

**Remedial Design (RD)/Remedial Action (RA)
Work Plan Update Track 3
Impact Area Munitions Response Area (MRA)
Munitions and Explosives of Concern (MEC) Removal
Former Fort Ord, California**

**August 2018
DRAFT FINAL**

Submitted to:



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LIST OF ACRONYMS

AGCMR	Advanced Geophysical Classification for Munitions Response
APP	Accident Prevention Plan
ARAR	Applicable or Relevant and Appropriate Requirement
Army	U.S. Department of the Army
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CA	chemical agent
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosives
CFR	Code of Federal Regulations
CMC	Central Maritime Chaparral
CWM	Chemical Warfare Material
DDESB	Department of Defense Explosives Safety Board
DGM	digital geophysical mapping
DMM	discarded military munitions
DoD	Department of Defense
DTSC	Department of Toxic Substances Control
EMI	electromagnetic induction
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
ESA	Endangered Species Act
ESS	Explosives Safety Submission
ESTCP	Environmental Security and Technology Certification Program
FFA	Federal Facility Agreement
FORA	Fort Ord Reuse Authority
FS	feasibility study
FWV	field work variance
GPS	global positioning system
GSV	Geophysical System Verification
HA	Historical Area
HE	high explosive
HMP	Habitat Management Plan
HQ	headquarters
HTW	Hazardous and Toxic Waste
IC	Institutional Control
ISO	industry standard objects
IVS	instrument verification strip
KEMRON	KEMRON Environmental Services, Inc.
LUC	Land Use Control
LUCIP	Land Use Control Implementation Plan
MC	munitions constituents
MDAS	material documented as safe
MD	munitions debris
MEC	munitions and explosives of concern
mm	millimeter
MMRP	Military Munitions Response Program

MOUT	Military Operations in Urban Terrain
MPPEH	material potentially presenting an explosive hazard
MQO	measurement quality objectives
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
NPL	National Priorities List
OESS	Ordnance and Explosives Safety Specialist
ODDS	Ordnance Detection and Discrimination Study
PBO	Programmatic Biological Opinion
POMFD	Presidio of Monterey Fire Department
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
QC/QA	quality control/quality assurance
RA	remedial action
RACR	Remedial Action Completion Report
RAR	Remedial Action Report
RCRA	Resource and Conservation Recovery Act
RD/RAWP	Remedial Design/ Remedial Action Work Plan
RI	remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSP	render safe procedures
RWQCB	Regional Water Quality Control Board
Shaw	Shaw Environmental, Inc.
SOP	standard operating procedure
SSWP	Site-Specific Work Plan
SUXOS	Senior UXO Supervisor
TBD	To be Determined
TM	technical memorandum
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded Ordnance

DEFINITIONS

Construction Support: Assistance provided by Department of Defense (DoD) explosive ordnance disposal (EOD) or Unexploded Ordnance (UXO)-qualified personnel and/or by personnel trained and qualified for operations involving chemical agent (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., Discarded Military Munitions [DMM]), or munitions constituents (MC) 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)). For the purposes of the Military Munitions Response Program (MMRP) being conducted at the former Fort Ord, DMM does not include small arms ammunition.

Explosive Ordnance Disposal (EOD) Personnel: Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal; are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties. EOD personnel have received specialized training to address explosive and certain CA hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform render safe procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices. Source: (6).

Expended: The state of munitions debris (MD) in which the main charge has been expended leaving the inert carrier. Source: (1).

Feasibility Study (FS): A study undertaken to develop and evaluate alternatives for remedial action. Source: (3).

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 General Jim Moore Boulevard to the west. Source: (1).

Institutional Control (IC): (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: (5).

Land Use Controls (LUCs): Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination, or physical barriers to limit access to real property, such as fences or signs. Source: (6).

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: (4).

Material Documented as Safe (MDAS): Material potentially presenting as an explosive hazard (MPPEH) that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH. Source: (6).

Material Documented as an Explosive Hazard: MPPEH that cannot be documented as MDAS, that has been assessed and documented as to the maximum explosive hazards the material is known or suspected to present, and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH. Source: (6).

Material Potentially Presenting an Explosive Hazard: Material that, prior to determination of its explosives safety status, potentially contains explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris); or potentially contains a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization or disposal operations). Excluded from MPPEH are munitions within the DoD established munitions management system and other

hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions. Source: (6).

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, or 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)).

Military Munitions Response Program: The MMRP is a program under which munitions responses are conducted. Source: (1)

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: (2).

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

Munitions and Explosives of Concern (MEC): A term distinguishing specific categories of military munitions that may pose unique explosives safety risks: UXO, as defined in 10 U.S.C. 101(e)(5); DMM, as defined in 10 U.S.C. 2710(e)(2)); or munitions constituents (e.g., TNT, cyclotrimethylenetrinitramine [RDX]), as defined in 10 U.S.C. 2710(e)(3)), present in high enough concentrations to pose an explosive hazard. Source: (6). For the purposes of the MMRP being conducted for the former Fort Ord, MEC does not include small arms ammunition.

Munitions Response: Munitions response means response actions, including investigation, removal actions, and remedial actions, to address the explosives safety, human health, or environmental risks presented by UXO, discarded military munitions (DMM), or munitions constituents (MC), or to support a determination that no removal or remedial action is required. (32 CFR 179.3)

Munitions Response Area (MRA): Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. An MRA is comprised of one or more munitions response sites. Source: (6).

Munitions Response Site (MRS): A discrete location within an MRA that is known to require a munitions response. Source: (6).

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 MEC 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. Source: (1).

Projectile: An object projected by an applied force and continuing in motion by its own inertia, such as a bullet, bomb, shell, or grenade. Also, applied to rockets and to guided missiles. Source: (2).

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

Remedial Investigation (RI): Process undertaken to determine the nature and extent of the problem presented by a release which emphasizes data collection and site characterization. The RI is generally performed concurrently and in an interdependent fashion with the feasibility study. Source: (3).

Removal Depth: The depth below ground surface to which all ordnance and other detected items are removed. Source: (1).

Small Arms Ammunition: Ammunition, without projectiles that contain explosives (other than tracers), that is .50 caliber or smaller, or for shotguns. Source: (6).

Technology-Aided Surface Removal: A removal of UXO, DMM, or chemical warfare material (CWM) on the surface (i.e., the top of the soil layer) only, in which the detection process is primarily performed visually, but is augmented by technology aids (e.g., hand-held magnetometers or metal detectors) because vegetation, the weathering of UXO, DMM, or CWM, or other factors make visual detection difficult. Source: (6).

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. (10 U.S.C. 101 (e)(5)). For the purpose of the MMRP 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. Source: (6).

UXO Technician: Personnel who are qualified for and filling Department of Labor, Service Contract Act, Directory of Occupations, contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III. Source: (6).

Sources of the Above Definitions:

(1) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the MEC cleanup.

(2) "Unexploded Ordnance (UXO): An Overview", October 1996. DENIX.

(3) Technical Guidance for Military Munitions Response Actions, Environmental Quality Engineer Manual 200-1-15, dated October 2015.

(4) Survey of Munitions Response Technologies, June 2006. ITRC (Interstate Technology and Regulatory Council) with ESTCP (Environmental Security and Technology Certification Program) and SERDP (Strategic Environmental Research and Development Program).

(5) 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.

(6) DoDM 6055.09, Volume 8 (DoD, February 2008. Administratively Reissued August 2010. Incorporating Change 2, Effective January 2018).

1.0 INTRODUCTION

This document updates the Remedial Design/Remedial Action Work Plan (RD/RAWP) for implementation of the remedy selected for the Impact Area Munitions Response Area (MRA) at the former Fort Ord, California and described in *Final Record of Decision (ROD), Impact Area Munitions Response Area (MRA), Track 3 Munitions Response Site (MRS), Former Fort Ord, California* (U.S. Department of the Army [Army], 2008).

The former Fort Ord is located in northwestern Monterey County, California, approximately 80 miles south of San Francisco (Figure 1). 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 until base closure. 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 portions 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, practice land mines, pyrotechnics, bombs, and demolition materials. For the purposes of the Fort Ord Military Munitions Response Program (MMRP) being conducted at the former Fort Ord, munitions and explosives of concern (MEC) does not include small arms ammunition.

Fort Ord was placed on the National Priorities List (NPL) of Superfund sites by U.S. Environmental Protection Agency (EPA) on February 21, 1990, due to evidence of contaminated soil and groundwater. A Federal Facility Agreement (FFA) was signed by the Army, EPA, Department of Toxic Substances Control (DTSC), and Regional Water Quality Control Board (RWQCB). DTSC and RWQCB are parts of California EPA. The FFA established procedures and schedules for conducting remedial investigations (RIs) and feasibility studies (FSs) and requires remedial actions (RAs) be completed as expeditiously as possible. The environmental response actions at the former Fort Ord are being conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The Army began investigating and removing MEC at the former Fort Ord in 1993 and a Munitions Response (MR) Remedial Investigation/Feasibility Study (RI/FS) was initiated in 1998. 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 Impact Area MRA was evaluated in the *Final Track 3 Impact Area Munitions Response Area Munitions Response Remedial Investigation/Feasibility Study (RI/FS) Report, Volumes 1 and 2, Former Fort Ord, California* (MACTEC, 2007). 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 Impact Area MRA consists of multiple units within 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 (HMP) for Former Fort Ord, California* (HMP; U.S. Army Corps of Engineers [USACE], 1997). [Figure 2](#) displays the approximate total geographic acreage per unit. The Impact Area MRA 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 Federal threatened or endangered species as well as many other rare species. The Impact Area MRA is designated as a Habitat Reserve in the HMP and 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. In 2012, current and future BLM lands at the former Fort Ord, including the Impact Area MRA, were designated as the Fort Ord National Monument.

The selected remedy for the Impact Area MRA is Technology-Aided Surface MEC Remediation, With Subsurface MEC Remediation in Selected Areas and Land Use Controls (LUCs). Implementation of the remedy has been underway since 2008 based on *Final Work Plan, Remedial Design/Remedial Action (RD/RA), Track 3 Impact Area Munitions Response Area (MRA), Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California* (USACE, 2009). This update summarizes the RAs completed to date, and incorporates the current guidance on military munitions response actions that applies to the remaining work under the Track 3 ROD.

The Track 3 remedy addresses the explosives safety risks from MEC. Potential for soil contamination is addressed under the Basewide Range Assessment (BRA) and Site 39 programs, separate from the Track 3 ROD remedy.

2.0 PURPOSE

The RD/RAWP was originally released in 2009. The work plan is intended to implement the selected RA identified in the ROD for MEC in the Impact Area MRA by specifying the general requirements to accomplish vegetation clearance, technology-aided surface removal, and subsurface MEC removal in selected areas. This update summarizes the RAs completed to date, and incorporates the current guidance on military munitions response actions that applies to the remaining work under the Track 3 ROD.

To conduct MEC removals vegetation clearance is required. The primary method of vegetation clearance is through prescribed burning. Unless approved by U.S. Fish and Wildlife Service (USFWS), the HMP

allows a maximum of 800 acres to be burned per year within habitat reserve containing CMC. The Impact Area MRA has been segmented into units approximately 200 to 400 acres, utilizing existing fuel break roads to accomplish the RA. A burn prescription has been developed for the prescribed burn program that will be conducive to good burn control and smoke management. This prescription requires specific weather conditions, fuel moisture levels, and equipment availability, among other specific conditions. These constraints limit the number of suitable burn days each year and necessitate that the RA be accomplished over several years. In locations where prescribed burning cannot be accomplished safely the vegetation will be cut. Prescribed burns have been conducted in several units and are shown on [Figure 7](#).

