

Final
Record of Decision
Impact Area Munitions Response Area
Track 3 Munitions Response Site

Former Fort Ord, California

April 18, 2008

United States Department of the Army
Base Realignment and Closure (BRAC)
Former Fort Ord, California

CONTENTS

1. DECLARATION	1
1.1. Site Name and Location.....	1
1.2. Basis and Purpose	2
1.3. Site Assessment	2
1.4. Description of the Selected Remedy	2
1.5. Statutory Determination.....	6
1.6. ROD Data Certification Checklist	6
1.7. Authorizing Signatures and Support Agency Acceptance of Remedy	8
2. DECISION SUMMARY	12
2.1. Site Description.....	12
2.2. Site History	12
2.3. Enforcement and Regulatory History	13
2.4. Community Participation.....	14
2.5. Scope and Role of Response Action.....	14
2.6. Site Characteristics.....	17
2.7. Impact Area MRA Track 3 RI/FS Background	17
2.8. Impact Area MRA Previous Investigation Summary	18
2.9. Current and Potential Future Land and Resource Uses	22
2.10. Summary of Site Risks.....	23
2.11. Remedial Action Objectives	24
2.12. Description of Alternatives	25
2.12.1. Description of Remedial Alternative Components	25
2.12.2. Description of Remedial Alternatives.....	30
2.12.3. Comparison of Remedial Alternatives	37
2.13. Principal Threat Wastes	38
2.14. Selected Remedy.....	39
2.14.1. Summary of the Rationale for the Selected Remedy	39
2.14.2. Description of the Selected Remedy	39
2.14.3. Summary of the Estimated Remedy Costs.....	45
2.14.4. Expected Outcomes of Selected Remedy	45
2.15. Statutory Determinations	45
2.16. Documentation of Significant Changes from Preferred Alternative of Proposed Plan.....	46
3. RESPONSIVENESS SUMMARY	47
3.1. Overview.....	47
3.2. Background on Community Involvement.....	49
3.3. Summary of Comments Received During the Public Comment Period and Department of the Army Responses	49
4. REFERENCES	64

TABLES

- 1 Summary of Investigations
- 2 Summary of Remedial Alternatives Evaluation
- 3 Applicable or Relevant and Appropriate Requirements (ARARs)

PLATES

- 1 Impact Area MRA and Fort Ord Location Map
- 2 Impact Area MRA and Munitions Response Investigation Sites

APPENDIX

- A GLOSSARY OF MUNITIONS RESPONSE PROGRAM TERMS

1. DECLARATION

1.1. Site Name and Location

The former Fort Ord is located in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The U.S. Environmental Protection Agency (EPA) identification number for Fort Ord is CA7210020676. This Record of Decision (ROD) addresses Munitions and Explosives of Concern (MEC) that are known or suspected to be present in the Impact Area Munitions Response Area (Impact Area MRA), one of the Track 3 Munitions Response Remedial Investigation/Feasibility Study (Track 3 MR RI/FS) sites at the former Fort Ord Army Base in Monterey County, California (Plate 2).

Since 1917, military units (e.g., cavalry, field artillery, and infantry) used portions of the former Fort Ord for training (e.g., maneuvers, live-fire) and other purposes. Because the military conducted munitions-related activities (e.g., live-fire training) on the facility, military munitions (e.g., unexploded ordnance [UXO], discarded military munitions [DMM]) may be present on parts of the former Fort Ord. The types of military munitions used at the former Fort Ord included: artillery and mortar projectiles, rockets, guided missiles, rifle and hand grenades, training land mines, pyrotechnics, bombs, and demolition materials. For the purposes of the Fort Ord Military Munitions Response Program (MMRP) being conducted and this ROD, MEC does not include small arms ammunition (.50 caliber and below). A Glossary of Munitions Response Program Terms is provided in Appendix A.

Track 3 sites are areas at the former Fort Ord where MEC is known or suspected to be present, but MEC investigations have not yet been completed. The Track 3 site known as the Impact Area MRA consists of the 6,560-acre portion of the 8,000-acre historical Impact Area that is entirely within the natural resources management area described in the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (HMP; USACE, 1997), and is currently identified for transfer to the Bureau of Land Management (BLM). The Impact Area MRA is covered by dense vegetation, and the dominant plant community is Central Maritime Chaparral (CMC). This plant community is host to several State and Federally threatened or endangered as well as many other rare species. The Impact Area MRA is designated as a habitat reserve in the Fort Ord Reuse Authority (FORA) Base Reuse Plan. The Impact Area MRA is fenced, warning signs are posted, and access is controlled by the Army. The perimeter of the historical Impact Area is patrolled to detect and prevent trespassing.

Within the 6,560-acre Impact Area MRA (shown on Plate 2), previous response actions to MEC (summarized on Table 1) included surface and subsurface removals on roads, trails, and permanent fuel breaks; surface removals in the Watkins Gate Burn Area and Eucalyptus Fire Area; surface and subsurface investigation and removals in limited areas; surface and subsurface removals in portions of Munitions Response Site (MRS)-Ranges 43-48 and Range 36A; and a limited visual surface removal of several other areas. The objectives of the munitions response actions varied and included subsurface sampling of 100-by 100-foot grids to specified depths, surface only removal in accessible areas, and removal of all detected anomalies to depth. Based on the data collected, MEC is known or suspected to be present. Therefore, there is a potential for a future land user (e.g., habitat monitor, habitat worker, or visitor) to encounter MEC at the Impact Area MRA. Accordingly, the Army conducted the Impact Area MRA Remedial Investigation/Feasibility Study that evaluated remedial alternatives to address the current (baseline) and hypothetical future (after-action) risk from MEC at the Impact Area MRA to future land users.

1.2. Basis and Purpose

This decision document presents the selected remedial action for MEC in the Impact Area MRA. The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendment and Reauthorization Act (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information and reports contained in the Administrative Record for the former Fort Ord.

This decision is undertaken pursuant to the President's authority under CERCLA Section 104, as delegated to the United States Department of the Army (Army) in accordance with Executive Order 12580, and in compliance with the process set out in CERCLA Section 120. The selection of the remedy is authorized pursuant to CERCLA Section 104, and the selected remedy will be carried out in accordance with CERCLA Section 121.

The Army and the EPA have jointly selected the remedy. The California Environmental Protection Agency as represented by the Department of Toxic Substances Control (Cal/EPA DTSC) has had an opportunity to review and comment on the ROD.

1.3. Site Assessment

The response action selected in this Record of Decision is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances, or of pollutants or contaminants that may present an imminent and substantial endangerment to public health or welfare.

1.4. Description of the Selected Remedy

The selected remedy described in this ROD addresses current or potential explosive safety risks to human health and the environment from MEC at the Impact Area MRA. Based on many years of site experience, the presence of MEC in the Impact Area MRA does not appear to be a concern in terms of explosive safety risks to ecological receptors. Potential human health and ecological risks related to any soil contamination from small arms and military munitions ranges are being addressed under the Basewide Range Assessment (*Shaw/MACTEC, 2006*) program and the Site 39 Feasibility Study Addendum (*MACTEC, 2007a*). The principal threats posed by the presence of MEC at the Impact Area MRA have not yet been treated (i.e., MEC remediation has not yet been completed throughout the entire site).

The Army and EPA have selected the remedy of *Technology-Aided Surface MEC Remediation, With Subsurface MEC Remediation in Selected Areas and Land Use Controls* to be implemented throughout the entire Impact Area MRA. This alternative is selected because it will achieve both substantial risk reduction through MEC remediation and risk management through implementation of Land Use Controls. The selected alternative best balances the risk reduction and associated environmental impacts in supporting the anticipated future use of the site as a habitat reserve.

The selected remedy includes the following components:

- Planned prescribed burning of up to 800 acres per year (in a series of several small burns of approximately 100 acres in size) to clear vegetation and provide access to conduct MEC remediation.
- Technology-Aided surface MEC remediation throughout the entire Impact Area MRA, and detonation, using engineering controls, of any MEC recovered. MEC detection instruments will be

available onsite to aide in the detection of surface MEC in areas where the ground surface is not visible.

- Subsurface MEC remediation (intrusive investigation of all anomalies) on fuel breaks and roads essential to habitat management activities, and in selected areas that require subsurface MEC removal for specific purposes to support the reuse (estimated to be approximately 10 percent of the Impact Area MRA);
- Digital survey to provide a record of anomalies to assist future property users in identifying areas where explosives safety support (e.g., onsite construction support) may be required for ground disturbing or intrusive activities. Burned vegetation will be cut to provide access for the digital geophysical equipment. Anomalies within the areas identified for subsurface removal will be investigated or resolved.
- Implementation of Land Use Controls (MEC recognition and safety training; construction support for ground disturbing or intrusive activities and UXO-qualified personnel support; access management measures including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs; helicopter support for select future habitat management prescribed burns; weed abatement support; and property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use).
- Post-remediation habitat monitoring within areas of subsurface MEC removal or other disturbances (e.g. mechanical clearance of vegetation) to collect data on HMP species and habitats; perform mapping, data management and evaluation, and reporting; and conduct habitat restoration as needed.

The total area of subsurface MEC remediation is estimated to be approximately 10 percent (656 acres) of the Impact Area MRA (6,560 acres), including:

- Regularly maintained fuel breaks and access roads that the Army, in coordination with the future landowner, identifies for habitat management.
- A minimum 100-foot buffer area along the habitat-development border of the Impact Area MRA on the habitat side of the border adjacent to developed areas. This buffer would both act as an additional safety zone for subsurface activity and enhance firefighters' ability to fight wildfires from the border-buffer area that might occur within the Impact Area. With this safe zone, firefighters may be able to widen fuel breaks to protect life and property. Per the HMP, fuel breaks are to be maintained on the development side of the border. The width of the safety buffer zone could be widened based on area-specific conditions to be specified in the site-specific work plans for each phase of work. Vegetation will be allowed to regrow in the 100-foot buffer following subsurface MEC remediation.
- Other areas to address specific risk and/or land use needs. Examples include proposed, future habitat restoration sites, and areas where there are high density anomalies associated with impact areas where military munitions with sensitive fuzes (all-ways-acting or piezoelectric fuzes, or 40mm grenade launcher high explosive (HE) or 40mm practice projectiles M382 series or M407 series [or any other 40mm practice series projectiles containing enough explosives to rupture the projectile]) were fired. The areas with high density anomalies of munitions with sensitive fuzes, which are assumed to be approximately 85 acres (total) of the Impact Area MRA, would be a candidate for subsurface MEC removal using excavation and sifting, as described below.

Based on a review of currently available data, an estimated 85 acres of the Impact Area MRA could contain significant amounts of UXO that are military munitions with sensitive fuzes and/or associated

metallic debris. These UXO could present a significant hazard to people that may work within these 85 acres if only a surface MEC removal is conducted. This acreage is a candidate for subsurface MEC removal that may include sifting the top 2-foot layer of soil, which would cause significant temporary impacts and loss of listed species, seed bank, or critical habitat. It should be noted that the size of the area that would require excavation and sifting is approximate. The actual area requiring the use of this removal process will be confirmed during remediation. Depending on the actual size of these large-scale excavations, it may also be necessary to re-initiate formal consultation with the U.S. Fish and Wildlife Service (USFWS) under the requirements of the Endangered Species Act (ESA).

Site-specific work plans outlining planned (1) vegetation clearance methods (prescribed burning); (2) surface and subsurface MEC detection and removal methodologies; and (3) habitat monitoring protocols will be developed for each phase of work. These plans, which are considered primary documents under the Federal Facility Agreement, will be made available for regulatory agency (EPA and DTSC) review and approval, and public review. The Army will coordinate the site-specific work plan with future landowners identified at the time of the plan's preparation.

The major elements of prescribed burning include:

- Coordination with the local air district;
- Preparation of a burn prescription and burn plan that outlines the objectives of the burn, the burn area, and the range of environmental conditions under which the burn will be conducted; the workforce and equipment resources required to ignite, manage and contain the fire; and communication procedures;
- Site preparation, including establishment and maintenance of containment lines;
- Conducting the burn within the range of environmental conditions established in the burn prescription; and
- Follow-up operations to ensure that the fire is fully contained.

Each phase will include a technology-aided surface MEC removal followed by digital geophysical survey. The Army, after reviewing the results of both the surface removal and the survey data, will prepare a Technical Memorandum for EPA and DTSC. This memorandum will provide an evaluation of the work completed to date and if necessary, describe additional removal recommended based on the evaluation. When evaluating whether additional removal is recommended, the Army will consider, among other factors: (1) explosive hazards associated with MEC so far recovered; (2) the proximity to potential receptors; (3) the density of MEC recovered; and (4) consistency with Applicable or Relevant and Appropriate Requirements (ARARs) (e.g., HMP and Biological Opinions). Generally, the recommended additional removal will be implemented prior to the next growing season for the CMC habitat; subsurface MEC removal beyond that timeframe would likely result in significant impacts to rare, threatened and endangered species that exist in the CMC which would have just began the process of natural re-growth after prescribed burning. If additional work is not recommended, the Army will document this fact and its rationale in the Technical Memorandum.

Because each Technical Memorandum will be an addendum to the site-specific work plan, which is a primary document under the Federal Facility Agreement (FFA), it will be disputable. To avoid impacts to rare, threatened and endangered species, completion and agency approval of the Technical Memorandum will be expedited to allow any additional actions to be completed before the next growing season. These Technical Memorandums and associated correspondence will be included in the Administrative Record. The Technical Memorandums will be provided for regulatory agency (EPA and DTSC) review, and are

subject to EPA approval (in consultation with DTSC). The Army will coordinate the Technical Memorandum with the future landowner identified at the time of its preparation.

The remedial action within the Impact Area MRA is expected to take eight or more years. At its completion, the Army will evaluate the work completed against planned reuse activities and the suitability of the selected Land Use Controls. The Army will include the results of this evaluation in a remedial action completion report that it provides to EPA and DTSC. This report is an FFA primary document; as such, selected Land Use Controls may be modified, when appropriate, with the approval of the regulatory agencies. Specific decisions about fences and the scope of post-transfer periodic inspections will be finalized after review of the report and consideration of information obtained during the remedial action. The Army, in coordination with the future landowner and regulatory agencies, will develop a detailed Land Use Control implementation plan that will be available at the time the property is transferred. Under CERCLA, the Army is ultimately responsible for the implementation, maintenance, enforcement, and reporting of remedial Land Use Controls, although all or part of such responsibilities may be transferred to another party (e.g., future landowner), with the approval of EPA and in consultation with DTSC.

The implementation of Land Use Controls at the Impact Area MRA will be described in more detail in the Remedial Design/Remedial Action Work Plan (RD/RAWP). This plan will: (1) outline the processes for implementing the Land Use Controls selected as part of the remedy; (2) identify procedures for responding to and coordinating response actions to unexpected circumstances (e.g., future MEC discoveries); and (3) outline the process for transferring property to future landowner(s). The property will not be transferred until all MEC remedial actions have been completed. Prior to property transfer and during the implementation of the remedial action, the Army will continue to implement site security measures to include maintenance of the existing perimeter fence and monitoring for evidence of trespassing. These activities will continue to be reported to the regulatory agencies as part of the Munitions Response Site Security Program annual reports. The location and design of security fencing that are part of the selected remedy will be documented in the RD/RAWP. Changes to the design or placement of fences that are made after submission of the RD/RAWP will be made in consultation with EPA and DTSC. Such changes will be documented in FFA primary documents. Because MEC will likely remain at the site, the Army will conduct five-year reviews. The selected Land Use Controls may be modified in the future based on the five-year reviews or the results of MEC removal with regulatory approval.

Under the FFA schedule, prior to property transfer, the Army shall prepare and submit to EPA for review and approval a Land Use Control implementation plan that is prepared as an addendum or amendment to the RD/RAWP. This plan shall contain implementation and maintenance actions, including periodic MEC inspections of open, accessible, or erosion-prone areas. The Army is responsible for enforcing Land Use Controls prior to property transfer and will remain responsible until such obligations are assumed by another party. These obligations will be included in a state land use covenant signed by DTSC and the Army, or a federal land use management plan.

The transfer of responsibility from the Army to another party for implementing, maintaining, monitoring, reporting, and enforcing Land Use Controls will be subject to regulatory approval. The transfer of any responsibility for selected Land Use Controls from the Army to another party will be described in a Land Use Control implementation plan that is prepared as an addendum or amendment to the RD/RAWP. This implementation plan will be subject to regulatory agency (EPA and DTSC) review and EPA approval.

As part of the Land Use Control implementation strategy, Long Term Management Measures will be performed by the Army, so long as the Army retains the property. The Army will provide a property

transfer document that: 1) informs future property owners of the selected remedy, including any land use or activity restrictions; 2) describes the response actions conducted to address MEC; 3) outlines appropriate procedures to be followed should MEC be encountered; and 4) establishes the transferee's obligations to maintain and enforce any land use and activity restrictions deemed necessary at the time of transfer.

The Army will perform annual monitoring and reporting of the Impact Area MRA regarding MEC encounters and changes in site conditions that could increase the possibility of encountering MEC within the MRA. The Army will also conduct five-year reviews.

The Army will notify the appropriate regulatory agencies, as soon as practicable, of any MEC encountered unrelated to active MEC remediation. The Army will report this information and other MEC-related information as part of the annual monitoring and reporting program and after five-year reviews. If, as a result of these reviews, the Army proposes a modification of the remedy, it will submit the proposal to EPA and DTSC per the FFA.

1.5. Statutory Determination

The selected remedy to address explosive risks posed by MEC known or suspected to be present at the Impact Area MRA is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost effective. The principal threat at the Impact Area MRA will be addressed (i.e., removing MEC from the surface of the entire Impact Area MRA, and removing subsurface MEC in selected areas) using permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, satisfying the statutory preference for treatment as a principal element (i.e., reducing the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants as a principal element through treatment).

Although surface and subsurface MEC removals will eliminate or reduce MEC present at the MRA, thereby reducing the possibility of future exposures, some MEC will likely remain present. Because some MEC may remain present, future land users may encounter MEC. Therefore, Land Use Controls are included in the selected remedy to allow for the management of the habitat reserve as described in the HMP and additional requirements, and to support safe reuse activities (e.g., habitat monitoring, invasive species control, prescribed burning, and associated fire management activities).

Because MEC will likely remain at the site under the selected remedy, a statutory review will be conducted within five years after initiation of the remedial action to ensure the remedy is, or will be, protective of human health and the environment regarding explosive safety risks posed by MEC. The next five-year review will occur in 2012.

1.6. ROD Data Certification Checklist

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this site.

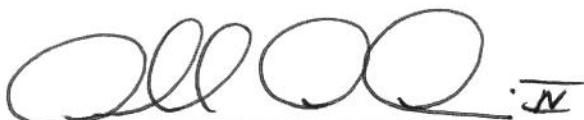
- Types of MEC identified during previous MEC sampling, investigation, and removal actions at the Impact Area MRA (Section 2.8. and Table 1).
- Current and reasonably anticipated future land use assumptions used in the risk assessment and ROD (Section 2.9.).

- The hypothetical current baseline and after-action “Overall MEC Risk Scores” estimated in the Risk Assessment before and after MEC remediation is conducted (Section 2.10.).
- The remedial action objectives for addressing the current baseline and after-action “Overall MEC Risk Scores” estimated in the Risk Assessment (Section 2.11.).
- How source materials constituting principal threats are addressed (Sections 2.12. and 2.13.).
- Potential land use that will be available at the site as a result of the selected remedy (Section 2.14.).
- Estimated capital, annual operations and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (Section 2.14.3.).
- Key factor(s) that led to selection of the remedy (Section 2.15.).

1.7. Authorizing Signatures and Support Agency Acceptance of Remedy

**Record of Decision
Impact Area Munitions Response Area
Track 3 Munitions Response Site
Former Fort Ord, California**

Signature Sheet for the foregoing Record of Decision for Impact Area Munitions Response Area, Track 3 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.



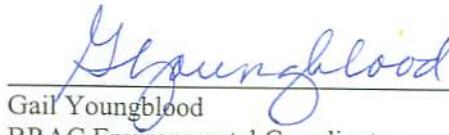
Addison D. Davis, IV
Deputy Assistant Secretary of the Army
Environment, Safety, and Occupational Health

27 MAY 2008

Date

**Record of Decision
Impact Area Munitions Response Area
Track 3 Munitions Response Site
Former Fort Ord, California**

Signature Sheet for the foregoing Record of Decision for Impact Area Munitions Response Area, Track 3 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.



Gail Youngblood
BRAC Environmental Coordinator
Fort Ord BRAC Office
U.S. Department of the Army



Date

**Record of Decision
Impact Area Munitions Response Area
Track 3 Munitions Response Site
Former Fort Ord, California**

Signature Sheet for the foregoing Record of Decision for Impact Area Munitions Response Area, Track 3 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.



Michael M. Montgomery
Chief, Federal Facilities and Site Cleanup Branch
U.S. Environmental Protection Agency
Region IX

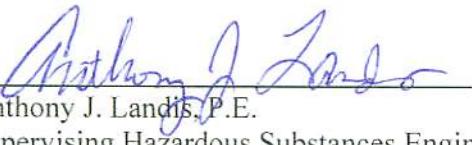
May 15, 2008

Date

**Record of Decision
Impact Area Munitions Response Area
Track 3 Munitions Response Site
Former Fort Ord, California**

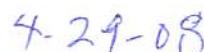
Signature Sheet for the foregoing Record of Decision Impact Area Munitions Response Area, Track 3 Munitions Response Site, Former Fort Ord, California, among the United States Army, the United States Environmental Protection Agency, and the California Environmental Protection Agency, Department of Toxic Substances Control.

The State of California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) had an opportunity to review and comment on the Record of Decision (ROD) and our concerns were addressed.



Anthony J. Landis, P.E.

Supervising Hazardous Substances Engineer II
Cal Center Cleanup Program
California Environmental Protection Agency
Department of Toxic Substances Control



Date

2. DECISION SUMMARY

2.1. Site Description

The former Fort Ord is located near Monterey Bay in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Plate 1). The former Army post consists of approximately 28,000 acres adjacent to Monterey Bay and the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south and Marina to the north. The Union Pacific Railroad and State Route 1 pass through the western portion of former Fort Ord, separating the beachfront from the rest of the Base. Laguna Seca Recreation Area and Toro Regional Park border former Fort Ord to the south and southeast, respectively, as well as several small communities such as Toro Park Estates and San Benancio. Additional information about the site:

- EPA Identification Number: CA7210020676;
- Lead Agency: Army;
- Lead Oversight Agency: EPA;
- Support Agency: DTSC;
- Source of Cleanup Monies: Army; and
- Site Type: Former Military Installation.

2.2. Site History

Since 1917, portions of Fort Ord were used by cavalry, field artillery, and infantry units for maneuvers, target ranges, and other purposes. From 1947 to 1974, Fort Ord was a basic training center. After 1975, the 7th Infantry Division occupied Fort Ord. Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993 and the Base was not officially closed until September 1994. The property remaining in the Army's possession was designated as the Presidio of Monterey Annex on October 1, 1994 and subsequently renamed the Ord Military Community (OMC). Although Army personnel still operate parts of the Base, no active Army division is stationed at the former Fort Ord. Since the Base was selected in 1991 for Base Realignment and Closure (BRAC), site visits, historical and archival investigations, military munitions sampling, and removal actions have been performed and documented in preparation for transfer and reuse of the former Fort Ord property. The Army will continue to retain the OMC and the U.S. Army Reserve Center located at the former Fort Ord. The remainder of Fort Ord was identified for transfer to Federal, State, and local government agencies and other organizations and, since Base closure in September 1994, has been subjected 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 U.S. Department of the Interior, BLM. Other areas on the installation have been or will be transferred through economic development conveyance, public benefit conveyance, negotiated sale, or other means.

Munitions-related activities (e.g., live-fire training, demilitarization) involving different types of conventional military munitions (e.g., artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, practice land mines, pyrotechnics, bombs, demolition materials) were conducted at Fort Ord. Because of these activities, MEC, specifically unexploded ordnance (UXO) and discarded

military munitions (DMM), have been encountered and are known or suspected to remain present at sites throughout the former Fort Ord. A Glossary of Munitions Response Program Terms is provided in Appendix A.

2.3. Enforcement and Regulatory History

The Army is the responsible party and lead agency for investigating, reporting, making cleanup decisions, and taking cleanup actions at the former Fort Ord under CERCLA. The reuse of the former Fort Ord following transfer of property increases the possibility of the public being exposed to explosive hazards. MEC investigation and removal began following BRAC listing and closure of Fort Ord. In November 1998, the Army agreed to evaluate military munitions at former Fort Ord in an Ordnance and Explosives Remedial Investigation/Feasibility Study (basewide OE RI/FS)—now termed the basewide Munitions Response RI/FS (basewide MR RI/FS)—consistent with CERCLA. An FFA was signed in 1990 by the Army, EPA, DTSC (formerly the Department of Health Services or DHS), and the Regional Water Quality Control Board (RWQCB). The FFA established schedules for performing remedial investigations and feasibility studies and requires that remedial actions be completed as expeditiously as possible. In April 2000, an agreement was signed between the Army, EPA, and DTSC to evaluate military munitions and perform military munitions response activities at the former Fort Ord subject to the provisions of the Fort Ord FFA.

The basewide MR RI/FS program reviews and evaluates past investigative and removal actions, as well as recommends future response actions deemed necessary to protect human health and the environment regarding explosive safety risks posed by MEC on the basis of proposed reuses. These reuses are specified in the Fort Ord Reuse Authority (FORA) Fort Ord Base Reuse Plan (*FORA, 1997*) and its updates. Potential human health and ecological risks related to any soil contamination from small arms and military munitions ranges are being addressed under the Basewide Range Assessment (*Shaw/MACTEC, 2006*) program and the Site 39 Feasibility Study Addendum (*MACTEC, 2007a*). All basewide MR RI/FS documents have been or will be prepared in cooperation with the EPA and DTSC in accordance with the FFA, made available for public review and comment, and placed in the Administrative Record. Primary documents under the FFA are subject to EPA approval (in consultation with DTSC).

The Army has been conducting military munitions response actions (e.g., investigation, removal) at identified Munitions Response Sites (MRSs) and will continue these actions to mitigate imminent MEC-related hazards to the public, while gathering data about the type of military munitions and level of hazard at each MRS for use in the basewide MR RI/FS. The Army is performing its activities pursuant to the President's authority under CERCLA Section 104, as delegated to the Army in accordance with Executive Order 12580 and in compliance with the process set out in CERCLA Section 120.

The Army's ongoing and future responses to MEC at the former Fort Ord are components of the Army's basewide efforts to promote explosive safety based on Fort Ord's history as a military base. These efforts include: (1) five-year reviews and reporting; (2) deed or property transfer documentation or letter of transfer notices; (3) MEC incident reporting; (4) MEC recognition and safety training; (5) school education; and (6) community involvement.

The basewide MR RI/FS program is organized as a "tracking" process whereby sites with similar characteristics will be grouped to expedite cleanup, reuse, and/or transfer based on current knowledge. A site or area is assigned to a specific "track" (i.e., Track 0, 1, 2, or 3) according to the level of military munitions usage, military munitions investigation, sampling, or removal conducted to date, as described in the OE RI/FS Work Plan (*USACE, 2000*). Track 0 areas at the former Fort Ord contain no evidence of MEC and have never been suspected as having been used for military munitions-related activities of any

kind. Track 1 sites were suspected to have been used for military training with military munitions, but based on a remedial investigation, no further action is required. Track 2 sites are areas at the former Fort Ord where MEC items were present, and MEC removal has been conducted. Track 3 sites are those areas where: (1) MEC are suspected or known to exist, but investigations are not yet complete or need to be initiated; or (2) areas identified in the future that meet this definition. The Impact Area MRA qualifies as a Track 3 site because MEC exists and actions have not been completed. This Track 3 Impact Area MRA ROD selects the final remedy to address MEC risks at the portion of the historical Impact Area that is currently designated for transfer to BLM as Habitat Reserve in the Fort Ord Base Reuse Plan (*FORA*, 1997) and its updates, as well as the HMP (*USACE*, 1997) (Plate 2).

Range 30A and a portion of Ranges 43 through 48 are included within the boundaries of the Impact Area MRA (Plate 2). These ranges were previously identified for Interim Action in the *Record of Decision, Interim Action for Ordnance and Explosives at Ranges 43-48, Range 30A, and Site OE-16, Former Fort Ord, California* (Interim Action ROD; Army, 2002), and the implementation of MEC remediation under the Interim Action ROD at these ranges are at varying levels of completion.

