**Superfund Proposed Plan**

# Interim Action Is Proposed For Vegetation Clearance, Ordnance and Explosives Remedial Action, and Ordnance and Explosives Detonation

## Ranges 43-48, Range 30A, and Site OE-16
## Former Fort Ord, California

**United States Army** **March 8, 2002**

## INTRODUCTION

The United States Department of the Army (Army) is presenting this **Proposed Plan*** for public review and comment describing the **interim action (IA)** proposed for cleanup of **ordnance and explosives (OE**) at Ranges 43-48, Range 30A and Site OE-16 at the former Fort Ord, California **(Figure 1)**. The purpose of the Proposed Plan is to:

- Summarize the IA OE **remedial investigations (RIs)** for these sites **(Pages 4 through 7).**
- Present an evaluation of cleanup alternatives for reducing immediate hazards from OE at these sites as an interim action while a comprehensive study of OE cleanup needs at Fort Ord is being conducted under the basewide OE Remedial Investigation/ Feasibility Study (basewide OE RI/FS) **(Pages 7 through 13).**
- Present the preferred alternative and solicit public review and comment **(Page 14)** on all alternatives described.

Specifically, this Proposed Plan summarizes information found in the *IA OE RI/FS for Ranges 43-48, Range 30A and Site OE-16* (*Harding ESE, 2002*) and other associated documents contained in the **Administrative Record** for the former Fort Ord. The location of the Administrative Record and information on how to make comments on the documents is provided on **Pages 14 and 15.**

## SUMMARY OF PROPOSED INTERIM ACTION

The need for interim action at Ranges 43-48, Range 30A, and Site OE-16 was determined based on:

- The presence of live, sensitively fuzed surface OE items
- The close proximity to residential neighborhoods and schools, and
- The history of trespassing incidents.

The IA alternatives that could be implemented to address the OE risks at these sites consist of three components: (1) vegetation clearance, (2) OE remedial action, and (3) OE detonation as described below.

***»» MARK YOUR CALENDAR ««***

**PUBLIC COMMENT PERIOD**
**March 12, 2002 – April 11, 2002**
Comments on the Proposed Plan will be accepted at the public meetings and throughout the 30-day comment period. **See Page 14 for information on how to make comments on the Proposed Plan.**

**PUBLIC MEETINGS**
Two public meetings regarding the Proposed Plan will be held:
March 25, 2002: 6 PM – 10 PM
Oldemeyer Center, 986 Hilby Ave., Seaside, CA
March 26, 2002: 6 PM – 10 PM
Veterans Memorial Building, Corner of 5th Street & Llano Avenue, Spreckels, CA

* **Terms in bold are defined in the Glossary on Page 16.**

- **Vegetation Clearance Alternatives** address site preparation procedures to clear vegetation to bare ground or approximately 6 inches above ground surface to allow for proper operation of OE detection equipment and to provide the required ground surface visibility for the safety of OE workers at the IA sites.

- **OE Remedial Action Alternatives** address remedial procedures to mitigate threats associated with the presence of OE at the IA sites.

- **OE Detonation Alternatives** address detonation procedures in areas where OE is identified during remedial activities at the IA sites.

***The Preferred Alternatives Are:***

**Prescribed Burning**
*For Vegetation Clearance*

**Subsurface OE Removal**
*For OE Remedial Action*

**Detonation with Engineering Controls**
*For OE Detonation*

Based on information currently available, the lead agency believes the Preferred Alternatives meet the threshold criteria and provide the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria (see Page 11). The lead agency expects the Preferred Alternatives to satisfy the following statutory requirements of CERCLA §121(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element (or justify not meeting the preference).

## BACKGROUND

The former Fort Ord is located in northwestern Monterey County, California, approximately 80 miles south of San Francisco **(Figure 1)**. The base comprises 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. A Santa Fe Pacific Railroad track and Highway 1 pass through the western portion of the former Fort Ord, separating the beach from the rest of the base. Laguna Seca Recreation Area and Toro Park border the former Fort Ord to the south and southeast, respectively, as well as several small communities such as Toro Park Estates and San Benancio.

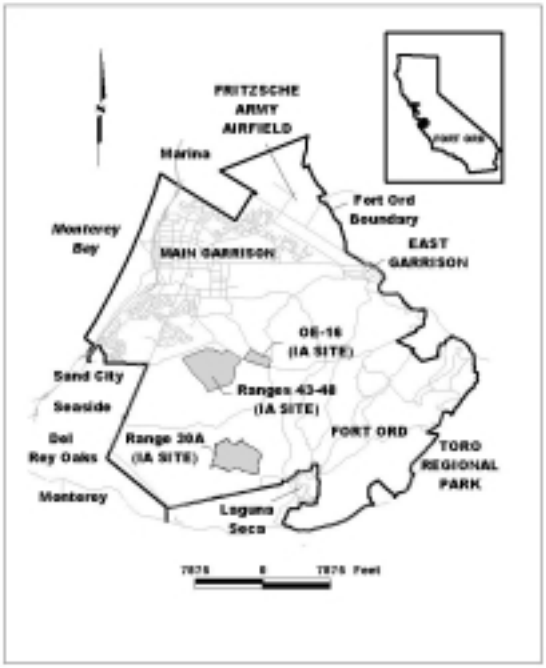



**Figure 1. Fort Ord Location Map and IA Sites**

Since it was established in 1917, Fort Ord primarily served as a training and staging facility for infantry troops. From 1947 to 1975, Fort Ord was a basic training center. After 1975, the 7th Infantry Division was based at Fort Ord. The former Fort Ord was selected in 1991 for base realignment and closure (BRAC), and the base was officially closed in September 1994. The majority of the soldiers were reassigned to other Army posts in 1993. An active Army division is no longer stationed at the former Fort Ord.

Because cavalry, field artillery, and infantry units used portions of the base for maneuvers, target ranges, and other purposes, OE including artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials, may be present in those areas.

***Guide to Fort Ord Remedial RI/FSs***

**Basewide RI/FS, 1991-1995**
Addressed soil and groundwater contamination.

**Basewide OE RI/FS Work Plan, 2000**
Addressed OE-related issues to be evaluated in the basewide OE RI/FS.

**Basewide OE RI/FS, 1998 - Ongoing**
Comprehensive evaluation of all OE-related data for entire Fort Ord, including long-term response alternatives for cleanup and risk management of OE.