Site-specific RA work plans identify the features that correspond to specific units such as historical use, known ranges, and expected types of munitions. Surface MEC removal, and subsurface MEC removal in selected areas, have been completed in several of the units and have been documented in unit-specific Remedial Action Reports (RARs). Units in which remedial actions have been conducted are shown on [Figure 3](#). A summary of completed actions is provided in [Appendix C](#).

It is the Army's goal to expeditiously complete the RAs and prepare the property for transfer for its intended use. The land is intended as habitat reserve with the remedial LUCs that were also selected as part of the remedy. Prior to property transfer the Army will prepare a Land Use Control Implementation Plan (LUCIP) as an addendum to this RD/RAWP (See [Section 15.0](#)).

3.0 REMEDIAL OBJECTIVES

The selected remedy addresses current or potential explosives safety risks to human health and the environment from MEC in the Impact Area MRA. The RA will achieve the EPA's threshold criteria of "Overall Protectiveness of Human Health and the Environment" and "Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)". The ARARs for this RA are identified in the Track 3 ROD and are provided in [Appendix A](#). The most significant short-term objective is to remove surface MEC and prevent public access until MEC removal is completed. The long-term objective is to make the property safe for required habitat management activities and public use by supplementing the RA with appropriate LUCs that will effectively manage risk from MEC that potentially remain after the RA is completed.

The selected remedy for the Impact Area MRA is Technology-Aided Surface MEC Remediation, With Subsurface MEC Remediation in Selected Areas and LUCs. The selected remedy includes the following components:

- Prescribed burning of up to 800 acres per year to clear vegetation and provide access to conduct MEC removal.
- Technology-aided surface MEC removal through the entire Impact Area MRA, and detonation, using engineering controls, of MEC recovered. MEC detection instruments will be available onsite to aid in the detection of surface MEC in areas where the ground is not visible.
- Digital geophysical mapping (DGM) 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. Anomalies within the areas identified for subsurface removal will be investigated or resolved.
- Subsurface MEC removal 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).
- Implementation of LUCs (munitions 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 cutting of vegetation) to collect data on HMP species and habitats; perform mapping, data management and evaluation, and reporting; and conduct habitat restoration as needed.

Pre- and post-remediation habitat monitoring is being conducted per the established protocols consistent with the HMP and Programmatic Biological Opinions (PBOs). As described in the *Memorandum for Record - Minor Change to the Selected Remedy, Fort Ord Track 3 Impact Area Munitions Response Area (MRA)* (Army, 2011), in locations where prescribed burning cannot be accomplished safely, the vegetation will be cut. Vegetation cutting required to establish containment lines for prescribed burns and to conduct MEC removals has been coordinated with the USFWS (USFWS, 2017).

When all identified RAs are completed in a unit or a group of units, the work will be documented in a site-specific RAR. At the completion of all RAs within the Impact Area MRA, a Remedial Action Completion Report (RACR) will be developed, and a detailed LUCIP will be prepared as an addendum to this RD/RAWP that will be available at the time the property is to be transferred.

4.0 SCHEDULE

The primary method of vegetation clearance is through prescribed burning. The burn season is July 1st through December 31st unless deviation is approved by USFWS. The Army will produce a Site-Specific Work Plan (SSWP) that describes the specific fieldwork planned to support the RA in a unit or a group of units.

Draft SSWP	To be Determined (TBD)
Agency and public review	30 days after Draft SSWP
Draft-Final SSWP	30 days after receipt of comments
Agency and public review	30 days after Draft-Final SSWP
Final SSWP (if required)	30 days after receipt of comments
Draft Prescribed Burn Plan	15 February (each year)
Agency and public review	30 days after Draft Prescribed Burn Plan
Draft-Final Prescribed Burn Plan	30 days after receipt of comments
Agency and public review	30 days after Draft-Final Prescribed Burn Plan
Final Prescribed Burn Plan (if required)	30 days after receipt of comments
TM (unit specific)	45 days after completion of surface removal and DGM
TM Approval	14 days after receipt of TM
Draft Site-Specific RAR (unit specific)	60 days after MEC RAs are complete
Agency and public review	30 days after Draft RAR
Draft-Final RAR	30 days after receipt of comments
Agency and public review	30 days after Draft-Final RAR
Final RAR (if required)	30 days after receipt of comments
Annual Report for Recurring Inspections	31 December (each year)
LUCIP	TBD

(Note: Schedule refers to calendar days.)

5.0 REMEDIAL ACTION STATUS

Implementation of the remedy has been underway since 2008. This section describes completed RAs and future RAs. Summaries of completed RAs by unit or group of units are provided in [Appendix C](#).

5.1 Overview

After vegetation clearance, technology-aided surface MEC removal is performed and DGM is conducted. The work is evaluated and the unit is inspected jointly with BLM. Any additional work identified through the evaluation is documented in unit-specific Technical Memorandums (TM). The additional actions are implemented prior to the development of the RAR. Quality control and quality assurance processes are implemented as described in the RD/RAWP, SSWPs and Quality Assurance Project Plan (QAPP).

5.1.1 Surface Munitions and Explosives of Concern Removal

Surface MEC removal has been conducted in several of the Impact Area units ([Figure 3](#)). Specific areas have been identified where surface MEC removal was not conducted. In Unit 21, surface removal was not conducted in 2.3 acres because it was inaccessible due to standing water in a vernal pool. A portion of Unit 32 was inaccessible for surface MEC removal due to poison oak, steep terrain, and standing water in a vernal pool. These areas have been evaluated through the unit-specific TMs and documented in the RAR. Portions of Units 25 and 28 were identified as inaccessible for surface MEC removal due to safety concerns related to steep terrain. These areas have been evaluated through the unit-specific TMs. Additional information is provided in [Appendix C](#).

Site conditions that could present significant challenges to accessibility for safe conduct of surface removal are expected in Units 13, 17, and 20. An evaluation is underway as described in *Final Field Evaluation Work Plan Munitions Response, Munitions Response Site (MRS)-Bureau of Land Management (BLM) Units 13, 17, and 20 Former Fort Ord Monterey County, California* (KEMRON Environmental Services, Inc. [KEMRON], 2016c).

Surface removal (and subsurface removal in portions of the area) was conducted in MRS-Ranges 43-48 South as part of the interim RA in 2003-5. As described in the Track 3 RI/FS (MACTEC, 2007), the site includes an area exhibiting high density of anomalies and where sensitive fuze-type UXO items were recovered during surface removal. A TM will be prepared to provide an evaluation of this area.

The Army's annual monitoring program periodically monitors areas of Track 3 where MEC surface removal has been completed to validate site conditions. Monitoring has been conducted since 2009 and

documented in annual reports. No additional response actions have been identified through the monitoring program. A list of annual reports is provided in [Appendix C](#).

5.1.2 Digital Geophysical Mapping Survey

Following surface MEC removal, DGM survey is conducted in accessible areas ([Figure 4](#)). Based on the 2009 RD/RAWP (USACE, 2009), DGM surveys have been conducted with the EM-61 in towed array mode as the standard equipment. The DGM results are articulated in terms of anomaly density 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. Site conditions (e.g. difficult terrain) may prevent DGM survey from being conducted in certain areas; areas inaccessible to DGM will be documented in RARs and DGM records. These areas have been documented in TMs and RARs.

5.1.3 Subsurface Munitions and Explosives of Concern Removal

The Track 3 ROD identifies the types of areas that may be selected for subsurface MEC removal. They are: (1) regularly maintained fuel breaks and access roads; (2) 100-ft wide buffers along the habitat-development border; and (3) other areas to address specific risk and/or land use needs. The regularly-maintained fuel breaks and 100-ft wide buffers are identified in the *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Non-Burn Areas, Former Fort Ord California* (Non-Burn Areas SSWP, Shaw Environmental, Inc. [Shaw], 2010). The third type of area can be identified in the SSWP or through the TM process. Once surface MEC removal and DGM are conducted, the data is reviewed and BLM is consulted to identify specific areas that may warrant additional work. The identified areas are then evaluated and documented in unit-specific TMs. The additional actions are implemented prior to the development of the RAR.

Areas where subsurface MEC removals were conducted are shown on [Figure 5](#). A status of subsurface MEC removal fieldwork is provided below:

- **Fuel break roads:** The system of regularly maintained fuel breaks is identified in the Non-Burn Areas SSWP (Shaw, 2010). The permanent fuel breaks were designed to be 45 to 50 feet wide and consist of a central drivable road of 15 to 20-foot width, with cleared areas 15 feet wide on each side of the road. Adjustments have been made to the fuel break system over time and have been identified through field work variances and will be documented in the Fuel Break Roads Technical Information Paper.
- **100-foot buffer:** The 100-foot buffer is the area along the habitat and development border around the BLM Work Center (formerly BLM Headquarters), around the Military Operations in Urban Terrain (MOUT) site, and the western and southern Impact Area MRA boundaries. The buffer

around the BLM Work Center was reconfigured to provide a complete 100-ft wide subsurface removal area that surrounds the original BLM Headquarters parcel and the current BLM Work Center parcel combined. This work is documented in *Final Bureau of Land Management (BLM) Headquarters (HQ) South Buffer, Munitions and Explosives of Concern (MEC) Remedial Action Technical Information Paper Former Fort Ord California* (ITSI Gilbane, 2014a). The western boundary buffer along Blueline Road was extended along South Boundary Road over time. The 100-foot buffer remedial action is documented in *Draft Final, Impact Area Munitions Response Area (MRA) 100-Foot Buffer Munitions and Explosives of Concern Remedial Action Technical Information Paper, Fort Ord, California* (Gilbane, 2015). MEC remedial actions associated with the 100-foot buffer around the MOUT site are documented in the *Draft Final MOUT Site Buffer, Munitions and Explosives of Concern, Remedial Action Technical Information Paper, Former Fort Ord, California* (ITSI Gilbane, 2014c). Remediation for the 100-foot buffer is complete, as described in the *Letter from the Army to EPA documenting that 100-foot buffer is complete* (Army, 2015).

- **Additional areas identified in Technical Memorandum:** Additional subsurface removals have been implemented in Units 1, 2, 3, and 5A. Summaries of completed actions are provided in [Appendix C](#).
- **Large projectiles:** Prescribed burns planned for Units 11 and 12 in 2011 were cancelled due to discovery of high explosive (HE) 8-inch and 155mm projectiles (MEC) on the ground surface during site preparation. Vegetation was cut in 2011 to conduct surface MEC removal, with the intention of performing prescribed burns in the future after sufficient regrowth of vegetation. Technology-aided surface removal and DGM were completed and documented in a TM and RAR. In 2015, the Ordnance and Explosives Safety Specialist (OESS) identified the potential presence of high explosive MEC, 155mm projectiles and 8-inch projectiles, remaining in the shallow subsurface as presenting a low-likelihood (but high-impact) risk to prescribed burn personnel. The OESS determined that removal of 155mm projectiles, 8-inch projectiles, and larger MEC items to one and two foot depths within Units 11 and 12 was required to reduce the high-impact risk during future prescribed burning. Existing DGM data was utilized to identify anomalies that could represent 155mm and 8-inch projectiles. Advanced geophysical classification was used to evaluate the anomalies. Anomalies classified as a source that potentially could have been a 155mm or 8-inch projectiles were investigated and removed to a one foot depth in the interior of Units 11 and 12 (436 feet or more from the perimeter of the 45-foot wide fuel break) and to a two foot depth in the outer perimeter of each unit (within 436 feet of the perimeter of the 45-foot wide fuel break). This work was completed and documented in the *Final Units 11 and 12 Munitions and Explosives*

of Concern (MEC) Risk Reduction Technical Memorandum, Former Fort Ord, California (KEMRON, 2017c). Similar work will be conducted in Unit 23 as identified in *Munitions Response Site-Bureau of Land Management Unit 23 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California* (KEMRON, 2017a).