2.4. Community Participation

The Final Impact Area MRA RI/FS Report was published on June 25, 2007, and the Proposed Plan for the Impact Area MRA was made available to the public on June 28, 2007 for a 60-day public comment period. The Proposed Plan presented the preferred alternative selected as the final remedy in this ROD, and summarized information in the Impact Area MRA RI/FS and other supporting documents in the Administrative Record. These documents were made available to the public at the following locations:

- Seaside Branch Library, 550 Harcourt Avenue, Seaside, California.
- California State University Monterey Bay (CSUMB) Library Learning Complex, 100 Campus Center, Building 12, Seaside, California.
- Fort Ord Administrative Record, Building 4463, Gigling Road, Room 101, Ord Military Community, California.
- www.fortordcleanup.com website.

The notice of the availability of the Proposed Plan was published in the Monterey County Herald and the Salinas Californian on June 28, 2007. The initial public comment period was held from June 28 to July 28, 2007, and was extended by 30 days at the request of the public, ending on August 27, 2007. In addition, a public meeting was held on July 10, 2007 to present the Proposed Plan to a broader community audience than those that had already been involved at the site. At this meeting, representatives from the Army, EPA, and DTSC were present, and the public had the opportunity to submit written and oral comments about the Proposed Plan. The Army's response to the comments received during this period is included in the Responsiveness Summary, which is part of this ROD.

2.5. Scope and Role of Response Action

This ROD addresses the planned response action for managing the potential risk to future land users from MEC at the Impact Area MRA, where MEC investigations and removal actions have not yet been completed, as described in the Impact Area MRA RI/FS (*MACTEC*, 2007b). The planned response action for this MRA will be the final remedy for protection of human health and the environment regarding explosive safety risks posed by MEC.

The Impact Area MRA includes two areas previously evaluated in the Interim Action ROD: a southern portion of Ranges 43-48, and Range 30A. The Interim Action ROD selected interim remedial actions for these areas, consisting of vegetation clearance by prescribed burning, surface and subsurface MEC removal, and detonation of MEC using engineering controls (*Army, 2002*). Subsurface removal depths were to be determined in the site-specific work plans based on the military munitions used, the depth to which these types of munitions would penetrate or be found, the planned reuse of the specific areas within the Interim Action site, and the capabilities of the geophysical detection equipment selected by the site geophysicist. Implementation of MEC removal under the Interim Action ROD at these ranges is at varying levels of completion. These sites were evaluated in the Track 3 Impact Area MRA RI/FS.

- In MRS-Ranges 43-48, the interim action was conducted from October 2003 to December 2005. The final report on the completed activities identified several areas within Ranges 43-48 where removal-to-depth was not completed, including areas of high metallic clutter (*Parsons, 2007*). The portion of MRS-Ranges 43-48 that is also part of the Impact Area MRA includes some of the areas where subsurface removal was not conducted. The evaluation of alternatives in the Track 3 Impact Area MRA RI/FS doubles as the follow-on evaluation of this portion of the Ranges 43-48 Interim Action site. The final remedy selected in this ROD is consistent with objectives of the interim actions taken at the Ranges 43-48 site.
- Implementation of the interim action in Range 30A is suspended due to the high wildfire risk associated with prescribed burning in this part of the Impact Area MRA. Range 30A, which consists of approximately 388 acres, contains and is surrounded by areas of healthy Central Maritime Chaparral (CMC) vegetation that is highly flammable and has not recently been burned. Under the Interim Action program, the site would be surrounded by a 45-foot primary fuel break and burned in one large prescribed burn. Drawing from the lessons learned from the prescribed burn conducted for Ranges 43-48, the Army has determined that remedial actions in that vicinity of the Impact Area MRA should be sequenced so that the area between Range 30A and the Base boundary is burned and cleaned up first, thus creating a larger fuel break in the process, before taking action in Range 30A. The remedy selected in this ROD provides for MEC removal to depth in selected areas, including areas of high-density metallic clutter associated with military munitions with sensitive fuzes – a type of area specifically suspected to exist in Range 30A. Therefore, the selected final remedy is consistent with the objectives of the interim action.

Therefore, the remedy that is selected in this ROD also serves as the final remedy for these two Interim Action areas. In effect, this Impact Area MRA Track 3 ROD amends the 2002 Interim Action ROD regarding the southern portion of Ranges 43-48 and Range 30A.

Additionally, the implementation of the selected remedy at the Impact Area MRA will also enable soil investigations to be conducted in previously inaccessible areas. During munitions response at the Impact Area MRA, the Army will continue to conduct characterization of potential chemicals of concern (COCs) to include munitions constituents (MC) in soil associated with former military munitions range uses (metals and explosive compounds). The Army will evaluate the data in a timely manner to determine whether sampling is required to characterize an area further with respect to potential soil contamination from MC. In addition, if there is evidence that military munitions recovered from the subsurface have degraded and leaked MC into the subsurface soils, these specific locations will also be evaluated to determine if sampling for MC is necessary. Potential human health and ecological risks related to any soil contamination from MC related to the use of small arms ammunition and military munitions ranges are being addressed under the Basewide Range Assessment (*Shaw/MACTEC, 2006*) program and the Site 39 Feasibility Study Addendum (*MACTEC, 2007a*).

Remedial Alternative 4 identified in the Proposed Plan is the selected remedy for addressing explosive safety risks posed by MEC at the Impact Area MRA, and is summarized as follows:

Remedial Alternative 4—Technology-Aided Surface MEC Remediation, With Subsurface MEC Remediation in Selected Areas and Land Use Controls:

This selected remedy includes Technology-Aided Surface MEC Remediation throughout the entire Impact Area MRA (with detection instruments available onsite to aid in the investigation for MEC where the ground surface is not visible), and Subsurface MEC Remediation in selected areas to support reuse of the area as a habitat reserve. Subsurface MEC remediation will be conducted in selected areas. These areas include: (1) regularly maintained fuel breaks and associated access roads; (2) a buffer area that is a minimum 100-foot width and that may be expanded, if site conditions warrant, along the habitat-side of the development border of the Impact Area MRA; and (3) other areas to address specific risk and/or land use needs (e.g., proposed future landowner habitat restoration areas). Subsurface MEC remediation is estimated to be conducted in approximately 10 percent of the Impact Area MRA.

Prescribed burning (followed by a munitions response) will be implemented using a phased approach. Prescribed burns will be conducted in stages and consist of several smaller burns, approximately 100 acres in size (actual size could be more or less than 100 acres depending on site-specific considerations), over several days, rather than one large burn. Prescribed burning and MEC remedial actions will be conducted in up to 800 acres per year. In compliance with the HMP, prescribed burns will be conducted in no more than 800 acres in any given year. Therefore, for the 6,560-acre Impact Area MRA, it will take approximately eight or more years to complete the prescribed burning and MEC remedial action in the Impact Area MRA.

Site-specific work plans outlining planned (1) vegetation clearance methods (prescribed burning), (2) surface and subsurface MEC detection and removal methodologies, and (3) habitat monitoring protocols; and will be made available for regulatory agency (EPA and DTSC) and public review. The Army will coordinate the site-specific work plan with future landowners identified at the time of the plan's preparation. Subsurface MEC remediation areas will be identified in the site-specific work plans.

After both the completion of a munitions response in the Impact Area MRA and property transfer, the following Land Use Controls will be implemented to support, from an explosives safety perspective, the safe use and management of the area as a habitat reserve:

- MEC recognition and safety training;
- Construction support for ground disturbing or intrusive activities and UXO-qualified personnel support;
- Access management measures including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs (Note: Based on site-specific considerations, other fencing may be required to be constructed and maintained to ensure public safety);
- Helicopter support for select future habitat management prescribed burns;
- Weed abatement support; and
- Property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use.

The RD/RAWP, will: (1) outline the processes for implementing the Land Use Controls selected as part of the remedy; (2) identify procedures for responding to and coordinating response actions to unexpected circumstances (e.g., future MEC discoveries); and (3) outline the process for transferring property to future landowner(s). Because MEC will likely remain at the site, the Army will conduct five-year reviews. The selected Land Use Controls may be modified based on the results of the five-year review process or response actions to MEC, with the approval of the regulatory agencies.

At the time of property transfer, the transfer of responsibility from the Army to another party for implementing, maintaining, monitoring, reporting, and enforcing Land Use Controls will be subject to regulatory approval. The Army is responsible for enforcing Land Use Controls prior to property transfer and will remain responsible post transfer unless and until such obligations are assumed by another party. The transfer of any responsibility for selected Land Use Controls from the Army to another party will be described in a Land Use Control implementation plan that is prepared as an addendum or amendment to the RD/RAWP. This implementation plan will be subject to regulatory agency (EPA and DTSC) review and EPA approval.

Under the FFA schedule, prior to property transfer, the Army shall prepare and submit to EPA for review and approval a Land Use Control implementation plan that is prepared as an addendum or amendment to the RD/RAWP. This plan shall contain implementation and maintenance actions, including periodic MEC inspections of open, accessible, or erosion-prone areas. The implementation of the selected remedy will, from an explosive safety perspective, allow for safe reuse and management of the Impact Area MRA as habitat reserve, as described in the HMP and additional requirements. In addition, the selected remedy will allow the general goal of the HMP to promote preservation, enhancement, and restoration of habitat and populations of HMP species to be met, while allowing development on selected properties on the former Fort Ord.

2.6. Site Characteristics

The Impact Area MRA consists of approximately 6,560 acres in the southwestern portion of the 8,000 acre historic Impact Area (Plate 1) that is currently identified for transfer to BLM as habitat reserve. The historical Impact Area is bounded by Eucalyptus road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and General Jim Moore Road to the west. The Impact Area MRA includes all of MRS-BLM, and a portion of MRS-Ranges 43 through 48. It does not include: (1) the development areas on the outer edges of the historical Impact Area (including MRS-15 SEA 01 through 04; MRS-15 DRO 01, MRS-15 DRO 01A, MRS-15 DRO 02, MRS-15 DRO 02A, MRS-15 MOCO 01, MRS-15 MOCO 02, MRS-46, or MRS-47); (2) the Monterey Peninsula College (MPC) development parcels and the MPC Habitat Reserve parcels; (3) the Military Operations on Urbanized Terrain (MOUT) (MRS-28); or (4) BLM Headquarters (MRS-35) (Plate 2).

The Impact Area MRA evaluated in this RI/FS includes two areas previously evaluated in the Interim Action ROD: a southern portion of Ranges 43-48, and Range 30A. The land comprising the historical Impact Area was purchased by the Government in 1917. The Impact Area MRA is primarily undeveloped.

2.7. Impact Area MRA Track 3 RI/FS Background

The Impact Area MRA was evaluated as a Track 3 site and contains all of MRS-BLM and a portion of MRS-Ranges 43 through 48. Former land use included live-fire training with military munitions. Multiple firing ranges operated within the historical Impact Area; generally, weapons firing was directed toward the center of the historical Impact Area.

This section provides background information on the Impact Area MRA Remedial Investigation data collection. Numerous MEC-related investigations and removal activities were conducted in the Impact Area MRA with the focus on addressing explosives safety. Table 1 summarizes the results of the investigations and removal actions, and Section 2.8 presents a summary of the site evaluations for the MRSs presented in the Impact Area MRA RI/FS (Volume I; *MACTEC, 2007b*).

Scope of Investigations and Removal Actions—The munitions response actions conducted within the Impact Area MRA focused on addressing explosive safety. According to the U.S. Army Corps of Engineers (USACE) UXO Safety Specialist for the Sacramento District, when non-military munitions related debris was found, it was removed from the excavation and inspected for explosive hazards and for the presence of hazardous wastes. If MEC or hazardous wastes were identified, it was removed and disposed of following the appropriate requirements. After inspection, non-hazardous debris was either left at or removed from the site.

Four primary munitions response contractors performed munitions response at the Impact Area MRA: (1) Human Factors Applications, Inc. (HFA); (2) CMS Environmental, Inc. (CMS), now known as USA Environmental, Inc. (USA); (3) Parsons Infrastructure & Technology Group, Inc. (Parsons); and (4) Shaw Environmental (Shaw).

Site Evaluations—Available data (e.g., archival investigation and removal data) for the Impact Area MRA was reviewed and evaluated during the Impact Area MRA Remedial Investigation (*MACTEC, 2007b*). Portions of the Impact Area MRA were investigated over the course of several munitions responses, conducted by the contractors previously identified. A surface removal of MEC was conducted within the Impact Area MRA at fuel breaks, access roads, and selected trails. Subsurface MEC removal was conducted on portions of some fuel breaks, roads, and trails to a depth of four feet. Investigations for MEC were conducted to four feet below ground surface (bgs) in selected grids, with all detected MEC removed. Surface removal was also conducted over portions of the Impact Area after a vegetation burn.

The data set for the Impact Area MRA indicated very few Quality Control (QC) or Quality Assurance (QA) failures, and the RI indicated that the data was usable for the Remedial Investigation, Risk Assessment and Feasibility Study. Data review for the Remedial Investigation included all investigations and removals within the Impact Area MRA as well as the full data set for Interim Action at Ranges 43 through 48, which includes land both inside and outside the Impact Area MRA. This extra data was included for three reasons: (1) the subsurface removal data set was larger than available dataset within the footprint of the Impact Area MRA; (2) the high density of MEC present on both the surface and the subsurface would result in a conservative risk score; and (3) the subsurface data set within the Impact Area MRA is limited to removals within fuel breaks, and on roads and trails, which are unlikely to provide representative sampling of MEC density within the Impact Area MRA. It is noted that the most complete data set, and the data set that most closely reflects current removal technology, is the Range 43 through 48 data set, which involved more field QA/QC and data management than previous actions.

2.8. Impact Area MRA Previous Investigation Summary

This section summarizes the munitions response actions conducted within the Impact Area MRA (see Table 1). The objectives of the munitions response actions conducted varied and included subsurface sampling of 100-by 100-foot grids to specified depths, surface only removal in accessible areas, and removal of all detected anomalies to depth. MEC encountered during these actions were destroyed by detonation and recovered munitions debris (MD) was disposed or recycled after being inspected and determined not to pose an explosive hazard. MEC-related data from the MMRP database used to prepare the RI/FS underwent QC/QA. The QC/QA evaluation included a review of field grid records to determine if any modifications to the MMRP database were necessary. Based on the review, the

descriptions and status (MEC or MD) of some items were corrected and may not match the contractor after-action report descriptions.

Grid Sampling

An initial evaluation to determine the scope of future munitions response in the Impact Area was conducted in 1997 and 1998. As part of this evaluation, grid sampling was performed within selected areas of the Impact Area to collect data regarding the type, depth, and distribution of military munitions present. Grid sampling is a method whereby 100 percent of the geophysical anomalies detected within a designated grid (typically 100-by 100-foot) are investigated. Each 100-by 100-foot grid was sampled to a minimum depth of four feet bgs (all anomalies detected were investigated to a depth of four feet, and deeper anomalies were investigated as directed by a USACE UXO Safety Specialist). The sample grids were selected to evaluate the possibility that MEC may be present on small arms ranges, areas behind the firing lines, and between the range fans. MEC and MD, which was inspected and determined not to present an explosive hazard, removed from the sample grids included illuminating projectiles, practice and smoke grenades, practice rockets, blasting caps, HE projectiles, rifle-fired smoke grenades, a HE antitank (HEAT) guided missile (Dragon), HEAT rockets, and practice anti-personnel mines (*USA, 2000a and 2000b*).

MEC Removal on Impact Area Roads and Trails

To facilitate safe travel within the Impact Area during field activities, MEC removal was performed on portions of 8 access roads and 32 dirt roads and trails in 1997 and 1998. The objective was to remove all MEC and MD to a depth of at least four feet. The MEC removal on roads was comprised of contiguous 15-by 100-foot grids. MEC and MD, which was inspected and determined not to present an explosive hazard, were removed from the roads and trails, and they included practice, HE and shrapnel projectiles, practice and HE rockets, projectile and rocket fuzes, antitank and practice rifle-fired grenades, incendiary and smoke hand grenades fuzes, and hand held signals (*USA, 2001a*).

MEC Removal on Fuel Breaks

To prevent the spread of accidental fires and to manage controlled burns within the Impact Area, fuel breaks were established around portions of the Impact Area perimeter. Three phases of fuel break MEC removal have been completed within the Impact Area MRA. The first phase, which was conducted in 1998, removed all MEC and MD detected to a depth of at least four feet bgs. The fuel breaks were comprised of contiguous 30-by 100-foot grids. The second phase was conducted to re-establish and maintain fuel breaks in the interior portions of the Impact Area MRA. The fuel breaks were comprised of contiguous 45-by 100-foot or 50-by 100-foot grids. All detected MEC and MD in the center 15- or 20-foot wide central portion of the fuel breaks was removed to a depth of at least four feet bgs. A surface MEC removal was also performed on either side of the central portion of the fuel breaks. The third phase was conducted on 10 additional fuel breaks in the interior portions of the Impact Area MRA. This phase included a subsurface removal along both the entire 45-foot width of Riso Ridge Road and 15-foot wide corridors (i.e., outer sections) on each of the other 9 existing fuel breaks so that all MEC detected was removed to depth from the entire width of these fuel breaks. MEC and MD, which was inspected and determined not to present an explosive hazard, were removed from the fuel breaks, and they included practice, HE, smoke and illuminating projectiles, practice, HEAT and incendiary rockets, HEAT guided missiles (Dragon), antitank and practice rifle-fired grenades, smoke producing hand grenades, hand grenade fuzes, practice mines, ignition cartridges, and pyrotechnics (*Parsons, 2006*).

Time Critical Removal Actions

To address an imminent threat to the public posed by the presence of MEC on the ground surface, Time Critical Removal Actions (TCRAs) were performed at several locations including three areas within the Impact Area MRA (Mortar Alley, Range 30A, and MRS-Ranges 43 through 48).

Mortar Alley

This TCRA at Mortar Alley was conducted in November and December 2001 (*Parsons, 2002a*). A surface removal was performed without either the use of geophysical equipment or vegetation removal. The field crews walked open areas and trails visually searching for MEC and MD. This surface removal covered approximately 50 percent of the 26-acre site. MEC found and removed included 4.2-inch and 81mm HE mortars, an HE 40mm grenade, and a 75mm shrapnel projectile.

Range 30A

This TCRA at Range 30A was conducted in November and December 2001 (*Parsons 2002b*). A surface removal was performed without the use of either geophysical equipment or vegetation removal. The TCRA's scope only included areas wide enough for bicycle travel, with field crews walking open areas and trails visually searching for MEC and MD. Surface removal operations covered approximately 1 percent of this 391-acre site. MEC items found and removed included 60mm practice mortars, 81mm HE, practice and illuminating mortars, HE and practice 40mm grenades, 75mm shrapnel projectiles, a 37mm low explosive projectile, and a 155mm shrapnel projectile.

MRS-Ranges 43 through 48

This TCRA was conducted over the MRS-Ranges 43 through 48 from August to December 2001 to remove surface MEC and MD from open and accessible areas (*Parsons, 2002c*). MEC removed included 35mm sub-caliber practice rockets, 66mm series HEAT and triethylaluminum (TPA) incendiary rockets, 84mm HEAT projectiles, 40mm HE grenades, 90mm HE projectiles, 60mm HE and target practice (TP) mortar projectiles, 81mm mortar projectiles, 57mm projectiles, and Dragon guided missiles and rocket motors from 2 Dragon guided missiles.

MRS-Ranges 43 through 48 Interim Action

Based on the results of previous sampling completed within the MRS-Ranges 43 through 48 boundary, the Army, in coordination with EPA and DTSC, determined that an interim remedial action was required. The Army prepared an RI/FS and proposed plan identifying the preferred alternative (prescribed burning, surface and subsurface removal, and detonation using engineering controls). The Interim Action ROD documenting the selection of the interim remedy was signed in September 2002.

A prescribed burn was conducted at Ranges 43-48 in October 2003. During the Interim Action surface removal over 3,000 sub-caliber practice rockets, and almost 600 HE projectiles were removed. The HE projectiles included 57mm, 60mm (mortars), 75mm, and 40mm (grenade) calibers. In addition, guided missiles (Dragon), hand grenades and various calibers of illumination mortars were removed. During the subsurface removal over 3,000 additional MEC items were identified. MEC included 37mm HE and low explosive (LE) projectiles, 60mm and 81mm HE mortars, and flares and fuzes (*Parsons, 2007*).

During the MRS-Ranges 43 through 48 Interim Action, areas of the site were identified as "special case areas" (SCAs). SCAs were defined for the Ranges 43 through 48 Interim Action as an area in an MRS in which MEC removal cannot be completed within the scope of work due to metallic clutter or

obstructions that compromise instrument performance or technician safety or because the removal process would cause a serious adverse impact to the habitat. Areas identified as SCAs include nearly 139 acres of Range 48 that contained numerous targets and dense MD. Due to time and funding constraints, not all of the subsurface removal process was completed in several other areas. These areas, which were designated as non-completed areas, included approximately 56 acres in the central and southern portions of the MRS (*Parsons, 2007*).

Time Critical Removal Actions (Burned Areas)

Watkins Gate Burn Area

In October 2003, a prescribed burn for MRS-Ranges 43 through 48 jumped the firebreak and burned approximately 1,000 additional acres. This acreage, which was both accessible to the public and near residences, was designated as the Watkins Gate Burn Area (WGBA). A TCRA was conducted in the WGBA from December 2003 to March 2004. The TCRA consisted of a visual surface sweep for most of the area. During this TCRA, 499 MEC items and MD (68,590 pounds [lbs]) were removed. Approximately 19 percent of the MEC removed was HE, the majority of which were projectiles. All MD removed was inspected and determined not to present an explosive hazard.

Non-intrusive geophysical transect sampling of most of the WGBA provided information to aid in planning future munitions response actions for the WGBA. Data collection via a towed array of 3 Geonics EM61-MK2 time-domain metal detectors revealed most areas (89 percent of the area) had light anomaly densities (between 0 and 0.02 anomalies per foot), 5 percent had light to medium densities, and 2 areas had medium to high densities (*Parsons, 2005*).

Eucalyptus Fire Area

In July 2003, an accidental fire burned approximately 644 acres, including approximately 367 acres in the northeast corner of the Impact Area. A visual surface sweep for military munitions was conducted in October 2003 to locate and remove any MEC and MD (over 2-inches in size) found on the ground surface (*Shaw, 2005*). Geophysical instruments were not used for these sweeps, except in areas where 40mm HE grenades were found. In the grenade areas, an investigation to a depth of 6-inches bgs was conducted using the Schonstedt GA-52/Cx magnetometer and the Whites Classic I Model 800-0303 metal detector. MEC identified included pyrotechnics, simulators, hand grenades, and hand grenade fuzes, 40mm grenades, a rocket fuze, and two Japanese manufactured mortars. Approximately 29,300 pounds of MD that was 2 inches or greater in size was removed. MD, which was inspected and determined not to present an explosive hazard, consisted primarily of 3.5-inch practice rockets, practice hand grenades, hand grenade fuzes, dummy rockets, and signals (*Shaw, 2005*).

Ordnance Detection and Discrimination Study

The Ordnance Detection and Discrimination Study (ODDS) was developed to evaluate subsurface detection and discrimination capabilities of commercially available MEC detection instruments and systems at the former Fort Ord (*Parsons, 2002d*). As part of this study, MEC removal was completed within parts of the Impact Area MRA (portions of Ranges 26, 31, and 37, as well as part of Badger Flats). This removal included sweeping the area with Schonstedt GA-52/Cx magnetometers and digital geophysical surveys. As a result, 14 MEC and 251 MD items were identified and removed from the test grids. Results of the ODDS study are presented in *Ordnance Detection & Discrimination Study (ODDS) Report, Volume I-IV* (*Parsons, 2002d*).

Range 36A Investigation

Range 36A was permitted as an open burn/open detonation (OB/OD) area under the Resource Conservation and Recovery Act (RCRA) program. The range was reportedly used from sometime in the 1940s through October 1992 (*Shaw, 2007*). Range 36A is undergoing clean closure for potential chemical residue as part of a RCRA closure process. Historical use of Range 36A included use as an explosive ordnance disposal training area and possibly as an OB/OD area (*Shaw, 2007*). The Army conducted a munitions response to address the possibility that MEC may be present at Range 36A. Numerous metallic anomalies identified from digital geophysical mapping indicated that more metallic debris may be buried on site than had been suspected. Subsequent trenching indicated metallic debris is mostly located within six inches of the surface. Based on these initial results, the Army prepared a fieldwork variance, and with agency approval, conducted additional investigation of the magnetic anomalies. No MEC was found during this additional investigation. The results of the MR investigation are presented in Volume II of the Final RCRA Closure Certification Report for Range 36A (*Shaw, 2007*).

Summary

Although the munitions response activities described above cover only a limited portion of the Impact Area MRA, their results indicate:

- MEC identified within the Impact Area MRA includes, but is not limited to, HE and practice projectiles, rockets, rifle and hand grenades, and mortars; and pyrotechnics.
- Based on existing data, the highest concentrations of MEC are expected to occur within range fans identified on historical training maps.
- Previous munitions responses indicate MEC is present on the ground surface or within 1-foot bgs, and densities appear to drop off quickly below a depth of 1 foot.

2.9. Current and Potential Future Land and Resource Uses

Future land uses are primarily based upon the FORA March 1997 Fort Ord Base Reuse Plan (*FORA, 1997*), the July 1995 USACE and BLM Site Use Management Plan (SUMP) (*USACE, 1995*), and the 1997 HMP (*USACE, 1997*). Since Base closure, the Army has been coordinating with the BLM regarding the management of habitat reserve within the former Impact Area. The 1995 SUMP and 1997 HMP outline agreements on conceptual reuse and management of the Impact Area based on MEC cleanup expectations at the time. Since then, BLM has provided several updates on its plans for reuse and habitat management. These documents include the 2004 draft Proposed Management Plan (*BLM, 2004*), 2006 Proposed Resource Management Plan/Final Environmental Impact Statement, and *Draft Installation-Wide Multispecies Habitat Conservation Plan for Former Fort Ord, California* (draft HCP; *Zander, 2007*).

The FORA Base 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 Impact Area MRA is designated as a habitat reserve in the FORA Base Reuse Plan. The SUMP identified three unique future reuse designations within the Impact Area MRA:

- 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.

A general goal of the HMP is to promote preservation, enhancement, and restoration of habitat and populations of HMP species while allowing development on selected portions of the former Fort Ord. The base-wide implementation of the HMP must comply with the Federal ESA and Biological Opinions for the disposal and reuse of the former Fort Ord. As such, habitat management parcels or habitat corridors that include portions of the Impact Area MRA were designed to offset habitat loss from designated development areas outside the Impact Area MRA. The HMP (*USACE, 1997*), East Garrison and Parker Flats Land Use Modification Assessment (*Zander, 2002*) and the Revised Attachment A – HMP map (March 2006) present the revised boundaries of the habitat reserve areas, including those managed by the BLM. For the habitat reserve in the Impact Area, the HMP and Biological Opinions (*USFWS, 1999, 2002, and 2005*) prescribe certain management actions and mitigation measures for predisposal actions (environmental cleanup and munitions response). These include minimizing disturbances in the habitat, conducting employee education program, habitat monitoring, and vegetation burning in support of munitions response in maritime chaparral habitat. Post-disposal management guidelines for the Impact Area habitat reserve areas include habitat restoration, enhancement, and monitoring; access control; controlled burning; and allowance for development-oriented use in as much as 2 percent of the Natural Resource Management Area (HMP; *USACE, 1997*).

BLM recently provided the draft HCP (*Zander, 2007*) to the Army. The draft HCP describes the projected land uses (habitat reserve), existing habitat features, species covered by the plan, and the resource conservation and management activities anticipated for the habitat reserve in the former Impact Area.

2.10. Summary of Site Risks

Based on the results of the evaluation performed in the Impact Area MRA Remedial Investigation (Volume 1, *MACTEC, 2007b*), the project team (the Army, EPA, and DTSC) determined that there was a strong weight of evidence to support the conclusion that the data were useable for performing a Risk Assessment and Feasibility Study.

The Remedial Investigation concluded that MEC, including HE munitions, is present on the surface and in the subsurface of the Impact Area MRA. Based on the Remedial Investigation, a risk assessment was conducted to evaluate the explosive safety risks to human health associated with MEC within the Impact Area MRA. The Impact Area MRA Risk Assessment (Section 4.0, Volume 1, *MACTEC, 2007b*) utilized the *Fort Ord Ordnance and Explosive Risk Assessment Protocol*, which was developed to estimate the risk to future land users from MEC. This Protocol states explosive safety risk in terms of “Overall MEC Risk Scores” (*Malcolm Pirnie, 2002*). Overall MEC Risk Scores were estimated for three scenarios: (1) a baseline scenario (conditions prior to conducting any MEC remediation); (2) a hypothetical surface removal after-action scenario (estimated risk after conducting surface-only remedial action at the MRA); and (3) a hypothetical removal-to-depth (intrusive investigation of all anomalies) after-action scenario (estimated risk after conducting removal-to-depth at the MRA).