**Interim Action OE RI/FS, January 2002, (Summarized in this Proposed Plan)**
Addresses three high-risk areas (Ranges 43-48, Range 30A, and Site OE-16) identified as needing near-term response action in order to ensure public safety while the basewide OE RI/FS is being conducted.

Fort Ord was placed on the National Priorities List (NPL) of Superfund sites by the United States Environmental Protection Agency (U.S. EPA) on February 21, 1990, due to evidence of contaminated soil and groundwater. A Federal Facility Agreement (FFA) was signed by the Army, U.S. EPA, Department of Toxic Substances Control (DTSC, then the California Department of Health Services), and the Regional Water Quality Control Board (RWQCB) in June 1990. The FFA established procedures and schedules for conducting **RIs** and **feasibility studies (FSs)** and requires remedial actions be completed as expeditiously as possible. In April 2000, an agreement was signed between the Army, U.S. EPA and DTSC to evaluate OE at the former Fort Ord subject to the provisions of the FFA.

## SCOPE AND ROLE OF THE INTERIM ACTION

An interim action is a remedial action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate risks to human health or the environment. This Proposed Plan evaluates remedial actions to be taken for OE at each of the IA sites.

### *Rationale for Conducting an Interim Action for OE*

The Army, as the lead agency, has determined that an interim action is appropriate to protect human health from the imminent threat posed by OE at Ranges 43–48, Range 30A, and Site OE-16 and is warranted for the following reasons:

- These areas contain sensitively fuzed, highly dangerous **unexploded ordnance (UXO)** present on the ground surface or mainly within the uppermost one foot of soil.
- Existing access deterrents such as barbed-wire fencing, concertina wire, and chain link gates posted with warning signs discourage, but do not prevent entry into the sites. Trespassers may knowingly or unknowingly come in contact with these items and cause them to explode.

Documented trespassing incidents include instances where persons, including children, have removed training items and ordnance related scrap. These IA sites are adjacent to (less than several thousand feet from) residential neighborhoods and are located within 1 mile of several schools.

## INTERIM ACTION REMEDIAL INVESTIGATION SUMMARIES

Ranges 43-48 (483 acres) and Range 30A (388 acres) are located within the Fort Ord Multi-Range Area (MRA), and Site OE-16 (80 acres) is adjacent to the MRA. The MRA consists of numerous firing ranges where personnel were trained in the use of live ammunition. The MRA and Site OE-16 are

fenced and posted with signs warning of the dangers associated with OE.

Areas in and around the MRA contain sensitively fuzed, highly dangerous OE such as 40mm, 57mm, 60mm, 66mm, 81mm, and 84mm high explosive (HE) and high explosive antitank (HEAT) projectiles, dragon guided missiles, and mortars, present on the ground surface or at shallow depths below the ground.

**IA Regulatory Process for OE**

The Army is the lead agency for investigating, reporting, and implementing remedial actions at the former Fort Ord. The Army is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** or **Superfund** and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Public comments on this Proposed Plan will be accepted during two public meetings and the 30-day public review and comment period. These comments will be considered when the Army, in consultation with the EPA and DTSC, a part of the California Environmental Protection Agency (Cal/EPA), makes a final decision in the **Record of Decision (ROD)** regarding the Interim Remedial Action related to OE at the former Fort Ord. Responses to these comments will be included in a responsiveness summary attached to the ROD. ***See Figure 2, Interim Action Implementation Process Flow Chart (page 14).***

Vegetation at the IA sites mainly consists of central maritime chaparral (CMC) with some grassland areas. CMC is a key habitat at Fort Ord and is an extremely rare plant community. Approximately 85 percent of the worldwide distribution of rare and endangered plants in CMC habitat exist at Fort Ord and are protected by the Endangered Species Act. Over the majority of the sites, vegetation is often very dense. In general, dense vegetation at the sites obscures the presence of OE on the ground surface, and OE could also be found aboveground in branches and brush.

Summaries of the remedial investigations for Ranges 43-48, Range 30A, and Site OE-16 are presented below. The Interim Action Remedial Investigations considered all available information on the IA sites, including what the ranges were used for during military activities; their current and proposed future uses; the type and amount of OE found there and the risks it presents; how accessible and close the ranges are to the public; and the type of vegetation that grows at the ranges.

## Ranges 43-48 – Remedial Investigation Summary

### *Ranges 43-48 – Description*

Ranges 43–48 cover approximately 483 acres to the south of Eucalyptus Road in the south-central portion of the former Fort Ord (Fort Ord) **(Figure 1)**. Future reuse of the northern portion is development (11 acres). The southern portion is designated as habitat reserve and will remain undeveloped (472 acres).

These ranges were part of Fort Ord's Multi-Range Area (MRA) and are categorized as firing ranges where personnel were trained in the use of live ammunition. The MRA is fenced and posted with signs warning of the dangers associated with OE. Vegetation at Ranges 43-48 mainly consists of CMC with some grassland areas.

Training facilities maps indicate these ranges were used for a variety of live fire exercises from the 1940s through the 1990s. Records and recent field investigations indicate that the ammunition used at these ranges included 4.2-inch, 60mm, and 81mm mortars; 14.5mm subcaliber projectiles; 35mm subcaliber rockets; 90mm recoilless rifle rounds; 84mm incendiary projectiles; 40mm HE grenades; 66mm light antitank weapon (LAW); small arms; anti-personnel mines; dragon guided missiles; claymore mines; and fragmentation hand grenades.

## ***Ranges 43-48 – Risks from OE***

In general, risks from contact with OE are acute and potentially catastrophic in nature, and may result in crippling injuries or death. The risks from OE at Ranges 43–48, including its location, public proximity, and access are summarized below.

### *Ranges 43-48 – Types and Amounts of OE*

Areas in and around the former firing ranges contain sensitively fuzed, highly dangerous OE present on the ground surface or at shallow depths below the ground. As described above, numerous types of OE ranging from hand grenades to 90mm recoillers rifle rounds are known or suspected to be on the site. During recent limited investigations, thousands of unexploded and expended items were recovered at Ranges 43-48.