- **Other areas:** Subsurface removal was previously conducted in other areas such as previously-used fuel breaks and roads (that were not included in the system of permanent fuel breaks), sampling grids, a borrow area, prescribed burn access routes, and Ordnance Detection and Discrimination Study (ODDS) test areas. Information about work in these areas was incorporated into the Track 3 RI/FS.
- **Site 39 soil remediation areas:** Soil remediation has been conducted within the Impact Area MRA boundary under the *Final, Record of Decision Amendment, Site 39 Inland Ranges, Former Fort Ord, California* (Army, 2009). Contaminated soil was excavated with construction support, and transported to the OU2 Landfill for disposal. In specific ranges, post-remediation subsurface MEC removal was conducted to support habitat restoration activities. These actions are documented in *Final Remedial Action Completion Report Site 39 Inland Ranges Habitat Reserve* (ITSI Gilbane, 2014b). If additional ranges are identified as requiring soil remediation in the future, appropriate construction support will be provided for such activities.
- **Range 36A:** Range 36A was an Explosive Ordnance Disposal (EOD) range and was used for disposal of various types of commercial explosives and military ordnance and ammunition. The final closure certification report was submitted in June 2007 (Shaw, 2007). These actions demonstrate that all Resource Conservation and Recovery Act (RCRA) /Hazardous and Toxic Waste (HTW) actions and all MR actions at Range 36A are complete and approval has been received from DTSC. Approval of the report was provided by DTSC in *Closure Certification Acknowledgement for Range 36A Open Burn/Open Detonation Unit, U.S. Department of the Army, Former Fort Ord, EPA ID Number CA 7210020676* (DTSC, 2007).
- **Munitions with unknown filler:** During surface removal in Unit 3, eight 4-inch Stokes mortar projectiles (4 screening smoke; 3 smoke, hexachloroethane; 1 smoke, white phosphorous) and one Livens Projector (screening smoke) were encountered and removed. Although all nine items were subsequently confirmed to contain smoke fillers, these items also have the potential to be used for delivery of chemical warfare agents. Since filler of these specific types of munitions cannot be confirmed visually, they are generally classified as munitions with unknown fillers. Both Department of Defense (DoD) and USACE guidance specify that only EOD or Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) response personnel can determine the most likely filler of these munitions. If a munition with an unknown filler is found, or if a MEC

item cannot be positively identified, active duty EOD will be contacted. Until the response is complete field work will cease, unless prior arrangements have been made and approved by the Department of the Army and Defense.

While surface removal has been completed in Unit 3, an unknown filler item could be encountered in the future, necessitating time-consuming procedures that could impact the planned long-term reuse of the property by BLM. A limited subsurface MEC removal was conducted in Unit 3 to intrusively investigate a subset of DGM anomalies that could represent a 4.2-inch mortar projectile (a close proxy item for a 4-inch Stokes mortar projectile) within areas where unknown filler items were previously encountered. No evidence of unknown filler munitions has been identified in any other unit within the Impact Area MRA. Unit 3 RA is complete and documented in *Final, Munitions Response Site-Bureau of Land Management Units 1, 2, 3 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (KEMRON, 2018a).

- **Munitions with sensitive fuzes:** Munitions with sensitive fuzes are associated with a higher level of concern due to their sensitive nature. In high density clutter areas, the possibility of sensitive fuze-type munitions in shallow subsurface becoming exposed over time is a concern that was identified in the RI/FS and ROD. Under the Track 3 ROD, subsurface removal will be conducted in identified areas to address specific risk and/or land use needs. An example of such areas are “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.” Such areas would be a candidate for subsurface MEC removal using excavation and sifting.

While excavation and sifting can be implemented to reduce the explosives safety risk, it will result in considerable disturbance and damage to the natural habitat. To comply with Endangered Species Act (ESA) requirements, an extensive habitat restoration effort would be required to bring about successful habitat recovery in the excavated areas. A considerable level of uncertainty is associated with such restoration effort especially when the area of disturbance is large. The overall cost of such an approach is very high. Considering these factors, the Army has explored ways to reduce the footprints of areas that could require sifting while addressing the risks.

The Army is continuing to collect data from the annual surface monitoring program as well as completing a field study according to *Final Work Plan Munitions with Sensitive Fuze Field Study Former Fort Ord, California* (KEMRON, 2017b). The study’s objective is to demonstrate the performance and capabilities of DGM systems, including advanced geophysical classification

technologies, for the identification of subsurface munitions, specifically those with sensitive fuzes. The sensitive fuze-type MEC recovered within the Impact Area MRA are shown on [Figure 6](#).

5.2 Prescribed Burn

Prescribed burning has been successfully conducted in several units. Units that have been burned are displayed on [Figure 7](#).

Prescribed burning was selected as the primary method to clear vegetation in habitat reserve containing CMC to provide access to conduct MEC removals. Vegetation clearance using manual and mechanical methods to clear unburned areas within habitat reserve areas containing CMC would be restricted to the extent possible and would typically be limited to 50 acres or less within a MRS or unit. Where prescribed burning has been determined infeasible based on site specific conditions, MEC remediation will be supported by manual and/or mechanical cutting, subject to USFWS consultation under the ESA and in coordination with EPA and DTSC as described in the PBO (USFWS, 2017). The *Memorandum for Record - Minor Change to the Selected Remedy, Fort Ord Track 3 Impact Area MRA* (Army, 2011) documents the types of areas that were identified as impractical for a prescribed burn prior to surface MEC removal. The types of areas include:

- (1) Areas with specific types of MEC on the ground surface that require safety setback distances that exceed the Army's capabilities to conduct a safe prescribed burn (e.g., Units 11, 12 and 23);
- (2) Areas where suitable burn conditions occur infrequently and are unpredictable (e.g., Units 1, 2 and 3);
- (3) Areas adjacent to populated areas where providing for contingency associated with burning is difficult (e.g., Units 4, 5A, 6 and 9); and
- (4) Areas with difficult terrain that prevents the development of sufficient burn containment lines (e.g., Units 28 and 25).

Based on USFWS coordination and as documented in the PBO (USFWS, 2017), follow-up prescribed burning is necessary to encourage the recovery of the habitat except for Unit 28. An evaluation on the feasibility of conducting prescribed burns in Units 13, 17 and 20 is underway per *Final Field Evaluation Work Plan Munitions Response, Munitions Response Site (MRS)-Bureau of Land Management (BLM) Units 13, 17, and 20 Former Fort Ord Monterey County, California* (KEMRON, 2016c).

5.3 Project Quality Plan Updates

Quality Plan updates have been implemented throughout the course of the MEC remediation as technological advances and more efficient methodologies have been developed. The *Quality Assurance*

Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Munitions Response, Appendix A, Munitions and Explosives of Concern Remedial Action (MEC QAPP, KEMRON, 2016a) incorporates these procedural updates and describes the current best practices. Key changes from the 2009 RD/RAWP are summarized below.

- Modified the geophysical field documentation process to include the digital recording of all field note data using personal digital assistant devices and the uploading of information to the geophysical database to carry out reporting functions. In cases of complex field situations, corrections or additions, supplemental sketches would be drawn on paper, scanned, and submitted along with the Data Delivery Report. Initially, both paper and electronic reporting were carried out in parallel for a 2-week period to provide a smooth transition to the digital format (Field Work Variance [FWV] 03-004-R2, ITSI, 2012a).
- Removed the fill-in requirement for incidental DGM data gaps in Category B areas such as near trees and other obstacles difficult to access with the standard towed array. Limitations on this change included: a) Fill-in remained a requirement for individual data gaps of 500 sq. ft. or more; and, b) Fill-in remained a requirement for grids in which the cumulative area of incidental data gaps exceeds 5% of the grid (standard grid size is 100'x100') (FWV 03-005-R3, AR# OE-0737B.3).
- Modified the geophysical data submittal process to include delivery of both raw and processed data files in one delivery, within 5 days of data acquisition, with the following stipulations:
 - The processed data file is delivered as a .xyz file that includes the raw data fields plus additional leveled data fields for each EM61 channel and a sum field of the combined EM61 channels (ch1_lev, ch2_lev, ch3_lev, ch4_lev, sum).
 - The processed data are masked to the grid or grid block boundaries. The omitted data points remain in the raw .xyz file, which includes an approximately 10-ft. buffer of additional data around the periphery of the grid block (03-006-R1, AR# OE-0737B.4).
- Modified the geophysical quality control (QC) reporting process to include the use of digital recording, discontinuing the use of paper forms (03-007-R2, AR# OE-0737B.5).

- Modified the QC seeding rate in accordance with revised EM-200-1-15 performance standards and required QC seeds to be placed at a rate such that an average of one QC seed would be encountered per surface MEC removal team per day. Seeding frequency would be determined at the onset of a project by projecting anticipated field team production. Seeding frequency would be modified, as necessary, throughout the duration of the project based on actual field team production to allow continued achievement of the target rate (03-016, AR# OE-0765B.3; 03-018, AR# OE-0626N).
- Modified the process for demonstrating geophysical system performance (MEC QAPP, KEMRON, 2016a).

The MEC QAPP removed the requirement for a geophysical prove-out and implemented the geophysical system verification approach for verification of system performance in accordance with *Geophysical System Verification (GSV): A Physics-Based Alternative to Geophysical Prove-Outs for Munitions Response* (Environmental Security Technology Certification Program [ESTCP], 2009). The GSV process is a rigorous physics-based program that verifies geophysical system performance using an instrument verification strip (IVS) seeded with industry standard objects (ISO) and an enhanced QC seeding program. Geophysical system response values over the IVS and QC seed items are compared to published response values of the ISO to verify performance of the system prior to and throughout the duration of geophysical mapping activities.

Advanced geophysical classification is addressed in *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Munitions Response, Appendix B, Advanced Geophysical Classification for Munitions Response Quality Assurance Project Plan* (AGCMR-QAPP; KEMRON, 2016b).

5.4 Remaining Actions

The remaining RAs are summarized below:

- RA implementation and documentation in Units 5, 13, 17, 20, and 31;
- Complete the TM documentation for Ranges 43-48 South;
- Complete subsurface removal in the network of regularly-maintained fuel break system;
- Complete additional actions identified in TMs;

- Complete an evaluation of areas where there are high density anomalies associated with impact areas where military munitions with sensitive fuzes were fired; and
- Conduct prescribed burning in required units. Post-remediation prescribed burns may continue to be implemented after completing MEC removals and potentially after property transfer, as the Army's ability to conduct a burn is dependent on many factors including weather conditions.

6.0 REMEDIAL ACTION

This section describes general requirements for key work elements of the RA. Planned RAs for a unit or a group of units are presented in unit-specific SSWPs supplemented by TMs. Prescribed burns are described in unit-specific prescribed burn plans and after-action reports. When all work is completed in a unit or a group of units the completed actions are documented in unit-specific RARs. When all RAs are completed a RACR will be developed. A LUCIP will be developed prior to property transfer. Habitat monitoring and reporting will be implemented according to the established protocols.

6.1 Site-Specific Work Plan

Unit-specific SSWPs identify planned work areas and procedures for vegetation clearance, surface MEC removal, subsurface MEC removal, and DGM. Subsurface MEC removal will be conducted in selected areas to address specific concerns regarding MEC risk or reuse needs, such as roads, fuel breaks, and habitat restoration sites. Known areas will be identified in the SSWP. If changes are required to the SSWP a fieldwork variance will be developed to document changes. Additional subsurface MEC removal areas may be identified after surface MEC removal and DGM are completed. These additional areas will be identified in unit-specific TMs.

6.2 Vegetation Clearance

Vegetation clearance is required to perform the MEC RA in the Impact Area MRA. Vegetation clearance will be accomplished using prescribed burning, and/or manual and mechanical cutting, depending on site conditions. These areas will be identified in the SSWP.