The MEC Risk Assessment Protocol results are based on three key factors (MEC Hazard Type, Accessibility, Exposure) that were assigned reuse-specific values and weighed in importance. These factors were used to develop an Overall MEC Risk Score for each potential receptor as follows:

Overall MEC Risk Score	A	B	C	D	E
	Lowest	Low	Medium	High	Highest

Based on the draft Installation-Wide Multispecies Habitat Conservation Plan (HCP) (*Zander, 2007*), the types of reuse activities planned for the future habitat reserve include:

- Road and trail management and maintenance;
- Habitat enhancement, including prescribed burning;
- Fuel break construction and management;
- Use of administrative areas;
- Habitat monitoring and educational programs;
- Species specific monitors and habitat enhancement; and
- Recreational access on established routes.

These activities, which involve varying levels of ground disturbance, were grouped by level of ground disturbance for the purpose of the risk assessment. In general, the results of the Risk Assessment indicated:

- Baseline (Current) Risks – The risk is the highest (E) for all reusers.
- Surface MEC Removal – The hypothetical after-action risk following surface removal only is medium (C) for surface-only users (e.g., habitat monitors and hikers) because MEC may remain just below the surface. The MEC Risk Assessment Protocol was designed so that for the Accessibility Factor, removal to a minimum of 1-foot below the level of intrusion achieves the lowest risk score (A) for surface only land users. The risk remains the highest (E) for users (e.g., firefighters, habitat workers, construction workers) conducting ground intrusive activities (e.g., battling wildfires, creating fuel breaks, placing stakes, invasive species control, planting).
- Subsurface MEC Removal – The hypothetical after-action risks following subsurface removal are the lowest (A) for surface only users and users conducting ground intrusive activities to up to 1 foot bgs. The risk remains highest (E) for users conducting ground intrusive activities greater than 1 foot bgs.

The response action selected in this ROD is necessary to protect the public health or welfare from the presence of MEC. Based on many years of site experience, the presence of MEC in the Impact Area MRA does not appear to be a concern in terms of explosive safety risks to ecological receptors.

2.11. Remedial Action Objectives

The primary remedial action objectives (RAOs) for the Impact Area MRA based on EPA's RI/FS Guidance (*EPA, 1989*) are to achieve the EPA's threshold criteria of "Overall Protection of Human Health and the Environment" and "Compliance with ARARs." Based on Base Realignment and Closure

Cleanup Team (BCT) concurrence, risks to plants and animals from explosive hazards are not addressed in this ROD.

As described in EPA's *Land Use in the CERCLA Remedy Selection Process* (EPA, 1995), "Remedial action objectives provide the foundation upon which remedial cleanup alternatives are developed. In general, remedial action objectives should be developed in order to develop alternatives that would achieve cleanup levels associated with the reasonably anticipated future land use over as much of the site as possible. EPA's remedy selection expectations described in Section 300.43.0(a)(1)(iii) of the NCP should also be considered when developing remedial action objectives. Where practicable, EPA expects to treat principal threats, to use engineering controls such as containment for low-level threats, to use institutional controls to supplement engineering controls...."

In keeping with EPA's expectations above: (1) the principal threats at the Impact Area MRA will be addressed (i.e., removing MEC from the surface of the entire Impact Area MRA, and removing subsurface MEC in selected areas); and (2) institutional controls (herein referred to as Land Use Controls) will be implemented to manage the risk from any MEC that potentially remains after remedial action is completed.

2.12. Description of Alternatives

Remedial alternatives for the Impact Area MRA, which were evaluated in the Impact Area MRA Feasibility Study (Volume II; *MACTEC, 2007b*), are summarized in the Proposed Plan (*Army, 2007*). Long Term Management Measures that will be implemented as part of the Land Use Control implementation strategy for the Impact Area MRA include a land transfer document that outlines any land use restrictions, annual monitoring, and five-year review reporting. The costs associated with implementing these measures for the entire Impact Area MRA over a period of 30 years are approximately \$453,000, and are included in the total cost of each alternative.

The four remedial alternatives that were developed to address the risk from MEC for future land users identified in the Impact Area MRA Risk Assessment (Volume I; *MACTEC, 2007b*) at the Impact Area MRA include:

- Alternative 1: No Further Action
- Alternative 2: Technology-Aided Surface MEC Remediation and Land Use Controls
- Alternative 3: Subsurface MEC Remediation and Land Use Controls
- Alternative 4: Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls.

The munitions response actions that are components of these alternatives are summarized below, with the remedial alternatives described in further detail in Section 2.12.2, and a comparison of the remedial alternatives based on EPA's evaluation criteria summarized in Section 2.12.3 (*EPA, 1989*).

2.12.1. Description of Remedial Alternative Components

MEC Remediation includes the following components:

- **Vegetation Clearance** involves preparing the site by clearing vegetation to provide visibility of the ground surface so that workers can safely investigate and remove MEC.

- **MEC Remedial Action** involves using the best available and most appropriate detection and removal technologies and procedures to detect and remove (remediate) surface or subsurface MEC.

Descriptions and applicable methods for implementation of MEC remediation are described below.

Vegetation Clearance Via Prescribed Burning

Because the Impact Area MRA is densely vegetated, vegetation clearance to provide surface visibility is required for worker safety. Methods of vegetation clearance for different plant communities at the former Fort Ord were evaluated and the results outlined in the *Evaluation of Vegetation Clearance Methods Technical Memorandum, Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California* (Vegetation Clearance Technical Memorandum; Harding ESE, 2002).

The Vegetation Clearance Technical Memorandum evaluated vegetation clearance methods that may be applicable in CMC and Coastal Scrub communities (types of vegetation dominant in the Impact Area MRA). It identified prescribed burning as the only method readily available for use in CMC and Coastal Scrub communities. Although other clearance methods were evaluated, it was determined that either their use was only allowable on a limited basis, or further study was required. As examples:

- “Crush and burn” methods may be applicable, but will require further study.
- Manual and mechanical cutting was applicable for up to 50 acres of unburned CMC in polygons located in habitat reserve areas.

The widespread use of cutting in habitat reserve containing CMC is unacceptable because it has not been shown to support successful recovery of this rare habitat. These methods will be retained for consideration for use on a limited basis depending on area-specific conditions identified in the work plan for each area. Prescribed burning has been demonstrated to achieve the vegetation clearance goal of removing the vegetation to successfully facilitate follow-on MEC removal in compliance with the HMP.

In accordance with the HMP that specifies requirements for implementation of prescribed burning in CMC habitat reserve areas, it is assumed:

- Prescribed burns will be conducted in stages. These burns will consist of several small burns of approximately 100 acres (actual size could be more or less than 100 acres depending on site-specific characteristics) over several days, rather than one large burn. A burn plan will be prepared that describes the locations and widths of temporary and permanent fuel breaks, and the number and size of burns planned for the year.
- Each contiguous prescribed burn area will not exceed 400 acres unless burning of a larger area is coordinated with and approved by USFWS. These contiguous areas will be separated to allow a mosaic pattern consisting of different age classes of vegetation, as specified under the HMP.
- No more than 800 acres will be allowed to be burned via prescribed burning in any given year as specified under the HMP, unless a larger area is coordinated with and approved by USFWS.
- Manual and/or mechanical cutting of unburned vegetation could be conducted as necessary, but such cutting will not exceed 50 acres in each polygon. Larger cuts will only be allowed after coordination with and approval by USFWS.
- Manual and/or mechanical cutting of burned vegetation may be conducted.

The major activities involved in prescribed burning include:

- Preparation of a burn prescription and burn plan that outlines the objectives of the burn, the burn area, and the range of environmental conditions (e.g., weather, wind) under which the burn will be conducted; the workforce and equipment resources required to ignite, manage and contain the fire; and communication procedures;
- Site preparation, including establishment and maintenance of containment lines;
- Conducting the burn within the range of environmental conditions established in the burn prescription; and
- Follow-up operations to ensure that the fire is fully contained.

MEC Remedial Action

Once the vegetation has been cleared, the MEC remedial action will be implemented.

MEC Removal

Technology-Aided Surface MEC Removal

This method will identify and remove MEC detected on the ground surface (with detection instruments available onsite to aid in the detection of surface MEC where the ground surface is not visible). After MEC removal is conducted, quality control and quality assurance activities will be implemented.

Subsurface MEC Removal

This method will identify and investigate anomalies, and remove MEC detected on the surface or in the subsurface to the depths found.

- Subsurface removal depths will be determined based on: (1) the type of munition, (2) the typical depth at which the type of MEC is found, and (3) the capabilities of the geophysical detection equipment selected as best suited for site conditions.
- Within areas that may be selected for subsurface MEC removal, there may be areas that contain significant amounts of MEC and/or metallic debris that limit or preclude the effective use of available detection technologies. These areas may require large-scale excavations to remove MEC present in the subsurface. The HMP and associated biological opinions currently limit the amount of temporary habitat destruction to 75 acres (*USACE, 2005; USFWS, 1999, 2002, 2005; BLM, 2004a; Zander, 2002, 2007*). The Army is required to use procedures that will allow habitat and species within any large-scale excavations to recover. The impacted areas must be monitored under the HMP and biological opinions to determine if the HMP success criteria have been achieved. It may be necessary to conduct active habitat restoration as a corrective action to meet the requirements of the HMP. Depending on the size of these large-scale excavations, it may also be necessary to re-initiate formal consultation with the USFWS in accordance with the requirements of the ESA.
- Based on a review of currently available munitions-related data, an estimated 320 acres of the Impact Area MRA could contain significant amounts of MEC and/or metallic debris. These acres, if selected for subsurface removal, may require large-scale excavations to remove MEC present in the subsurface. The effort may include sifting the top 2-foot layer of soil.

- A digital geophysical survey will be performed using the best available and appropriate technology. This survey will provide a record of anomalies identified during the survey. Anomalies identified within the subsurface removal areas will be investigated or resolved.
- After the MEC removals are conducted, QC/QA procedures will be implemented.

MEC Detonation

Explosive Ordnance Disposal (EOD) procedures will be used to detonate MEC items that are recovered during remedial activities. When required, these detonations will be conducted using Department of Defense Explosives Safety Board (DDESB)-approved engineering controls. These procedures involve applying detonating charges to single MEC item or consolidated MEC items, and applying engineering controls (covering the MEC with tamped dirt, sandbags, contained water, or other materials) to control the blast and any fragmentation, emissions, or noise that would be associated with the detonation. These procedures, which proved effective during the Ranges 43-48 Interim Action within the Impact Area MRA, can be performed in any location where MEC is found.

Digital Survey of Anomalies

After surface removal of MEC, a digital survey will be performed using the best available and appropriate technology. During this survey, a digital record of the location of anomalies identified during the survey will be maintained. A map of the anomalies will be included in the after-action report to assist future property users in identifying areas where requirements may exist for explosive safety support (e.g., onsite construction support) for surface or subsurface activities and to assist in land management decision making.

The digital survey may require manual and/or mechanical cutting of burned vegetation to provide for the safety of personnel conducting the survey and allow use of digital geophysical equipment. Digital geophysical equipment and associated Standard Operating Procedures (SOPs) will be outlined in the implementation work plan based on site conditions and according to USACE Data Item Description (DIDs), site-specific Quality Control (QC) criteria (considered as Data Quality Objectives [DQOs]), the *Ordnance Detection and Discrimination Study for Fort Ord* (Parsons, 2002d) and other guidance. Site conditions (e.g., difficult terrain) may prevent a digital survey from being conducted of certain areas. These areas will be documented in the After-Action report and digital mapping records.

Post-Remediation Habitat Monitoring

The HMP requires habitat monitoring be conducted following MEC remedial action to assess the recovery of HMP species. Baseline monitoring will be conducted in each area where MEC remedial action is planned. Follow-up monitoring will then be conducted per the Vegetation Monitoring Plan and Wetland Monitoring and Restoration Plan (Burleson, 2006, 2007) for: (1) HMP annual plants; (2) HMP shrubs; and (3) wetland species. The results of the monitoring will be documented in annual reports submitted to USFWS and California Department of Fish and Game (CDFG).

Land Use Controls

Under CERCLA, the Army is ultimately responsible for the implementation and maintenance of remedial Land Use Controls, although all or part of such responsibilities may be transferred to another party (e.g., future landowner) with the approval of EPA and in consultation with DTSC. The Land Use Controls for the Impact Area MRA are described below:

- Property Transfer Documentation that identifies prohibited uses and activities or restrictions;

- MEC recognition and safety training;
- Construction support/UXO-qualified personnel support;
- Helicopter support for select future habitat management prescribed burns;
- Weed abatement support; and
- Access management measures.

Property Transfer Documentation

Restrictions or conditions on the property that are specified in property transfer documentation may be appropriate if placing controls on, or limits to, property use that will prevent or limit exposure to MEC that potentially remains after remedial action is completed at the Impact Area MRA. Specific types of restrictions will vary depending on the conditions, potential risks, and anticipated future land use. The Army will follow appropriate Federal property management regulations. The property transfer document will identify the agency or party responsible for implementation, monitoring, reporting, and enforcement of land use controls.

The documentation for the transfer of the Impact Area MRA will establish any restriction required. This documentation will indicate:

- Specified land uses evaluated in the Risk Assessment, which were designated and approved at the time the Army transfers the property, must be maintained by all property owners.
- Any modifications to these restrictions must be approved by the project team (the Army, EPA, and DTSC) prior to implementation.

At the time of the five-year review, the Army or Army's representatives, in consultation with property users and regulatory agencies, will determine whether any land use restrictions implemented continue to be protective or require modifications.

MEC Recognition and Safety Training

For the Impact Area MRA, some digging or ground disturbing or intrusive activities are planned for the proposed reuses. Personnel conducting reuse activities at the Impact Area MRA will be required to attend the "MEC recognition and safety training" to increase their awareness of and ability to recognize MEC. Prior to conducting any planned ground disturbing or intrusive activities, the landowner will be required to notify the Army or the Army's representatives to arrange for MEC recognition and safety training. This training will be provided to all workers that are to perform intrusive activities.

Construction Support/UXO-Qualified Personnel Support

Construction support will be provided by UXO-qualified personnel during any intrusive or ground-disturbing activities at the Impact Area MRA to address potential explosive safety risks to construction personnel. Prior to the start of any ground disturbing or intrusive activities, construction support will be arranged during the planning stages of a construction project. UXO-qualified personnel will monitor ground disturbing and intrusive construction activities for the potential presence of MEC. During ground disturbing activities, if MEC is encountered, ground disturbing activities in the area and adjacent areas will cease and the encounter will be reported to local law enforcement. The local law enforcement agency will promptly request Department of Defense (DoD) support for response (e.g., an EOD unit).

After the response, the Army will reassess the probability of encountering MEC. If the probability of encountering MEC remains low, construction may resume with construction support. If the probability is determined to be moderate or high, then MEC removal will be conducted in the construction footprint before construction can resume.

Helicopter Support for Selected Future Habitat Management Prescribed Burns

Helicopter Support will be provided as necessary for select future habitat management prescribed burns where subsurface MEC risks cannot be otherwise mitigated. Support equivalent to two helicopters will be provided onsite during select prescribed burns in areas where the risk posed by potential subsurface MEC cannot be mitigated by other methods through planning. MEC remaining at the site may pose a risk to fire fighters that are trying to suppress spot fires. The presence of MEC may also require the rapid completion of prescribed burns using an aerial ignition method.

Weed Abatement Support

Control of weed infestation is a critical component of habitat management. Intrusive weed abatement activities will require support by UXO-qualified personnel. Such support is provided as part of the remedy; however, the work will likely be conducted in a more controlled setting. These limitations are the basis for requiring additional resources to support performance of the level of weed abatement activities required to control weed infestations. Weed abatement support consisting of the equivalent of two biological technicians will be provided.

Access Management Measures

- **Fencing and Signs.** The Army will maintain fences and signs. The requirement for fences and signage will be based on reuse and the potential risks. The existing fencing surrounding the Impact Area MRA (a four-strand barbed wire fence with concertina wire in some portions) and signage will be maintained. Other fencing may be constructed and maintained if necessary for public safety based on site-specific considerations.
- **Law Enforcement Support.** The Army will provide law enforcement (private or governmental) support to maintain and control access restrictions, and to monitor and discourage trespassing into areas potentially containing MEC.

2.12.2. Description of Remedial Alternatives

The four remedial alternatives developed for the Impact Area MRA are:

- Alternative 1: No Further Action.
- Alternative 2: Technology-Aided Surface MEC Remediation and Land Use Controls.
- Alternative 3: Subsurface MEC Remediation and Land Use Controls.
- Alternative 4: Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls.

Alternative 1: No Further Action

This alternative assumes no further action would be taken to address MEC. This alternative is provided as a baseline for comparison to the other remedial alternatives as required under CERCLA and the National Contingency Plan (NCP).

Alternative 2: Technology-Aided Surface MEC Remediation and Land Use Controls

This alternative assumes Technology-Aided Surface MEC Remediation would be conducted throughout the entire Impact Area MRA. MEC detection instruments would be available onsite for use in detecting MEC where the ground surface is not visible. Prescribed burning and MEC removal actions would be conducted in stages, with a site-specific work plan developed for each phase of work. The work plan would describe the anticipated distribution of MEC, the vegetation clearance plan, and the method for completion of MEC remediation.

Prescribed burning (followed by MEC remediation) would be conducted in stages and consist of several small burns of approximately 100-acre units, rather than one large burn. During each mobilization for a burn, a contiguous area of up to 400 acres would be burned, unless burning of a larger area is coordinated with and approved by USFWS.

Planned prescribed burns would not exceed 800 acres per year as allowed by the HMP for Habitat Reserve areas at the former Fort Ord. Therefore, for the 6,560-acre Impact Area MRA, MEC remedial actions would be conducted on up to 800 acres of the Impact Area MRA each year, for approximately eight or more years.

The Technology-Aided Surface MEC Remediation and Land Use Controls Alternative would include:

- Prescribed burning to clear vegetation and provide safe access to conduct MEC remediation.
- Technology-aided surface MEC remediation throughout the entire Impact Area MRA, and detonation of any MEC recovered using engineering controls. MEC detection instruments would be available onsite for use in detecting MEC where the ground surface is not visible.
- Digital survey to provide a record of anomalies and to assist future property users in identifying areas where construction support may be required for surface or subsurface activities.
- Implementation of Land Use Controls (MEC recognition and safety training; construction support for ground disturbing or intrusive activities and UXO-qualified personnel support; access management measures, including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs; helicopter support for select future HCP prescribed burns; weed abatement support; and property transfer documentation that outlines land use restrictions, including the prohibition of unrestricted land use and any other reuse restrictions or conditions).

It should be noted that a digital survey would require manual and/or mechanical cutting of the burned vegetation to provide access for the digital geophysical equipment. Manual and mechanical cutting of CMC immediately following a prescribed burn is protective of the seed bank and is consistent with the HMP and Biological Opinions. Post-remediation habitat monitoring would be required. Site conditions (difficult terrain) may prevent a digital survey of some areas. Such areas would be documented in the After-Action report and digital survey records.

Under this alternative, users conducting surface-only activities (e.g., habitat monitoring, prescribed burns) would be provided MEC recognition and safety training. Public access would be managed or

restricted (e.g., accompanied by people who have received MEC recognition and safety training). In addition, regular security patrols would be conducted along the perimeter of the Impact Area MRA to enforce access restrictions, and fences and signs would be maintained. Intrusive activities (e.g., erosion control, some invasive species control, construction activities) would be conducted with construction support by UXO-qualified personnel. MEC recognition and safety training would also be provided for workers conducting ground disturbing or intrusive activities. The Army would provide a team of two full-time onsite UXO-qualified personnel to provide long-term support during reuse of the property.

To address potential changes in site conditions due to erosion, the site would be inspected within 1 year of the surface MEC removal to identify areas where erosion or other natural phenomena would cause MEC to be present on the surface. Annual surface MEC inspections would be conducted by or with the oversight of UXO-qualified personnel, until vegetation growth is sufficient to minimize erosion at the site. Any areas where erosion and/or MEC are identified will be placed in a monitoring program, with additional surface removal conducted when required. In addition, after the property is transferred, UXO-qualified personnel would be available for long-term support of reuse activities. UXO-qualified personnel could be required to perform additional inspections for surface MEC following prescribed burns that may be conducted by the future landowner.

The future landowner may conduct HMP/HCP prescribed burns after property transfer for fire and habitat management purposes. The possible presence of subsurface MEC could make the use of hand crews and heavy equipment unsafe in some areas to address spot fires that may occur. Rapid completion of prescribed burns using aerial ignition methods may also be required in some instances. Alternative methods to address these challenges could require additional resources; therefore, onsite helicopter support would be provided on an as-needed basis for the duration of prescribed burning activities.

Control of weed infestations is a critical component of successful habitat management. The potential presence of subsurface MEC may require additional resources to perform the level of weed abatement needed. Weed abatement support would be provided under this alternative.

Alternative 3: Subsurface MEC Remediation and Land Use Controls

This alternative assumes Subsurface MEC Remediation would be conducted throughout the entire Impact Area MRA. Prescribed burning and MEC remedial actions would be conducted in stages. A site-specific work plan, which would be developed for each phase of work, would describe the anticipated distribution of MEC, the vegetation clearance plan, and the method for completion of the removal. It is assumed prescribed burning (followed by MEC remediation) would be implemented using a phased approach. Each phase would consist of several small burns of approximately 100-acre units, rather than one large burn. During each mobilization for a burn, a contiguous area of up to 300 acres would be burned. Based on the implementation of interim action at Ranges 43 through 48, it is assumed that subsurface MEC removal can be conducted for approximately 300 acres per year before the vegetation grows back. Subsurface MEC remediation would be conducted on 300 acres of the Impact Area MRA, each year, for approximately 22 years.

The Subsurface MEC Remediation and Land Use Controls Alternative would include:

- Prescribed burning to clear vegetation and provide safe access to conduct MEC remediation.
- Investigation of all anomalies and MEC removal on the surface and in the subsurface throughout the entire Impact Area MRA, with detonation using engineering controls, of any MEC identified.
- Digital survey to provide a record of anomalies, and investigation of anomalies.

- Implementation of Land Use Controls (MEC recognition and safety training; construction support for ground disturbing or intrusive activities and UXO-qualified personnel support; access management measures, including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs; and property transfer documentation that outlines land use restrictions, including the prohibition of unrestricted land use and any other reuse restrictions or conditions).
- Post-remediation habitat monitoring to collect data on HMP species and habitats; perform mapping, data management and evaluation, and reporting; and conduct habitat restoration as needed.

Based on a review of currently available munitions-related data, an estimated 320 acres of the Impact Area MRA could contain significant amounts of MEC and/or metallic debris. This area may require large-scale excavations to remove the subsurface MEC. This effort may require sifting the top 2-foot layer of soil. Post-remediation habitat restoration and monitoring would be required. The size of the area that would require excavation and sifting is approximate. The actual acreage can only be determined during MEC removal. Based on the approximate size of these large-scale excavations, it will likely be necessary to re-initiate formal consultation with the USFWS in accordance with the requirements of the ESA prior to implementation of remedial action in these areas.

Subsurface removal and digital surveys would require manual and/or mechanical cutting of the burned vegetation. Manual and mechanical cutting of CMC immediately following a prescribed burn is protective of the seed bank and is consistent with the HMP and Biological Opinions. Post-remediation habitat monitoring would be required. Site conditions (e.g., difficult terrain) may prevent a digital survey of some areas. Such areas would be documented in the After-Action report and digital mapping records.

Under this alternative, land users conducting surface-only activities (e.g., habitat monitoring, prescribed burning) would be provided MEC recognition and safety training. In addition, regular security patrols would be conducted along the perimeter of the Impact Area MRA to enforce access restrictions, and fences and signs would be maintained. Public access would be managed or restricted (e.g., restricted to designated roads and trails). Intrusive activities (e.g., erosion control, some invasive species control, and construction) activities would be conducted with construction support by UXO-qualified personnel. MEC recognition and safety training would be provided for workers conducting ground disturbing or intrusive activities. A team of two full-time onsite UXO-qualified personnel would be available to provide long-term support during reuse of the property. Existing access roads would continue to be available for vehicle access.

Alternative 4: Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls

This alternative assumes Technology-Aided Surface MEC Remediation would be conducted throughout the entire Impact Area MRA, and Subsurface MEC Remediation would be conducted in selected areas to support the reuse as described below. The components of this alternative would be as described for the other alternatives above. As under the Technology-Aided Surface MEC Remediation and Land Use Controls Alternative (Alternative 2), prescribed burning and MEC removal actions would be conducted in stages, and a site-specific work plan would be developed for each phase of work. The work plan would describe the anticipated distribution of MEC, the vegetation clearance plan, and the method for completion of the removal. It is assumed that prescribed burning (followed by MEC remediation) would be conducted in stages, and consist of several small burns of approximately 100-acre units, rather than one large burn. During each mobilization, a contiguous area of up to 400 acres would be burned, unless a larger area was coordinated with and approved by USFWS. Planned prescribed burns would not exceed 800 acres per year as allowed by the HMP for Habitat Reserve areas at the former Fort

Ord. Therefore, for the 6,560-acre Impact Area MRA, MEC remedial actions would be conducted on 800 acres of the Impact Area MRA each year for approximately eight or more years.

The Technology-Aided Surface MEC Remediation, With Subsurface MEC Remediation in Selected Areas, and Land Use Controls Alternative would include:

- Prescribed burning to clear vegetation and provide safe access to conduct MEC remediation.
- Technology-aided surface MEC remediation throughout the entire Impact Area MRA, and detonation, using engineering controls, of any MEC recovered. MEC detection instruments would be available onsite to aide in the detection of surface MEC in areas where the ground surface is not visible.
- In selected areas specified below, all anomalies would be investigated, and all subsurface MEC would be remediated. Selected areas (i.e., fuel breaks, roads essential to habitat management, other areas requiring such removal for a specific purpose) are estimated to be approximately 10 percent [656 acres] of the 6,560 acre Impact Area MRA).
- Digital survey to provide a record of anomalies and to assist future property users in identifying areas where explosive safety support (e.g., onsite construction support) may be required for ground disturbing or intrusive activities. Anomalies within the areas identified for subsurface MEC remediation would be investigated or resolved. The digital survey record could be used by the future landowner to assist in land management decision making. The digital survey would require manual and/or mechanical cutting of the burned vegetation to provide access for the digital geophysical equipment.
- Implementation of Land Use Controls (MEC recognition and safety training; construction support for ground disturbing or intrusive activities and UXO-qualified personnel support; access management measures, including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs; helicopter support for select future HCP prescribed burns; weed abatement support; and property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use and any other reuse restrictions or conditions).
- Post-remediation habitat monitoring within areas of subsurface MEC removal or other disturbances (e.g., mechanical clearance of vegetation) to collect data on HMP species and habitats; perform mapping, data management and evaluation, and reporting; and conduct habitat restoration as needed.

Portions of Impact Area MRA Where Subsurface MEC Remediation Would be Implemented in Selected Areas

Under Alternative 4, subsurface MEC removal would be conducted in selected areas of the Impact Area MRA to support reuse and address specific reuse concerns and needs. The area requiring subsurface removal is estimated to be approximately 10 percent (656 acres) of the 6,560-acre Impact Area MRA. The following portions of the Impact Area MRA may be selected for subsurface MEC removals:

- Regularly maintained fuel breaks and access roads that the Army, in coordination with the future landowner, identifies for habitat management;
- A minimum 100-foot buffer area along the habitat-development border of the Impact Area MRA on the habitat side of the border adjacent to developed areas. This buffer would both act as an additional safety zone for subsurface activity and enhance firefighters' ability to fight wildfires from the border-buffer area that might occur within the Impact Area. With this safe zone, firefighters may be able to widen fuel breaks to protect life and property. Per the HMP, fuel breaks are to be maintained on the

development side of the border. The width of the safety buffer zone could be widened based on area-specific conditions to be specified in the site-specific work plans for each phase of work. Vegetation would be allowed to regrow in the 100-foot buffer following subsurface MEC remediation;

- Other areas to address specific risk and/or land use needs. Examples include proposed, future habitat restoration sites, and areas where there are high density anomalies associated with impact areas where military munitions with sensitive fuzes (all-ways-acting or piezoelectric fuzes, or 40mm grenade launcher HE or 40mm practice projectiles M382 series or M407 series [or any other 40mm practice series projectiles containing enough explosives to rupture the projectile]) were fired. The areas with high density anomalies of munitions with sensitive fuzes, which are assumed to be approximately 85 acres (total) of the Impact Area MRA, would be a candidate for subsurface MEC removal using excavation and sifting, as described below.