### *Ranges 43-48 – Location, Public Proximity and Access*

This IA site is adjacent to (less than 4,000 feet from) residential neighborhoods at Ord Military Community (Fitch and Marshall Parks) and is near the City of Seaside. The Fitch and Martin Luther King Jr. Middle Schools are located less than a mile from Ranges 43–48. Existing site security measures include: four-strand barbed-wire fencing with one to two rolls of concertina wire behind it, chain link gates reinforced with concertina wire, and warning signs posted approximately every 500 feet along the fencing. In the last three years, five documented incidents of persons trespassing into the Range 43–48 area occurred. In 1999, there were two documented cases of children entering the fenced MRA at Ranges 44 and 45, and collecting and removing 40mm practice grenades found on the ground surface. Although no one was injured in these incidents, it substantiates the premise that fences posted with warning signs deter, but do not prevent entry.

## Range 30A – Remedial Investigation Summary

### ***Range 30A – Description***

Range 30A includes approximately 388 acres located in the southeastern portion of the Multi-Range Area (MRA), approximately 1,500 feet north of South Boundary Road and to the west of Barloy Canyon Road **(Figure 1)**. The IA site was delineated based on the presence of 40mm HE projectiles and is designated as habitat reserve. Range 30A is part of the former Fort Ord MRA and is categorized as a firing range where personnel were trained in the use of live ammunition. The MRA is fenced and posted with signs warning of the dangers associated with OE. Vegetation at Range 30A mainly consists of CMC with some grassland areas.

Range 30A was constructed in 1990 as a 40mm machine gun range and was in use until 1993. According to the Fort Ord Training Ranges Standard Operating Procedure (SOP), the only weapon authorized for use at Range 30A from 1991 and 1992 was the MK19 40mm machine gun, Mod 3. Ammunition authorized for use at Range 30A included HE, high explosive dual purpose (HEDP) and target practice (TP).

### ***Range 30A – Risks from OE***

The risks from OE at Range 30A, including its location, public proximity, and access are summarized below.

### *Range 30A – Types and Amounts of OE*

Areas in and around Range 30A are known to contain sensitively fuzed, highly dangerous 40mm grenades, other OE found in and around Range 30A include evidence of 60mm and 81mm mortars, and 37mm, 75mm, 155mm, and 8-inch projectiles. Limited investigations in the accessible areas of Range 30A have recovered hundreds of whole or partial ordnance items.

### *Range 30A – Location, Public Proximity and Access*

The Range 30A IA site is located in close proximity (approximately 2,200 feet north) to the Laguna Seca residential area and Laguna Seca Golf Course, and less than a mile from the Laguna Seca Raceway. South Boundary Road, located approximately 2,000 feet to the south, is open to vehicular traffic during events at Laguna Seca Raceway and is always open to the public for jogging, hiking, and biking. This range was part of Fort Ord's MRA and is categorized as a firing range where personnel were trained in the use of live ammunition. The MRA is fenced and posted with signs warning of the dangers associated with OE. Existing access deterrents include: four-strand barbed-wire fencing with one to two rolls of concertina wire behind it, chain link gates reinforced with concertina wire, and warning signs posted approximately every 500 feet along the fencing. In 2001 alone, two incidents of damaged fencing that may have been caused by trespassers occurred within 2,000 feet of Range 30A (near Range 30), and three other incidents of fence damage were reported within 4,000 feet of the range (near Range 29). In addition, two known incidents of persons trespassing into Range 27A occurred within 8,000 feet of Range 30A in the last two years. Although no one was injured in these incidents, it substantiates the premise that fences posted with warning signs deter, but do not prevent entry.

## Site OE-16 – Remedial Investigation Summary

### ***Site OE-16 – Description***

Site OE-16 includes approximately 80 acres located immediately north of the former Fort Ord MRA, between Eucalyptus and Parker Flats roads and bounded by Watkins Gate Road to the east **(Figure 1)**. This area will become habitat reserve and will remain undeveloped. The Bureau of Land Management (BLM) land (immediately adjacent) is open to the public for hiking, biking, jogging, and horseback riding. Site OE-16 is surrounded by a temporary 6-foot high chain linked fence. The area is posted with signs warning of the dangers associated with unexploded ordnance. Vegetation at Site OE–16 mainly consists of CMC with some grassland areas.

Site OE-16 is a World War II (WWII) era rocket range. The area is identified as a "bazooka practice" area on Fort Ord Training Facilities maps dating from 1945 and 1946. Available training maps after 1946 do not identify the bazooka practice area. According to Fort Ord Range Control, this range was probably used as an antitank rocket range during and shortly after WWII. Available information indicates that Site OE-16 had been used for training and live fire exercises from approximately the 1940s until the time the base was officially closed in 1994. Practice and HE rockets and rifle grenades were used in the 1940s and possibly the early 1950s. The site was later used for a portion of time as an anti-armor training area. Evidence from the site indicates that both practice and HEAT rounds were used.

### ***Site OE-16 – Risks from OE***

The risks from OE at Site OE-16, including its location, public proximity, and access are summarized below.

### *Site OE-16 – Types and Amount of OE*

Areas in and around Site OE-16 contain sensitively fuzed; highly dangerous OE, such as HEAT projectiles, present on the ground surface or at shallow depths below the ground.

During recent limited investigations, hundreds of OE items including expended and live 2.36-inch rockets (practice and HE), practice antitank mines, rifle grenades and hand grenade fuzes were recovered.

### *Site OE-16 – Location, Public Proximity and Access*

Site OE-16 is located adjacent to the MRA and land that has been transferred to the BLM. The BLM land is open to the public for hiking, biking, jogging, and horseback riding. Site OE-16 is surrounded by a temporary 6-foot high chain linked fence posted with signs warning of the dangers associated with

unexploded ordnance. The area is in close proximity to a residential neighborhood (Fitch Park) on the former Fort Ord **(Figure 1)**. Existing site security measures include temporary 6-foot high chain link fencing and chain link gates posted with warning signs. In 2001, an incident of persons trespassing within the MRA adjacent to Site OE-16 was reported. In addition, five incidents of trespassing into the MRA adjacent to Site OE-16 occurred within the last three years. Although no one was injured in these incidents, it substantiates the premise that fences posted with warning signs deter, but do not prevent entry.

# INTERIM ACTION FEASIBILITY STUDY SUMMARIES

The primary objective of conducting an interim action is to reduce risks to human health and the environment associated with OE. The cleanup goal for interim action is to minimize OE hazards by removing OE at these sites. The basewide OE RI/FS will subsequently determine whether the interim action taken was adequate in reducing overall risks from OE and if there is a need for further action, if any, after the interim action is taken. The following sections describe the Interim Action Remedial Alternatives evaluated for each of the three IA sites and the Preferred Alternatives.