6.2.1 Mechanical and Manual Vegetation Cutting

Mechanical and manual vegetation cutting equipment will be used to cut the vegetation. Manual tools such as trimmers may be used in areas where the mechanical cutter cannot gain access, or to trim tree branches. Trees will be left in place while removing lower branches to allow access for MEC removal teams. Field procedures are described in the MEC QAPP (KEMRON, 2016a).

6.2.2 Prescribed Burning

Prescribed burning is the primary method of vegetation clearance in habitat reserve areas containing CMC. One or more areas will be prepared for burning in any given year. Multiple burn events may be conducted over a period of several days that could be interrupted by one or more days of no burning. Prescribed burning will be performed for vegetation clearance in conjunction with the Presidio of Monterey Fire Department (POMFD). POMFD Chief will act as the Incident Commander during prescribed burn operations. Vegetation removal (manual and mechanical cutting) will be performed in the burn containment areas to provide for safe burn operations.

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.
- Follow-up operations to ensure that the fire is fully contained.

A site-specific prescribed burn plan will be developed for each or a group of prescribed burn unit(s) in the Impact Area MRA. Each prescribed burn plan will also include a community notification plan and air monitoring plan.

6.3 Technology-Aided Surface Munitions and Explosives of Concern Removal

Technology-aided surface removal will be conducted throughout the entire Impact Area MRA. Technology-aided surface removal procedures are governed by the MEC QAPP (KEMRON, 2016a). Detection instruments will be used to aid in the detection of surface MEC in areas where the ground surface is not visible. Recovered MEC will be destroyed by detonation, either blown in-place or collected for consolidation shots. MEC disposal procedures and notifications are described in the MEC QAPP (KEMRON, 2016a).

Site conditions (e.g., difficult terrain) may prevent surface MEC removal in certain areas from being conducted; these areas will be evaluated and documented in the TM and RAR.

6.4 Digital Geophysical Mapping Survey

DGM surveys will be conducted to provide a record of geophysical 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. Within areas identified for subsurface removal, geophysical anomalies potentially representing MEC items will be investigated and resolved.

Appropriate DGM technologies and sensor systems will be selected based on site conditions and project objectives. DGM instruments may include the Geonics EM61 for standard DGM surveys or advanced electromagnetic induction (EMI) sensor systems, such as the MetalMapper, TEMTADS, OPTEMA and MetalMapper 2x2, for classification of subsurface anomalies. Standard DGM will be conducted in accordance with the MEC QAPP (KEMRON, 2016a). Advanced geophysical classification surveys will be conducted in accordance with AGCMR-QAPP (KEMRON, 2016b). The AGCMR-QAPP has been updated with procedures for TEMTADS (FWV 009; KEMRON, 2017d) and MetalMapper 2x2 (FWV 012; KEMRON, 2018b). If other geophysical sensor systems are utilized for DGM, the functionality and integrity of the systems will be verified and documented through the GSV process. Such geophysical systems will be documented in the SSWP, and associated standard operating procedures (SOPs) and measurement quality objectives (MQOs) will be included in the MEC QAPP and/or AGCMR-QAPP.

Site conditions, such as difficult terrain or extensive overhead tree canopy, may prevent a digital survey from being conducted in specific areas. These areas will be documented in the TM and RAR and digital geophysical mapping records.

6.5 Technical Memorandum for Subsurface Removal

Following surface removal and DGM, the Army will review the data and submit a TM to EPA and DTSC that will present an evaluation of the work completed to date and, if necessary, describe subsurface removals recommended based on the results of the work in the removal area. Subsurface removal areas determined necessary for specific reuse, e.g., future restoration areas requested by the future landowner and identified in coordination with the Army, will also be documented in the TM. Factors that will be considered when determining whether additional actions are necessary in any identified area include MEC types and amounts and future reuse activity requirements. If no additional work is required, this also will be documented in the TM along with the rationale for no further removal actions.

Each TM will be an addendum to the SSWP. To avoid impacts to rare, threatened, and endangered species, completion and agency approval of the TM will be expedited to allow any additional actions to be completed before the next growing season. These TMs and associated correspondence will be included in the Administrative Record. The TMs will be provided for regulatory agency (EPA and DTSC) review and are subject to EPA approval (in consultation with DTSC). The Army will coordinate each TM with BLM at the time of its preparation.

For areas recommended for sifting as the best MEC removal technology, the Army may consolidate sift areas from multiple units into one removal action. Under this scenario, a separate SSWP and RAR will be developed to address sifting operations. The Army is evaluating newer technologies as part of the evaluation of alternatives to sifting.

During MEC removal activities, any observed evidence of potential soil contamination will be documented in the TM and provided to the Fort Ord Base Realignment and Closure (BRAC) office to address the HTW issues under the BRA and Site 39 programs.

6.6 Subsurface MEC Removal

Subsurface MEC removal will be conducted in selected areas. The total area of subsurface MEC removal is estimated to be approximately 10 percent of the Impact Area MRA, including:

- Regularly maintained fuel breaks and access roads that the Army, in coordination with BLM, 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 development areas.
- 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 were fired.

Subsurface removal areas will be identified in unit-specific SSWPs and TMs. Subsurface removal procedures are governed by the MEC QAPP (KEMRON, 2016a). In some portions of the Impact Area MRA, advanced classification techniques may provide an efficient method of completing the subsurface removal. The use of advanced classification at Fort Ord is governed by the AGCMR-QAPP (KEMRON, 2016b). Recovered MEC will be destroyed by detonation, either blown in-place or collected for consolidation shots. MEC disposal procedures and notifications are described in the MEC QAPP (KEMRON, 2016a).

6.7 Material Potentially Presenting an Explosive Hazard Disposal

Recovered material potentially presenting as an explosive hazard (MPPEH) items will be secured, subjected to detonation, or transported to a secure location for processing as either material documented as an explosive hazard, which would then be detonated, or as material documented as safe (MDAS), which is then certified as safe for recycling. The MEC QAPP (KEMRON, 2016a) contains MPPEH disposal and debris management requirements. The following references provide the regulatory framework for processing and disposal of MPPEH.

- DoDM 4160.21 (DoD, October 2015. Incorporating Change 1, effective January 2018)
- DoDI 4140.62 (DoD, August 2015. Incorporating Change 1, Effective October 2017)
- DoDM 6055.09 (DoD, February 2008. Administratively Reissued August 2010. Incorporating Change 2, effective date varies)
- Engineering Manual (EM) 200-1-15 (USACE, October 2015)
- EM 385-1-97 (USACE, September 2008. Incorporating Change 1, effective April 2013 and six errata sheets, June 2009 through May 2013)

6.8 Fort Ord Military Munitions Response Program Database

All data collected during execution of the RAs in the Impact Area MRA shall be stored in the Fort Ord MMRP database. The MEC QAPP (KEMRON, 2016a) describes the data collection during various activities to document field work and data processing for grid surveying, surface MEC removal, DGM, and subsurface MEC removal operations, as well as the database field descriptions for the required data.

7.0 QUALITY CONTROL

Each SSWP will incorporate the QC processes defined in the MEC QAPP (KEMRON, 2016a). The MEC QAPP describes the planning, implementation, acquisition, and assessment of data using effective methodologies, and QC for surface MEC removal and other field activities. The QC processes defined in the AGCMR-QAPP (KEMRON, 2016b) will be incorporated where advanced classification is used.

8.0 QUALITY ASSURANCE

The Army will provide QA to evaluate that the Contractor's QC system is functioning as stated. Areas of QA include:

- Monitor contractor field practices, including announced and extemporaneous, unobtrusive observations.
- QA seeding may occur in areas of surface removal.
- QA seeding and and/or QA digs may occur in areas of subsurface MEC removal.
- Review and observe field ground control and Global Positioning System (GPS) procedures. This is meant to avoid geo-referencing incompatibilities between the Army and the contractor.
- Independently examine data files and anomaly maps. QA will check the database against Team Leader data to ensure all anomalies flagged were excavated.
- Independently conduct surveys over a minimum of 10 percent of each grid where analog "mag and dig" (subsurface removal) and technology-aided surface removal is conducted.
- Independently conduct DGM QA which will include, at a minimum, 3 to 5 percent digital resurvey in subsurface removal areas.

9.0 HEALTH AND SAFETY

9.1 General

Each SSWP will reference the Accident Prevention Plan (APP). The APP must adhere to the requirements of EM 385-1-1 *Safety and Health Requirements* (USACE, 2014). The Contractor will ensure Health and Safety training requirements for on-site project personnel have been established in accordance with Occupational Safety and Health Administration requirements for hazardous site workers (29 Code of Federal Regulations [CFR] 1910.120). The training requirements will be specified in the APP and are to be met before project personnel can begin site work.

9.2 Explosives Siting Plan

All munitions response fieldwork will be conducted in accordance with DoD and Army explosives safety standards.

Explosives will be stored at the Department of Defense Explosives Safety Board (DDESB) sited explosive storage location. Explosive operations are to be performed in accordance with the DDESB-approved

Explosives Safety Submission (ESS). All explosive operations will be supervised by the Senior UXO Supervisor (SUXOS) and coordinated with the USACE OESS.

The Army will establish an exclusion zone to protect the public and personnel in accordance with DDESB standards. The required safety distances/zones will be described in each SSWP and prescribed burn plan.

10.0 DATA MANAGEMENT

Data management is addressed in the MEC QAPP (KEMRON, 2016a) which describes the planning, implementation, acquisition, and assessment of data using effective methodologies and thorough QC activities for MEC removal.

11.0 ENVIRONMENTAL PROTECTION PLAN

The SSWP will include an Environmental Protection Plan (EPP) that describes the approach, methods, and procedures to be employed to protect the natural environment during performance of the RAs. Specifically, the EPP will describe the procedures and methods that will be implemented during site activities to minimize pollution, protect and conserve natural resources (including trees), restore disturbed areas, and control noise and dust within reasonable limits.

The EPP will address the protection of special-status biological resources and implement mitigation measures identified in Chapter 3 of the HMP (USACE, 1997) and the PBO (USFWS 2017). Mitigation measures identified in any subsequent consultations with USFWS will also be incorporated. The HMP was developed to meet the requirements of the federal ESA for Army actions during disposal and reuse of the former Fort Ord. The HMP and PBO identify impacts and mitigation measures to be implemented during Army pre-disposal activities, such as cleanup of remediation sites. Implementation of the HMP and PBO mitigation measures constitutes compliance with the ESA and the substantive requirements of the California ESA.

To protect sensitive habitats and rare, threatened, or endangered species that could be impacted by these activities, baseline monitoring surveys are conducted prior to remediation. Baseline surveys consist of shrub transect surveys to characterize the CMC vegetation communities on the sites and in the surrounding areas, and surveys to identify locations and population size of the HMP annual species - sand gilia (*Gilia tenuiflora* ssp. *arenaria*), Monterey spineflower (*Chorizanthe pungens* var. *pungens*), and Seaside bird's-beak (*Cordylanthus rigidus* ssp. *littoralis*). Baseline and follow-up habitat monitoring are being conducted to

document and analyze the recovery of HMP species and habitat. The results of the monitoring are submitted by the Army to USFWS under established protocols.

12.0 SITE SECURITY

During the remedial action the Impact Area MRA is subject to site security requirements as outlined in the *Munitions Response Site (MRS) Security Program Former Fort Ord, California* (Army, 2016).

12.1 Access Management

Because the Impact Area MRA was determined to contain high explosive MEC on the surface, it was designated as a restricted MRS. Restricted MRS require physical barriers and other processes in place to control access. Access to the Impact Area is limited to authorized vehicles and personnel. Persons wishing to access the Impact Area are required to have munitions recognition and safety training prior to entry and may be required to have UXO escort.