Based on a review of currently available data, an estimated 85 acres of the Impact Area MRA could contain significant amounts of UXO that are military munitions with sensitive fuzes, and/or associated metallic debris. These UXO could present a significant hazard to people that may work within these 85 acres if only a surface MEC removal is conducted. This acreage is a candidate for subsurface MEC removal that may include sifting the top 2-foot layer of soil, which would cause significant temporary impacts and loss of listed species, seed bank, or critical habitat. It should be noted that the size of the area that would require excavation and sifting is approximate. The actual area requiring the use of this removal process will be confirmed during remediation. Depending on the actual size of these large-scale excavations, it may also be necessary to re-initiate formal consultation with the USFWS under the requirements of the ESA. Site-specific work plans would be developed for each phase of work, outlining planned (1) vegetation clearance methods (prescribed burning), (2) surface and subsurface MEC detection and removal methodologies, and (3) habitat monitoring protocols. These plans, which are considered primary documents under the FFA, will be made available for regulatory agency (EPA and DTSC) and public review. The Army will coordinate the site-specific work plan with future landowners identified at the time of the plan's preparation.

The major elements of prescribed burning include:

- Coordination with the local air district;
- Preparation of a burn prescription and burn plan that outlines the objectives of the burn, the burn area, and the range of environmental conditions under which the burn will be conducted; the workforce and equipment resources required to ignite, manage and contain the fire; and communication procedures;
- Site preparation, including establishment and maintenance of containment lines;
- Conducting the burn within the range of environmental conditions established in the burn prescription; and
- Follow-up operations to ensure that the fire is fully contained.

Each phase would include a technology-aided surface MEC removal followed by digital geophysical survey. The Army, after reviewing the results of both the surface removal and the survey data, would prepare a Technical Memorandum for EPA and DTSC. This memorandum would provide an evaluation of the work completed to date and if necessary, describe additional removal recommended based on the evaluation. When evaluating whether additional removal is recommended, the Army would consider, among other factors: (1) explosive hazards associated with MEC so far recovered; (2) the proximity to potential receptors; (3) the density of MEC recovered; and (4) consistency with ARARs (e.g., HMP and Biological Opinions). Generally, the recommended additional removal would be implemented prior to

the next growing season for the CMC habitat; subsurface MEC removal beyond that timeframe would likely result in significant impacts to rare, threatened and endangered species that exist in the CMC which would have just began the process of natural re-growth after prescribed burning. If additional work is not recommended, the Army would document this fact and its rationale in the Technical Memorandum.

Because each Technical Memorandum would be an addendum to the site-specific work plan, which is a primary document under the FFA, it would be disputable. To avoid impacts to rare, threatened and endangered species, completion and agency approval of the Technical Memorandum would be expedited to allow any additional actions to be completed before the next growing season. These Technical Memorandums and associated correspondence would be included in the Administrative Record. The Technical Memorandums would be provided for regulatory agency (EPA and DTSC) review, and are subject to EPA approval (in consultation with DTSC). The Army would coordinate the Technical Memorandum with the future landowner identified at the time of its preparation.

Under this alternative, property users conducting surface-only activities (e.g., habitat monitoring, prescribed burns) would be provided MEC recognition and safety training. In addition, regular security patrols would be conducted along the perimeter of the Impact Area MRA to enforce access restrictions, fences and signs would be maintained, and based on site-specific considerations, other fencing may be required to be constructed and maintained to ensure public safety. Public access would be managed or restricted (e.g., accompanied by people who have received MEC recognition and safety training). Intrusive activities (e.g., erosion control, invasive species control, construction activities) would be conducted with construction support by UXO-qualified personnel, and MEC recognition and safety training would be provided for workers conducting ground disturbing or intrusive activities. The Army would provide a team of two full-time onsite UXO-qualified personnel to provide long-term support during reuse of the property. Existing access roads would continue to be available for vehicle access.

To address potential changes in site conditions due to erosion, the site would be inspected within 1 year of surface removal to identify areas where erosion or other natural phenomena would cause MEC to be present on the surface. Annual surface MEC inspections would be conducted by or with the oversight of UXO-qualified personnel until vegetation growth is sufficient to minimize erosion at the site. Any areas where erosion and/or MEC are identified would be placed in a monitoring program, with additional surface removal conducted when required. In addition, after the property is transferred, UXO-qualified personnel would be available for long-term support of reuse activities. UXO-qualified personnel could be required to perform additional inspections for surface MEC following prescribed burns that may be conducted by future landowners.

A digital survey would require manual and/or mechanical cutting of the burned vegetation to provide for the safety of personnel conducting the survey and allow use of digital geophysical equipment. Manual and mechanical cutting of CMC immediately following a prescribed burn is both protective of the seed bank and consistent with the HMP and Biological Opinions. Post-remediation habitat monitoring would be required. Site conditions (e.g., difficult terrain) may prevent digital mapping of some areas. These areas would be documented in the After-Action report and digital mapping records.

The future landowner may conduct HMP/HCP prescribed burns for fire and habitat management purposes. The possible presence of subsurface MEC could make the use of hand crews and heavy equipment unsafe in some areas to address spot fires that may occur. Rapid completion of prescribed burns using aerial ignition method may also be required in some instances. Alternative methods to address these challenges could require additional resources; therefore, onsite helicopter support would be provided on an as-needed basis for the duration of prescribed burning activities.

Control of weed infestations is a critical component of successful habitat management. The potential presence of subsurface MEC may require additional resources to perform the level of weed abatement needed. Weed abatement support would be provided under this alternative.

2.12.3. Comparison of Remedial Alternatives

This section compares the remedial alternatives, except the No Further Action alternative (Alternative 1), in terms of how well each alternative satisfies the requirements of Section 121 of CERCLA.

- Protection of Human Health and the Environment: Alternatives 2, 3 and 4 provide different levels of protection and rely to a greater or lesser degree on institutional controls. Alternative 2 provides limited protection and relies primarily on activity/use restrictions to provide protection from subsurface MEC. Alternative 3 would eliminate most of the MEC present and would rely on land use controls to limit exposure to MEC which had not been detected and removed. Alternative 4 provides protection of human health and the environment by implementation of MEC removal on the surface and from the subsurface of selected areas to support the anticipated land use, and Land Use Controls to mitigate the risk from MEC remaining in those areas not cleared to depth and potentially present in the selected areas.
- Compliance with Applicable or Relevant and Appropriate Requirements: Each of the alternatives could be implemented in a manner that complies with ARARs. Land Use Controls will be implemented in a manner consistent with Federal and State guidance.
- Cost Effectiveness: The net present value of the total estimated costs for implementation of each remedial alternative are summarized in Table 2: Alternative 2, Technology-Aided Surface MEC Remediation and Land Use Controls is estimated to be approximately \$89.35 million; Alternative 3, Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation and Land Use Controls is estimated to be approximately \$423.65 million; Alternative 4, Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls is estimated to be approximately \$148.23 million. Long Term Management Measures costs of \$453,000 for the entire Impact Area MRA are included in the total cost for implementing each alternative. Alternative 4 is well below the estimate for Alternative 3 and provides a comparable level of protection given the anticipated future use of the property.
- Use of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable: The principal threats at the Impact Area MRA will be addressed by remediating surface MEC under each of the alternatives, and under Alternatives 3 and 4 subsurface MEC remediation will be undertaken in all of the MRA or in selected areas to support the anticipated use of the property. Subsurface removal of MEC throughout the MRA would have an unnecessary impact on habitat and would require far too much time and too many resources. Therefore, Alternative 4, which provides for surface remediation throughout the MRA and subsurface remediation in those areas which present the greatest risk to potential users, is the alternative which uses permanent solutions to the maximum extent practicable. There are no alternative treatment or resource recovery options available.
- Preference for Treatment as a Principal Element: As noted above, Alternative 2 involves the least treatment, and Alternative 3 provides the most treatment of the principal threats at the Impact Area MRA. Alternative 4 will provide for the treatment of MEC present on the surface and a substantial portion of the subsurface MEC present, which will satisfy the statutory preference for treatment as a principal element of the remedy.

- Implementability: The active remediation elements of Alternative 2 could be implemented, but the imposition of adequate land use/activity restrictions to address the risks associated with subsurface MEC would be very difficult to implement in light of the anticipated use of the property. Alternative 3 would be far more difficult to implement because it would involve remediation of subsurface MEC throughout the 6,560 acre MRA. The active remediation elements of Alternative 4 would be easier to implement than Alternative 3, and the land use/activity restrictions can be implemented in a manner consistent with the anticipated use of the property.
- Regulatory Acceptance: Alternative 2 provides the least treatment of the principal threat wastes and does not provide adequate protection to potential users of the Impact Area from the explosive safety risks posed by subsurface MEC. Therefore, it is unacceptable to the regulatory agencies (EPA and DTSC). Both Alternatives 3 and 4 provide substantial treatment of principal threat wastes and adequate protection to potential users of the Impact Area from the explosive safety risks posed by subsurface MEC. Therefore, both Alternatives 3 and 4 are acceptable to the regulatory agencies.
- Community Acceptance: Although the community has expressed concerns regarding prescribed burns, which are a component of Alternatives 2 through 4 (and required under the Habitat Management Plan), the community has not expressed a preference for a particular alternative. In general, the community is supportive of the overall approach to the Impact Area MRA MEC cleanup.
- Five-Year Review Requirements: Under each of the alternatives, MEC will likely remain at the site. Therefore, a statutory review will be conducted, as part of the Fort Ord five-year review process, to ensure the remedy remains protective of human health and the environment from the explosive safety risks posed by MEC. The purpose of a five-year review is to update information, evaluate the site conditions, and determine whether the site's conditions allow for safe use given any contamination or MEC present. The next five-year review will occur in 2012.

2.13. Principal Threat Wastes

The source material constituting the principal threats at the Impact Area MRA are MEC known or suspected to be present on the surface and below the ground surface (in the subsurface). The principal threats at the Impact Area MRA will be addressed (i.e., surface MEC remediation will be completed throughout the entire Impact Area MRA, and subsurface MEC remediation will be completed in selected areas to support reuse), significantly reducing the risks to human health and the environment regarding explosive safety risks posed by MEC. Access to areas that have not been cleared to depth will be restricted. Furthermore, detection technologies are limited, and subsurface MEC remediation will not be conducted throughout the Impact Area MRA. Therefore, Land Use Controls will be implemented to manage the risks from MEC potentially remaining after the completion of the remedial action.

The remedial alternative will address the threat through implementing:

- Technology-Aided Surface MEC Remediation throughout the entire Impact Area MRA, and detonation, using engineering controls, of any MEC recovered. MEC detection instruments will be available onsite to aide in the detection of surface MEC in areas where the ground surface is not visible;
- Subsurface MEC Remediation (intrusive investigation of all anomalies) on fuel breaks and roads essential to habitat management activities, and in selected areas that may require subsurface MEC removal for specific purposes to support the reuse (estimated to be approximately 10 percent of the Impact Area MRA); and

- Implementation of Land Use Controls (MEC recognition and safety training; construction support for ground disturbing or intrusive activities and UXO-qualified personnel support; access management measures including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs (Note: based on site-specific considerations, other fencing may be required to be constructed and maintained to ensure public safety); helicopter support for select future habitat management prescribed burns; weed abatement support; and property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use).

2.14. Selected Remedy

2.14.1. Summary of the Rationale for the Selected Remedy

Each alternative developed for the Impact Area MRA was assessed against the nine EPA evaluation criteria described in Table 2. The remedy that best meets the nine EPA evaluation criteria is Remedial Alternative 4 (Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls). This remedy was selected because it would be protective of human health regarding explosive safety risks posed by MEC for all anticipated future land users, and would be effective in the short-term during MEC removals and in the long-term at mitigating the risk to future reusers from MEC that will likely remain at the site. This remedy will require a high level of effort to implement, a moderate level of effort to administer over time, and is cost effective. The remedy can be implemented in a manner that complies with ARARs, and Land Use Controls will be implemented in a manner consistent with Federal and State guidance. ARARs are listed in Table 3.

This alternative best balances the risk reduction and associated environmental impacts in supporting the anticipated future use of the site as a habitat reserve.

The Army and the EPA have jointly selected the remedy. The DTSC has had an opportunity to review and comment on the ROD.

Community acceptance is discussed in the Responsiveness Summary (Section 3.). The selected remedy is further described below.

2.14.2. Description of the Selected Remedy

Remedial Alternative 4—Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls is the selected remedy for the Impact Area MRA.

This selected remedy includes Technology-Aided Surface MEC Remediation throughout the entire Impact Area MRA (with detection instruments available onsite to aid in the investigation for MEC where the ground surface is not visible), and Subsurface MEC Remediation in selected areas to support reuse of the area as a habitat reserve. Subsurface MEC remediation will be conducted in selected areas. These areas include: (1) regularly maintained fuel breaks and access roads; (2) a 100-ft wide (minimum) buffer area along the habitat-side of the development border of the Impact Area MRA that will act as an additional safety zone for subsurface activity and enhance firefighters' ability to fight wildfires from the border-buffer area; and (3) other areas to address specific risk and/or land use needs (e.g., proposed, future landowner habitat restoration areas). Subsurface MEC remediation is estimated to be conducted in approximately 10 percent of the Impact Area MRA.

Prescribed burning (followed by MEC remediation) will be implemented using a phased approach. Prescribed burns will be conducted in stages and consist of several burns of approximately 100-acre units

(actual size could be more or less than 100 acres depending site-specific considerations), and over several days rather than one large burn. Prescribed burning and MEC remedial actions will be conducted in up to 800 acres of the 6,560-acre Impact Area MRA per year, for approximately eight or more years. In compliance with the HMP, no more than 800 acres will be burned via prescribed burning in any given year.

The Technology-Aided Surface MEC Remediation, Subsurface MEC Remediation in Selected Areas, and Land Use Controls remedy includes:

- Prescribed burning to clear vegetation and provide safe access to conduct MEC remediation.
- Technology-aided surface MEC remediation throughout the entire Impact Area MRA, and detonation of any MEC recovered using engineering controls. MEC detection instruments will be available onsite for use in detecting MEC where the ground surface is not visible; annual inspections following surface MEC removal to identify and address erosion-prone areas, until vegetation growth is sufficient to minimize erosion at the site.
- Subsurface MEC remediation in selected areas (e.g., fuel breaks, roads essential to safe habitat management, a safety buffer along the habitat-side of the development boundary, and other areas requiring such removal for a specific purpose (e.g., proposed future landowner habitat restoration areas). Subsurface MEC remediation is estimated to be conducted in approximately 10 percent of the Impact Area MRA. Additional subsurface MEC remediation areas will be identified in coordination with the regulatory agencies and the future landowner. Determination of such areas is based on such factors as the feasibility of implementation, cost, and habitat management requirements. Based on a review of currently available data, an estimated 85 acres of the Impact Area MRA could contain significant amounts of UXO that are military munitions with sensitive fuzes, and/or associated metallic debris. These UXO could present a significant hazard to people that may work within these 85 acres if only a surface MEC removal is conducted. This acreage is a candidate for subsurface MEC removal that may include sifting the top 2-foot layer of soil, which would cause significant temporary impacts and loss of listed species, seed bank, or critical habitat. It should be noted that the size of the area that would require excavation and sifting is approximate. The actual area requiring the use of this removal process will be confirmed during remediation. Depending on the actual size of these large-scale excavations, it may also be necessary to re-initiate formal consultation with the USFWS under the requirements of the ESA. Post-remediation habitat restoration and monitoring will be required in these areas.
- Digital survey to provide a record of anomalies and to assist future property users in identifying areas where explosive safety support (e.g., on site construction support) may be required for ground disturbing or intrusive activities. Burned vegetation will be cut to provide access for the digital geophysical equipment. Anomalies within the areas identified for subsurface removal will be investigated or resolved.
- Implementation of Land Use Controls for the entire Impact Area MRA shown on Plate 2, including: MEC recognition and safety training; construction support for ground disturbing or intrusive activities and UXO-qualified personnel support; access management measures including regular security patrols of the Impact Area MRA perimeter and maintaining fences and signs; helicopter support for select future habitat management prescribed burns; weed abatement support; and property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use. In addition to providing MEC recognition training and construction support, the full-time onsite UXO-qualified personnel will be available to provide assistance as needed to support reuse activities based

on area-specific conditions and activities, such as surface reconnaissance of future prescribed-burned areas and activity planning.

- Post-remediation habitat monitoring within the areas of subsurface MEC removal or other disturbances (e.g., mechanical clearance of vegetation); collecting data on HMP species and habitats; and performing mapping, data management and evaluation, and reporting; and habitat restoration in sifting areas.

Site-specific work plans outlining planned: (1) vegetation clearance methods (prescribed burning); (2) surface and subsurface MEC detection and removal methodologies; and (3) habitat monitoring protocols; will be developed for each phase of work. These plans, which are considered primary documents under the FFA, will be made available for regulatory agency (EPA and DTSC) and public review. The Army will coordinate the site-specific work plan with future landowners identified at the time of the plan's preparation. Subsurface MEC remediation areas will be identified in the site-specific work plans.

Each phase will include a technology-aided surface MEC removal followed by digital geophysical survey. The Army, after reviewing the results of both the surface removal and the survey data, will prepare a Technical Memorandum for EPA and DTSC. This memorandum will provide an evaluation of the work completed to date and if necessary, describe additional removal recommended based on the evaluation. When evaluating whether additional removal is recommended, the Army will consider, among other factors: (1) explosive hazards associated with MEC so far recovered; (2) the proximity to potential receptors; (3) the density of MEC recovered; and (4) consistency with ARARs (e.g., HMP and Biological Opinions). Generally, the recommended additional removal will be implemented prior to the next growing season for the CMC habitat; subsurface MEC removal beyond that timeframe would likely result in significant impacts to rare, threatened and endangered species that exist in the CMC which would have just begun the process of natural re-growth after prescribed burning. If additional work is not recommended, the Army will document this fact and its rationale in the Technical Memorandum.

Because each Technical Memorandum will be an addendum to the site-specific work plan, which is a primary document under the FFA, it will be disputable. To avoid impacts to rare, threatened and endangered species, completion and agency approval of the Technical Memorandum will be expedited to allow any additional actions to be completed before the next growing season. These Technical Memorandums and associated correspondence will be included in the Administrative Record. The Technical Memorandums will be provided for regulatory agency (EPA and DTSC) review, and are subject to EPA approval (in consultation with DTSC). The Army will coordinate the Technical Memorandum with the future land owner identified at the time of its preparation.

Pursuant to Section 8.3 of the FFA, within 21 days of issuance of this ROD, the Army will submit to EPA and DTSC proposed deadlines for submitting the RD/RWP. The RD/RWP will be subject to EPA and DTSC review in accordance with the FFA and will include implementation and maintenance actions, and periodic inspections.

Land Use Control Implementation Strategy

Prior to property transfer, existing land use controls will be maintained until EPA and DTSC concur that, from an explosive safety perspective, site's conditions are protective of human health and the environment without a need for Land Use Controls. The performance objectives for the Land Use Controls that are selected as part of the remedy are the following:

MEC Recognition and Safety Training

For the Impact Area MRA, some digging or ground disturbing or "intrusive" activities are planned for the proposed reuses. Personnel conducting reuse activities at the Impact Area MRA will be required to attend the "MEC recognition and safety training" to increase their awareness of and ability to recognize MEC. Prior to conducting any planned ground disturbing or intrusive activities, the landowner will be required to notify the Army or Army's representatives to arrange for MEC recognition and safety training. This training will be provided to all workers that are to perform ground disturbing or intrusive activities.

Construction Support/UXO-Qualified Personnel Support

Construction support will be provided by UXO-qualified personnel during any intrusive or ground-disturbing activities at the Impact Area MRA to address potential explosive safety risks to construction personnel. Prior to the start of any ground disturbing or intrusive activities, construction support will be arranged during the planning stages of a construction project. UXO-qualified personnel will monitor ground disturbing and intrusive construction activities for the potential presence of MEC. During ground disturbing activities, if MEC is encountered, ground disturbing or intrusive activities in the area and adjacent areas will cease, and the encounter will be reported to local law enforcement. The local law enforcement agency will promptly request DoD support for response (e.g., an EOD unit). After the response, the Army will reassess the probability of encountering additional MEC. If the probability of encountering MEC remains low, construction may resume with construction support. If the probability is determined to be moderate or high, then MEC removal will be conducted in the construction footprint before construction can resume.

Helicopter Support for Selected Future Habitat Management Prescribed Burns

Helicopter Support will be provided as necessary for select future habitat management prescribed burns where subsurface MEC risks cannot be otherwise mitigated. Support equivalent to two helicopters will be provided onsite during select prescribed burns in areas where the risk posed by potential subsurface MEC cannot be mitigated by other methods through planning. MEC remaining at the site may pose a risk to fire fighters that are trying to suppress spot fires. The presence of MEC may also require the rapid completion of prescribed burns using an aerial ignition method.

Weed Abatement Support

Control of weed infestation is a critical component of habitat management. Intrusive weed abatement activities will require support by UXO-qualified personnel. Such support is provided as part of the remedy; however, the work will likely be conducted in a more controlled setting. These limitations are the basis for requiring additional resources to support performance of the level of weed abatement activities required to control weed infestations. Weed abatement support consisting of the equivalent of two biological technicians will be provided.

Access Management Measures

- **Fencing and Signs.** The Army will maintain fences and signs. The requirement for fences and signage will be based on reuse and the potential risks. The existing fencing surrounding the Impact Area MRA (a four-strand barbed wire fence with concertina wire in some portions) and signage will be maintained, with vegetation mowed along the fence line. Other fencing may be constructed and maintained if necessary to ensure public safety, based on site-specific considerations.
- **Law Enforcement Support.** The Army will provide law enforcement (private or governmental) support to maintain and control access restrictions, and monitor and discourage trespassing into areas potentially containing MEC.

Prohibited Reuses and Activities or Restrictions

The property transfer document will include the following land use or activity restrictions:

- Prohibit unauthorized public access to or within the Impact Area MRA;
- Prohibit ground disturbing or intrusive activities outside of specified areas, unless construction support is provided by UXO-qualified personnel; and
- Prohibit inconsistent uses (e.g., residential and schools).

Land use controls will be maintained until EPA and DTSC concur that, from an explosive safety perspective, site is protective of human health and the environment regarding explosive safety risks posed by MEC without a need for Land Use Controls. This decision will be based on:

- 1) Post remediation site evaluation incorporating new information (e.g., geophysical mapping); and/or
- 2) Where clearance to depth has adequately addressed potential of MEC remaining in soil.

The remedial action within the Impact Area MRA is expected to take eight or more years. At its completion, the Army will evaluate the work completed against planned reuse activities and the suitability of the selected Land Use Controls. The Army will include the results of this evaluation in a remedial action completion report that it provides to EPA and DTSC. This report is an FFA primary document; as such, selected Land Use Controls may be modified, when appropriate, with the approval of the regulatory agencies. Specific decisions about fences and the scope of post-transfer periodic inspections will be finalized after review of the report and consideration of information obtained during the remedial action. The property will not be transferred until all MEC remedial actions have been completed. Prior to property transfer and during the implementation of the remedial action, the Army will continue to implement site security measures to include maintenance of the existing perimeter fence and monitoring for the evidence of trespassing; these activities will continue to be reported to the regulatory agencies as part of the Munitions Response Site Security Program annual reports. The Army, in coordination with the future landowner and regulatory agencies, will develop a detailed Land Use Control implementation plan that will be available at the time the property is to be transferred. Under CERCLA, the Army is ultimately responsible for the implementation, maintenance, monitoring, enforcement, and reporting of remedial Land Use Controls, although all or part of such responsibilities may be transferred to another party (e.g., future landowner), with the approval of EPA and in consultation with DTSC.

The selected Land Use Controls, including plans for their implementation, monitoring, reporting, and enforcement, will be explained in more detail in the RD/RAWP. The location and design of security fencing that are part of the selected remedy will be documented in the RD/RAWP. Changes to the design or placement of fences that are made after submission of the RD/RAWP will be made in consultation with EPA and DTSC. Such changes will be documented in FFA primary documents. The RD/RAWP will also describe the following long-term management measures:

- **Property transfer documentation:** When the property is transferred, the Army will prepare a property transfer document or letter of transfer (equivalent to Federal deed) that: 1) informs future property owners of the selected remedy, including any land use or activity restrictions, 2) describes the response actions conducted to address MEC, 3) outlines appropriate procedures to be followed should MEC be encountered, and 4) establishes the transferee's obligations to maintain and enforce any land use and activity restrictions deemed necessary at the time of transfer. If the property transfers to a non-federal agency, the transferee's obligations will be contained in a State land use

covenant signed by DTSC and the Army. If the property transfers to a federal agency, these obligations will be contained in a federal land use management plan.

- **Annual monitoring and reporting:** The Army will monitor the Impact Area MRA and report MEC encounters unrelated to active MEC remediation and changes in site conditions that could increase the possibility of encountering MEC within the MRA. The Army will report the results of this monitoring to EPA and DTSC on an annual basis. If MEC is encountered during use, the Army will notify EPA and DTSC as soon as practicable. If, as a result of these reviews, the Army proposes a modification of the remedy, the Army will submit the proposal to EPA and DTSC under the FFA.
- **Five-year review reporting:** The Army will conduct five-year reviews, under CERCLA Section 121(c) and the Fort Ord FFA, as part of the Fort Ord five-year review process. The five-year review will evaluate the protectiveness of the selected remedy. If, upon review, the Army recommends any modification of the remedy, the Army will submit the proposal to EPA and DTSC under the FFA. The next five-year review will occur in 2012.

At the time of property transfer, the Army will specify the remedial Land Use Controls in the property transfer documentation (equivalent to a Federal deed). The Army does not consider California laws and regulations concerning land use covenants to be potential ARARs. Although the DTSC and EPA Region IX disagree with the Army's determination that California laws and regulations concerning land use covenants are not potential ARARs, they will agree-to-disagree on this issue and consider Title 22, Division 4.5, Chapter 39, Section 67391.1(e)(2) of the California Code of Regulations complied with if the Army will assure that a mechanism, satisfactory to the Regulators, is in place to ensure that future land use will be compatible with MEC risks that may remain after MEC remediation.

The Army is responsible for implementing, monitoring, maintaining, enforcing, and reporting on Land Use Controls. The property will not be transferred until all MEC remedial actions have been completed.

Property transfer documentation will establish the appropriate restrictions regarding potential MEC risks at the Impact Area MRA that indicates:

- Specified reuses designated and approved at the time the Army transfers the property must be maintained by all property owners.
- Potential MEC risks may significantly increase if changes are made to the designated and approved uses.
- Any modifications to these land use restrictions must be approved by the project team (the Army, EPA, and DTSC) prior to implementation.

Under the FFA schedule, prior to property transfer, the Army shall prepare and submit to EPA for review and approval a Land Use Control implementation plan prepared as an addendum or amendment to the RD/RAWP. This plan shall contain implementation and maintenance actions, including periodic MEC inspections of open, accessible, or erosion-prone areas. The Army is responsible for enforcing Land Use Controls prior to property transfer, and will remain responsible until such obligations are assumed by another party.

The transfer of responsibility from the Army to another party for implementing, maintaining, monitoring, reporting, and enforcing Land Use Controls will be subject to regulatory approval. The transfer of any responsibility for selected Land Use Controls from the Army to another party will be described in a Land Use Control implementation plan that is prepared as an addendum or amendment to

the RD/RAWP. This implementation plan will be subject to regulatory agency (EPA and DTSC) review, and EPA approval.

2.14.3. Summary of the Estimated Remedy Costs

For those alternatives whose life-cycle is indeterminate or exceeds 30 years, for the purposes of evaluating and comparing alternatives as specified in EPA's RI/FS Guidance (*EPA, 1989*), a period of 30 years is used for estimating long term operations and maintenance (O&M) costs. For the Impact Area MRA, the life cycle is indeterminate; therefore, long-term O&M costs were estimated over a period of 30 years. The total estimated 30-year Net Present Value cost of the remedy is approximately \$148.23 million, including the long-term management cost of approximately \$453,000. Long-term O&M costs are based on a 2.7 percent real interest rate for Years 1-9, a 2.8 percent real interest rate for Years 10-20; and a 3.0 percent real interest rate for Years 20-30. A detailed, activity-based breakdown of the estimated costs associated with implementing and maintaining the remedy is provided in the Impact Area MRA Feasibility Study (Volume II; *MACTEC, 2007b*).