## *Summary of Interim Action Alternatives*

In order to perform comprehensive OE-related actions at these sites, a three-tiered approach to developing Interim Action Alternatives was used. Interim Action Alternatives for each of the three IA sites include the following components as described below:

- Vegetation Clearance Alternatives
- OE Remedial Action Alternatives
- OE Detonation Alternatives.

## *Vegetation Clearance Alternatives*

Vegetation Clearance Alternatives consist of site preparation procedures to clear vegetation to bare ground or approximately 6 inches above ground surface. This will allow the proper operation of OE detection equipment and will provide the required ground surface visibility for the safety of OE cleanup workers. Based on the screening and evaluation of vegetation clearance methods presented in the Interim Action OE RI/FS, the following methods were retained for further consideration for all three IA sites and are described below:

- No Action
- Prescribed Burning
- Mechanical Cutting Methods
- Manual Cutting Methods.

### *No Action*

The No Action Alternative is provided, as required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP), as a baseline for comparison to the other proposed alternatives. This alternative assumes no action would be taken to clear vegetation prior to remedial activities. There are no capital or operation and maintenance (O&M) costs associated with the No Action Alternative for vegetation clearance.

### *Prescribed Burning*

Prescribed burning is the use of fire under a specific set of conditions to burn vegetation. Prescribed burning is used in a large number of plant communities in California to achieve a range of objectives. The most common uses of prescribed burning are: fuel hazard reduction and control; range improvement; agricultural land clearing; commercial forest stand improvements; slash reduction or removal (tree cutting operations); and habitat maintenance or enhancement. The central maritime chaparral community that occurs at Fort Ord is similar to other California chaparral associations, having herbaceous and shrub plant species which are considered dependent on fire for reproduction. Reproductive strategies that relate to the occurrence of fire include the release of dormancy by heating (*Wright, 1931*); and the reduction or alteration of chemicals either on the seed coat or in the soil, which inhibit reproduction (*Muller, 1966; Christensen and Muller, 1975*). Several of these plant species are

either uncommon or endemic to the Monterey Peninsula, and are subject to management provisions (such as prescribed burning) of the *Installation-Wide Multispecies Habitat Management Plan* (HMP; *USACE, 1997*).

The average total cost for this alternative is approximately $3,950 per acre, including the cost for monitoring the recovery of the habitat for five years as required under the HMP.

### *Mechanical Cutting Methods*

Mechanical cutting is conducted by an operator situated on self-propelled equipment in the area being cleared. An example would be a worker operating a tractor from inside the cab. This method consists of using human-operated equipment in three basic configurations to cut vegetation: tractor pulled, track-carriers with booms, and skid-steer. Mechanical clearance would have adverse impacts on rare, threatened and endangered plants present at the IA sites during and after implementation because it does not facilitate the long-term health and functioning of their habitat. If CMC vegetation is mechanically cleared, it likely will not grow back as diverse or healthy and may result in converting CMC habitat to more common vegetation types.

Vegetation that is mechanically cleared would fall onto the ground and cover OE and reduce visibility. In order to clear the cut vegetation from the ground surface, significant additional labor would be required to gather and stockpile it in staging areas, and shred or chip it to reduce its volume. This could cause workers to come into direct contact with OE.

The average total cost for this alternative is $3,250 per acre including the cost for monitoring the recovery of the habitat for five years as required under the HMP.

### *Manual Cutting Methods*

Manual cutting is conducted by an operator who is on foot while operating the equipment. Examples would be a worker using pruning shears or a handheld trimmer fitted with a brush blade. This method involves cutting and clearing of vegetation using motorized chainsaws, power chippers, mowers, weed eaters, and non-motorized hand tools such as clippers and loppers. Cutting would have the same adverse impacts on rare, threatened and endangered plants as would be caused by mechanical cutting.

Vegetation that is manually cleared would fall onto the ground and cover OE and reduce visibility. In order to clear cut vegetation from the ground surface, significant additional labor would be required to gather and stockpile it in staging areas, and shred or chip it to reduce its volume. This could cause workers to come into direct contact with OE.

The average total cost of this alternative is approximately $5,570 per acre including the cost for monitoring the recovery of the habitat for five years as required under the HMP.

## ***OE Remedial Action Alternatives***

OE Remedial Action Alternatives address actions to reduce threats associated with the presence of OE at the IA sites. Based on the evaluation of OE Remedial Action Alternatives presented in the Interim Action OE RI/FS the following methods were retained for further consideration for all three IA sites and are described below:

- No Action with Existing Site Security Measures
- Enhanced Site Security Measures
- Subsurface OE Removal.

### *No Action with Existing Site Security Measures*

The No Action with Existing Site Security Measures Alternative is provided, as required under CERCLA and the NCP, as a baseline for comparison to the other proposed alternatives. This alternative assumes existing site access restrictions such as fencing, warning signs, and regular security patrols would be maintained in accordance with the Ordnance and Explosives Site Security Program Summary (*Army, 2001*). There are no capital costs associated with the No Action with Existing Site Security Measures Alternative. O&M costs for this alternative would include those associated with maintaining existing site access restrictions and are estimated

at an average total cost of approximately $450 per acre.

### *Enhanced Site Security Measures*

Enhanced Site Security Measures would include improvements to existing site security measures at the IA sites, and makes the following assumptions:

- Existing fencing will be upgraded to the maximum level possible to deter access
- Large warning signs will be posted at a greater frequency along fencing and at access roads or gates that lead to IA sites
- The frequency of patrols will be increased around the perimeters of the sites.

The costs for this alternative range from $9,222 per acre at Ranges 43-48, to $10,871 per acre at Range 30A and $23,088 per acre at Site OE-16, including O&M costs for an interim period of 5 years until long term measures are decided in the basewide OE RI/FS ROD.

### *Subsurface OE Removal*

Subsurface OE Removal will consist of identification of OE (conduct a visual search and operate OE detection equipment), and investigation and removal of any OE found/detected on the ground surface of the site and in the subsurface to depths determined in each site-specific work plan. Subsurface OE removal depths will be determined based on (1) the type and amount of OE, (2) the typical depth the type of OE is found, (3) planned reuse of specific areas within the IA site, and (4) the capabilities of the geophysical detection equipment selected as best suited for site conditions by the OE Site Geophysicist. The site-specific work plan outlining planned subsurface OE removal depths will be available for regulatory agency and public review.