The Impact Area MRA is enclosed by a four-strand barbed wire fence to prevent people from unknowingly or impulsively entering the restricted Impact Area. Concertina wire has been installed at critical locations such as at gates or in areas adjacent to high traffic corridors. The Impact Area is posted with bilingual (English and Spanish) “Danger” and “No Trespassing” signs in accordance with specifications in AR 385-30. The Impact Area MRA is located on land that is planned to be transferred to the BLM. Personnel from the Fort Ord BRAC office and BLM routinely check the Impact Area MRA fences to ensure that they remain in good condition and to identify and perform needed repairs in a timely manner.

The Army monitors the Impact Area perimeter for indications of trespassing or vandalism, documents evidence, and maintains a database on trespassing incidents within restricted MRS. This information is compiled in the MRS security program annual reports. Access management measures that include maintenance of the perimeter fence system and monitoring for and addressing trespassing incidents, have been implemented successfully. The measures are reviewed annually by the MRS Security Program Committee. The security committee was established to enhance coordination with outside agencies in an effort to reduce MEC hazards to the community, and serves as a mechanism for the review of ongoing site security measures and other security issues in the Impact Area. Access management measures may be adjusted based on committee recommendations. Changes to the design or placement of fences will be documented.

12.2 Public Education and Outreach

Public education plays an important role in discouraging activities that might lead to a trespass or vandalism incident in the Impact Area MRA. A brochure titled “Safety Alert” is widely distributed to local organizations and the Fort Ord BRAC office. The material follows Department of the Army guidance on implementing the 3 R’s (Recognize, Retreat, Report) of explosives safety. The Fort Ord BRAC office also offers a munitions safety education program for local schools to provide school age children with an understanding of munitions safety and the ability to implement the 3 R’s.

12.3 Long-Term Site Security

At the completion of the onsite RAs in the Impact Area MRA, long-term access management measures such as fencing will be re-evaluated as part of the development of a LUCIP.

13.0 REPORTING

At the completion of all RAs identified in a unit or a group of units that are associated with a SSWP, the Contractor will submit a RAR. [Section 4.0](#) provides the schedule for agency review and finalizing the RAR. Concurrent with issuing the final report, the Army will verify acceptance of the data deliverable in accordance with [Section 10.0](#) and that storage requirements are completed. Once site-specific RARs are finalized, the unit or group of units will be considered closed. Inspections and interim LUCs will continue to be implemented. Issued RARs and EPA concurrence letters are listed in [Appendix C](#).

At the completion of all RAs within the Impact Area MRA, the Army will evaluate the work completed against planned reuse activities and suitability of the selected LUCs. The Army will include the results of this evaluation in a RACR, which will be provided to EPA and DTSC.

14.0 LONG-TERM MANAGEMENT MEASURES

Long-term management measures will be further described in the LUCIP that will be prepared after completion of the remedial action in the Impact Area MRA.

14.1 Property Transfer Documentation

The Army will provide a property transfer document that:

- (a) informs BLM of the selected remedy, including land use or activity restrictions;
- (b) describes the munitions response actions conducted on the property;

(c) outlines appropriate procedures to be followed should suspected MEC be encountered; and

(d) establishes BLM's obligations to maintain and enforce any land use and activity restrictions selected as part of the remedy.

The property transfer documentation will also indicate:

- Specified designated reuses that are approved at the time the Army transfers the property, and that BLM must maintain.
- The risks associated with MEC that may be present can significantly increase if changes are made to the designated and approved uses.

14.2 Annual Surface Monitoring

The Army periodically monitors areas of Track 3 where a MEC surface removal has been completed. The monitoring includes a visual check for surface MEC, changes in area conditions that could increase the possibility of encountering MEC, and of locations where suspected MEC has initiated an incident report within the Track 3 areas of the former Fort Ord. Enhanced procedures are implemented in areas where projectiles with sensitive fuzes were found to be co-located with a high density of subsurface anomalies as part of a completed MEC response.

14.3 Annual Monitoring and Reporting

The Army will report MEC encounters unrelated to active MEC removal 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. MEC will be appropriately disposed and documented in the data base. The Army is reporting on this information as described in the MRS Security Program (Army, 2016).

14.4 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 remedies. If, upon review, the Army recommends any modification of the remedies, the Army will submit the proposal to EPA and DTSC under the FFA. The next five-year review will occur in 2022.

15.0 LAND USE CONTROLS

Prior to property transfer, the Army will prepare and submit to EPA for review and approval a LUCIP prepared as an addendum to this RD/RAWP. This plan shall contain implementation and maintenance actions. The Army is responsible for enforcing LUCs prior to property transfer, and will remain responsible until such obligations are assumed by another party. LUCs will be maintained until EPA and DTSC concur that, from an explosives safety perspective, the site is protective of human health and the environment regarding explosives safety risks posed by MEC, without a need for LUCs. This decision will be based on:

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

Under CERCLA, the Army is ultimately responsible for implementation, maintenance, monitoring, enforcement, and reporting of the remedial LUCs, 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 transfer of any responsibility for selected LUCs from the Army to another party will be described in a LUCIP that will be prepared as an addendum to this RD/RAWP. This implementation plan will be subject to regulatory agency (EPA and DTSC) review, and EPA approval.

15.1 Interim Land Use Controls

Prior to property transfer and during implementation of the RA, the Army will provide munitions recognition and safety training as needed, UXO-qualified personnel support for intrusive work or escort as needed, and site security and access management (maintain gates, fences and signs). Site security measures include maintenance of the existing perimeter fence and monitoring for evidence of trespass; these activities will continue to be reported to the regulatory agencies as part of the MRS Security Program annual reports. 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 RA. See [Section 12.0](#) for additional information on site security.

15.2 Future Land Use Controls

At the completion of all RAs, the Army will evaluate the work completed against planned reuse activities and the suitability of the selected LUCs. The Army will include the results of this evaluation in a RACR that it provides to EPA and DTSC. This report is a FFA primary document; as such, selected LUCs may be modified, when appropriate, with the approval of the regulatory agencies.

The Army, in coordination with the future landowner and regulatory agencies, will develop a detailed LUCIP prepared as an addendum to this RD/RAWP that will be available at the time the property is to be transferred. At the time of property transfer, the Army will specify the remedial LUCs in the property transfer documentation.

16.0 REFERENCES

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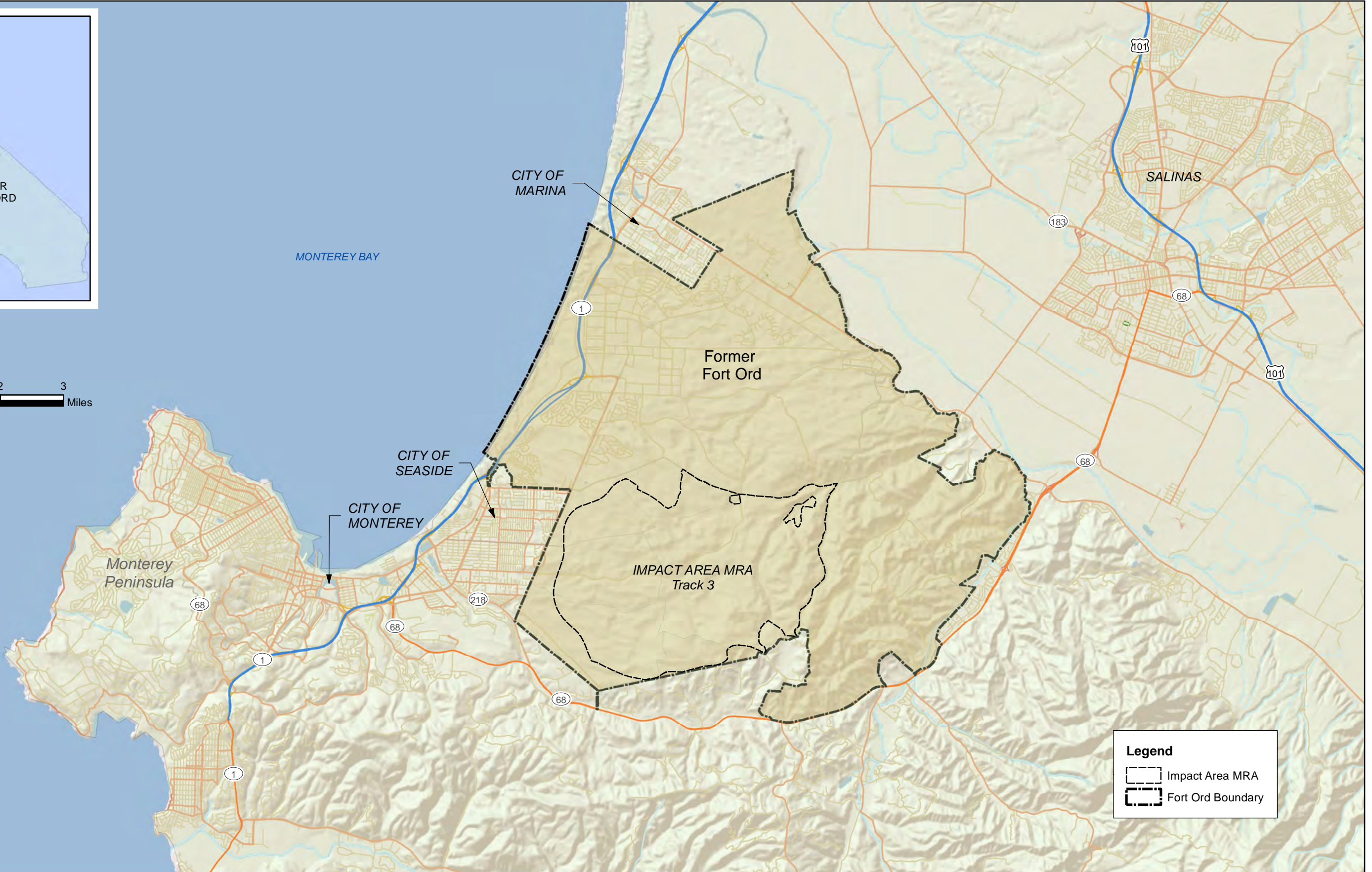
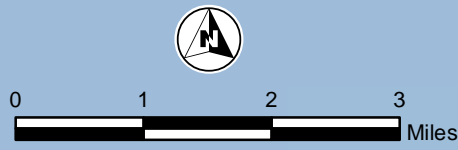
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Figures