2.14.4. Expected Outcomes of Selected Remedy

The expected outcomes of Remedial Alternative 4 would be protection of human health and the environment regarding explosive safety risks posed by MEC through implementation of: (1) Technology-Aided Surface MEC Remediation and Subsurface MEC Remediation in Selected Areas, and (2) Land Use Controls that will be maintained during long-term reuse. The implementation of the selected remedy will allow for safe reuse and management of the Impact Area MRA as habitat reserve, as described in the HMP and additional requirements, in keeping with a general goal of the HMP to promote preservation, enhancement, and restoration of habitat and populations of HMP species while allowing development on selected properties on the former Fort Ord.

If residential or other types of development not identified for future reuse in Section 2.9. are planned for any part of the Impact Area MRA included in this ROD, the plans will be subject to regulatory review and approval.

2.15. Statutory Determinations

The selected remedy satisfies the requirements of Section 121 of CERCLA:

- **Protection of Human Health and the Environment:** The selected remedy provides protection for both human health and the environment regarding explosive safety risks posed by MEC through implementation of: (1) MEC remediation on the surface and in selected areas of the subsurface to support reuse needs, and (2) Land Use Controls to mitigate the risk from MEC that potentially remains onsite.
- **Compliance with Applicable or Relevant and Appropriate Requirements:** The selected remedy can be implemented in a manner that complies with ARARs. Land use controls will be implemented in a manner consistent with Federal and State guidance.
- **Cost Effectiveness:** The selected remedy is a cost-effective solution for reducing risks to human health and the environment regarding explosive safety risks posed by MEC. The net present value of the total estimated costs for implementation of each remedial alternative summarized in Table 2 (when Long Term Management Measures costs of \$453,000 for the entire Impact Area MRA are added to the cost for implementing each alternative), are: \$453,000 for the No Further Action

alternative (Alternative 1) which has no other costs associated with its implementation; approximately \$148.23 million for the selected remedy of Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls (Alternative 4, updated), which is well below the estimate for Subsurface MEC Remediation and Land Use Controls (Alternative 3) of approximately \$423.65 million; but is higher than the estimate for Technology-Aided Surface MEC Remediation and Land Use Controls (Alternative 2) of approximately \$89.35 million.

- Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable: The principal threats at the Impact Area MRA will be treated (i.e., surface MEC remediation will be completed throughout the entire Impact Area MRA, and subsurface MEC remediation will be completed in selected areas [estimated to be approximately 10 percent of the Impact Area MRA] to support reuse needs) utilizing permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.
- Preference for Treatment as a Principal Element: The principal threats at the Impact Area MRA will be treated (i.e., MEC remediation will be completed), satisfying the statutory preference for treatment as a principal element (i.e., reducing the toxicity, mobility, or volume of explosive hazard as a principal element through treatment).
- Five-Year Review Requirements: Because MEC will likely remain at the site under the selected remedy, a statutory review will be conducted as part of the Fort Ord five-year review process to ensure the remedy is, or will be, protective of human health and the environment regarding explosive safety risks posed by MEC. The purpose of a five-year review is to gather updated information, evaluate the condition of the site, and determine if the site remains safe from any contamination that might be left at the site. The next five-year review will occur in 2012.

2.16. Documentation of Significant Changes from Preferred Alternative of Proposed Plan

As described in Section 2.4., the Proposed Plan for the Impact Area MRA was released for public comment on June 28, 2007, and a public meeting was held on July 10, 2007. This Proposed Plan identified a preferred remedial alternative for the Impact Area MRA that has been selected as the final remedy in this ROD. Comments collected over the 60-day public comment period between June 28 and August 27, 2007, did not identify significant changes to the conclusions or procedures outlined in the Impact Area MRA RI/FS and Impact Area MRA Proposed Plan.

Although not considered to be significant, based on new information regarding intended reuse that was provided to the Army, the preferred alternative (Alternative 4) as described in the Proposed Plan has been modified to include weed abatement support as part of the remedial Land Use Controls.

Additionally, based on BLM's comments to the Proposed Plan, minor adjustments have been made to the descriptions of the remedial Land Use Control components, resulting in an increase in the remedy cost by \$9.38 million. The estimated cost of the selected remedy has been updated accordingly, to be a total of \$148.23 million (including the long-term management cost of approximately \$453,000). This update is not considered a significant change.

3. RESPONSIVENESS SUMMARY

This Responsiveness Summary is organized as follows:

Section 3.1. Overview

Section 3.2. Background on Community Involvement

Section 3.3. Summary of Comments Received During the Public Comment Period and Department of the Army Responses

- (A) Overall Community Concerns
- (B) Prescribed Burning for Vegetation Clearance
- (C) MEC Remedial Action and Land Use Controls
- (D) Regulatory Issues
- (E) Agency Comments

3.1. Overview

In the *Final Track 3 Impact Area Munitions Response Area (MRA), Munitions Response Remedial Investigation/Feasibility Study (RI/FS), Former Fort Ord, California*, dated June 25, 2007, and the Proposed Plan for the Track 3 Impact Area MRA, dated June 25, 2007, the Army identified a preferred remedial alternative, Remedial Alternative 4: Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls, that is documented as the selected remedy in this ROD.

Public comments on the Proposed Plan were received at a public meeting held on July 10, 2007, with written comments received from the public, community organizations, and government and regulatory agencies during the 60-day public comment period. The 30-day public comment period, which was initially scheduled for June 28 to July 28, 2007, was extended by 30 days at the request of the public, ending on August 27, 2007.

Public comments were submitted by 14 people and 2 community organizations — the Fort Ord Environmental Justice Network (FOEJN) and a technical advisor who was with Environmental Stewardship Concepts (ESC); and the Fort Ord Community Advisory Group (FOCAG). Comments were also submitted by 4 government agencies: (1) the City of Seaside, California; (2) BLM; (3) the Monterey Bay Unified Air Pollution Control District (MBUAPCD); and (4) DTSC.

These comments and the Army's responses are summarized below.

Based on the comments received, the Army's Proposed Plan was received with mixed reviews. While there is a general recognition that MEC needs to be removed from the Track 3 Impact Area MRA, the public was concerned about the use of prescribed burns for vegetation clearance because of the potential adverse impact of these burns and the associated smoke on the surrounding community. On the other hand, several individuals expressed support for the preferred remedial alternative because they believed there was a substantial environmental benefit and that such burns would provide for fire safety and habitat management. The City of Seaside indicated its full support for cleaning up the Impact Area MRA because, given the presence of MEC, it is unusable and because, once cleaned up, those areas that abut the City residential areas can be turned into valuable recreational assets and habitat reserve management areas. Agency comments supported the overall approach of the preferred remedial alternative, but identified some issues that required clarification. The issues concerned air monitoring during prescribed

burning, implementation and enforcement of Land Use Controls related to long-term management and reuse of the property after MEC cleanup activities are conducted.

The following issues and concerns expressed in the comments are categorized below. The Army's responses are provided in Section 3.3.

A. Overall Community Concerns. Several members of the public expressed concern about whether they will have a voice in the Army's cleanup decisions, and the need for the community to have a plan whereby they can be included in the process and their concerns can be addressed. In general, the public supported the proposed cleanup approach for MEC at the Impact Area MRA. However, several members of the public requested an extension of the Proposed Plan review period, and raised concerns about whether the preferred remedial alternative was the best alternative in terms of its potential impacts on human health and the environment.

B. Prescribed Burning for Vegetation Clearance. Many issues regarding prescribed burning were raised by members of the public. Several supported prescribed burning because: 1) they felt it was the most effective way of clearing vegetation for MEC remedial action to be conducted safely, 2) controlled (prescribed) burning would lessen the potential for future wildfires, and 3) it is beneficial to the type of habitat that occurs at the Impact Area MRA. Many were also against prescribed burning because they were concerned about the fire getting out of control and endangering the public, and they were concerned about adverse health effects of smoke exposure from burning vegetation and MEC that would be detonated by the fire. Several individuals expressed opposition to prescribed burning at the former Fort Ord in general, and expressed opinions that alternatives to burning should be considered. Members of the public also raised concerns about potential adverse health effects from smoke during prescribed burns, including: 1) requests for the Army to pay for relocation costs for people wishing to relocate during the burns, and 2) how the Army will make sure everyone knows when the burns will occur. Several comments were made requesting clarification on the type of air monitoring that would be performed during prescribed burns.

C. MEC Remedial Action and Land Use Controls. Some members of the public and agencies raised issues regarding how potential risks to property reusers would be addressed that would remain after MEC cleanup is completed under the preferred remedial alternative. In areas where subsurface MEC remediation would not be conducted, concerns were raised regarding how the future property owner would perform habitat management activities safely, and future recreational reusers would be protected from risks posed by MEC remaining at the site. Clarification was also requested regarding the extent of MEC remediation proposed along the property boundary adjacent to development areas, and how the risks posed by MEC that remained in the subsurface that may become exposed over time due to erosion would be addressed by the Land Use Controls included in the preferred remedial alternative.

D. Regulatory Issues. Some members of the public cited the National Environmental Policy Act (NEPA) statute they thought should be considered for the Impact Area MRA cleanup and for MEC in general at the former Fort Ord. Several members of the public also expressed that a health assessment should be conducted, and an Environmental Impact Statement (EIS) should be performed that looks at all the health impacts associated with taking the action outlined in the Proposed Plan, and specifically for prescribed burning for vegetation clearance. A concern was also raised regarding the applicability of the Administrative Order on Consent (AOC) and the related Finding of Suitability for Early Transfer (FOSET) for properties assumed to be included in the Impact Area MRA. One member felt that third party oversight or enforcement of the Army's cleanup decisions in addition to the regulatory agencies is needed, the remedial alternatives evaluated do not meet many of the CERCLA evaluation criteria, and the Habitat Management Plan should not be used as the basis for the cleanup because it states cleanup is not intended in high impact areas.

E. Agency Comments. Agency comments identified several issues that require clarification regarding land management and planning aspects of implementing the preferred remedial alternative, as well as Land Use Controls related to long term management and reuse of the property after MEC cleanup activities are conducted.

3.2. Background on Community Involvement

In 1991, the former Fort Ord was added to the BRAC List. The economic impact of the former Fort Ord's closure has created much community interest relative to the potential economic reuse of portions of the former Fort Ord. The Impact Area MRA will primarily be managed and maintained as habitat reserve.

Focused community involvement regarding the Proposed Plan has most recently involved the public's review of the Army's Proposed Plan for the Impact Area MRA. A 30-day public comment period began June 28, 2007 and was extended to 60 days at the request of the public, closing on August 27, 2007.

This Responsiveness Summary responds to written comments received during the public comment period as well as oral comments expressed during the public meeting conducted on July 10, 2007.

3.3. Summary of Comments Received During the Public Comment Period and Department of the Army Responses

Comments received during the Impact Area MRA Proposed Plan public comment period, and Army responses, are summarized below according to the topics identified in Section 3.1. (Overview):

A) Overall Community Concerns, B) Prescribed Burning for Vegetation Clearance, C) MEC Remedial Action and Land Use Controls, D) Regulatory Issues, and E) Agency Comments.

A. Overall Community Concerns

As summarized below, several members of the public raised concerns about the preferred remedial alternative and public participation process, and requested an extension of the Proposed Plan public comment period.

A1. Several members of the public supported the overall approach to the Impact Area MRA cleanup for MEC because safety is a top priority, especially with the property being located adjacent to developing and residential areas. Several comments were received that cleanup of MEC in preparation for reuse of land at the former Fort Ord will benefit the public and ecological resources, and the efforts of the Army, regulatory agencies, and other involved parties in developing a sound cleanup approach for MEC are appreciated. It was also stated that it was imperative that the Army and FORA pursue their plan as vigorously as possible so that the economic benefits of the former Fort Ord can accrue to the public.

Response: The Army is committed to conducting the MEC cleanup within the Impact Area MRA to support the safe reuse of the property as habitat reserve, which is a critical component of reuse of the former Fort Ord lands.

A2. Several members of the public requested a 30-day extension to the public comment period for the Superfund Impact Area MRA Proposed Plan. It was also requested that a presentation made during the formal comment session of the July 10, 2007 public meeting be included by reference as comments on the Proposed Plan and the transcript become part of the Administrative Record.

Response: A 30-day public comment period began June 28, 2007 and was extended to 60 days at the request of the public, closing on August 27, 2007. Comments made during the public comment period, and at the Proposed Plan public meeting, are addressed within this Responsiveness Summary, including the presentation made during the formal comment session of the July 10, 2007 public meeting, which is included by reference as comments on the Proposed Plan, and has become part of the meeting transcripts in the Administrative Record. Copies of the transcripts are available in the former Fort Ord Administrative Record, and on the web site www.fortordcleanup.com.

A3. Some members of the public raised concerns regarding the need for the community to be more aware of and involved in decision-making on the cleanup process, and asked how "community acceptance" of the Proposed Plan would be determined. Others felt the Army's efforts to involve the community members and invite them to learn about and participate in the process were important and appreciated.

Response: The Army has solicited and responded to public comments and input throughout the public review and comment periods on the Impact Area MRA RI/FS and Proposed Plan, and held the public meeting as part of its public participation responsibilities under Section 117(a) of CERCLA or Superfund and Section 300.430(f)(2) of the NCP. In addition to conducting the public meeting, the Army has mailed out newsletters and the Proposed Plan that provide information on the proposed cleanup, and has published notices of meetings in local newspapers and on the Fort Ord Environmental Cleanup Website www.fortordcleanup.com, including email notifications of information availability as it is posted on the web site.

Additional public input opportunities were also provided as follows:

- A Former Fort Ord Environmental Cleanup Open House/Bus Tour was held on June 23, 2007, at which an information table displayed the Track 3 Impact Area MRA RI/FS. The public was provided the opportunity to discuss various aspects of the cleanup program with technical staff, Army representatives and regulatory agencies.
- The Former Fort Ord Cleanup Newsletter, Fort Ord NEWS Winter 2007 (approximately 50,000 copies), was mailed in February 2007 to citizens living in the postal regions of Monterey, Seaside, Del Rey Oaks, Marina, and unincorporated areas of south Salinas (including Spreckels) that included information on the Track 3 Impact Area MRA RI/FS, Proposed Plan, and public meeting announcement.
- Two Community Involvement Workshops were held on October 11, 2006, and on April 11, 2007, that addressed the Track 3 Impact Area MRA RI/FS, and members of the public were invited to submit written and oral comments during the workshop. A description of reports expected to be completed through October 2007 was also provided.
- Two Technical Review Committee meetings were held on October 12, 2006, and April 12, 2007, that addressed the Track 3 Impact Area MRA RI/FS. A description of reports expected to be completed through October 2007 was also provided.
- The Fort Ord Environmental Cleanup 2006 Annual Report (approximately 50,000 copies) was mailed to citizens living in the postal regions of Monterey, Seaside, Del Rey Oaks, Marina, and unincorporated areas of south Salinas (including Spreckels) in June 2007. The annual report addressed the Track 3 Impact Area MRA RI/FS, Proposed Plan, and public meeting.

As described in the Proposed Plan, community acceptance, along with State acceptance, is one of the two modifying criteria amongst U.S. EPA's nine CERCLA evaluation criteria. Community acceptance is

gauged using available public input and reactions to the information presented within the Proposed Plan as summarized in this Responsiveness Summary. The Army acknowledges some members of the community may not accept the Proposed Plan; however, many members of the public accept it and recognize the need for MEC cleanup to address risks posed by MEC at the Impact Area MRA.

A4. Several members of the public expressed community opposition to the use of prescribed burning as a vegetation clearance method, and believe that addressing MEC risks should not outweigh the potential risks to the community at large from involuntary exposure to air emissions from prescribed burning and chemicals in smoke from MEC detonations.

Response: The Army recognizes there are public concerns regarding prescribed burning and MEC cleanup being conducted adjacent to populated areas, and that MEC remedial activities may have impacts on people at the former Fort Ord and in surrounding communities. The Army strives to balance these concerns with the need to conduct MEC remedial actions to reduce the explosive safety risks posed by MEC known to be present within the Impact Area MRA. The implementation of the selected remedy will allow for safe reuse and proper management of the Impact Area MRA as habitat reserve, in keeping with a general goal of the HMP to promote preservation, enhancement, and restoration of habitat and populations of HMP species while allowing development on selected properties on the former Fort Ord.

Building the community's trust is an important priority to the Army. The Army strives to do this through, in part, making the cleanup information available to the public, inviting the public to participate in the decision-making process, ensuring that cleanup decisions are made based on the most accurate information available, and taking advantage of community support programs such as the EPA's technical assistance grant program to enhance the community's participation. The Army will conduct remedial actions in a manner protective of public health by complying with applicable environmental standards.

Please see Responses to Comments B1—B7 below that provide the Army's response to concerns regarding prescribed burning, smoke and air emissions from prescribed burning and MEC detonations. The impacts to the community were considered in the Impact Area MRA RI/FS, and the Army plans to take appropriate action to mitigate impacts to the public during the cleanup. Site-specific plans for each burn that will be conducted will be made available for regulatory agency review and approval and public review prior to implementation.

B. Prescribed Burning for Vegetation Clearance

Several members of the public expressed support or raised concerns about the prescribed burning component of the preferred remedial alternative, as summarized below.

B1. Several members of the public strongly supported prescribed burning for vegetation clearance under the preferred remedial alternative because they felt: (1) prescribed burning is the most effective way of clearing vegetation for MEC remedial action to be conducted safely, (2) controlled (prescribed) burning would lessen the potential for future wildfires, and (3) burning is beneficial to the type of habitat that occurs at the Impact Area MRA.

Response: The comments on the positive aspects of prescribed burning are acknowledged. The Army considered these and other factors such as prescribed burning's proven effectiveness at the former Fort Ord in similar types of habitat, and the short duration of this vegetation clearance method compared to the other methods evaluated that would allow for safe access into areas where MEC cleanup needs to be conducted.

B2. Several members of the public were against prescribed burning because they were concerned about adverse health effects of smoke exposure on workers and community members

who live in and around former Fort Ord, that is a heavily populated community. It was also noted that some of the previous burns conducted at former Fort Ord have ended up burning more acres of land than were intended, and that controlled safe burns are very difficult to implement in the environment found at the former Fort Ord.

Response: The Army will address community concerns regarding prescribed burns and reducing the potential for public exposure to smoke, through careful planning and community notification. In addition, prescribed burns to clear vegetation and allow for MEC removals within the 6,560-acre Impact Area MRA will be conducted in stages each year, using a phased approach that consists of several smaller burns, approximately 100 acres in size (actual size could be more or less than 100 acres depending site-specific considerations), over several days, rather than one large burn. Each contiguous prescribed burn area would not exceed 400 acres (separated by a minimum of 25 acres to allow a mosaic pattern consisting of difference age classes of vegetation) unless specifically coordinated with USFWS. Per the Habitat Management Plan, no more than 800 acres would be allowed to be prescribed burned in any given year.

The Army will develop a community notification plan as part of each burn plan. Site-specific burn plans will set protocols to control the fire within the designated burn area, reduce smoke generation, and manage smoke dispersion to minimize downwind impacts, and will be made available for agency and public review prior to conducting each burn. The site-specific burn plans will outline the objectives of the burn, burn area, and the range of environmental conditions under which the burn will be conducted; workforce and equipment resources required to ignite, manage, and contain the fire; and communication procedures. A prescribed burn will be started only when optimum burn conditions are confirmed. Please see Responses to Comments B3 and B4 below regarding the results of previous air emissions studies, and air monitoring that will be conducted during the prescribed burns as part of the selected remedy.

B3. Concerns were raised about the potential adverse health impacts on the community from chemicals present in smoke generated during prescribed burns at the former Fort Ord, including: (1) biomass from burning vegetation, (2) MEC and MEC materials that would be detonated and burned, and (3) herbicide spraying from helicopters to accelerate burns. Several members of the public also requested that the risks to the public from prescribed burns should be described in the Proposed Plan to provide local residents with all the information they need to make well informed decisions on the plan. Others requested that the Army conduct a health study or risk assessment on the affects of smoke exposure from prescribed burning on human health, or provide an environmental health clinic for the community.

Response: The Army recognizes there are public concerns regarding the potential health impacts of chemical constituents present in smoke generated during prescribed burning, and acknowledges the potential for smoke to affect sensitive individuals within the community. Please see Response to Comment B4 below regarding the approach for air monitoring for prescribed burns that will be presented in site-specific work plans. Air monitoring will be conducted during prescribed burning to evaluate whether the prescribed burns at the former Fort Ord result in downwind ambient concentrations of smoke particulates that exceed the applicable health-based screening level and to provide data to assess the adequacy of the burn prescription relative to downwind impacts.

The Army conducted an assessment of potential MEC-related air emissions associated with conducting the prescribed burn at the Ranges 43–48 Interim Action site, part of which occurs within the Impact Area MRA. The results are presented in the *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord (Harding ESE, 2001)* (Air Emissions Technical Memorandum) prepared in cooperation with and under review by the regulatory agencies. The study focused on Ranges 43–48 because the Ranges 43–48 area is

considered to have the highest concentration of MEC on the surface within the MRA. Results of the study indicated that air pollutant emissions from incidental MEC detonation during a prescribed burn in Ranges 43–48 would be minor compared to emissions contributed directly by biomass (vegetation) burning.

The Army subsequently conducted extensive air monitoring during the Ranges 43-48 prescribed burn in October 2003 (*Harding ESE, 2004*). The air screening levels identified for the air monitoring program were developed through the cooperative efforts of the Army, EPA, DTSC, California Air Resources Board and MBUAPCD, and were based on established risk-based standards. The air monitoring results, as they apply to the concerns identified, are discussed below.

In regards to portion (1) of the comment regarding concerns that smoke from prescribed burning may contain chemicals from biomass (burning vegetation), although their presence is expected to be temporary, the combustion by-products from vegetation burning are acknowledged by the Army to have the potential to affect sensitive individuals.

It is acknowledged that short-term exceedances of the PM₁₀ screening level could occur during prescribed burn programs. The 2003 burn, which covered approximately 1,500 acres, resulted in PM₁₀ exceedances, partly due to the additional acreage unintentionally burned. However, during the MRS-16 prescribed burn of approximately 68 acres in 2006, the PM₁₀ standard was exceeded at only one monitoring station, but was attributed to a nearby unrelated fire. Based on the results of this more recent prescribed burn, it is reasonable to assume that the burns of similar size planned for the Impact Area MRA (approximately 100 acres each) would have minimal or no PM₁₀ exceedances.

During the prescribed burn of Ranges 43-48 in 2003, formaldehyde and acetaldehyde, which are vegetation combustion by-products, were not detected in receptor areas at concentrations exceeding air screening levels. Acrolein, also a vegetation combustion by-product, was detected above air screening levels, even during baseline (non burn) monitoring, suggesting that other sources contributed to the concentrations seen. In *Health Consultation, Former Fort Ord Site (a/k/a Fort Ord)* dated February 3, 2005, the U.S. Department of Health and Human Services, the Agency for Toxic Substances and Disease Registry (ATSDR) stated “At the maximum estimated hourly acrolein air concentration of 424 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) [during the smolder phase], temporary minor respiratory and eye irritation could have occurred in some sensitive individuals”.

In regards to portion (2) of the comment regarding concerns that smoke from prescribed burning may contain MEC-related chemicals from detonations and burning of MEC materials:

During the 2003 prescribed burn, air monitoring samples were collected at fourteen (14) locations at and surrounding the Ranges 43-48 site. The analysis of the air samples collected showed that, although an additional 1,000 acres unintentionally burned (a total of approximately 1,500 acres), munitions-related chemicals (i.e., explosive residues) were not detected, even at monitoring stations most heavily impacted by smoke. Samples from the most heavily impacted monitoring stations and the mobile station were analyzed for dioxins and furans which were detected in the heavily impacted areas (nearest the burn), but at levels 7 to 300 times less than the chronic reference exposure level (REL) for these compounds set by the State of California. Outside of the immediate 2003 burn area, particulate metals were either not detected or were detected at levels less than the screening levels with one exception: the estimated peak concentration of aluminum at one monitoring station exceeded the screening level. However, aluminum, as well as other metals detected are common to native soil and plant tissue and their presence would be expected in smoke even where no MEC are present. Therefore, concentrations of aluminum are not likely to exceed the regulatory screening levels for future planned burns, which are expected to be approximately one-tenth or less the size of the 2003 burn.

In *Health Consultation, Former Fort Ord Site (a/k/a Fort Ord)* dated February 3, 2005, ATSDR conducted an independent evaluation of the 2003 air monitoring results, and concluded emissions from the burn posed “no apparent public health hazard” (ATSDR, 2005).

Future prescribed burns during remedial actions planned for the Impact Area MRA will include smoke management performed in accordance with the smoke management guidelines outlined in California Code of Regulations, Title 17, and will include air monitoring and a post-burn evaluation. Smoke impacts on the community are expected to be temporary, and through community notification, the public will be advised of reasonable precautions they can take to minimize exposure to smoke from prescribed burns, such as staying indoors with doors and windows closed, and limiting outdoor activity when smoke is present.

In regards to portion (3) of the comment regarding concerns that smoke from prescribed burning may contain herbicides from helicopter spraying to accelerate burns, the Army does not apply herbicides within the Impact Area MRA via helicopter spraying. Helicopters are only used by the Army during prescribed burning activities to apply burn ignition or suppression materials.

B4. Several people asked whether the Army will perform air monitoring and studies on the health effects of the smoke during prescribed burning, and if that data will be used in a study that tells what the health risks are to the community from smoke exposure.

Response: Please see Response to Comment B2 above regarding the actions the Army will take to minimize downwind smoke impacts. The Army will perform air monitoring during prescribed burns, and that data will be used to further evaluate the potential smoke impacts to the community. The remedial actions will be conducted in accordance with the smoke management guidelines outlined in California Code of Regulations, Title 17 and will include air monitoring and a post burn evaluation. The air monitoring program will be coordinated with MBUAPCD and will be consistent with the Air District's smoke management program for similar prescribed burns in the air basin, and the methods will be described in site-specific burn plans.

B5. Several people indicated they had experienced health problems from smoke exposure during previous burns or had respiratory illnesses that made them sensitive to smoke exposure. They also asked how the Army will make sure everyone knows when the burns will occur, and if they planned to leave the area during prescribed burns, whether the Army would reimburse their expenses associated with relocating. Other comments were made that relocation should be offered during burns by the Army to people who have health problems, and noted the Army discontinued their relocation program in 2006. Suggestions were also made for other vegetation clearance options to be used, especially since (1) the temporary relocation program was not handled well in the past, and (2) notice of the burn given on the same day it is conducted does not allow sufficient time for community members who need to give notice to employers and schools that they will need to leave the area.

Response: Please see Responses to Comments B1—B4 above that describe the Army’s plans to minimize impacts on the community from smoke during prescribed burns, and the results of the ATSDR study and previous studies on air emissions & monitoring, which determined that prescribed burns were not a public health hazard.

Community notification and smoke management would minimize potential impacts from smoke. The short duration and repetitive nature of these burn events may produce a significant time and travel burden on those attempting to relocate, return, and then relocate several times within days or weeks. For these reasons, the Army has determined it is not possible to implement an effective temporary voluntary relocation program for the community during prescribed burns in the Impact Area MRA. Therefore, temporary relocation of residents during prescribed burns will not be provided.

The Army will provide information and notification to the public prior to conducting prescribed burns about reasonable precautions to avoid smoke exposure. A prescribed burn will be started only when optimum burn conditions are confirmed. Mobilization of fire management personnel and equipment, and public notification, will occur when optimum burn conditions are reasonably expected. Once mobilized, fire and management personnel, equipment, and supplies may be in place and standing by for several days. Because the Army will be waiting for appropriate atmospheric conditions rather than trying to anticipate them, the Army will not know conclusively until moments before the fire is lit that the burn will occur that particular day. In addition, multiple burn events may be conducted over a period of several days that could be interrupted by one or more days of no burning. Through community notification, the public will be advised of reasonable precautions they can take to minimize exposure to smoke from prescribed burns, such as staying indoors with doors and windows closed, and limiting outdoor activity when smoke is present. Please see Response to Comment B7 below regarding the other vegetation clearance options that were considered for the habitat reserve within the Impact Area MRA, which can only be used on a limited basis, or for which further studies are needed to determine their effectiveness and potential impacts on ecological resources.

B6. Members of the public questioned whether prescribed burning's beneficial impacts on the plant habitat described in the Proposed Plan necessarily means it is the best overall method for implementation in terms of impacts to wildlife.

