERCLA). OE Removal Actions are intended to address immediate explosive safety risks associated with unexploded ordnance, and will continue during the development and preparation of the OE RI/FS.

Comment 4: **4) It states that the Army is the Lead Agency for OE Removal activities and that the EPA and DTSC have been and will continue to be involved. This short sentence neglects the history of disputes between the agencies. It states that the Army is the Lead Agency as a given. Why? This is tantamount to having the fox watch the henhouse. The army's business and purpose is national security. The army's business and purpose is preparing for war. The United States Army was not intended to do cleanups after the fact. The Army can be of great assistance in helping to identify known and suspected OE sites. The Army understands Chain of Command. As this is a Remedial Action, there needs to be a clear CHAIN of Command, with the EPA in charge of it.**

Response 4: Under the National Contingency Plan (NCP) and Presidential Executive Order 12580 the DOD (Army) has been identified as the lead agency for the cleanup of ordnance and explosives.

In addition, the Army and the regulatory agencies have reached agreement on addressing OE at Fort Ord using the principals established in the existing Federal Facility Agreement (FFA). The Fort Ord FFA is an agreement that provides the process to facilitate cooperation, exchange of information and participation among the Army and the regulatory agencies in addressing the cleanup at Fort Ord. The Army is committed to working with the regulatory agencies in the development of the OE RI/FS.

Comment 5: **1.2 WORK PLAN OBJECTIVES**
1) Please add a bullet that states an objective is a "Basewide, fence to fence investigation"

Response 5: Section 1.3 explains that all Fort Ord lands will be included in some level of evaluation under the OE RI/FS. The level of evaluation (whether it will include such activities as sampling, removal or remedial actions), will be determined in the OE RI/FS process.

Comment 6: **1.3 DECISION CRITERIA FOR SITE CHARACTERIZATION**
1) Please add the word "help" in the first sentence, i.e. "A literature review (Section 4.1) will be conducted to 'help' locate and retrieve documents . . . "

Response 6: The Literature Review work included the actual locating and obtaining of documents.

Comment 7: **2) Please change the latter part of the first sentence from the past tense by eliminating the word "were" to may be, i.e. ". . . for identification of areas at Fort Ord where OE-related activities occurred or 'may be' suspected."**

Response 7: The text "are suspected to have occurred" was substituted for the word "were".

Comment 8: **3) The second sentence is inconsistent with the following sentence. The sentence states "The literature review will include all lands at Fort Ord." It then follows that if it can't be found in the literature, therefore, those areas need no longer be addressed." This investigation involves safety. It is not a police investigation,**

whereby, if the police can't prove the suspect was at the scene at the time of the crime, the "suspect" walks. At numerous Community Meetings, it has been pointed out that the literature review and interviews are a good place to start. However, one can't assume that just because the Army can't produce a document that an area was used for maneuvers or range practice from 1917 to 1994 that therefore it is clean, is defeating the purpose of a basewide study and proper cleanup of the former Army Base.

Response 8: Similar questions concerning the adequacy of the Literature Review were addressed in the *Summary of Public Comments and Responses on the Draft Literature Report*, dated January 4, 2000.

Comment 9: 1.3.1 TRACK 0

1) Explain the word "candidates" as to the process and possible deed restrictions.

Response 9: "Candidates" in the Track 0 context, refers to areas/parcels at Fort Ord that based on the Army's current knowledge, were never used or suspected of being used for ordnance-related training. These areas are candidates for no further investigation related to the use of ordnance only. The supporting rationale for the Track 0 candidate areas is provided in the Track 0 Technical Memorandum. The candidate areas will undergo regulatory review and approval before receiving concurrence on their non-ordnance status. This process will be documented in a Record of Decision (ROD) for no further ordnance-related action regarding the Track 0 candidate areas. No deed restrictions will apply to the regulatory concurred Track 0 areas as documented in the ROD. However, since the Track 0 areas lie on a former military base, a general statement of condition, stating that the potential for ordnance to be found on the property exists, will be attached to the deed and run with the land.

Comment 10: 1.3.2 TRACK 1

1) We suggest changing the wording from, "Track 1 sites are those where OE was suspected to have been used but was not found . . ." to the following, "Track 1 sites are those where OE was suspected, or will be found to be suspected, but has not been found yet." We suggest changing the second sentence to read ". . . Track 1 sites will be examined to verify that procedures may have been appropriate, pending the study of future methodologies to be used in searching for OE."

Response 10: Track 1 sites include areas where OE was suspected and a sampling or reconnaissance effort has been completed and nothing was found. The adequacy of the sampling or reconnaissance effort will be evaluated in the OE RI/FS.