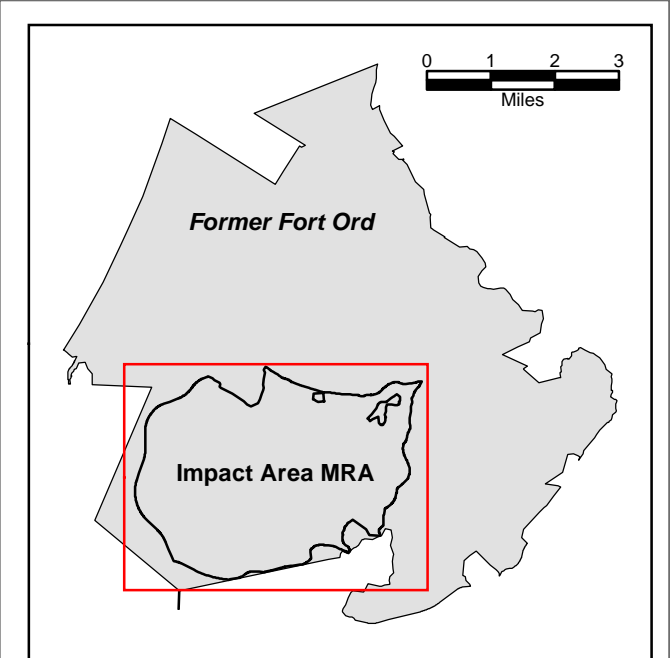
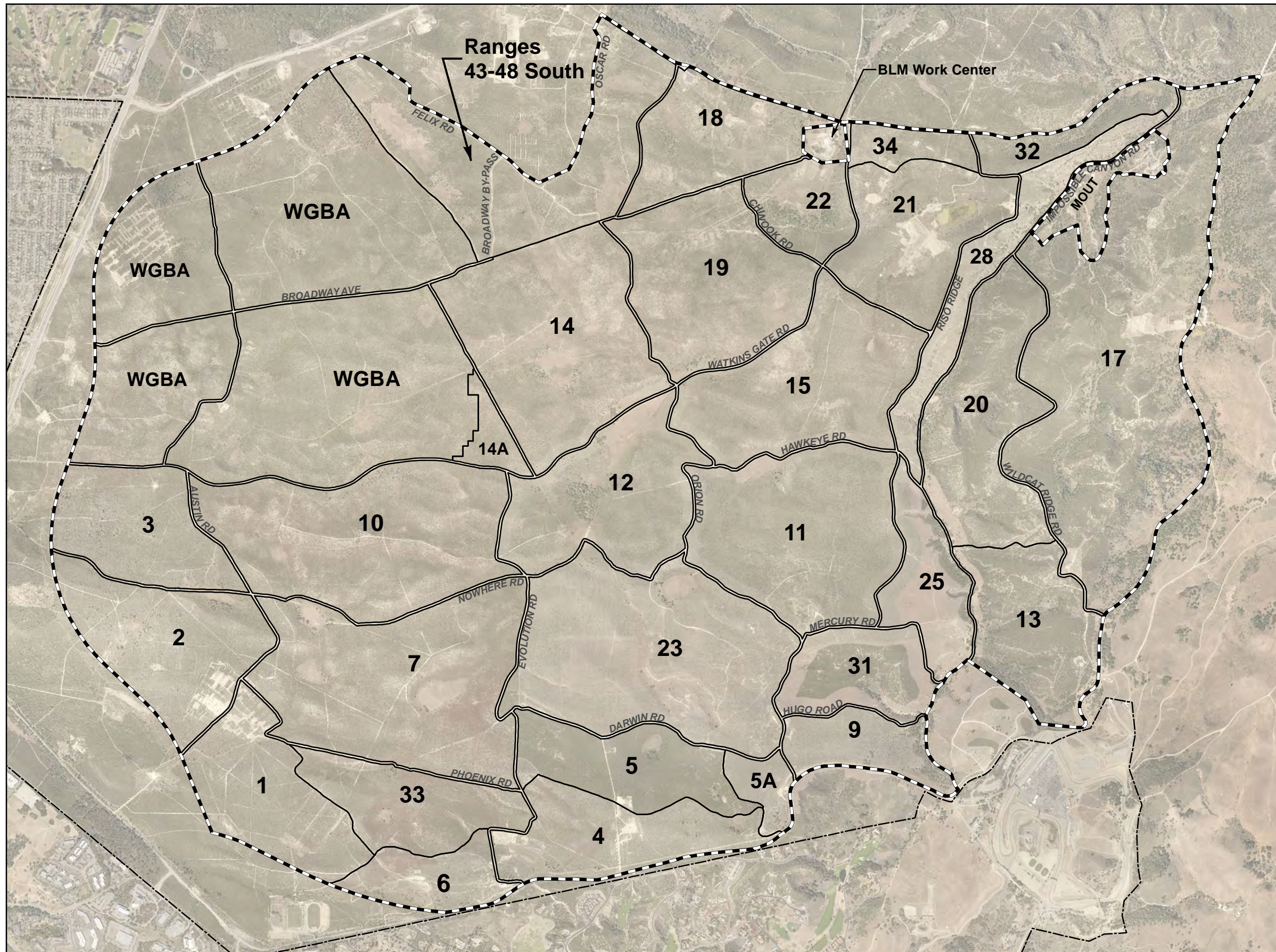
Legend

- Impact Area MRA
- Fort Ord Boundary



Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area
 Munitions Response Area (MRA)
 Munitions and Explosives of Concern (MEC) Removal
 Former Fort Ord, California

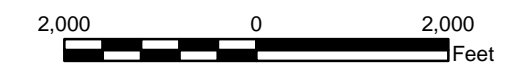
Figure 1
 Track 3 Impact Area MRA
 Regional Location Map



Legend

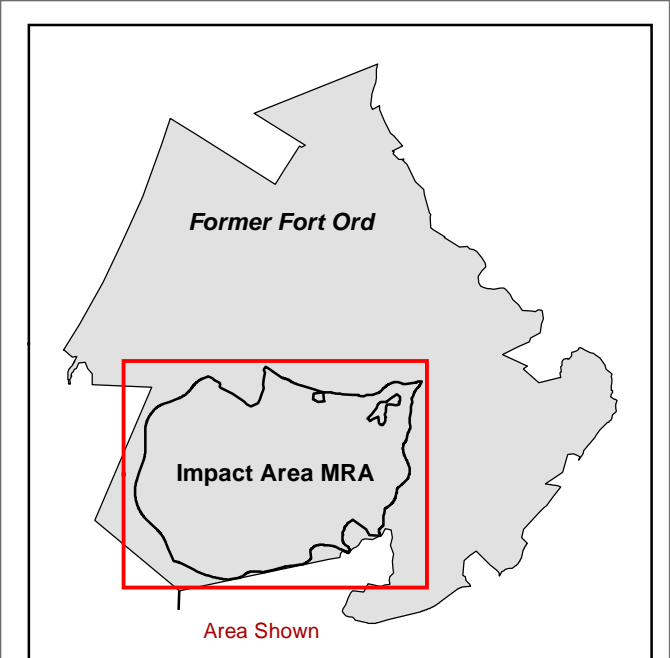
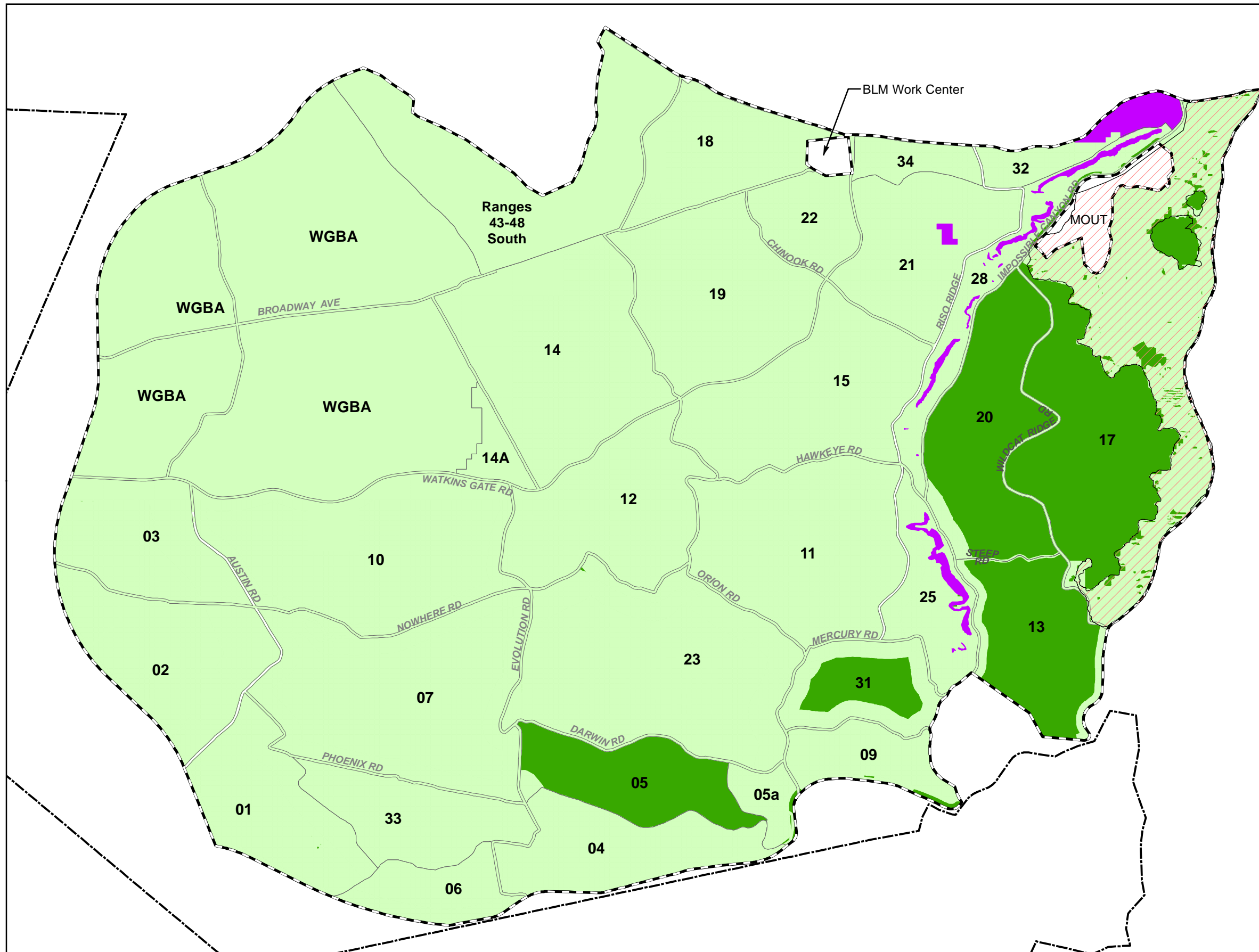
- 14 Unit
- Impact Area MRA
- Fort Ord Boundary

Note: Unit boundaries changes are based on adjustments that have been made to the fuelbreak system.



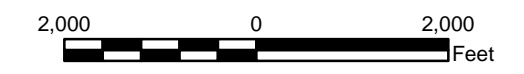
Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area
 Munitions Response Area (MRA)
 Munitions and Explosives of Concern (MEC) Removal
 Former Fort Ord, California