Response: Prescribed burning is not expected to have adverse impacts on the environment. Mitigation measures described in Chapter 3 of the HMP (*USACE, 1997*) will be implemented to minimize impacts to wildlife resources during vegetation clearance. As described in the Impact Area MRA RI/FS and Proposed Plan, prescribed burning has beneficial effects on the regrowth and long term health of vegetation in habitat reserve areas at the former Fort Ord. With regards to impacts of prescribed burning on wildlife and habitat, wildlife resources have adapted to periodic fires within chaparral habitat and benefit from the temporary changes to their habitat. The USFWS supports the HMP for the former Fort Ord (*USACE, 1997*), which emphasizes the positive impacts of burning on special status species, and indicates plant species and wildlife at the former Fort Ord are not adversely affected.

B7. Several members of the public who are opposed to prescribed burning requested that other vegetation clearance alternatives should be considered and used wherever possible, such as manual and mechanical clearance, and “crush and burn” methods that have already been used in previous MEC cleanups and proven to be effective at the former Fort Ord. A comment was also made that the manual cutting planned for clearing areas to conduct digital surveys should be done prior to germination of seedlings, or if not, the impacts should be monitored, and mitigation procedures to reduce impacts on sensitive species should be developed.

Response: The Impact Area MRA is densely vegetated; therefore, in order to provide safe access for workers to conduct MEC removals, vegetation clearance is required as a first step. Methods of vegetation clearance for different plant communities at the former Fort Ord were evaluated. The Impact Area MRA is a designated habitat reserve, and is primarily covered by CMC. The *Evaluation of Vegetation Clearance Methods Technical Memorandum, Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California* (Vegetation Clearance Technical Memorandum; *Harding ESE, 2002*) identified prescribed burning. Other vegetation clearance methods were evaluated, but either their use is allowable on a limited basis only, or further study of their effectiveness and implementability is required. “Crush and burn” methods may be applicable, but would require further study. Manual and mechanical cutting are applicable for up to 50 acres of unburned CMC in polygons located in habitat reserve areas; widespread use of cutting in habitat reserve containing CMC is unacceptable because it has not been shown to support successful recovery of the rare habitat. These methods will be retained for further consideration on a limited basis depending on area-specific

conditions identified in the site-specific work plan for each area. Prescribed burning has been demonstrated to achieve the vegetation clearance goal of removing the vegetation to successfully facilitate follow-on MEC removal in compliance with the HMP.

The Army has also considered the potential implementation of mechanical vegetation clearance followed by MEC removal, and then prescribed burning, in order to be able to implement MEC removals without first conducting a prescribed burn. Dense vegetation with potentially high densities of high explosive MEC on the ground surface may make it difficult for the mechanical clearance equipment to safely access the area and to cut the vegetation. In addition, there is insufficient data at this time to determine whether this methodology could be implemented successfully and in compliance with HMP requirements and ARARs. It has not been shown that recovery of CMC habitat and sensitive species would be successful after implementing this methodology. Therefore, this potential option was not considered further at this time for the Impact Area MRA.

With regards to mitigating or monitoring impacts on vegetation from limited manual or mechanical vegetation clearance, as stated in the Impact Area MRA RI/FS, limited manual or mechanical cutting and the overall implementation of the remedy will be performed in compliance with HMP and biological opinions, and will include monitoring and mitigation procedures to reduce impacts on sensitive species.

C. MEC Remedial Action and Land Use Controls

Some members of the public and agencies raised issues regarding how potential risks to property reusers would be addressed that would remain after MEC cleanup is completed under the preferred remedial alternative, as summarized below.

C1. Several members of the public expressed concerns that the proposed cleanup approach for the Impact Area MRA will leave areas behind that are not completely cleaned up of MEC and associated chemicals, and indicated an analysis of the residual chemicals that are of concern that would be left in soil after MEC cleanup should be performed as part of the Proposed Plan.

Contamination that is left behind, or other unknown areas of contamination that may be discovered in the future at the former Fort Ord, could affect the health of residents in nearby communities. After the proposed cleanup is done and the Army departs, the community will be left to shoulder an insurance risk related to uncertainties in the cleanup. Some sort of credible insurance or bond guaranteeing rapid and adequate response and response funding by the appropriate U.S. government agencies to deal with any future, unexpected contamination should be provided.

Response: With regards to the areas where subsurface MEC remediation would not be conducted within the Impact Area MRA, please see Response to Comment C2 below that describes the reuse assumptions for this habitat reserve area, and the Land Use Controls included in the selected remedy that the regulatory agencies have agreed are appropriate to address any potential MEC risks that remain at the site during reuse.

The Track 3 Impact Area MRA RI/FS and Proposed Plan only address the explosive safety risks from MEC. Potential human health and ecological risks related to any soil contamination from MC related to the use of small arms ammunition and military munitions ranges are being addressed under the Basewide Range Assessment (*Shaw/MACTEC, 2006*) and the Site 39 Feasibility Study Addendum (*MACTEC, 2007a*), which are components of the Hazardous Toxic Waste (HTW) RI/FS program, separate from the Munitions Response RI/FS program.

The Army is the lead agency under CERCLA ultimately responsible for conducting cleanups at the former Fort Ord, and would return to the site to address any contamination caused by past Army activities that may be found in the future.

Comment C2. In areas where subsurface MEC remediation would not be conducted, concerns were raised regarding how the future property owner would perform habitat management activities safely, and future recreational reusers would be protected from risks posed by MEC remaining at the site. Clarification was also requested regarding the extent of MEC remediation proposed along the property boundary adjacent to development areas - other contiguous and transferred properties on the periphery of the Impact Area MRA should also be considered in terms of the effect on the future property owner's ability to safely and effectively provide public access and manage and maintain the habitat reserve.

Response: The Army recognizes the concerns people may have that the selected remedy does not include MEC cleanup throughout the entire subsurface of the Impact Area MRA. However, the subsurface MEC remediation will be conducted in areas to support specific reuse needs by the future landowner (currently identified as BLM). The Army is conducting the MMRP RI/FS program, including the proposed cleanup of the Track 3 Impact Area MRA, under CERCLA and with the oversight of EPA and DTSC. Consistent with the CERCLA five-year review process, the Army and EPA are responsible for periodically evaluating the long-term protectiveness of the remedy that is implemented.

Based on the results of the Impact Area MRA FS for Alternative 3, which was evaluated as "full MEC cleanup" (i.e., subsurface MEC remediation throughout the entire Impact Area MRA), the CERCLA evaluation and comparison specified in the EPA's RI/FS Guidance (*EPA, 1989*) indicated that if full MEC cleanup (Remedial Alternative 3) were implemented, it would: (1) result in the most significant impacts to natural resources and would likely take decades to recover; (2) more than double the cost of the cleanup; and (3) still require long term implementation of Land Use Controls to address potential risks that will remain from MEC. The combination of site-wide surface MEC remediation, subsurface MEC remediation in selected areas, and Land Use Controls under the selected remedy will support safe reuse activities (e.g., habitat monitoring, invasive weed control, prescribed burning, and associated fire management) and allow for proper management of the habitat reserve as described in the HMP and additional requirements.

Subsurface MEC remediation is assumed to be conducted in approximately 10 percent of the Impact Area MRA. Additional subsurface MEC remediation areas would be identified in coordination with the agencies and the future landowner (currently identified as BLM) based on factors such as the feasibility of implementation, cost, and habitat management requirements. An HCP for the former Fort Ord is being developed in coordination with BLM, FORA, and other property recipients. The Draft HCP (*Zander, 2007*) currently identifies reuse activities anticipated to occur within the Impact Area MRA. Subsurface MEC remediation would be conducted in selected areas. These areas include: (1) regularly maintained fuel breaks and access roads; (2) a 100-ft wide (minimum) buffer area along the habitat-side of the development border of the Impact Area MRA that will act as an additional safety zone for subsurface activity and enhance firefighters' ability to fight wildfires from the border-buffer area; and (3) other areas to address specific risk and/or land use needs (e.g., proposed, future habitat restoration areas). There is flexibility in how the Army, future landowner (currently identified as BLM), and regulatory agencies determine the approximate 10 percent (%) of the Impact Area MRA where subsurface MEC remediation will be conducted, including considerations such as compliance with HMP and biological opinions, and the scope of buffer areas and their treatment. The proposed cleanup includes a comprehensive set of Land Use Controls that would support the long-term reuse of the site as a habitat reserve.

With regards to the comment that the other contiguous and transferred properties on the periphery of the Impact Area MRA be considered in terms of the effect on the future property owner's ability to safely manage and maintain the habitat reserve, please see Response to Comment C6 below that describes the coordination process for developing the phased cleanup approach with the future landowners and managers (currently identified as BLM).

C3. Clarification was requested on the basis for sifting and inspecting only a two-foot layer of soil under the subsurface MEC remediation along the 100-foot buffer area along the boundary of the site, which seems shallow since the high-powered weapons used at the site may send munitions deeper in the soil.

Response: The 100-foot buffer is proposed for full subsurface MEC remediation using the best available detection and removal technology that will be described in the site-specific work plans for each phase of work. Based on previous MEC investigation and removal data collected at MRSs at the former Fort Ord, the majority of MEC items were removed from the top 2 feet of soil. Therefore, excavation and sifting of the top 2 feet of soil will be considered in areas that contain significant amounts of UXO that are military munitions with sensitive fuzes, and/or associated metallic debris. After the top layer is remediated, the remainder of the subsurface beneath the excavation would also be investigated, and all detected MEC would be removed.

C4. Other MEC detection technologies should also be looked at because the current methods are not 100% effective, and there will still be risks to people from MEC even after the cleanup has been completed.

Response: Site-specific work plans will describe the approach for each phase of work that will be used for surface and subsurface MEC remediation, including selection of MEC detection methods and equipment that are best suited for site conditions. The site-specific work plan is a primary document under the FFA, and will be available for regulatory agency and public review and comment.

C5. The MEC recognition and safety training the Army conducts is good, but it needs to be more mandatory, and although the Army can not force people to take the training, it should be offered more regularly and effectively. It was also requested that all workers performing intrusive activities in the entire Fort Ord area should be required to receive MEC recognition and safety training.

Response: At the former Fort Ord, MEC recognition and safety training is recommended and available for anyone who requests it as a reasonable precaution. In areas such as the Track 3 Impact Area MRA, the Army will require MEC safety training for all workers conducting activities within the Impact Area MRA. These Land Use Controls are intended to be in place indefinitely unless periodic reviews indicate that the safety programs are no longer necessary.

C6. A comment was made that the proposed cleanup of surface-only MEC remediation is not adequate if the HCP goals for habitat maintenance, educational, and recreational uses on designated routes cannot take place due to the level of MEC risk that will leave the area effectively closed without an escort. The proposal does not include enough areas where subsurface MEC remediation will be conducted to support BLM reuse under the HCP, and should include areas that will maximize reusable areas based on data and digital mapping. Also, it was suggested that BLM should be consulted to see what areas or trails they would like to develop, or areas where habitat enhancement is most important, such as current areas of invasive weeds that could have subsurface MEC remediation, so BLM can restore them.

Response: The Army will coordinate with the future landowner (currently identified as BLM) and regulatory agencies to develop site-specific work plans and coordinate the surface and subsurface MEC remediation in compliance with the HMP, and in a manner consistent with HCP goals for habitat

maintenance and recreational and educational uses on designated routes. As part of the selected remedy, subsurface MEC remediation will be conducted in those areas selected to specifically support reuse of the Impact Area MRA as habitat reserve, such as future habitat restoration areas identified by BLM.

D. Regulatory Issues

Several comments were made by members of the public regarding the National Environmental Policy Act (NEPA) documentation, and other statutes, studies, and CERCLA evaluation criteria they thought the Army should consider further for the proposed cleanup as summarized below.

D1. Some members of the public cited NEPA statute they thought should be considered for the Impact Area MRA cleanup and for MEC in general at the former Fort Ord.

Response: In accordance with Army policy, 32 CFR Part 651.5(1), response actions implemented in accordance with CERCLA or RCRA are not legally subject to NEPA and do not require a separate NEPA analysis. As a matter of Army policy, CERCLA and RCRA analysis and documentation should incorporate the values of NEPA; establish the scope of the analysis through full and open public participation; analyze all reasonable alternative remedies; evaluate the significance of impacts resulting from the alternatives examined; and consider public comments in the selection of the remedy. The decision maker shall ensure that issues involving substantive environmental impacts are addressed by an interdisciplinary team. This process serves as the functional equivalent to NEPA, and has been followed by the Army in preparation of the Impact Area MRA RI/FS and Proposed Plan.

The CERCLA/NCP process provides for evaluation of alternatives and public involvement in a manner that is functionally equivalent to the NEPA process, and compliance is achieved by following the NCP procedures. CERCLA specifically seeks to avoid unnecessary duplication of effort. The CERCLA/NCP process addresses, where appropriate, consideration of environmental effects and compliance with applicable legal standards, and the public is afforded the same opportunity to review and comment that is provided by NEPA.

D2. Several members of the public also expressed that a health assessment should be conducted, and an EIS should be performed that looks at all the health impacts on humans and animals associated with explosives and chemicals under the action outlined in the Proposed Plan, and specifically for prescribed burning for vegetation clearance.

Please see Response to Comment B3 above regarding the independent evaluation of prescribed burn air monitoring results by the Agency for Toxic Substances and Disease Registry that concluded emissions from the burn posed “no apparent public health hazard” (ATSDR, 2005). Also, please see Responses to Comments B1—B7 above regarding the Army’s plans to minimize potential smoke impacts from prescribed burning. The Army acknowledges smoke generated during prescribed burning could have adverse impacts on sensitive individuals, and as such, has included measures to minimize or mitigate potential impacts as part of the remedy as described in the Impact Area MRA RI/FS and Proposed Plan. Please see Response to Comment C1 above regarding the assessment of potential risks to humans and animals from chemical contamination associated with MEC cleanups that are being assessed and addressed under the Basewide Range Assessment (*Shaw/MACTEC, 2006*) and Site 39 Ranges Feasibility Study (*MACTEC, 2007a*).

Please see Response to Comment D1 above regarding preparation of an EIS at the former Fort Ord. The Army is conducting a comprehensive basewide MMRP RI/FS that will follow the same CERCLA/NCP process as described above, therefore a separate NEPA EIS analysis is not required.

With regards to the potential explosive risks to plants and animals, the Army has been evaluating and managing the habitat at the former Fort Ord, as well as investigation and cleaning up MEC, since the Base was listed for closure in the early 1990s. Based on many years of site experience, the presence of MEC in the Impact Area MRA does not appear to be a concern in terms of explosive safety risks to ecological receptors. Several iterations of biological resource evaluations and many years of habitat monitoring show that the ecological environment is healthy and thriving.

With regards to potential impacts from prescribed burning on wildlife and habitat, please see Response to Comment B6 above that summarizes the positive impacts of burning on special status species, and indicates plant species and wildlife at the former Fort Ord are not adversely affected.

D3. Some members of the public asked why the process being followed by the Army for the Impact Area MRA did not reference the AOC between EPA and FORA, or the related FOSET for properties assumed to be included in the Impact Area MRA.

Response: The Proposed Plan described the Army's proposed munitions response remedy for the Impact Area MRA. The Army will address other Track 3 MRSs in site-specific RI/FSs and resulting Records of Decision. The AOC is an agreement between the regulatory agencies and FORA, regarding the performance of certain cleanup activities by FORA only for the parcels that are currently being considered for early transfer, which do not include the Impact Area MRA, at the former Fort Ord. The AOC does not affect the evaluation of remedial alternatives or the selection of the remedy for the Impact Area MRA. Comments regarding the AOC do not pertain to the Proposed Plan and should be directed to FORA. The Army is the current property owner of the 6,560-acre Impact Area MRA that is the subject of the Proposed Plan, and does not plan to transfer the Impact Area MRA until MEC cleanup is complete. Therefore, a FOSET will not be prepared for this property. The FOSET that was available for public comment in 2007 was for other parcels at the former Fort Ord.

D4. A member of the public expressed a concern that third party oversight or enforcement of the Army's cleanup decisions in addition to the regulatory agencies is needed, the remedial alternatives evaluated do not meet many of the CERCLA evaluation criteria, and the Habitat Management Plan should not be used as the basis for the cleanup because it states cleanup is not intended in high impact areas.

Response: The Army is the lead agency for investigating, reporting, and implementing remedial actions at the former Fort Ord. The EPA is the lead regulatory agency and has oversight responsibility. Public comments on the Proposed Plan were considered by the Army, in consultation with the EPA and DTSC, in making a final decision in the ROD regarding the proposed cleanup related to MEC at the former Fort Ord. Under the FFA, if there is a dispute between the FFA signatories, the EPA Administrator has the final remedy selection authority. Regarding whether the remedial alternatives meet the CERCLA criteria, the Impact Area MRA RI/FS and Proposed Plan described how the criteria were met for each alternative, and compared each alternative. The Army and the regulatory agencies determined the selected remedy best met the criteria. The Habitat Management Plan is being used as a basis for managing ecological resources in habitat reserve areas under the MMRP RI/FS program, and does not preclude the implementation of full subsurface MEC remediation in high impact areas.

E. Agency Comments

Agency comments identified several issues that require clarification regarding land management and planning aspects of implementing the preferred remedial alternative, as well as Land Use Controls related to long term management and reuse of the property after MEC cleanup activities are conducted, as summarized below.

E1. DTSC Comments

DTSC submitted comments on the Proposed Plan in a letter dated August 27, 2007. DTSC's comments and the Army's responses are summarized below.

Comment: BLM representatives indicated their intention that roads and trails would be accessible to unescorted individuals who had been warned of potential MEC hazards, and BLM anticipates up to 75,000 individuals may visit the site each year. BLM would attempt to limit access using controls including informational pamphlets, periodic patrols, and warning signs. DTSC's position is that these controls are not sufficient to control access to areas where it is likely that live MEC remains near the surface. DTSC's preference is that the Army remove live MEC from the subsurface in all accessible, unfenced areas. In areas where the BCT agrees full subsurface removals will not be conducted where live MEC may remain near the surface, DTSC's position is that: (1) access must be prevented by using fencing equivalent to 6-foot chain link topped by three strands of barbed wire, regular fence maintenance, appropriate "Keep Out" signage, and patrols; and (2) periodic 100% surface MEC removals must be conducted to assure live MEC items do not surface and pose a hazard. Further, DTSC's position is that these decisions must be made in consultation with BLM and memorialized in a disputable Technical Memorandum. DTSC's intention is to work cooperatively with all parties to achieve a safe remedy based on parcel by parcel conditions defined by data from surface MEC removals and geophysical mapping.

Response: The Army is committed to the goal of designing a cleanup plan that will support the reuse of the site as a habitat reserve. The Army acknowledges DTSC's chief remaining concern expressed in their comments is public safety during the reuse of the site. Public access to the Impact Area MRA is currently restricted and is managed by the Army, and will continue until the MEC cleanup is completed and the property is to be transferred. At the time the property is to be transferred, Land Use Controls identified as components of the selected remedy, will be implemented based on site-specific data obtained from conducting MEC cleanups at the site, in coordination with the future landowner (currently identified as BLM) and the regulatory agencies. Under CERCLA, the Army is ultimately responsible for the implementation and maintenance of the Land Use Controls, although all or part of such responsibilities may be transferred to another party (e.g., the future landowner) with the approval of EPA in consultation with DTSC.

The Army believes the Land Use Controls identified as components of the selected remedy are sufficient to support the safe management of the habitat reserve. In regards to DTSC's position on fencing and access controls, the current four strand barbed wire fence backed by concertina wire, signs, gates, and patrols, in conjunction with the overall security plan, will be maintained by the Army, and have been proven to significantly reduce illegal trespassing and be protective of human health. The location and design of security fence(s), which is part of the selected remedy, will be documented in the RD/RAWP; any subsequent decisions concerning the location or design of security fence(s) will be made in consultation with EPA and DTSC, and will be documented in FFA primary documents. Fence type and location, and access controls will be confirmed through a remedial action completion report, which is a FFA primary document, when the remedial action is completed within the Impact Area MRA.

In regards to DTSC's position on conducting periodic surface MEC removals in areas where subsurface MEC removals are not conducted, under the selected remedy the Army will conduct annual MEC inspections of all surface MEC removal areas to identify areas where erosion or other natural phenomena has caused MEC to be present on the surface. These annual inspections will continue until vegetation growth is sufficient to minimize erosion at the site. In addition, remedial Land Use Controls include onsite UXO-qualified personnel that will provide long-term support for the future landowner to conduct subsequent surface inspections as necessary, after MEC remedial actions are completed and the property is transferred. Details of post-transfer periodic inspections will be finalized through the remedial

action completion report incorporating information obtained during the remedial action that will have been taken. In addition, the Army will develop a detailed Land Use Control implementation plan at the time the property is to be transferred, with coordination with the future landowner and the regulatory agencies.

E2. BLM Comments

BLM indicated their comments provided on the Draft Final Impact Area MRA RI/FS are the same as, and should be included in, the list of comments on the Proposed Plan. BLM provided comments: (1) in their July 2, 2007 letter regarding minimum requirements for munitions response actions related to potential future uses of the land under the HMP and pending HCP; and (2) in a joint BLM/USFWS July 27, 2007 letter regarding the same requirements. Comments were submitted by BLM specifically on the Proposed Plan, as summarized below.

Comment: The BLM remains greatly concerned with the prospect of managing any lands that have MEC contamination in the Track 3 area that will soon be surrounded by residential, educational, and resort/recreational development. However, there may be a remediation option where partial subsurface removal is sufficient to allow the BLM to fulfill HCP commitments and allow some public use of the area. In these comment letters, BLM identified “minimum requirements,” without which the implementation of the HCP cannot be realistically achieved by any future landowner. These minimum requirements were based on the limited information available regarding the distribution, types, location, sensitivity, and associated risk of the MEC within the Track 3 area. BLM intends to work with the Army on site-specific work plans that will further describe BLM’s requirements and intentions in managing the Track 3 areas. As the cleanup program progresses, the BLM may learn of additional limitations and complications that MEC contamination may have, once the individual work plan areas have been properly investigated and characterized. This iterative cleanup process, however, is likely the only option in performing a remediation of such a large area.

Response: The Army is committed to the goal of designing a cleanup plan that would support the reuse of the former Impact Area as a habitat reserve. The Army intends to accommodate the “minimum requirements” identified by BLM, however, requirements that are largely land management actions that would be required of the future land recipient as part of the reuse, or requirements that are associated with areas outside of the Track 3 Impact Area MRA, cannot be included as part of the remedy under CERCLA. The proposed cleanup alternative outlined in the Proposed Plan addressed many of the requirements. The final remedy, which is described in this ROD, has been revised from the proposed cleanup alternative based on the BLM’s comments to the Proposed Plan: weed abatement support has been included in the remedial Land Use Controls.

Comment: Regarding the request that the Army/FORA provide fiscal commitment for air quality / atmospheric conditions monitoring for each prescribed burn due to the presence of MEC that is above and beyond the BLM’s typical prescribed burning funding abilities, BLM strongly encourages the Army to conduct future air monitoring during prescribed burns over sites that contain heavy accumulations of surface munitions.

Response: Meteorological monitoring associated with prescribed burning is a land management reuse activity. Follow-up inspection of surface MEC removal areas described in the Impact Area MRA RI/FS and Proposed Plan will address concerns about possible surface MEC items which could detonate during future prescribed burns. The Army anticipates that the local air district would require the level of air and meteorological monitoring that is normally required of similar habitat management burns in the air basin. Therefore, the issue of MEC risks will not place an additional burden on this aspect of reuse. In addition, the Army’s years of experience in prescribed burns has and will continue to provide an extensive dataset

which will aid the future landowner (currently identified as BLM) during planning and development of future prescribed burns.

Comment: Development of each phase of future site-specific work plans for each burn area should be coordinated closely between BLM and the Army so that site-specific reuse information is included.

Response: The Army is committed to coordinating with the future landowner (currently identified as BLM) in its development of site-specific work plans and during remedy implementation.

Comment: Contingency funding must be available to deal with MEC that is not identified during the work plan planning phase, but is found during surface MEC remediation. Additional subsurface removals may be required in areas proposed for surface MEC remediation if sensitive MEC are found on the surface.

Response: The selected remedy includes the Technical Memorandum process that will be used to propose additional subsurface removal if warranted. After technology-aided surface MEC remediation is completed for each phase of work described in the site-specific work plans, digital geophysical survey will be conducted. Following the geophysical survey the Army will review the data and prepare a Technical Memorandum to EPA and DTSC that will present an evaluation of the work completed to date and if necessary, describe additional subsurface removals recommended based on the results of the initial work.

E3. MBUAPCD Comments

In an August 22, 2007 letter, the following comment was submitted by MBUAPCD on the Proposed Plan, as summarized below.

Comment: The Proposed Plan references smaller burns approximately 100 acres in size will be conducted; however, the Impact Area MRA RI/FS references “a continuous area of up to 400 acres would be burned.” MBUAPCD suggested the burns should be limited to no more than 100 acres whenever feasible, because: (1) a burn nearly 100 acres in size was recently conducted without serious public smoke impacts within MRS-16; and (2) it has not been demonstrated that a burn of 400 acres can be conducted at the former Fort Ord with the same level of smoke impacts.

Response: The Army acknowledges the comment, and would like to clarify that both the Impact Area MRA RI/FS and Proposed Plan identify the scope of the prescribed burning component of the preferred remedial alternative as follows:

“Prescribed burning (followed by a munitions response) would be conducted in stages and consist of several small burns (approximately 100-acre units) rather than one large burn. During each mobilization, a contiguous area of up to 400 acres would be burned (unless specifically coordinated with USFWS). Planned prescribed burns would not exceed 800 acres per year as allowed by the HMP for Habitat Reserve areas at the former Fort Ord.”

MBUAPCD’s suggestion that the burns should be limited to no more than 100 acres whenever feasible is consistent with the proposed phased approach described above of conducting individual burns in approximate 100-acre units.

4. REFERENCES

- Agency for Toxic Substances and Disease Registry (ATSDR), 2005. *Health Consultation, Public Health Evaluation of October 2003 Prescribed Burn, Former Fort Ord, California*. February.
- Burleson Consulting, Inc. (Burleson), 2006. *Draft Wetlands Restoration Plan, Former Fort Ord, California*. September.
- _____, 2007. *Draft Vegetation Monitoring Plan, Former Fort Ord, California*. January.
- Department of Defense Explosives Safety Board (DDESB), 2004. *Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel*. DDESB TP 18. December 20.
- Fort Ord Reuse Authority (FORA), 1997. *Fort Ord Base Reuse Plan*. March.
- Harding ESE (formerly Harding Lawson Associates [HLA]; now MACTEC Engineering and Consulting, Inc. [MACTEC]), 2001. *Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48, Former Fort Ord, California*. June.
- _____, 2002. *Evaluation of Vegetation Clearance Methods Technical Memorandum, Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*.
- _____, 2004. *Draft Final Ranges 32-48 Prescribed Burn Air Monitoring Report, Former Fort Ord, California*. June.
- Harding Lawson Associates (HLA; now MACTEC), 2000a. *Draft Final Literature Review Report Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. Report prepared for the Department of the Army, Corps of Engineers, Sacramento District (USACE). January 4.
- _____, 2000b. *Final Plan for Evaluation of Previous Work, Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. Report prepared for USACE. December 4.
- IT Corporation (IT), 2001. *Basewide Range Assessment Work Plan and Contractor Quality Control Plan, Small Arms and Multi-Use Ranges, Fort Ord, California*. January.
- MACTEC Engineering and Consulting, Inc. (MACTEC; formerly Harding ESE and HLA), 2007a. *Draft Feasibility Study Addendum, Site 39 Ranges, Former Fort Ord, California*. Prepared for Shaw Environmental, Inc. May 31.
- _____, 2007b. *Final Impact Area Munitions Response Area Remedial Investigation/ Feasibility Study, Track 3 Munitions Response Area, Former Fort Ord, California*. Report prepared for the Department of the Army, Corps of Engineers, Sacramento District. June 25.
- Malcolm-Pirnie, 2002. *Final Fort Ord Ordnance and Explosives Risk Assessment Protocol*. October.
- Parsons Infrastructure & Technology Group Inc. (Parsons), 2002a. *Final Technical Information Paper, Surface Removal, Ordnance and Explosives (OE) Site OE-15 (Mortar Alley) Former Fort Ord, Monterey, California. Ordnance and Explosives (OE) Cleanup*. January.
- _____, 2002b. *Final Technical Information Paper, Surface Removal, Ordnance and Explosives (OE) Site OE-15 Range 30A Area, Former Fort Ord, Monterey California, Ordnance and Explosive (OE) Cleanup*. January.