The costs for this alternative range from $22,013 to $23,109 per acre at Ranges 43-48; from $17,511 to $19,895 per acre at Range 30A; and from $16,230 to $16,254 per acre at Site OE-16.

## ***OE Detonation Alternatives***

OE Detonation consists of detonating any OE found during physical removal of OE after vegetation clearance has been performed. OE workers would conduct a visual search and walk the site using geophysical OE detection equipment. Any OE identified visually or using the detection equipment would be handled as follows:

***Small Arms/Subcaliber OE Items*** including bullets/ammunition and practice 35mm subcaliber M73 rockets (without spotting charge) would be transported offsite to a facility that would perform detonation by heating in a "popper oven" and the metal would be recycled. These transportable OE items would be excluded from onsite detonation procedures and are not considered further in the evaluation of detonation alternatives.

***Nontransportable OE Items*** – For the purposes of addressing OE at Fort Ord, non-transportable OE items include those that are non-movable (unsafe to move under any circumstances), and moveable (may be moved by hand only within close proximity to their original position for consolidation and/or to ensure detonations are performed under the safest possible conditions). Because nontransportable OE items are extremely dangerous and cannot be moved except under the circumstances described above, detonation-in-place with engineering controls is the selected alternative for all nontransportable OE items. Although detonation of OE has the potential to release air pollutants to the atmosphere, studies evaluated in *Final Ordnance Detonation Sampling and Analysis Plan* (*Harding ESE, 2000*) suggest that air emissions from ordnance detonations at Fort Ord are not expected to be significant. In addition, detonation would be performed in conjunction with engineering controls that typically consist of covering the OE item to dampen the explosion and in turn minimize OE-related emissions as described below.

***Transportable OE Items*** – For the purposes of addressing OE at Fort Ord, transportable OE items are those that, as determined by the OE contractor (with concurrence of the USACE UXO Safety Specialist), may be transported by vehicle from their original position to an area

outside the vicinity for the purposes of storage, consolidation with other items for detonation, or for offsite destruction. A range of methods for detonation of transportable OE items are available and potentially applicable at the IA sites.

For OE items that can be transported (excluding small arms/subcaliber OE items as described above), a range of detonation methods are available and potentially applicable at the IA sites. Based on the screening and analysis of the OE detonation methods, the following methods were retained for further consideration as OE Detonation Alternatives and are described below:

- No Action
- Detonation with Engineering Controls
- Detonation Chamber and Detonation with Engineering Controls.

### *No Action*

The No Action Alternative is required for consideration under CERCLA and the NCP as a baseline for comparison to the other alternatives, and would consist of taking no action to detonate any OE items found at the IA sites. There is no cost associated with the No Action Alternative.

### *Detonation with Engineering Controls*

The Detonation with Engineering Controls Alternative consists of applying explosive charges to single or consolidated OE items, and applying engineering controls (covering the OE with tamped dirt, sandbags, contained water, or other materials) prior to detonation. These controls will reduce the blast, fragmentation, emissions, or noise that would be associated with the detonation. This method would be applicable and well suited for detonations at the IA sites because it can be performed in any location OE is found during physical removal of OE.

The costs for this alternative range from $2,221 per acre at Ranges 43-48, to $319 per acre at Range 30A, and $157 per acre at Site OE-16. There are no long-term O&M costs.

### *Detonation Chamber and Detonation with Engineering Controls*

The Detonation Chamber and Detonation with Engineering Controls Alternative consists of operation of the Donovan Blast Chamber for transportable OE items (approximately 5 to 10 percent of the total items) and using detonation with engineering controls as described above for nontransportable OE items (approximately 90 to 95 percent of the total items). The Donovan Chamber is the only type of chamber approved for use by the Department of Defense Explosives Safety Board (DDESB), and is a detonation containment device capable of withstanding multiple detonations. For 5 to 10 percent of the OE items found, this method would reduce noise and emissions, contain fragmentation, and reduce fire risks associated with detonations, but would require handling and transfer of OE over the IA sites to temporary chamber locations immediately within the perimeter of the IA sites (i.e., access gates, firing points). For the other 90 to 95 percent of the OE items found, applying engineering controls (covering the OE with tamped dirt, sandbags, contained water or other materials) prior to detonation to control the blast would also reduce noise and emissions, contain fragmentation, and reduce fire risks associated with detonations, but not to the same degree as detonation in the chamber.

The costs for this alternative range from $2,361 per acre at Ranges 43-48, to $352 per acre at Range 30A, and $344 per acre at Site OE-16. There are no long-term O&M costs.

## *Comparison of Interim Action Alternatives*

Comparisons of the Interim Action Alternatives for the IA sites based on the evaluation criteria of effectiveness, implementability, and cost are summarized below for Ranges 43-48, Range 30A, and Site OE-16, respectively.

The three-tiered Interim Action Alternatives developed for the IA sites were evaluated and compared to the nine criteria specified in the U.S. EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (*EPA, 1988*) (RI/FS Guidance) as described below.

The evaluation of Interim Action Alternatives is discussed within the following three categories that encompass the nine criteria as shown in **Table 1 (found at the back of this Proposed Plan)**:

**Effectiveness** (Includes *Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence,* and *Reduction of Toxicity, Mobility, or Volume Through Treatment*)

**Implementability** (Includes *State and Community Acceptance,* which will be addressed in the Interim Action OE RI/FS ROD once comments on the Interim Action OE RI/FS report and this Proposed Plan have been received [*EPA, 1988*]).

**Cost** (Includes capital and O&M costs)

### U.S. EPA's Nine Evaluation Criteria

***Threshold Criteria***

*1) Overall Protection of Human Health and the Environment* - An alternative must eliminate, reduce, or control threats to public health and the environment through treatment or institutional controls.

*2) Compliance with Applicable or Relevant and Appropriate Requirements* (*ARARs*) - The alternative must meet Federal and State environmental statutes, regulations, and other requirements that pertain to the site unless a waiver is justified.

***Balancing Criteria***

*3) Long-Term Effectiveness and Permanence* - Considers the ability of an alternative to maintain protection of human health and the environment over time.

*4) Reduction of Toxicity, Mobility, or Volume Through Treatment* - Evaluates the alternative's use of treatment (for which there is a statutory preference) to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

*5) Short-Term Effectiveness* - Considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.