Figure 2
 Track 3 Impact Area MRA
 Unit Overview



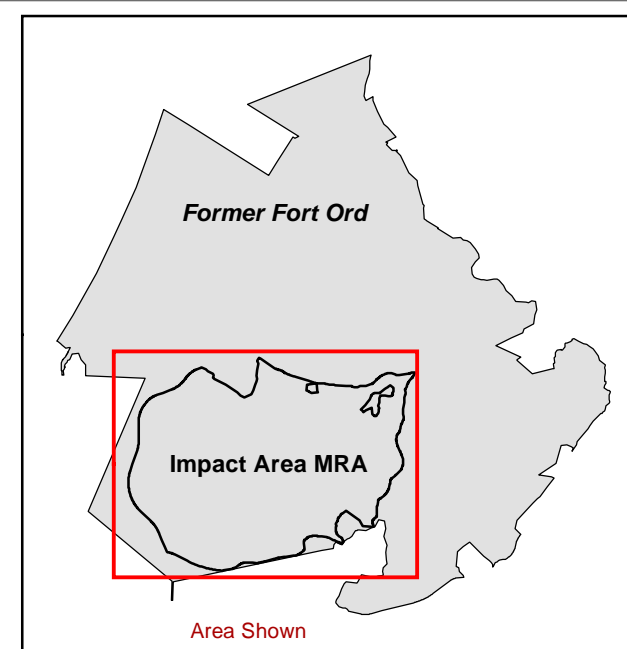
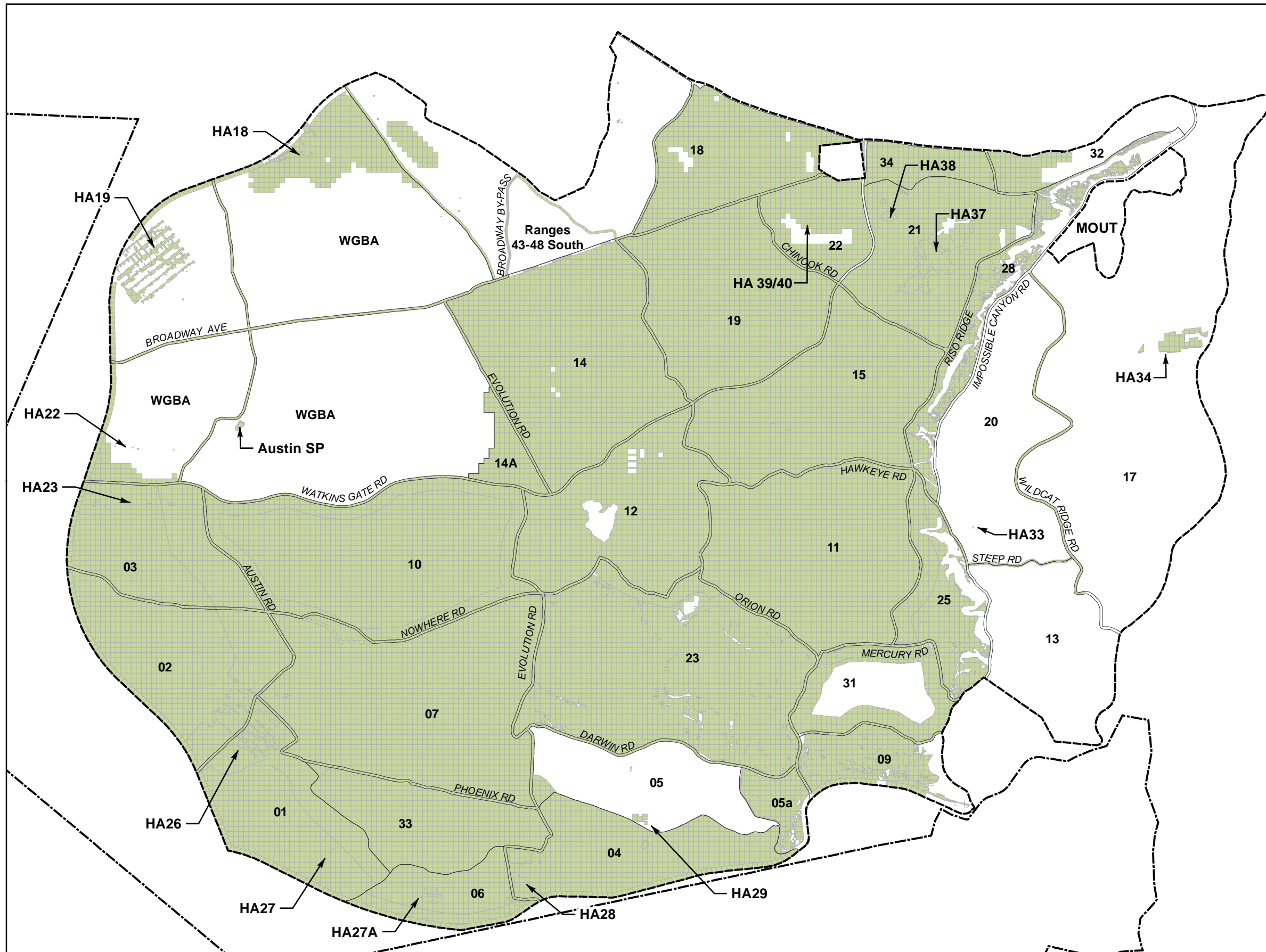
Legend

- Surface Removal Complete
- Surface Removal Planned
- Surface Removal Not Conducted
- Eucalyptus Fire Area (2003)
- Impact Area MRA
- Fort Ord Boundary



Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area
Munitions Response Area (MRA)
Munitions and Explosives of Concern (MEC) Removal
Former Fort Ord, California

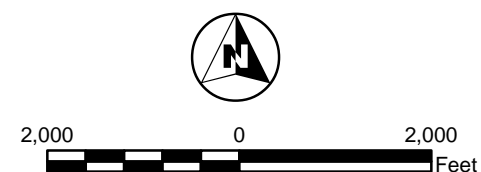
Figure 3
Surface MEC Removal Status



Legend

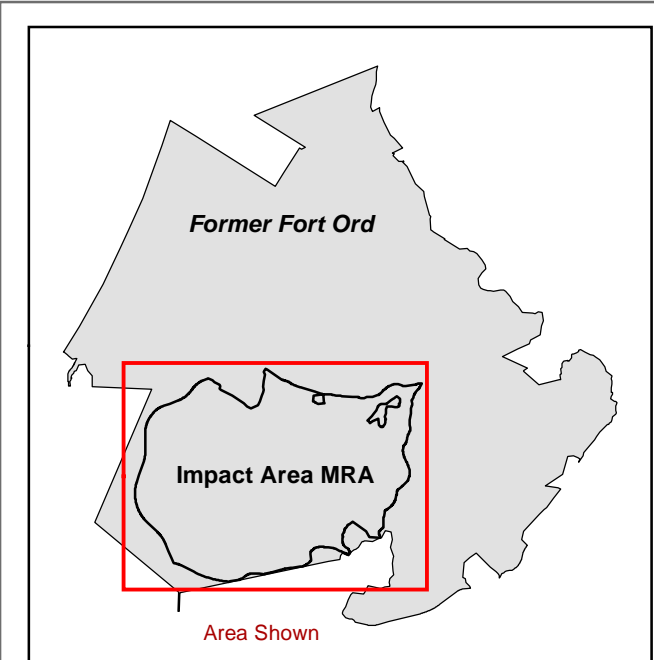
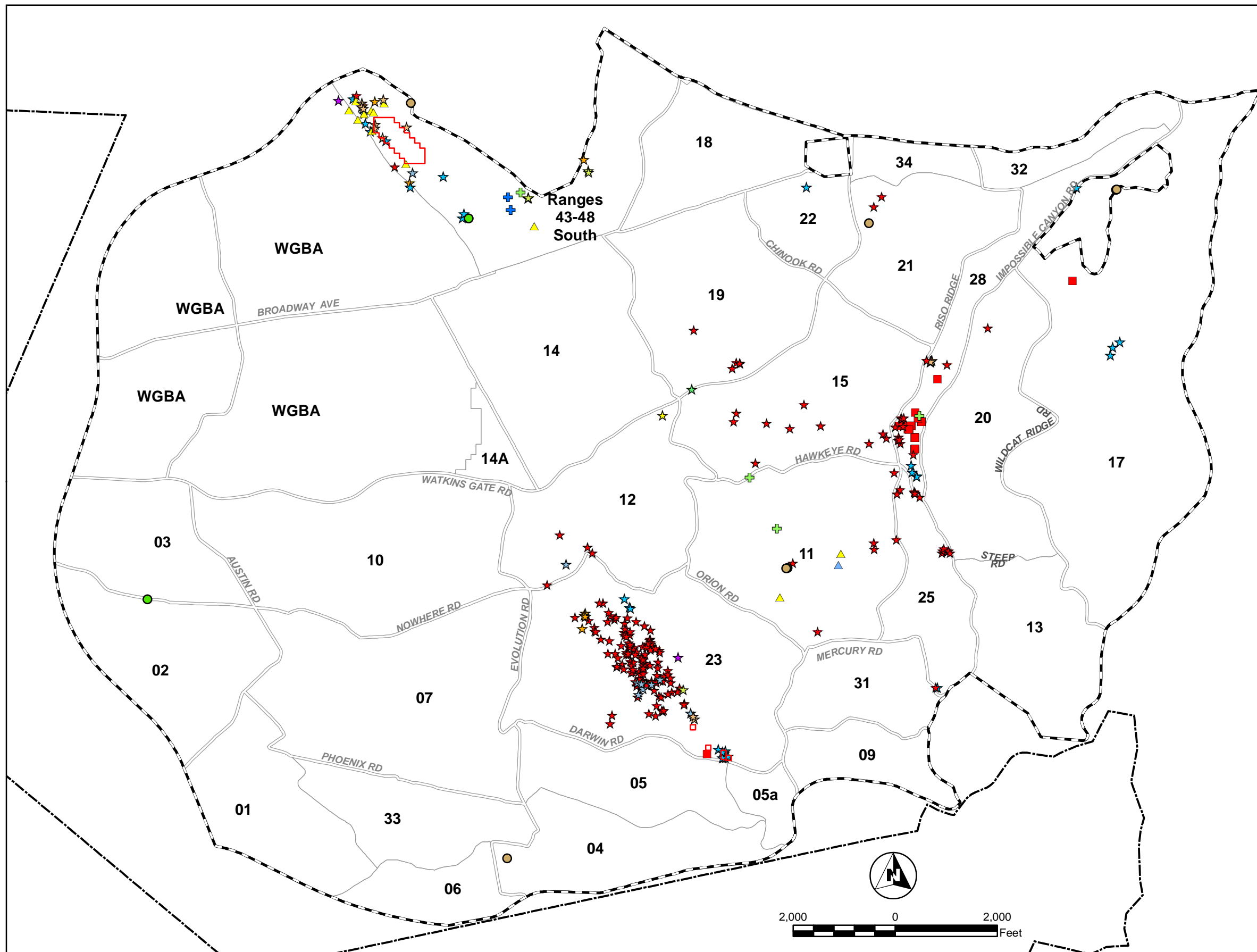
- Impact Area MRA
- Fort Ord Boundary
- DGM Survey Grid

Note: DGM transects were performed in Watkins Gate Burn Area and in Ranges 43-48 South.

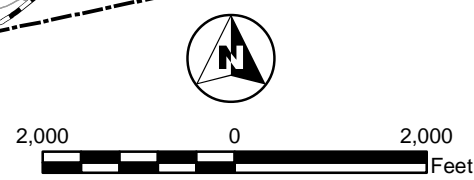


Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area
 Munitions Response Area (MRA)
 Munitions and Explosives of Concern (MEC) Removal
 Former Fort Ord, California