Comment 11: 1.3.3 TRACK 2

1) The initial statement defeats the purpose of why an RI/FS is being done. It states, "Track 2 sites are those where OE was found, and appropriate removal actions have been completed." According to whom? The Army? The Restoration Advisory Board that was illegally disbanded? We are all aware of the U.S. EPA going into an area that was determined to be completed and finding a whole range of O.E. remaining by using a different methodology of search. Note: where are the charts, plates, identifying which areas of Fort Ord are Tracks 0-5. Where are these areas? If they were included with the larger download, we were unable to obtain

them as it caused our computer to crash twice. The recently obtained maps showing the FORA proposed reuse of Fort Ord with the overlay of currently known or suspected O.E. and U.X.O. sites would be helpful to be included in this document. How do the Tracks 0-5 correspond to the FORA reuse plan parcels?

Response 11: The word appropriate has been removed from the Track 2 description. The adequacy of the removal actions completed on Track 2 sites will be evaluated in the OE RI/FS. Conclusions reached on the adequacy of the removal actions will be evaluated by both the State and Federal regulatory agencies.

A table and area specific maps listing and delineating the proposed Track 0 areas is included in the Track 0 Technical Memorandum (January 21, 2000) and the No Action Superfund Proposed Plan (February 1, 2000). Areas will be managed during the OE RI/FS process within one of four (not six) proposed "tracks" (Tracks 0 through 3).

The delineation of Track 0 through 3 areas is based on identifying areas of ordnance or non-ordnance use and will be developed independent of the Fort Ord Reuse Authority (FORA) reuse plan. The OE RI/FS will, however, take into account the proposed reuse in the evaluation of the remedial action proposed for the various OE areas (Tracks 1 through 3) at Fort Ord.

Comment 12: 1.3.4 TRACK 3

1) This is a confusingly written section that leaves loopholes broad enough to keep attorneys busy for years. We suggest a rewrite so the layperson can identify what is or may be going on.

Response 12: The final decision for managing areas within a given track will be based on the results of the remedial investigation tasks proposed in the OE RI/FS Work Plan. This section is intended to present the general approach for managing various areas of Fort Ord in separate tracks and facilitate a streamlined remedial investigation. The Track 3 process will provide a mechanism (plug-in) to handle ordnance areas that may be identified in the future.

Comment 13: 2.1.1 HISTORICAL USE

1) Please make the distinction that tanks and armor were in use at Fort Ord prior to 1975. Please indicate which areas of Fort Ord are currently known or suspected to have been used for training purposes of these.

Response 13: This section is intended to provide a brief description of the use of Fort Ord as a military training facility over time. Areas at Fort Ord that were used to support tank training are presented in the Archives Search Reports and the Literature Review Report.

Comment 14: PAGE 21 states "Groundwater extraction by the city of Marina, by Fort Ord, and by irrigation wells in the Salinas Valley have historically induced seawater intrusion into the Lower 180-foot and the 400-foot aquifers. Seawater intrusion continues to affect these aquifers. Intrusion into the Upper 180-foot aquifer appears to be limited to the vicinity of the beach at Fort Ord." Our response is, WHERE IS YOUR DATA? Please provide us with a reference to all data used and the dates of this data used to conclude and make the above statement. If all

Harding Lawson Associates is going to do but print unsubstantiated statements this draft needs a rewrite.

Response 14: Extensive ground water monitoring is conducted under the Basewide RI/FS for chemical contamination. A reference that discusses the seawater intrusion that occurs in the vicinity of Fort Ord has been added to Section 2.4.4.2.

Comment 15: 3.2.1 TRAINING SITES

1) We request you add the following, "An evaluation/investigation of the potential for buried munitions in former foxholes will be conducted at all such sites, in addition to the firing ranges."

Response 15: A discussion related to the potential for buried munitions at Fort Ord is presented in Section 3.2.4. All geophysical anomalies detected during removal actions, including burial pits, are investigated and the contents removed by the ordnance contractor.

Comment 16: 3.2.2 FIRING RANGES

1) We request you add the following, "The target area(s) are guesstimates at best. As stated in Community Meetings at least one target area was overshoot with munitions going outside the boundaries of Fort Ord, over State Highway 68, and landing in adjacent Corral de Tierra."

Response 16: It is understood that the locations of some target areas are approximations pending completion of the remedial investigation, however, the word "guesstimate" is not appropriate in reference to the target areas in the firing ranges. The intent of this section is to provide a general description of the firing areas and target areas and show their relationship to one another. The Army is committed to investigating the firing ranges as well as those areas where munitions may have landed.