- _____, 2002c. *Final Technical Information Paper, Surface Removal, Ordnance and Explosives (OE), Site Ranges 43-48*. February.
- _____, 2002d. *Ordnance Detection & Discrimination Study (ODDS) Report, Volume I-IV*. January 15.
- _____, 2005. *Final Watkins Gate Burn Area, Technical Information Paper, Geophysical Transect Sampling, Former Fort Ord, Monterey California, Military Munitions Response Program*. May.
- _____, 2006. *Reestablishment of Impact Area Fuel Breaks, Phases 1, 2, and 3, After Action Report, Former Fort Ord, Monterey California, Military Munitions Response Program*. January 30.
- _____, 2007. *Final MRS-Ranges 43-48 Interim Action Technical Information Paper*. January 26,
- Shaw Environmental Inc. (Shaw), 2005. *Final After Action Report, Time Critical Removal Action and Military Munitions Reconnaissance. Eucalyptus Fire Area, Former Fort Ord, California, Revision 0*. January.
- _____, 2007. *Final RCRA Closure Certification Report, Range 36A (Solid Waste Management Unit FTO-016), Former Fort Ord, California, Revision 1*. July.
- Shaw/MACTEC, 2006. *Draft Final Comprehensive Basewide Range Assessment Report, Former Fort Ord, California, Revision 1C*. November.
- U.S. Army Corps of Engineers (USACE), 1995. *Site Use Management Plan (SUMP) for Land Transfer and Reuse of the Multi-Range Area, Fort Ord, California*. Prepared by U.S. Army and U.S. Department of the Interior, Bureau of Land Management. July 25.
- _____, 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California (HMP)*. April. With technical assistance from Jones and Stokes Associates, Sacramento, California.
- _____, 2005. *Revised Attachment A – Habitat Management Plan Map for Former Fort Ord*. April, 2000. *Ordnance and Explosives, Remedial Investigation/Feasibility Study Work Plan, Former Fort Ord, Monterey County, California. Draft Final*. May 15.
- U.S. Army Engineer Division, Huntsville (USAEDH), 1997. *Draft Revised Archives Search Report, Former Fort Ord, California. Monterey County, California*. Prepared by U.S. Army Corps of Engineers, St. Louis District.
- U.S. Bureau of Land Management (BLM), 2004. *Draft Proposed Management Plan, Multiple Range Area Former Fort Ord, California*. July.
- U.S. Department of the Army (Army), 2002. *Record of Decision, Interim Action For Ordnance and Explosives at Ranges 43-48, Range 30A, and Site OE-16, Former Fort Ord, California*. August 26.
- _____, 2007. *Superfund Proposed Plan: Remedial Action is Proposed for Impact Area Munitions Response Area, Track 3 Munitions Response Remedial Investigation/Feasibility Study, Former Fort Ord*. June 25.

- U.S. Environmental Protection Agency (EPA), 1989. *Guidance for Conducting Remedial Investigation/Feasibility Studies Under CERCLA. Interim Final.* EPA 540/G-89/001. October.
- _____, 1995. *Land Use in the CERCLA Remedy Selection Process.* OSWER Directive No. 9355.7-04. May.
- U.S. Department of the Interior, Fish and Wildlife Service (USFWS), 1993. *Biological Opinion for the Disposal and Reuse of Fort Ord, Monterey County, California.* (I-8-93-F-14). October.
- _____, 1997a. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord (1-8-97-F/C-13).* January.
- _____, 1997b. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California (1-8-97-F/C-23R).* April.
- _____, 1999. *Biological and Conference Opinion on the Closure and Reuse of Fort Ord, Monterey County, California (1-8-99-F/C-39R).* Response to Army letter dated 11/11/98 to reinitiate formal consultation in accordance with Section 7 of Endangered Species Act of 1973. March.
- _____, 2001. *Correspondence to Mr. Willison, Director, Environmental and Natural Resources Management, Department of the Army Defense Language Institute and Presidio of Monterey, Presidio of Monterey County, California.* January 31.
- _____, 2002. *Biological Opinion on the Closure and Reuse of Fort Ord, Monterey County, California, as it affects Monterey Spineflower Critical Habitat, (1-8-01-F-70R).* October.
- _____, 2005. *Cleanup and Reuse of Former Fort Ord, Monterey County, California, as it affects California Tiger Salamander and Critical Habitat for Contra Costa Goldfields (1-8-04-F-25R).* March.
- USA Environmental, Inc. (USA), 2000a. *Draft Final after Action Report, 100 Percent Grid Sampling, Former Fort Ord, California, Site OE-15A.* October 18.
- _____, 2000b. *Final After Action Report, 100 Percent Grid Sampling, Inland Range Contract, Former Fort Ord, California, Site OE-15B.* December 18.
- _____, 2001a. *4'OE Removal After Action Report, Inland Range Contract, Former Fort Ord, California, Site OE-15 (Roads and Trails).* September 23.
- Zander Associates, 2002. *Assessment East Garrison - Parker Flats Land Use Modifications, Fort Ord, California.* May.
- _____, 2007. *Draft Installation-Wide Multispecies Habitat Conservation Plan for Former Fort Ord, California.* January

TABLES

Table 1. Summary of Investigations
Record of Decision, Impact Area Munitions Response Area,
Track 3 Munitions Response Site, Former Fort Ord California

Investigation	Area Investigated	MEC and Munitions Debris Removed	Site Investigation Status	Acreage Investigated/ Removal Completed
Grid Sampling (1997-1998)	Random 100 by 100 foot grids identified in MRS-15A and 15B	Practice and illuminating projectiles, practice hand, smoke hand, and rifle smoke grenades, practice rockets, practice and HE projectiles and projectile fuzes, rifle-fired smoke grenades, HEAT guided missile and rockets, and practice anti-personnel mines.	100% of anomalies were investigated to a depth of 4 ft bgs	Approximately 15 acres**
Removal Actions on Impact Area Roads and Trails (1997-1998)	Portions of MRS-BLM and Ranges 43 through 48 along roads	Practice, HE and shrapnel projectiles, practice and HE rockets, projectile and rocket fuzes, AT and practice rifle-fired grenades, incendiary and smoke hand grenades, hand grenade fuzes, rifle fired and hand held signals, and a claymore mine.	Combination of surface and subsurface removal. For subsurface, 100% of anomalies were investigated to a depth of 4 ft bgs	Approximately 43 acres**
Fuel Break Removal (1998-2005)	Portions of the Impact Area MRA	Practice, HE, smoke and illuminating projectiles, practice, HEAT and incendiary rockets, HEAT guided missiles (Dragon), antitank and practice rifle-fired grenades, smoke producing hand grenades, hand grenade fuzes, practice mines, ignition cartridges and pyrotechnics (i.e., signals and pyrotechnic mixtures).	100% of anomalies were investigated to a depth of 4 ft bgs*	Approximately 302 acres**
Time Critical Removal Action: Mortar Alley (2001)	Trails and open areas, approximately 50% of MRS-15 Mortar Alley	MEC included 4.2-inch and 81mm HE mortars, an HE 40mm grenade, and a 75mm shrapnel projectile. Munitions debris was consistent with 81mm practice mortars and several 60mm practice mortars.	Surface removal without vegetation clearance	Approximately 13 acres
Time Critical Removal Action: MRS-15 Range 30A (2001)	approximately 1% of MRS-15 Range 30A	MEC included 60mm mortars, 81mm HE, grenades practice, and illumination mortars, HE and practice 40mm grenades, 75mm shrapnel projectiles, a 37mm low explosive projectile, a 155mm shrapnel projectile. 7,252 lbs of munitions debris were found.	Surface removal without vegetation clearance	Approximately 4 acres
MRS-Ranges 43 through 48 Time Critical Removal Action and Interim Action (2001, 2003-2005)	MRS-Ranges 43 through 48	60mm and 81mm mortars, 40mm HE, 57mm HE, 75mm HE, and 37mm HE and low explosive (LE) projectiles, missiles, hand grenades, illumination signals, and fuzes, 66mm rockets, and 35mm subcaliber rockets.	100% of anomalies were investigated except in special case areas	Surface Removal Approximately 500 acres**, Subsurface removal Approximately 195 acres**

Table 1. Summary of Investigations
Record of Decision, Impact Area Munitions Response Area,
Track 3 Munitions Response Site, Former Fort Ord California

Investigation	Area Investigated	MEC and Munitions Debris Removed	Site Investigation Status	Acreage Investigated/ Removal Completed
Watkins Gate Burn Area (2003-2004)	WGBA within MRS-Ranges 43 through 48	MEC included 40mm, grenades and 57mm, 60mm, 75mm, 105mm, and 155mm projectiles and 60mm and 81mm HE mortars. 68,590 pounds of munitions debris found. Approximately 19 percent of MEC was HE, the majority of which were projectiles	Surface removal	Approximately 1,005 acres**
Digital Geophysical Transect Sampling (2004-2005)	Portions of WGBA within MRS-Ranges 43 through 48	No intrusive investigation performed.	Geophysical transect sampling	Approximately 1,005 acres**
Eucalyptus Fire Area (2003-2004)	Eucalyptus Fire Area	Pyrotechnics, simulators, hand grenades, and hand grenade fuzes, rifle-fired antitank grenades, 40mm grenades, practice and HE, a rocket fuze, and 2 Japanese manufactured HE mortars. Approximately 29,300 pounds of munitions debris 2 inches or greater in size (primarily of 3.5-inch practice rockets, practice hand grenades, hand grenade fuzes, dummy rockets, and signals)	Surface removal	Approximately 367 acres**
Ordnance Detection and Discrimination Study (2000)	Four sites within the Impact Area MRA	269 munitions debris items, and ten MEC items.	100% of anomalies were investigated	Approximately 4 acres
Range 36A (2006-2007)	Range 36A	No MEC was found.	100% surface removal, digital geophysical mapping, and exploratory trenching to investigate anomaly areas	Approximately 1.8 acres

* MEC removal actions were designed to address MEC to depths of four feet below ground surface (bgs); however, all anomalies (i.e., ferromagnetic material), even those deeper than four feet bgs, were investigated and all detected MEC was removed.

** Approximate acreage figures include areas investigated outside of the Impact Area MRA as part of the particular action.

TABLE 2. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATION
 Record of Decision, Impact Area MRA, Former Fort Ord California
 Track 3 Munitions Response Site, Former Fort Ord California

REMEDIAL ALTERNATIVE	EPA's 9 CERCLA EVALUATION CRITERIA							
	Threshold Criteria		Balancing Criteria				Modifying Criteria	
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short-Term Effectiveness	Long-Term Effectiveness & Permanence	Reduction of T, M, V Through Treatment	Implementability	Cost	State Acceptance
Alternative 1 No Further Action	<p>Not protective of human health. Unsafe for the future property owner to conduct the required habitat management activities, and for the public.</p> <p>Not protective of the environment. Existing minimum requirements under HMP, and other requirements for management of the habitat such as prescribed burning and monitoring could not be implemented.</p>	<p>Does not comply with ARARs. HMP and other requirements for management of the habitat such as prescribed burning and monitoring could not be implemented.</p>	<p>Not effective in the short term because no action is taken.</p>	<p>Not effective or permanent in the long term since no further action would be taken to address MEC risks. It would be unsafe for the future property owner to conduct the required habitat management activities, and the continued presence of MEC on the ground surface would pose a hazard to the public.</p>	<p>Does not provide reduction because no further action would be taken.</p>	<p>Not administratively feasible to implement. While the No Further Action Alternative would be easy to implement, it would not comply with ARARS. In addition, taking no further action is unacceptable in terms of safety, and the necessary approvals are not expected.</p>	<p>\$0.45 million</p>	<p>Not acceptable to the regulatory agencies.</p>
Alternative 2 Technology-Aided Surface MEC Remediation and Land Use Controls	<p>Protective of human health. Land Use Controls would provide a level of protection that would allow for proper management of the habitat reserve.</p> <p>Protective of environment. Prescribed burning of CMC habitat is essential for long-term management of listed and sensitive species. Prescribed burning and MEC removals would be performed incorporating required mitigation to avoid and reduce impacts to listed species or critical habitat for species. Post-remediation habitat monitoring would continue to be conducted.</p>	<p>MEC remediation would be implemented in compliance with ARARs. HMP and other requirements for management of the habitat such as prescribed burning and monitoring could be implemented.</p>	<p>Workers and the community would be protected during implementation of prescribed burning, MEC removal, and land use controls via safety protocols. Prescribed burns may cause some smoke impacts to the community, which are expected to be temporary. Community notification and smoke management would minimize potential impacts from smoke.</p> <p>Regarding the environment, would not have significant short-term impacts. It would take 8 years to implement.</p>	<p>Provides long-term effectiveness and permanence during reuse, because all MEC detected on the surface would be removed using the best available and most appropriate detection and removal technologies, and land use controls would be implemented to mitigate risks from MEC potentially remaining during reuse.</p>	<p>Provides significant reduction through surface MEC removal.</p>	<p>Implementable from an administrative perspective. Necessary approvals to conduct MEC removals and associated habitat management could be obtained. Necessary services, equipment, and skilled workers to implement are readily available. High level of effort to implement; requires significant coordination to implement prescribed burning prior to MEC removals.</p>	<p>\$89.35 million</p>	<p>Not acceptable to the regulatory agencies.</p> <p>Although the community has expressed concerns regarding prescribed burns, which are a component of this alternative (and required under the HMP), the community has not expressed a preference for a particular alternative. In general, the community is supportive of the overall approach to the Impact Area MRA MEC cleanup. Specific comments and Army responses are presented in the Responsiveness Summary of this ROD.</p>

TABLE 2. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATION
RECORD OF DECISION, IMPACT AREA MRA, FORMER FORT ORD CALIFORNIA
TRACK 3 MUNITIONS RESPONSE SITE, FORMER FORT ORD CALIFORNIA

REMEDIAL ALTERNATIVE	EPA's 9 CERCLA EVALUATION CRITERIA							
	Threshold Criteria		Balancing Criteria				Modifying Criteria	
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short-Term Effectiveness	Long-Term Effectiveness & Permanence	Reduction of T, M, V Through Treatment	Implementability	Cost	State Acceptance
Alternative 3 Subsurface MEC Remediation and Land Use Controls	Protective of human health. Provides greatest level of protection; would remove all detected MEC on surface and in subsurface. Land Use Controls would provide a level of protection that would allow for proper management of the habitat reserve. Protective of environment for majority of Impact Area MRA. Prescribed burning of CMC habitat is essential for long-term management of listed and sensitive species. Prescribed burning and MEC removals would be performed incorporating required mitigation to avoid and reduce impacts to listed species or critical habitat. Most significant impacts to the environment due to approximately 320 acres containing high-density anomalies anticipated to require large-scale excavations to remove subsurface MEC. Post-remediation habitat monitoring would continue to be conducted, and habitat restoration as necessary.	MEC remediation would be implemented in compliance with ARARs. HMP and other requirements for management of the habitat such as prescribed burning and monitoring could be implemented for the majority of the Impact Area MRA. The HMP and other requirements currently limit the amount of temporary habitat destruction to 75 acres. Large-scale excavations in high-density anomaly areas of approximately 320 acres are not consistent with the HMP and other requirements. It would therefore be necessary to re-initiate formal consultation with the USFWS in accordance with the requirements of the ESA.	Workers and the community would be protected during implementation of prescribed burning, MEC removal, and land use controls via safety protocols. Prescribed burns may cause some smoke impacts to the community, which are expected to be temporary. Community notification and smoke management would minimize potential impacts from smoke. Due to logistical considerations involved in conducting subsurface removals, smaller areas would be cleaned up each year; therefore, this alternative would take longer to implement and complete. Regarding the environment, would have significant short-term impacts on the environment for the portions of the Impact Area MRA where areas of high-density anomalies would require excavation and sifting. It would take 24 years to implement.	Provides long-term effectiveness and permanence during reuse, because all MEC detected on the surface and in the subsurface would be removed using the best available and most appropriate detection and removal technologies, and land use controls would be implemented to mitigate risks from MEC potentially remaining during reuse.	Provides greatest degree of reduction through surface and subsurface MEC removal.	Implementable from an administrative perspective. Necessary approvals to conduct MEC removals and associated habitat management could be obtained. Significant coordination required for excavation of high density anomaly areas. Necessary services, equipment, and skilled workers to implement are readily available. Highest level of effort to implement; requires significant coordination to implement prescribed burning prior to MEC removals.	\$423.65 million	Acceptable to the regulatory agencies. Although the community has expressed concerns regarding prescribed burns, which are a component of this alternative (and required under the HMP), the community has not expressed a preference for a particular alternative. In general, the community is supportive of the overall approach to the Impact Area MRA MEC cleanup. Specific comments and Army responses are presented in the Responsiveness Summary of this ROD.

TABLE 2. SUMMARY OF REMEDIAL ALTERNATIVES EVALUATION
RECORD OF DECISION, IMPACT AREA MRA, FORMER FORT ORD CALIFORNIA
TRACK 3 MUNITIONS RESPONSE SITE, FORMER FORT ORD CALIFORNIA

REMEDIAL ALTERNATIVE	EPA's 9 CERCLA EVALUATION CRITERIA							
	Threshold Criteria		Balancing Criteria				Modifying Criteria	
	Overall Protection of Human Health & Environment	Compliance with ARARs	Short-Term Effectiveness	Long-Term Effectiveness & Permanence	Reduction of T, M, V Through Treatment	Implementability	Cost	State Acceptance
Alternative 4 Technology-Aided Surface MEC Remediation (100%), Subsurface MEC Remediation in Selected Areas (10%), and Land Use Controls	Protective of human health. Provides a high level of protection; would remove all detected MEC on surface and reuse-specific selected areas in the subsurface. Land Use Controls would provide a level of protection that would allow for proper management of the habitat reserve. Protective of environment for majority of Impact Area MRA. Prescribed burning of CMC habitat is essential for long-term management of listed and sensitive species. Prescribed burning and MEC removals would be performed incorporating required mitigation to avoid and reduce impacts to listed species or critical habitat. Some impacts to the environment due to approximately 85 acres containing high density anomalies associated with sensitively fuzed munitions anticipated to require large-scale excavations to remove subsurface MEC for safe reuse. Post-remediation habitat monitoring would continue to be conducted, and habitat restoration as necessary.	MEC remediation would be implemented in compliance with ARARs. HMP and other requirements for management of the habitat such as prescribed burning and monitoring could be implemented for the majority of the Impact Area MRA. Approximately 85 acres of high density anomaly areas associated with sensitively fuzed munition types would require large-scale excavation; it may therefore be necessary to re-initiate formal consultation with the USFWS in accordance with the requirements of the ESA.	Workers and the community would be protected during implementation of prescribed burning, MEC removal, and land use controls via safety protocols. Prescribed burns may cause some smoke impacts to the community, which are expected to be temporary. Community notification and smoke management would minimize potential impacts from smoke. Regarding the environment, would have significant short-term impacts on the environment for the portions of the Impact Area MRA where areas of high density anomalies associated with sensitively fuzed munitions types would require excavation and sifting. It would take 8 years to implement.	Provides long-term effectiveness and permanence during reuse, because all MEC detected on the surface and in selected areas of the subsurface would be removed using the best available and most appropriate detection and removal technologies, and land use controls would be implemented to mitigate risks from MEC potentially remaining during reuse.	Provides significant reduction through surface removal and subsurface MEC removal in selected areas.	Implementable from an administrative perspective. Necessary approvals to conduct MEC removals and associated habitat management could be obtained. Necessary services, equipment, and skilled workers to implement are readily available. High level of effort to implement; requires significant coordination to implement prescribed burning prior to MEC removals.	\$148.23 million	Acceptable to the regulatory agencies. Although the community has expressed concerns regarding prescribed burns, which are a component of this alternative (and required under the HMP), the community has not expressed a preference for a particular alternative. In general, the community is supportive of the overall approach to the Impact Area MRA MEC cleanup. Specific comments and Army responses are presented in the Responsiveness Summary of this ROD.

Acronyms

ARARs = Applicable or Relevant and Appropriate Requirements

ESA = Endangered Species Act

MEC = munitions and explosives of concern

ROD = Record of Decision

T, M, V = toxicity, mobility, volume

USFWS = U.S. Fish and Wildlife Service

Table 3. Applicable Or Relevant And Appropriate Requirements (ARARs)
Record of Decision, Impact Area Munitions Response Area,
Track 3 Munitions Response Site, Former Fort Ord California

Source or Authority	Requirement, Standard, or Criterion	Type	Description	Remarks
			Federal ARARs	
Endangered Species Act (16 USC §§ 1531–1543)	16 USC § 1536 (a) and (c); 16 USC § 1538 (a)(1)	Applicable (1,2,3)* / Location	Federal agencies are required under Section 7 of the ESA to ensure that their actions do not jeopardize the continued existence of a listed species or result in destruction of or adverse modification of its critical habitat (16 USC § 1536). If the proposed action may affect the listed species or its critical habitat, consultation with the USFWS and/or California Fish and Game may be required (50 CFR § 402.14). Additionally, Section 9 of the ESA prohibits the illegal taking of a listed species (16 USC§ 1538(a)(1)).	The Army has completed an endangered species, Section 7 consultation, and the USFWS has issued several Biological Opinions for the Army disposal and reuse actions at the former Fort Ord. Endangered plant and animal species and critical habitats occur at Fort Ord. Each reuse area will be screened for potential impacts to any endangered species identified in the <i>Installation-Wide Multispecies Habitat Management Plan</i> (HMP; USACE, 1997) and additional requirements identified in subsequent documents (USACE, 2005; USFWS, 1999, 2002, 2005; BLM, Army; 2004; Zander, 2002). The provisions of the HMP and referenced additional requirements satisfy the requirements of the ESA.
Migratory Bird Treaty Act (MBTA)	16 U.S.C. §§703-712	Applicable (1,2,3) / Location	The statute sections prohibit the taking, possession of, buying, selling, purchasing, or bartering of any migratory bird, including feathers or other parts, nest eggs, or products, except as allowed by regulations.	The requirement includes specific standards of control. U.S. Fish and Wildlife Service has issued a non-jeopardy biological opinion for Army predisposal actions to include the remediation of MEC, which provides that vegetation clearance activities occur outside the nesting seasons for migratory birds.
Hazardous Materials & Transportation Act	49 CFR Part 172.101	Applicable (3) / Chemical and Action	These regulations impose procedures and controls on the transportation of hazardous materials.	The regulations include specific standards of control and substantive requirements, criteria and limitations that may apply to the transport of detonation materials and selected recyclable ordnance materials.
Federal Resource Conservation and Recovery Act (RCRA), Subpart M (Military Munitions Rule)	40 CFR Parts 266 and 270	Relevant and Appropriate (2, 3) / Chemical and Action	The regulations identify when military munitions on active ranges become subject to the regulatory definition of “solid waste”, for purposes of Subtitle C, and if these wastes are hazardous, the management standards which apply.	Portions of the Rule may be relevant and appropriate, but those provisions of the Rule which exclude military munitions from RCRA Subtitle C regulations are not appropriate to the remediation of a closed range. The relevant portions relate to the management of MEC which is recovered, including characterization as hazardous waste and requirements for treatment, storage, and transportation. The Rule provides for the storage and transportation of recovered military munitions in accordance with DDESB standards.

Table 3. Applicable Or Relevant And Appropriate Requirements (ARARs)

Record of Decision, Impact Area Munitions Response Area,
Track 3 Munitions Response Site, Former Fort Ord California

Source or Authority	Requirement, Standard, or Criterion	Type	Description	Remarks		
			State of California ARARs			
California Endangered Species Act	Fish and Game Code §§ 2051 et seq.; §2080.	Relevant and Appropriate (1,2,3) / Location	The statute sections provide a declaration of policy and definitions. Section 2080 provides that no person shall take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts.	Section 2080 includes specific standards of control with respect to the taking of endangered or threatened species. Under CERCLA, the Army is not required to comply with non-substantive, procedural and administrative provisions of §2051. The Army has coordinated the development of the HMP with CDFG and that mitigation measures to protect both State and federal rare, threatened and endangered species have been identified and will be implemented during the Army's action of MEC remediation if selected for implementation.		
California Fish and Game Code	§3511	Relevant and Appropriate (1,2,3) / Location	This statute section prohibits taking or possessing fully protected birds or parts thereof, listed as: (a) American peregrine falcon (<i>Falco peregrinus anatum</i>) (b) Brown pelican (c) California black rail (<i>Laterallus jamaicensis coturniculus</i>) (d) California clapper rail (<i>Rallus longirostris obsoletus</i>) (e) California condor (<i>Gymnogyps californianus</i>) (f) California least tern (<i>Sterna albifrons browni</i>) (g) Golden eagle (h) Greater sandhill crane (<i>Grus canadensis tabida</i>) (i) Light-footed clapper rail (<i>Rallus longirostris levipes</i>) (j) Southern bald eagle (<i>Haliaeetus leucocephalus leucocephalus</i>) (k) Trumpeter swan (<i>Cygnus buccinator</i>) (l) White-tailed kite (<i>Elanus leucurus</i>) (m) Yuma clapper rail (<i>Rallus longirostris yumanensis</i>).	The requirement includes specific standards of control that may apply to the American peregrine falcon (some possibility), golden eagle (slight possibility), brown pelican (not likely but possible), and California least tern (not likely but possible). Vegetation clearance activities will occur outside the nesting seasons for these protected birds.		
California Fish and Game Code	§3513	Relevant and Appropriate (1,2,3) / Location	This statute section declares that it is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act.	The requirement includes specific standards of control. U.S. Fish and Wildlife Service has issued a non-jeopardy biological opinion for Army predisposal actions to include the remediation of MEC. In addition, vegetation clearance activities will occur outside the nesting seasons for migratory birds.		
California Fish and Game Code	§3503.5	Relevant and Appropriate (1,2,3) / Location	This statute section prohibits the take, possession or destruction of any birds in the orders of Falconiformes or Strigiformes, or to take, possess, or destroy the nest or eggs of any such bird, except as provided in the code.	The requirement includes specific standards of control that may apply to vultures, hawks, ospreys, falcons and owls. Vegetation clearance activities will occur outside the nesting seasons for these birds.		
California Fish and Game Code	Title 14, CCR §472	Relevant and Appropriate (1,2,3) / Location	This regulation limits the taking of nongame birds and mammals except for specified species.	The requirement includes specific standards of control that may affect American crows. Vegetation clearance activities will occur outside the nesting seasons.		
California Fish and Game Code	§4800 et. seq.	Relevant and Appropriate (1,2,3) / Location	This statute section declares that it is unlawful to take, injure, possess, transport or sell any mountain lion.	The requirement includes specific standards of control. Due to the size of vegetation clearance and MEC remediation activities that may be selected for implementation, it is unlikely that mountain lions will be negatively affected. In fact, the use of fire to set back plant community succession will result in an improvement to wildlife habitat that will benefit mountain lions.		

Table 3. Applicable Or Relevant And Appropriate Requirements (ARARs)

Record of Decision, Impact Area Munitions Response Area,
Track 3 Munitions Response Site, Former Fort Ord California

Source or Authority	Requirement, Standard, or Criterion	Type	Description	Remarks
California Fish and Game Code	Title 14, CCR §§40-42	Relevant and Appropriate (1,2,3) / Location	These regulations make it unlawful to take, possess, purchase, propagate, sell, transport, import, or export any native reptile or amphibian, unless under special permit.	<p>The requirement includes specific standards of control that may apply to black legless lizard and coast horned lizard.</p> <p>CDFG was heavily involved in the development of the Installation-Wide Multispecies Habitat Management Plan (HMP), which included the development of mitigation measures to protect the California black legless lizard.</p>
California Clean Air Act (Health and Safety Code)	Monterey Bay Unified Air Pollution Control District Rule 438 (Open Outdoor Fires; Adopted April 16, 2003; Revised September 15, 2004)	Applicable (1) / Action	These prohibitory rules describe permit requirements, allowable days for burning, and restrictions. The rules include both substantive and procedural requirements regarding open burning.	<p>The rule includes specific standards of control. It also includes non-substantive procedural and administrative provisions with which the Army, under CERCLA, is not required to comply.</p> <p><u>Substantive requirements:</u></p> <p>§3.3, prohibiting burn on no-burn days. The Army will conduct prescribed burns on allowable days in accordance with CCR Title 17, §80110.</p> <p>§3.4.10, burn shall be ignited only by devices and methods approved by the California Department of Forestry and Fire Protection. The Army will use ignition devices approved by CDF.</p> <p>§3.4, materials to be burned shall be dry and reasonably free of dirt, soil and visible surface moisture prior to burning, and shall be free from combustible impurities such as tires, tar paper, household rubbish, demolition or construction debris, and other materials not grown at a site. The Army will comply with this section by removing tires, structures and other debris from the sites prior to conducting prescribed burns, where it is safe to do so. Numerous MEC items have been removed from the areas where accessible and where it was safe to do so. Emissions from incidental detonation of MEC during prescribed burning are expected to be insignificant, based on a study conducted by the Army, in consultation with EPA and DTSC (<i>Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48 (Harding ESE, 2001)</i>). The study concluded that air pollutant emissions from incidental MEC detonation during a prescribed burn will be minor compared to emissions contributed directly from biomass burning, and will result in pollutant concentration well below health-protective regulatory screening levels.</p> <ul style="list-style-type: none"> ▪ The regulation is intended to protect the public health. The Army will substantively comply with this regulation by implementing the site preparation measures as described above, as well as conducting the burns in accordance with the smoke management program, and applying resources to contain the fire within the intended boundaries to minimize public exposure to smoke.