*6) Implementability* - Considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

*7) Cost* - Includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 percent to -30 percent.

***Modifying Criteria***

*8) State Acceptance* – Evaluates technical and administrative issues and concerns that the state may have regarding each alternative.

*9) Community Acceptance* - Evaluates issues and concerns that the public may have regarding each alternative.

***It is the lead agency's current judgment that the Preferred Alternatives identified in this Proposed Plan, or other active measures considered in the Proposed Plan, are necessary to protect public health or welfare or the environment from actual or threatened OE risks.***

## *Preferred Alternatives*

The Preferred Alternatives for each of the sites are summarized below based on the evaluation and comparison of alternatives presented in **Table 1 (found at the back of this Proposed Plan)**. These alternatives will undergo formal public and regulatory agency review in this Proposed Plan and the final remedy will be selected and documented in the IA OE RI/FS ROD.

### Vegetation Clearance Via Prescribed Burning

***Effectiveness***

*Overall Protection of Human Health* – Smoke management and temporary relocation of individuals from areas affected by smoke to unaffected areas would minimize impacts of the burn on human health. Workers would conduct burn from safe distance. Emissions from detonated OE are expected to be insignificant and not of concern in terms of human health.

*Protection of the Environment* – CMC has evolved with fire as a critical part of its natural life cycle.

*Compliance with ARARs* – Complies with ARARs to the extent practicable and HMP and Endangered Species Act (ESA) requirements that burning be used as the primary method of vegetation clearance in CMC habitat areas predominant at the IA sites.

*Short Term-Effectiveness* – Very effective; clears vegetation quickly.

*Reduction of Toxicity, Mobility, or Volume Through Treatment* – This criteria is not applicable to vegetation clearance.

*Long Term Effectiveness and Permanence* – Effective in the long term because it has beneficial effects on the regrowth and long term health of CMC vegetation.

***Implementability*** – Easy to implement to clear vegetation over large areas if conducted in close coordination with regulatory agencies and the public. Personnel and equipment are readily available.

*State and Community Acceptance* – Will be evaluated after public and regulatory agency comments on this Proposed Plan have been received, and will be documented in the ROD.

***Cost*** – *Ranges 43-48* – Total estimated cost is $1.92 million ($1.7 million in capital costs; O&M costs for 5 years of HMP species recovery monitoring are $213,000).

*Range 30A* – Total estimated cost is $1.52 million ($1.37 million in capital costs; O&M costs for 5 years of HMP species recovery monitoring are $149,000).

*Site OE-16* – Total estimated cost is $318,000 ($288,000 in capital costs; O&M costs for 5 years of HMP species recovery monitoring are $30,000).

### OE Remedial Action Via Subsurface OE Removal

***Effectiveness***

*Overall Protection of Human Health and the Environment* – Protective; removes OE hazards.

*Compliance with ARARs* – Complies with ARARs.

*Short Term-Effectiveness* – Very effective; removes OE.

*Reduction of Toxicity, Mobility, or Volume Through Treatment* – Would reduce mobility and volume of OE.

*Long Term Effectiveness and Permanence* – Very effective in the long term at reducing OE risks because it removes OE to depths consistent with planned reuse of IA site.

***Implementability*** – Difficult to implement over large areas, but equipment and personnel are available. Performed for many years at Fort Ord.

*State and Community Acceptance* – Will be evaluated after public and regulatory agency comments on this Proposed Plan have been received, and will be documented in the ROD.

***Cost*** – *Ranges 43-48* – Total estimated cost ranges from $10.63 to $11.16 million

*Range 30A* – Total estimated cost ranges from $6.79 to $7.72 million

*Site OE-16* – Total estimated cost ranges from $1.29 to $1.30 million

### OE Detonation Via Detonation with Engineering Controls

***Effectiveness***

*Overall Protection of Human Health and the Environment* – Protective. Previous studies have shown that air and soil emissions from detonations are insignificant.

*Compliance with ARARs* – Complies with ARARs.

*Short Term-Effectiveness* – Very effective; removes explosive hazard through detonation of OE.

*Reduction of Toxicity, Mobility, or Volume Through Treatment* – Would reduce OE risks.

*Long Term Effectiveness and Permanence* – Very effective in the long term for reducing OE risks through detonation.

***Implementability*** – Easy to implement because it is performed as part of OE removal. Performed for many years at Fort Ord.

*State and Community Acceptance* – Will be evaluated after public and regulatory agency comments on this Proposed Plan have been received, and will be documented in the ROD.

***Cost*** – *Ranges 43-48* – Total estimated cost is $1.07 million

*Range 30A* – Total estimated cost is $124,000

*Site OE-16* – Total estimated cost is $13,000

#### Total Preferred Alternative Costs

The total costs for the Preferred Alternative for the sites, which includes Vegetation Clearance, OE Remedial Action, and OE Detonation is estimated as follows:

***Ranges 43-48*** – TOTAL: $13.6 - $14.2 million (Capital: $13.4 - $14.0 million; 5 Year O&M: $213,000).

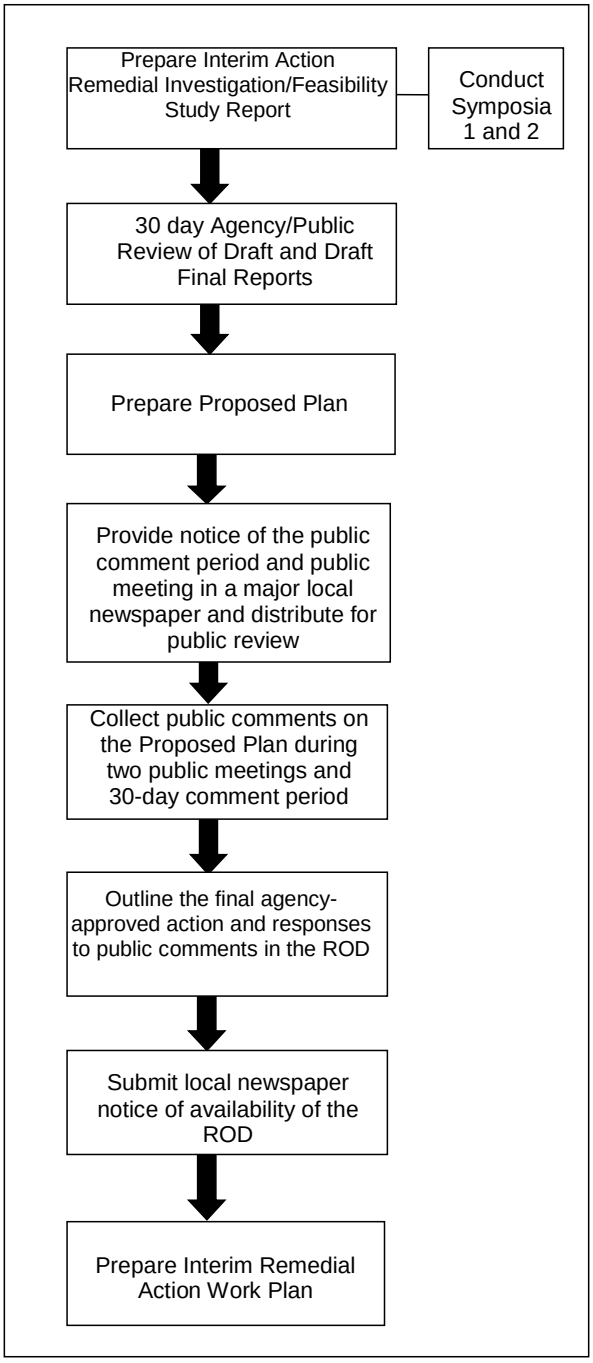
***Range 30A*** – TOTAL: $8.3 - $9.3 million (Capital: $8.3 - $9.3 million; 5 Year O&M: $149,000).

***Site OE-16*** – TOTAL: $1.62 - $1.63 million (Capital: $1.59 - $1.6 million; 5 Year O&M: $30,000).

## INTERIM ACTION APPROVAL PROCESS

**Figure 2** presents the Implementation Process Flow Chart for Interim Action. The figure summarizes the approval process that will be followed for interim action at the IA sites, which includes preparation of the Interim Action OE RI/FS, this Proposed Plan, the ROD and Community Relations activities including the public and regulatory agency review and comment periods.

**Figure 2. Interim Action Implementation Process Flow Chart**




## HOW TO MAKE COMMENTS

The local community and interested parties are encouraged to comment on this Proposed Plan and the Preferred Alternatives summarized herein. Two public meetings regarding the Proposed Plan will be held. Representatives from the Army, U.S. EPA, and DTSC will be present at these meetings to explain the Proposed Plan, hear concerns, and answer questions.

The public is invited to submit oral and written comments on the Proposed Plan during two public meetings. The meeting schedule is as follows:

Public Meeting #1
March 25, 2002, 6 p.m. – 10 p.m.
Oldemeyer Center, 986 Hilby Avenue
Seaside, California

Public Meeting # 2
March 26, 2002, 6 p.m. – 10 p.m.
Spreckels Veterans Memorial Building,
Corner of 5th Street & Llano Avenue
Spreckels, California

The public may also comment in writing or via the Fort Ord Cleanup web site during a 30-day public comment period beginning March 12, 2002 and ending April 11, 2002. The online comment form can be found on the Fort Ord website at: http://www.FortOrdCleanup.com/news.shtml. Instructions for submitting comments are provided there.

Written comments will be accepted at the two public meetings and throughout the 30-day public comment period that ends on April 11, 2002. Correspondence should be postmarked no later than April 11, 2002 and should be sent to the attention of the U.S. Army representative at the address provided in the following section.

# INFORMATION ACCESS

**U.S. ARMY REPRESENTATIVE**

**Department of the Army**
**Environmental & Natural Resources**
ATTN: Gail Youngblood, BEC
P.O. Box 5004
Monterey, California 93944-5004
(831) 242-7924

Hours: Monday through Friday
8:00 a.m. to 5:00 p.m.

**REGULATORY REPRESENTATIVES**

**U.S. Environmental Protection Agency (Region IX)**
Contact: John Chesnutt
Superfund Federal Facilities Cleanup Branch
75 Hawthorne Street, Mail Code SFD-8-3
San Francisco, California 94105
(415) 972-3005
(800) 231-3075

Hours: Monday through Friday
8:00 a.m. to 5:00 p.m.

**Department of Toxic Substances Control, Region I**
Contact: Rizgar Ghazi
8800 Cal Center Drive
Sacramento, California 95826-3200
(916) 255-3610

Hours: Monday through Friday
8:00 a.m. to 5:00 p.m.

**INFORMATION REPOSITORIES**

**Chamberlin Library**
Building 4275 General Jim Moore Boulevard
Ord Military Community,
California 93944-5000
(831) 242-7680

Hours: Monday through Friday 10:00 a.m. to 6:00 p.m.
Saturday: Closed
Sunday 12:00 p.m. to 5:00 p.m.

**California State University Monterey Bay (CSUMB)**
Library Learning Center
100 Campus Center, Building 12
Seaside, California 93955
(831) 582-3872

Hours:
Monday through Thursday
8:00 a.m. to 10:00 p.m.
Friday 8:00 a.m. to 5:00 p.m.
Saturday 1:00 p.m. to 5:00 p.m.
Sunday 1:00 p.m. to 8:00 p.m.
(for exceptions to these hours see:
http://library.monterey.edu/about/hours/php)

**Seaside Branch Library**
550 Harcourt Avenue
Seaside, California 93955
(831) 899-2055

Hours:
Monday through Thursday
10:00 a.m. to 8:00 p.m.
Friday and Saturday 10:00 a.m. to 6:00 p.m.
Sunday 1:00 p.m. to 5:00 p.m.

**Administrative Record Department Location**
Fort Ord Administrative Record
Building 4463 Gigling Road, Room 101
Ord Military Community,
California 93944-5004
(831) 393-9186

Hours:
Monday through Friday 9:00 a.m. to 4:00 p.m.
Closed 12:00 to 1:30 p.m. for lunch
Closed on all Federal Holidays
Other hours can be arranged by appointment.
(see: http://www.fortordcleanup.com/repository.shtml)

## REFERENCES


Christensen, N., and C. Muller, 1975. *Relative Importance of Factors Controlling Germination and Seedling Survival in* Adenostoma *Chaparral*. American Midland Naturalist. 93: 71-78.

Harding ESE, Inc. (Harding ESE, formerly Harding Lawson Associates [HLA]), 2000. *Final Ordnance Detonation Sampling and Analysis Plan, Former Fort Ord, Monterey, California*. October.