Comment 17: STEP 1: STATE THE PROBLEM (page 28)

1) Item #2 states, "Identify the primary decision maker - There will NOT be a primary decision maker; decisions will be made by consensus among the Army, EPA and Cal-EPA and will consider public input." As stated earlier, unless there is a clear chain of command we will continue to suffer unannounced detonations, accidental fires, disputes as to whether an area is adequately cleaned or not, how to adequately clean an area, etc., etc. The public is extremely tired of this. The public that lives next door to this Superfund Site deserves better. This cleanup of a former Army Base is a remedial action that clearly should be under the control of the U.S. EPA and should follow the laws and guidelines of California State Law and the California Environmental Quality Act.

Also, the statement "will consider public input" offers no guarantees that the adjacent property owners and residents will get any more respect then the customary historical response to their questions and concerns, which is "comment noted". The Army does what it darn well pleases in an anxious desire to clear out of Fort Ord as rapidly as possible. Big developers are pushing politicians for rapid transfer of former parcels of Fort Ord. The local residents and adjacent property owners get stuck in the middle. It is inadequate to state ". . . and will consider public input." The legally required Restoration Advisory Board served a necessary

purpose. It was disbanded. The public was promised that by closing the Fort, the property could be sold to help reduce the national debt. The local politicians now argue that the army should pay them to take the property because of the expenses involved in creating the infrastructure needed to "reuse" the property in a fashion that they determined was desired. The public's input was to a large extent "ignored" on this proposed reuse also.

Response 17: As stated in the response to Comment 4, under the NCP the Army is the lead agency, however, the Army will not be the only primary decision maker. The Army is committed to partnering with the regulatory agencies in the development of the OE RI/FS.

In addition the Army and the regulatory agencies have reached an agreement addressing OE at Fort Ord using the principals established in the existing FFA. The Fort Ord FFA is an agreement that provides the process to facilitate cooperation, exchange of information and participation among the Army and the regulatory agencies in addressing the cleanup at Fort Ord. The Army is committed to working with the regulatory agencies in the development of the OE RI/FS.

The public will have many opportunities to provide input during the OE RI/FS process as identified in the Fort Ord Community Relations Plan and the Community Relations Plan Update Number 1. Based on the present reuse plan developed by FORA, the OE RI/FS will take into account the proposed reuse in the evaluation of the remedial action proposed for the various sites at Fort Ord. Issues concerning former Fort Ord reuse designations should be directed at FORA.

Comment 18: Step 2: IDENTIFY THE DECISION

1) Who is in charge of identifying the decision?

Response 18: The Army with input from the regulatory agencies and the public.

Comment 19: Step 3: IDENTIFY THE INPUTS TO THE DECISION

1) Who is in charge of identifying the inputs to the decision?

Response 19: The Army with input from the regulatory agencies and the public.

Comment 20: Step 4: DEFINE THE BOUNDARIES OF THE STUDY

1) Who is in charge of identifying the boundaries of the study?

Response 20: The Army with input from the regulatory agencies and the public.

Comment 21: Step 5: DEVELOP A DECISION RULE

**1) Paragraph two asks, "What would the decision maker really like to know?"
Who is the ultimate decision-maker if there is no chain of command?**

Response 21: The chain of command has been identified in previous responses and the ultimate decision-makers are the Army, the regulatory agencies and the public. Should the decision-makers not be able to come to consensus on a decision the US Environmental Protection Agency (EPA) Administrator would make the final decision.

Comment 22: Step 6: SPECIFY LIMITS ON DECISION ERRORS

1) Paragraph two states "... the OE Team will establish them by consensus."

Please identify who is the OE Team? What if there is no consensus? Who gets to outvote the others? Will the unidentified OE Team "consider public input"?

Response 22: The OE team is comprised of the Army, US EPA, and the Department of Toxic Substances Control (DTSC) with input from the public. In accordance with the FFA, Section 12.7, the US EPA Administrator will review and resolve disputes that can not be addressed at the lower levels. The dispute resolution will occur after conferences with the Army secretariat representative and the DTSC chief deputy director.

Comment 23: Step 7: OPTIMIZE THE DESIGN

1) We suggest a rewrite so that a person with say an I.Q. of 140 can actually understand what is being said in this section.

Response 23: The text describing Step 7 has been re-written as suggested.

DISTRIBUTION

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Ordnance and Explosives
Remedial Investigation/Feasibility Study Work Plan
Former Fort Ord, Monterey County, California

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Copy No.

Copies 1 - 20: Ms. Jennifer Faler
 U.S. Army Corps of Engineers
 Monterey Project Office
 Building 1A-136
 Presidio of Monterey, California 93944-5000

Copies 21 - 28: Harding Lawson Associates Project Files

Quality Control Reviewer



Donald R. Smallbeck
Principal Environmental Scientist

MLS/JJF/BJW/y154343DF-FO