Table 3. Applicable Or Relevant And Appropriate Requirements (ARARs)
 Record of Decision, Impact Area Munitions Response Area,
 Track 3 Munitions Response Site, Former Fort Ord California

Source or Authority	Requirement, Standard, or Criterion	Type	Description	Remarks										
California Health and Safety Code, Division 20	Title 22, CCR Division 4.5	Applicable (3) / Chemical and Action	The statute and regulations provide for identification of hazardous waste in §§66261. If a material is a hazardous waste, Division 4.5 provisions further regulate hazardous waste generators, transporters, and treatment, storage, and disposal facilities.	<p>The Army will evaluate discovered items in accordance with the approved work plan to determine the presence of energetic materials or other constituents that would cause it to be characterized as a hazardous waste.</p> <p>Substantive requirements:</p> <ul style="list-style-type: none"> ▪ Storage: onsite storage of MEC items occur in a designated bunker that meets the standard of DDESB 6055.9 STD, including security measures such as fences, signs, and an alarm system. ▪ Transportation: offsite transportation of small arms ammunition will incorporate applicable manifesting and placarding requirements. Conforms to Defense Reutilization and Marketing Office (DRMO) instruction. ▪ Disposal/recycling: offsite disposal or recycling facility or facilities for small arms ammunition will be state and/or RCRA-authorized. 										
California Health and Safety Code	Title 22, CCR §66264.601-603	Relevant and appropriate (2) / Action	These regulations apply to hazardous waste treatment which is conducted in a device that does not meet the definition of a “container” in 22 CCR 66260.10 is characterized as a “Miscellaneous Unit” subject to the provisions of 22 CCR 66264.601-603. For activities where detonations are in a device that meet the 22 CCR 66260.10 definition of a container, the requirements for “temporary units,” as set forth in 22 CCR 66264.553 apply.	<p>The regulations include generally described narrative standards. Compliance with substantive requirements is achieved through regulatory coordination of site-specific work plans in accordance with CERCLA and FFA.</p> <p>Under CERCLA, the Army is not required to comply with procedural requirements such as obtaining a permit.</p>										
California Health and Safety Code	Title 22, CCR §66265.382	Relevant and Appropriate (3)/ Chemical and Action	<p>Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment. Detonation is an explosion in which chemical transformation passes through the material faster than the speed of sound (0.33 kilometers/second at sea level). Owners or operators choosing to open burn or detonate waste explosives shall do so in accordance with the following table and in a manner that does not threaten human health or the environment.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 30%;">lb. waste explosives</th> <th style="text-align: left; width: 70%;">Min. Distance from OB/OD to property</th> </tr> </thead> <tbody> <tr> <td>0 to 100</td> <td>204 meters (670 feet)</td> </tr> <tr> <td>101 to 1,000</td> <td>380 meters (1,250 feet)</td> </tr> <tr> <td>1,001 to 10,000</td> <td>530 meters (1,730 feet)</td> </tr> <tr> <td>10,001 to 30,000</td> <td>690 meters (2,260 feet)</td> </tr> </tbody> </table>	lb. waste explosives	Min. Distance from OB/OD to property	0 to 100	204 meters (670 feet)	101 to 1,000	380 meters (1,250 feet)	1,001 to 10,000	530 meters (1,730 feet)	10,001 to 30,000	690 meters (2,260 feet)	The requirement includes specific standards of control and addresses situations similar to those that may be addressed during MEC remediation; detonation of MEC will comply with these requirements.
lb. waste explosives	Min. Distance from OB/OD to property													
0 to 100	204 meters (670 feet)													
101 to 1,000	380 meters (1,250 feet)													
1,001 to 10,000	530 meters (1,730 feet)													
10,001 to 30,000	690 meters (2,260 feet)													
California Fish and Game Code	§1900 et. seq.	Relevant and Appropriate (1,2,3)/ Action	These statute sections sets forth programmatic and administrative provisions, and in §1908, provides that no person shall import into the state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or rare native plant.	<p>Although the definition of “person” in the statute does not apply to the Army, the standards of control are relevant and appropriate, and the citation is therefore considered as ARAR.</p> <p>The Army is implementing the HMP which contains mitigation measures designed to protect the continued survival of rare and endangered plants.</p>										

Table 3. Applicable Or Relevant And Appropriate Requirements (ARARs)
 Record of Decision, Impact Area Munitions Response Area,
 Track 3 Munitions Response Site, Former Fort Ord California

Source or Authority	Requirement, Standard, or Criterion	Type	Description	Remarks
California Fish and Game Code	Title 14, CCR §783 et. seq.	Relevant and Appropriate (1,2,3)/ Action	<p>These regulations provide that no person shall import into the State, export out of the State or take, possess, purchase, or sell within the State, any endangered species, threatened species, or part or product thereof, or attempt any of those acts, except as otherwise provided in the California Endangered Species Act, Fish and Game Code Section 2050, et seq. (“CESA”), the Native Plant Protection Act, the Natural Community Conservation Planning Act, the California Desert Native Plants Act, or as authorized under this article in an incidental take permit. The regulations also provide programmatic and administrative procedures for incidental take permits.</p>	<p>The Section includes specific standards of control with respect to taking rare or endangered plants. Although the definition of “person” in the statute does not apply to the Army, the standards of control are relevant and appropriate, and the citation is therefore considered as ARAR.</p> <p>The Army is implementing the HMP which contains mitigation measures designed to protect the continued survival of threatened and endangered species.</p>
California Clean Air Act (Health and Safety Code)	Title 17, CCR §80100 et. seq.	Relevant and Appropriate (1)/ Action	<p>The regulations provide guidelines, programs and agency procedures for smoke management plans.</p>	<p>The regulations are relevant and appropriate. The Army will comply with substantive elements of the regulations. Under CERCLA, the Army is not required to comply with procedural and administrative provisions; however these elements will be addressed as part of the remedial design/remedial action process.</p> <p><u>Substantive requirements:</u></p> <p>§80110(d) prohibiting burn on no-burn days. The Army will conduct prescribed burns on allowable days in accordance with CCR Title 17, §80110.</p> <p>§80145(o)(1) [local air district smoke management plan or other enforceable mechanisms shall] require the material to be burned to be free of material that is not produced on the property or in an agricultural or prescribed burning operation. Material not to be burned includes, but not limited to, tires, rubbish, plastic, treated wood, construction/demolition debris, or material containing asbestos. The Army will comply with this section by removing tires, structures and other debris from the sites prior to conducting prescribed burns, where it is safe to do so. Numerous MEC items have been removed from the ground surface of the areas where accessible and where it was safe to do so. Emissions from incidental detonation of MEC during prescribed burning are expected to be insignificant, based on a study conducted by the Army, in consultation with EPA and DTSC (<i>Technical Memorandum, Air Emissions from Incidental Ordnance Detonation During a Prescribed Burn on Ranges 43 through 48</i> (Harding ESE, 2001)). The study concluded that air pollutant emissions from incidental MEC detonation during a prescribed burn will be minor compared to emissions contributed directly from biomass burning, and will result in pollutant concentration well below health-protective regulatory screening levels.</p> <ul style="list-style-type: none"> ▪ The regulation is intended to protect the public health. The Army will substantively comply with this regulation by implementing the site preparation measures as described above, as well as conducting the burns in accordance with the smoke management program, and applying resources to contain the fire within the intended boundaries to minimize public exposure to smoke.

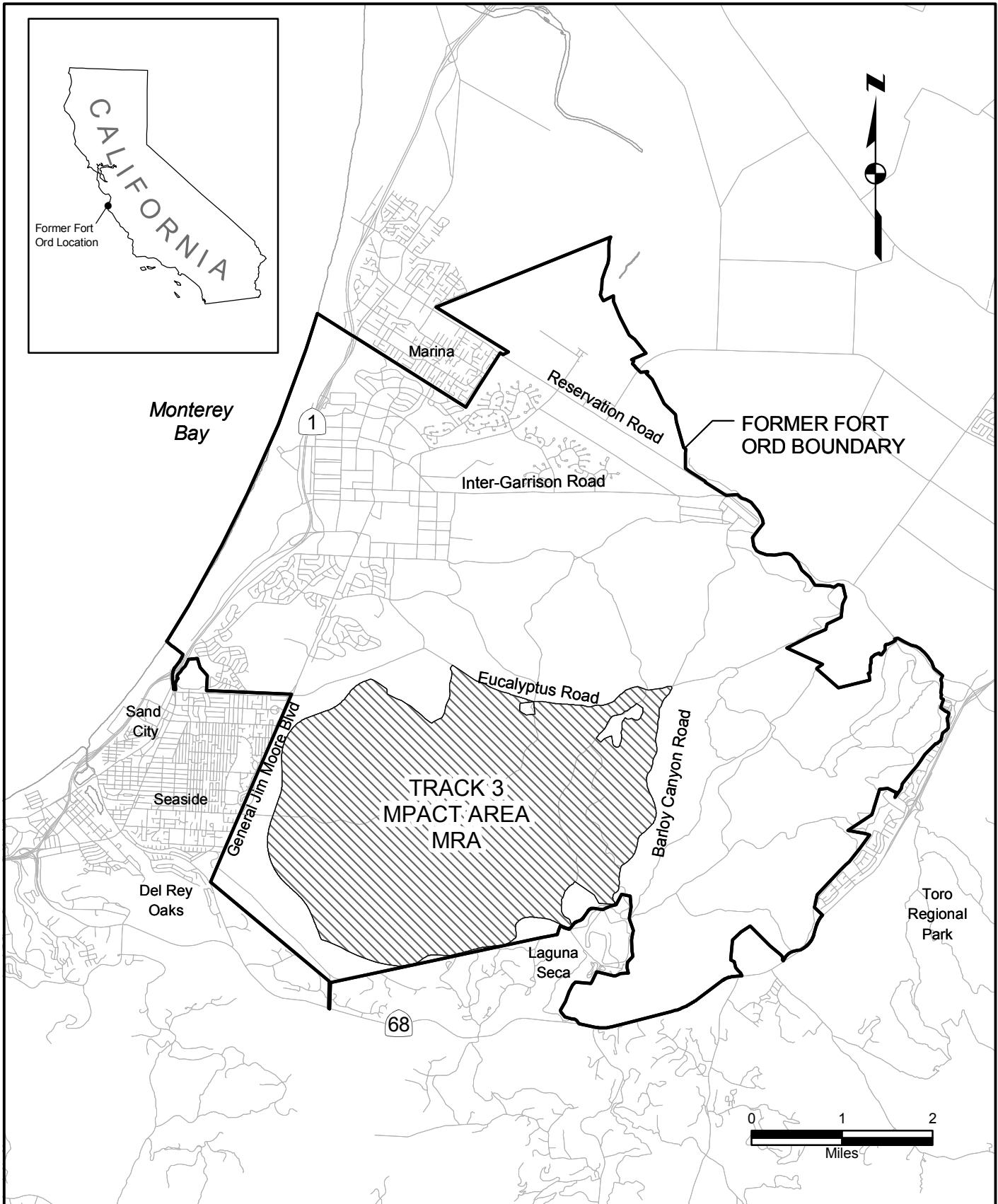
Table 3. Applicable Or Relevant And Appropriate Requirements (ARARs)

Record of Decision, Impact Area Munitions Response Area,
Track 3 Munitions Response Site, Former Fort Ord California

Source or Authority	Requirement, Standard, or Criterion	Type	Description	Remarks
			State of California TBC	
California Fish and Game Commission	Wetlands Resources (pursuant to §703 of California Fish and Game Code; not a statute)	Policy (1,2,3) / Location	This policy (1) seeks to provide for the protection, preservation, restoration, enhancement and expansion of wetland habitat in California; (2) strongly discourages development in or conversion of wetlands; and (3) opposes, consistent with its legal authority, any development or conversion which would result in a reduction of wetland acreage or wetland habitat values. To that end, the Commission (1) opposes wetland development proposals unless, at a minimum, project mitigation assures there will be "no net loss" of either wetland habitat values or acreage; and (2) strongly prefers mitigation which would achieve expansion of wetland acreage and enhancement of wetland habitat values.	The policy provides for the protection of wetland resources. CDFG was heavily involved in the development of the Installation-Wide Multispecies Habitat Management Plan (HMP) (and subsequent Wetland Resources Protection Plan specific to former Fort Ord), which include the development of mitigation measures to protect wetland resources.
			Regulations that were considered as potential ARARs but were not considered applicable.	
California Fish and Game Code	§3005		The statute section prohibits the taking of birds or mammals, except non-game mammals, with any net, pound, cage, trap, set line or wire, or poisonous substance. Included in the term "taking" is the killing of birds or mammals by poison.	Birds and mammals will be protected by achieving the identified Remedial Action Objectives (RAOs). Further, the scope of the remedial actions does not include intentional taking of birds and mammals with unlawful devices.
California Fish and Game Code	§4000 et. seq.		This statute section provides that a fur-bearing mammal may be taken only with a trap, firearm, bow and arrow, poison under a proper permit, or with the use of dogs.	The scope of the remedial actions does not involve intentional taking of fur-bearing mammals with unlawful devices.
California Fish and Game Code	Title 14, CCR §460		This regulation makes it unlawful to take Fisher, marten, river otter, desert kit fox and red fox.	The remedial actions will not result in the take of Fisher, marten, river otter, desert kit fox and red fox. The species of red fox protected by the State is located in the Sierra Nevada mountain range. The species of red fox located at former Fort Ord is an introduced species and is not protected by this section.
California Clean Air Act	Health and Safety Code §41701		This statute section prohibits the discharge into the atmosphere from any source whatsoever any air contaminant for a period or periods aggregated more than three minutes in any one hour which is dark or darker than No. 2 on the Ringelmann Chart or obscures the view to a degree equal to or greater than smoke.	Agricultural burning for which a permit has been granted pursuant to Article 3 (commencing with §41850, emission limitations for agricultural burning) are exempt from this requirement per §41704(b). Any prescribed burns that would be conducted for vegetation removal prior to MEC remediation will be conducted under MBUAPCD Rule 407, which implements the requirements of Article 3 (California Health and Safety Code §41850 et. seq.). The exemption applies though the Army is not required to obtain a permit under CERCLA.

1 = Vegetation Clearance; 2 = MEC Remediation; 3 = Detonation of MEC

PLATES



Impact Area MRA and Fort Ord Location Map

Record of Decision
Track 3 Munitions Response Site
Former Fort Ord, California

PLATE

1

DRAWN
TJH

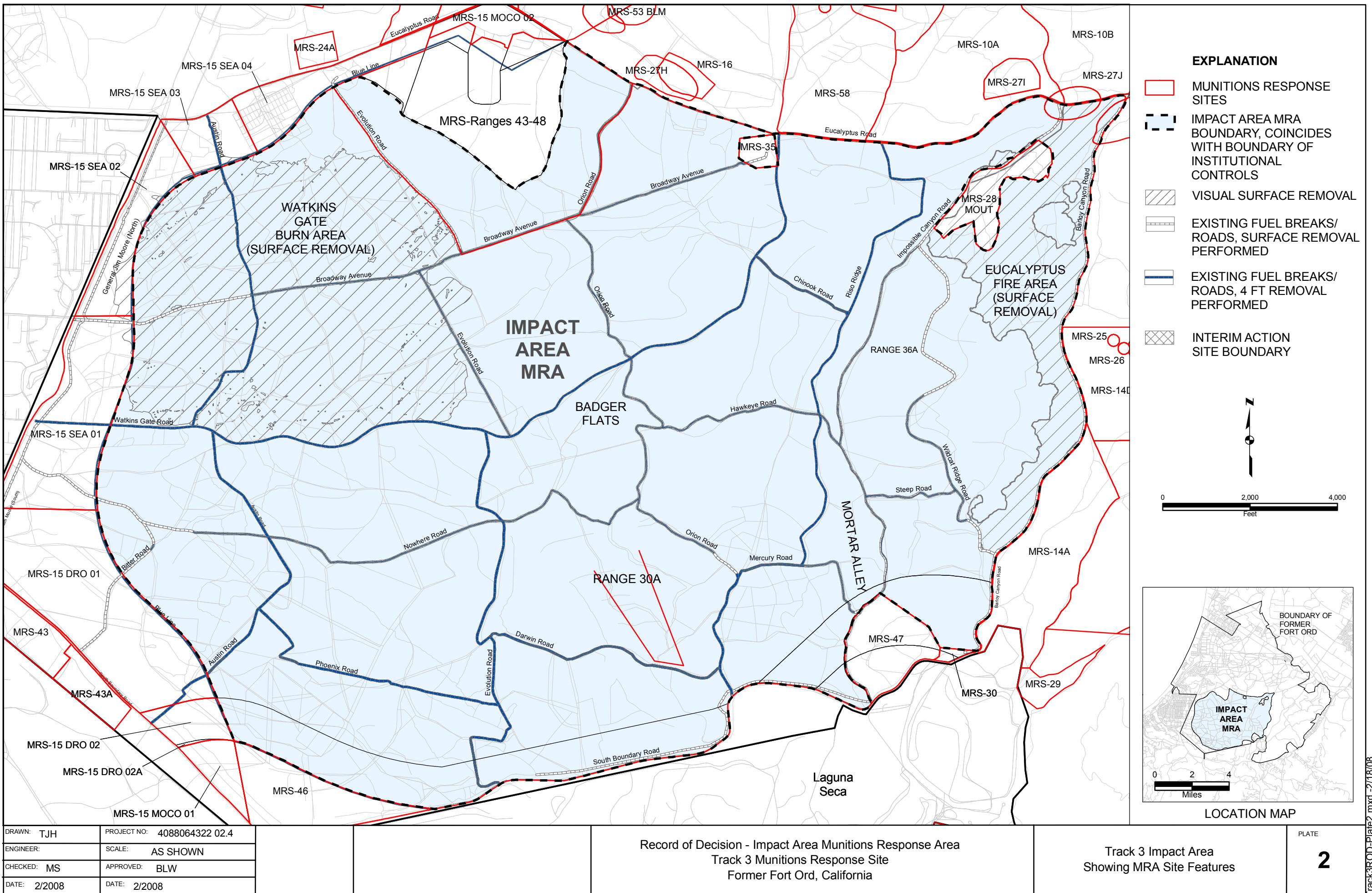
JOB NUMBER
4088064322 02.4

CHECKED
MS

CHECKED DATE
2/2008

APPROVED
BLW

APPROVED DATE
2/2008



APPENDIX A
GLOSSARY OF MUNITIONS RESPONSE PROGRAM TERMS

APPENDIX A

Glossary of Munitions Response Program Terms

Administrative Record – A compilation of all documents relied upon to select a remedial action pertaining to the investigation and cleanup of Fort Ord. *Source:* (2).

After Action Report (AAR) – A report presenting the results of MEC investigation, sampling and/or removal actions conducted at a site pertaining to the investigation and cleanup of Fort Ord. *Source:* (2).

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 [Department of Defense (DoD)] component. *Source:* (3).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, otherwise known as Superfund) – A Federal law that addresses the funding for and cleanup of abandoned or uncontrolled hazardous waste sites. This law also establishes criteria for the creation of decision documents such as the RI, FS, Proposed Plan, and ROD. *Source:* (2).

Construction Support – Assistance provided by DoD, EOD or UXO-qualified personnel and/or by personnel trained and qualified for operations involving chemical agents (CA), regardless of configuration, during intrusive construction activities on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g., DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or CA, regardless of configuration, to ensure the safety of personnel or resources from any potential explosive or CA hazards. *Source:* (6).

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. (10 U.S.C. 2710(e)(2)). *Source:* (6).

For the purposes of the basewide Munitions Response Program being conducted at the former Fort Ord, DMM does not include small arms ammunition .50 caliber and below.

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. *Source:* (5).

Expended – The state of munitions debris in which the main charge has been expended leaving the inert carrier. *Source:* (2).

Explosive Soil – Explosive soil refers to mixtures of explosives in soil, sand, clay, or other solid media at concentrations such that the mixture itself is explosive.

- (a) The concentration of a particular explosive in soil necessary to present an explosion hazard depends on whether the particular explosive is classified as “primary” or “secondary.” Guidance on whether an explosive is classified as “primary” or “secondary” can be obtained from the Ordnance and Explosives Mandatory Center of Expertise (OE MCX) or Chapters 7 and 8 of TM 9-1300-214, Military Explosives.

- (b) Primary explosives are those extremely sensitive explosives (or mixtures thereof) that are used in primers, detonators, and blasting caps. They are easily detonated by heat, sparks, impact, or friction. Examples of primary explosives include Lead, Azide, Lead Styphnate, and Mercury Fulminate.
- (c) Secondary explosives are bursting and boosting explosives (i.e., they are used as the main bursting charge or as the booster that sets off the main bursting charge). Secondary explosives are much less sensitive than primary explosives. They are less likely to detonate if struck or when exposed to friction or electrical sparks. Examples of secondary explosives include Trinitrotoluene (TNT), Composition B, and Ammonium Picrate (Explosive D).
- (d) Soil containing 10 percent or more by weight of any secondary explosive or mixture of secondary explosives is considered “explosive soil.” This determination was based on information provided by the USAEC as a result of studies conducted and reported in USAEC Report AMXTH-TE-CR 86096.
- (e) Soil containing propellants (as apposed to primary or secondary high explosives) may also present explosion hazards. (ER 1110-1-8153). *Source* (5).

Feasibility Study (FS) – An evaluation of potential remedial technologies and treatment options that can be used to clean up a site. *Source* (2).

Impact Area – The impact area 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. *Source*: (2).

Institutional Controls (ICs) – (a) Non-engineered instruments such as administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use; (b) are generally to be used in conjunction with, rather than in lieu of, engineering measures such as waste treatment or containment; (c) can be used during all stages of the cleanup process to accomplish various cleanup-related objectives; and (d) should be “layered” (i.e., use multiple ICs) or implemented in a series to provide overlapping assurances of protection from contamination *Source*: (9).

Land Use Controls (LUC) –Include any type of physical, legal, or administrative mechanism that restricts the use of, or limits access to, real property to prevent or reduce risks to human health, safety, and the environment. *Source*: (3).

Magnetometer – An instrument used to detect ferromagnetic (iron-containing) objects. Total field magnetometers measuring the strength of the earth’s natural magnetic field at the magnetic sensor location. Gradient magnetometers, sensitive to smaller near-surface metal objects, use two sensors to measure the difference in magnetic field strength between the two sensor locations. Vertical or horizontal gradients can be measured. *Source*: (8).

Military Munitions – Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof.

The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, other than non nuclear components of nuclear devices that are

managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)). *Source:* (7).

Military Munitions Response Program (MMRP) – DoD-established program to manage the environmental, health and safety issues presented by Munitions and Explosives of Concern (MEC). *Source:* (2).

Mortar – Mortars typically range from approximately 1 inch to 11 inches in diameter or larger, and can be filled with explosives, toxic chemicals, white phosphorus or illumination flares. Mortars generally have thinner metal casing than projectiles but use the same types of fuzing and stabilization. *Source:* (1).

Munitions Constituents (MC) – Any materials originating from unexploded ordnance (UXO), discarded military munitions (DMM), or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 U.S.C. 2710 (e) (3)). *Source:* (7).

Munitions Debris – Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarizations, or disposal. *Source:* (6).

Munitions and Explosives of Concern (MEC) – Distinguishes specific categories of military munitions that may pose unique explosives safety risks, such as: UXO, as defined in 10 U.S.C. 101 (e) (5); discarded military munitions, as defined in 10 U.S.C. 2710 (e) (2); or munitions constituents (e.g., TNT, Cyclotrimethylene trinitramine [RDX]), as defined in 10 U.S.C. 2710 (e) (3), present in high enough concentrations to pose an explosive hazard. *Source:* (7).

For the purposes of the basewide Munitions Response Program being conducted for the former Fort Ord, MEC does not include small arms ammunition .50 caliber and below.

MEC Sampling – Performing MEC searches within a site to determine the presence of MEC. *Source:* (2).

Munitions Response Area (MRA) – Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples are former ranges and munitions burial areas. A MRA comprises of one or more munitions response sites. *Source:* (7).

Munitions Response Site (MRS) – A discrete location within MRA that is known to require a munitions response. *Source:* (7).

No Further Action – Determination following a remedial investigation or action that a site does not pose a significant risk and so requires no further activity under CERCLA. *Source:* (2).

Operating Grids – Typically, 100-foot by 100-foot parcels of land as determined by survey and recorded by Global Positioning System (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). *Source:* (2).

Projectile – An object projected by an applied force and continuing in motion by its own inertia, as a bullet, bomb, shell, or grenade. Also applied to rockets and to guided missiles. *Source:* (4).

Proposed Plan – A plan that identifies the preferred alternative for a site cleanup, and is made available to the public for comment. *Source:* (2).

Range-Related Debris – Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material). *Source:* (6).

Record of Decision (ROD) – A report documenting the final action, approved by the regulatory agencies, that is required at Superfund sites. *Source:* (2).

Remedial Investigation (RI) – Exploratory inspection conducted at a site to delineate the nature and extent of chemicals, and in this case OE, present at the site. *Source:* (2).

Removal Depth – The depth below ground surface to which all ordnance and other detected items are removed. *Source:* (2).

SiteStats/GridStats – Programs developed by QuantiTech for the Huntsville Corps of Engineers to predict the density of ordnance on sites with spatially random dispersal of ordnance. *Source:* (2).

Superfund – See Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) above.

Surface Removal – Removal of MEC from the ground surface by UXO teams using visual identification sometimes aided by magnetometers. *Source:* (2).

Track 2 Sites – Track 2 Sites are those where MEC was found and a removal action has been completed. Track 2 sites differ from Track 1 sites in that a removal action has been completed and that Land Use Controls may be applicable based on future identified land uses and results of the removal actions. *Source:* (2).

Transferred Range – A property formerly used as a military range that is no longer under military control and has been leased by the DOD, transferred, or returned from the DOD to another entity, including Federal entities. This includes a military range that is no longer under military control but was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. *Source:* (3).

Transferring Range – A military range that is proposed to be transferred or returned from the DoD to another entity, including Federal entities. This includes a military range that is used under the terms of a withdrawal, executive order, act of Congress, public land order, special-use permit or authorization, right-of-way, , or other instrument issued by the Federal land manager or property owner. An operational or closed range will not be considered a “transferring range” until the transfer is imminent. *Source:* (3).

Unexploded Ordnance (UXO) – Military munitions that:

- (A) Have been primed, fuzed, armed, or otherwise prepared for action;
- (B) Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or materials; and
- (C) Remain unexploded, whether by malfunction, design, or any other cause. (100 U.S.C. 101 (c)(5)).
Source: (7).

For the purposes of the basewide Munitions Response Program being conducted for the former Fort Ord, UXO does not include small arms ammunition .50 caliber and below.

UXO-Qualified Personnel – Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist or Senior UXO Supervisor (*DDESB, 2004*).

Sources:

- (1) Compendium of Department of Defense Acronyms, Terms, and Definitions: The Interstate Technology and Regulatory Council (ITRC) Work Group (Unexploded Ordnance Work Team), December 2000.
- (2) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the MEC cleanup.
- (3) Management Guidance for the Defense Environmental Restoration Program published by the office of the Under Secretary of Defense (Installations and Environment), September 2001.
- (4) "Unexploded Ordnance (UXO): An Overview", October 1996. DENIX.
- (5) Ordnance and Explosives Response Engineer Manual (EM) 1110-1-4009. U.S. Army Corps of Engineers, June 23, 2000.
- (6) Memorandum for the Assistant Chief of Staff for Installation Management, Subject: Munitions Response Terminology (April 21, 2005).
- (7) Federal Register/Volume 70. No. 192/Wednesday, October 5, 2005/Rules and Regulations, 32 CFR Part 179, Munitions Response Site Prioritization Protocol, Department of Defense, Final Rule. October, 2005.
- (8) Survey of Munitions Response Technologies, June 2006. DTSC with ESTCP (Environmental Security and Technology Certification Program) and SERDP (Strategy, Environmental Research and Development Program).
- (9) Institutional Controls: A Site Managers' Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups. US EPA Office of Solid Waste and Emergency Response (OSWER) 9355.0-74FS-P, EPA 540-F-00-005. September, 2000.