_____, 2002. *Draft Final Interim Action Ordnance and Explosives Remedial Investigation/Feasibility Study For Ranges 43-48, Range 30A, Site OE-16, Former Fort Ord, California*. March 7.

Muller, C., 1966. *The Role of Chemical Inhibition (Allelopathy) in Vegetational Composition.* Bulletin of the Torrey Botanical Club. 93: 332-351.

U.S. Department of the Army, 2001. *Ordnance and Explosives Site Security Program Summary, Former Fort Ord, Monterey County, California*. March.

U.S. Army Corps of Engineers (USACE)—Sacramento District, 1997. *Installation-Wide Multispecies Habitat Management Plan* (HMP) *for Former Fort Ord, California*. With Technical assistance from Jones and Stokes Associates, Sacramento, California. April.

Wright, E., 1931. *The Effect of High Temperature on Seed Germination.* Journal of Forestry. 29: 679-687.


## GLOSSARY

**Administrative Record** - The official collection of documents related to investigation and cleanup activities at Fort Ord relied upon to select a remedial action pertaining to the investigation and cleanup of the former Fort Ord.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** - 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.

**Feasibility Study(s) (FS[s])** - An evaluation of potential remedial technologies and treatment options that can be used to clean up a site.

**Interim Action (IA)** - A remedial action that can be implemented quickly and that, although not necessarily intended as a final remedial measure at a site, substantially reduces potential immediate risks to human health or the environment.

**Ordnance and Explosives (OE)** - Anything related to munitions designed to cause damage to personnel or material through explosive force or incendiary action including bombs, warheads, missiles, projectiles, rockets, antipersonnel and antitank mines, demolition charges, pyrotechnics, grenades, torpedoes and depth charges, high explosives and propellants, and all similar and related items or components explosive in nature or otherwise designed to cause damage to personnel or material.

**Proposed Plan** - A report specifically prepared for public review and comment that summarizes the content and conclusions of a Plan of Action or Study.

**Record of Decision (ROD)** - A report documenting the final action, approved by the regulatory agencies, that will be required at a particular Superfund site.

**Remedial Investigation(s) (RI[s]) -** Exploratory inspection conducted at a site to delineate the nature and extent of contamination, in this case OE.

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

**Unexploded Ordnance (UXO) -** A military munition that contains an explosive or pyrotechnic charge and has been primed, fuzed, armed, or otherwise prepared for action, and that been fired, placed, dropped launched, projected, and remains unexploded by design or malfunction.

## Table 1. Summary of the Preferred Interim Action Alternatives
## Ranges 43-48, Range 30A, Site OE-16

| Evaluation Criteria | Preferred Interim Action Alternatives | | |
|---|---|---|---|
| | **Vegetation Clearance Alternative** | **OE Remedial Action Alternative** | **OE Detonation Alternative** |
| | **Prescribed Burning** | **Subsurface OE Removal** | **Detonation with Engineering Controls** |
| **Effectiveness**<br>*(Includes Overall Protection of Human Health and the Environment, Compliance with ARARs, Short-Term Effectiveness, Long-Term Effectiveness and Permanence, Reduction of Toxicity, Mobility and Volume Through Treatment)* | Very effective in short term at clearing vegetation quickly over large areas; effective as a long term because it has beneficial effects on the regrowth and long term health of CMC vegetation. Would comply with ARARs and be protective of human health and the environment (with mitigation measures such as smoke management and relocation of affected residents during burning). Reduction of toxicity, mobility or volume criteria is not applicable to vegetation clearance. | Very effective in short term and long term at reducing OE hazards because it removes OE to depths consistent with planned reuse of IA site. Would comply with ARARs and be protective of human health and the environment by removing OE hazards. Would reduce mobility and volume of OE. | Very effective in short term and long term for 100% of OE items in reducing OE-related hazards through detonation. Would comply with ARARs and be protective of human health and the environment. Would reduce hazards associated with OE. |
| **Implementability**<br>*(Includes State and Community Acceptance)* | Easy to implement to clear vegetation quickly; would take approximately 1 month to coordinate burn and clear vegetation. Equipment and personnel readily available. Must be conducted in close coordination with agencies and public to address concerns about smoke and fire danger. Would require prior public notification, smoke management while conducting the burn, and temporary relocation of individuals from areas affected by smoke to unaffected areas to minimize impacts of smoke and emissions. State and Community Acceptance will be evaluated in the ROD after public and regulatory agency comments on this Proposed Plan have been received. | Difficult to implement over large areas, but equipment and personnel are readily available. Performed for many years at Fort Ord. State and Community Acceptance will be evaluated in the ROD after public and regulatory agency comments on this Proposed Plan have been received. | Easy to implement; performed during OE removal activities at Fort Ord for many years. Equipment and personnel readily available. State and Community Acceptance will be evaluated in the ROD after public and regulatory agency comments on this Proposed Plan have been received. |
| **Ranges 43-48 Total Alternative Cost:**<br>*$13.6 - $14.2 million | Capital: $1.7 million<br>O&M: 213,000 $ (5 years)<br>TOTAL COST: $1.9 million | Capital: *$10.6-$11.2 million<br>O&M: None<br>TOTAL COST:<br>$10.6-$11.2 million | Capital: $1.1 million<br>O&M: None<br>TOTAL COST:<br>$1.1 million |
| **Range 30A Total Alternative Cost:**<br>*$8.3 - $9.3 million | Capital: $1.4 million<br>O&M: 149,000 $ (5 years)<br>TOTAL COST: $1.5 million | Capital: *$6.7-$7.7 million<br>O&M: None<br>TOTAL COST:<br>$6.7-$7.7 million | Capital: $124,000<br>O&M: None<br>TOTAL COST: $124,000 |
| **Site OE-16 Total Alternative Cost:**<br>*$1.62 - $1.63 million | Capital: $288,000<br>O&M: 30,000 $ (5 years)<br>TOTAL COST: $318,000 | Capital: *$1.29-$1.3 million<br>O&M: None<br>TOTAL COST:<br>$1.29-$1.3 million | Capital: $13,000<br>O&M: None<br>TOTAL COST: $13,000 |

* Range of Costs for Subsurface OE Removal based on estimated costs for 1 ft. to 4 ft. depth of removal.
ARAR Applicable or relevant and appropriate requirements.
HMP Habitat Management Plan.
OE Ordnance and Explosives.
O&M Operations and Maintenance.
UXO Unexploded Ordnance.