Figure 4
 DGM Grid Status

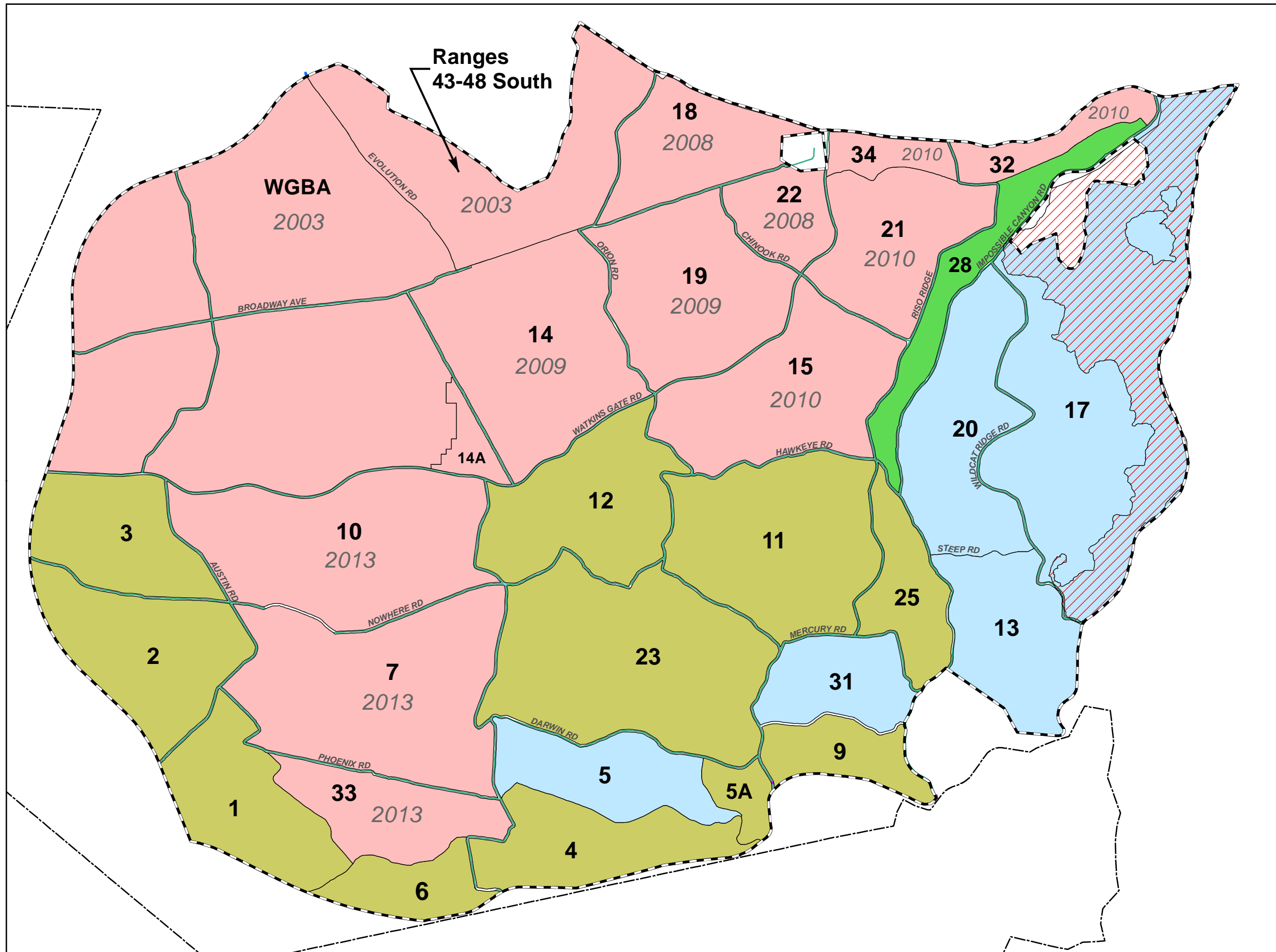


- Sensitive Fuze Type MEC**
- UXO**
- ★ Projectile, 40mm, high explosive dual-purpose, M430
 - ★ Projectile, 40mm, high explosive dual-purpose, M433
 - ★ Projectile, 40mm, high explosive tracer, M677
 - ★ Projectile, 40mm, high explosive, M381
 - ★ Projectile, 40mm, high explosive, M383
 - ★ Projectile, 40mm, high explosive, M384
 - ★ Projectile, 40mm, high explosive, M386
 - ★ Projectile, 40mm, high explosive, M406
 - ★ Projectile, 40mm, high explosive, M441
 - Projectile, 40mm, practice, M382
 - Projectile, 40mm, practice, M407A1
 - ✚ Projectile, 90mm, high explosive antitank, M348
 - ✚ Projectile, 90mm, high explosive antitank, M371A1
 - ▲ Rocket, 66mm, high explosive antitank, M72 series
 - ▲ Rocket, 66mm, incendiary, TPA, M74
- DMM**
- Cartridge, 40mm, high explosive, M383
- Field Study Area
- ▭ Impact Area MRA
- ▭ Fort Ord Boundary

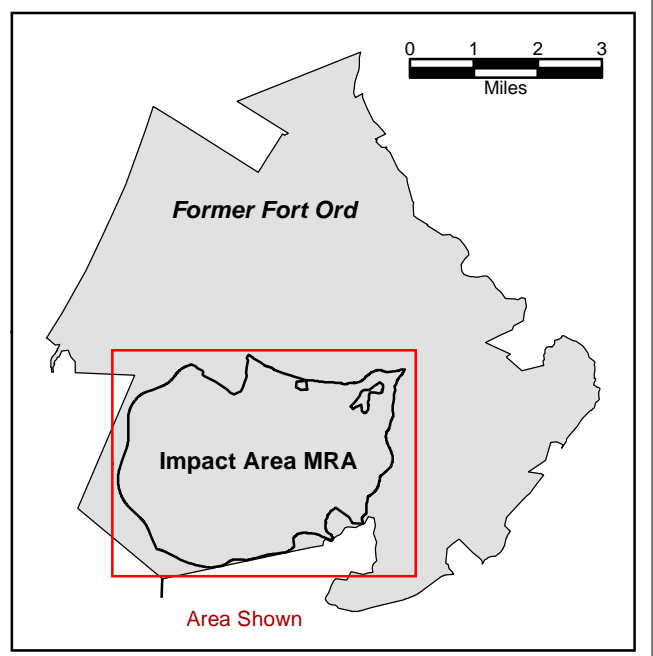


Preliminary Draft Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3
 Impact Area Munitions Response Area (MRA)
 Munitions and Explosives of Concern (MEC) Removal
 Former Fort Ord, California

Figure 6
 Sensitive Fuze Type Munitions

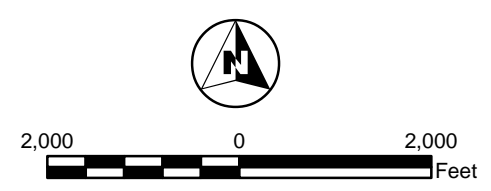


Ranges
43-48 South



Legend

- 14 Unit #
- 2009 Burn year
- Burn Completed/Remedial Action Completed
- Completed Non-Burn Unit (Cut)
- Planned Burn
- Remedial Action Complete - Follow-Up Burn Pending
- Eucalyptus Fire Area
- Impact Area MRA
- Fort Ord Boundary



Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area
Munitions Response Area (MRA)
Munitions and Explosives of Concern (MEC) Removal
Former Fort Ord, California

Figure 7
Prescribed Burn Status

Appendix A

*Applicable or Relevant and Appropriate
Requirements*

Table 3 from the Track 3 ROD (AR# OE-0647)

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 (HMP; USACE, 1997)</i> and additional requirements identified in subsequent documents (<i>USACE, 2005; USFWS, 1999, 2002, 2005; BLM, Army; 2004; Zander, 2002</i>). 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; <i>Adopted April 16, 2003; Revised September 15, 2004</i>)	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.	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. Substantive requirements: <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.	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. Under CERCLA, the Army is not required to comply with procedural requirements such as obtaining a permit.										
California Health and Safety Code	Title 22, CCR §66265.382	Relevant and Appropriate (3)/ Chemical and Action	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. <table border="1"> <thead> <tr> <th><u>lb. waste explosives</u></th> <th><u>Min. Distance from OB/OD to property</u></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>	<u>lb. waste explosives</u>	<u>Min. Distance from OB/OD to property</u>	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.
<u>lb. waste explosives</u>	<u>Min. Distance from OB/OD to property</u>													
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.	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. The Army is implementing the HMP which contains mitigation measures designed to protect the continued survival of rare and endangered plants.										

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	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>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	The regulations provide guidelines, programs and agency procedures for smoke management plans.	<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

Appendix B
Completed Primary Documents
as of August 2018

Completed Primary Documents as of August 2018

Unit/Area	Document (Administrative Record Number)
General	<ul style="list-style-type: none"> • Final, Work Plan Remedial Design / Remedial Action Track 3 Impact Area Munitions Response Area, Munitions and Explosives of Concern Removal, Former Fort Ord, California (OE-0660K) • Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Munitions Response(OE-0861B) • Final, Quality Assurance Project Plan, Former Fort Ord, California, Volume II, Appendix A – Munitions and Explosives of Concern Remedial Action (OE-0884A) • Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II Munitions Response, Appendix B - Advanced Geophysical Classification for Munitions Response (OE-0868B) • Final, Quality Assurance Project Plan, Former Fort Ord, California, Volume II, Appendix C - Prescribed Burn Air Monitoring (BW-2806B)
Non-Burn Areas	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, Non-Burn Areas, Former Fort Ord, California (OE-0685D) • Range 26 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0738) • Range 34 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0744)
Units 1, 2 and 3	<ul style="list-style-type: none"> • Final, Work Plan, Munitions Response Site-Bureau of Land Management Units 1-5 Munitions and Explosives of Concern Removal, Former Fort Ord, California (OE-0626L) • Munitions Response Site-Bureau of Land Management Units 1, 2, and 3 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0875) • Final, Munitions Response Site-Bureau of Land Management Units 1, 2, and 3 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0920B)
Units 4, 11 and 12	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 4, 5A, 9, 11, and 12, Former Fort Ord, California (OE-0736B) • Final, Munitions Response Site-Bureau of Land Management Units 11 and 12 Prescribed Burn Plan, August 2011, Updated May 2015, Former Fort Ord, California (OE-0735J) • Munitions Response Site-Bureau of Land Management Units 4, 11 and 12 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0790B) • Final, Munitions Response Site-Bureau of Land Management Units 4, 11, and 12, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0799B)

<p style="text-align: center;">Units 5A and 9</p>	<ul style="list-style-type: none"> • Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes Portions of 5A, 9, 25, and 31), Former Fort Ord, California (OE-0862B) • Munitions Response Site-Bureau of Land Management Units 5A and 9 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0878A) • Draft Final, Munitions Response Site-Bureau of Land Management Units 5A and 9 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0908A)
<p style="text-align: center;">Units 6, 7, 10 and 33</p>	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 6, 7, and 10, Former Fort Ord, California (OE-0765B) • Final, Munitions Response Site-Bureau of Land Management Units 7 and 10 Prescribed Burn Plan, Former Fort Ord, California (OE-0764C) • Final, Munitions Response Site-Bureau of Land Management Unit 6 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0811A) • Munitions Response Site-Bureau of Land Management Units 7, 10, and 33 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0842) • Final, Prescribed Burn 2013, Munitions Response Site-Bureau of Land Management Units 7 and 10, After Action Report, Former Fort Ord, Monterey County, California (OE-0812B) • Draft Final, Munitions Response Site-Bureau of Land Management Units 6, 7, 10, and 33, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0867)
<p style="text-align: center;">Units 14 and 19</p>	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 14 and 19, Former Fort Ord, California, Revision 0 (OE-0688G) • Final, Munitions Response Site-Bureau of Land Management Units 14 and 19 Prescribed Burn Plan, Former Fort Ord, California (OE-0681J) • Final, Munitions Response Site-Bureau of Land Management Units 14 and 19, Technical Memorandum, Former Fort Ord, California (OE-0723A) • Final, Prescribed Burn 2009, Munitions Response Site-Bureau of Land Management Units 14 and 19, After Action Report, Former Fort Ord, Monterey County, California (OE-0712B) • Munitions Response Site-Bureau of Land Management Units 14 and 19, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California, Revision 1 (OE-0753B)

<p>Units 15, 21, 32 and 34</p>	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 15, 21, 32, and 34, Former Fort Ord, California Revision 0 (OE-0711B) • Final, Munitions Response Site-Bureau of Land Management Units 15, 21, 32 and 34 Prescribed Burn Plan, 2010, Former Fort Ord, Monterey, California (OE-0708B) • Final, Munitions Response Site-Bureau of Land Management Units 15 and 21 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0760A) • Munitions Response Site-Bureau of Land Management Units 32 and 34 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0745) • Draft Final, Prescribed Burn 2010, Munitions Response Site-Bureau of Land Management Units 15, 21, 32 and 34, After Action Report, Former Fort Ord, Monterey County, California. Includes Draft Final Prescribed Burn Air Monitoring Report Munitions Response Site-Bureau of Land Management Burn Units 15, 21, 32, and 34, Former Fort Ord, California, Revision 0 (OE-0732A) • Final, Munitions Response Site-Bureau of Land Management Units 15, 21, 32 and 34, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0783B)
<p>Units 18 and 22</p>	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, Units 18 and 22, Former Fort Ord, California (OE-0648G) • Final, Munitions Response Site-Bureau of Land Management Units 18 and 22 Prescribed Burn Plan, 2008, Former Fort Ord, Monterey, California (OE-0645J) • Munitions Response Site-Bureau of Land Management Units 18 and 22, Technical Memorandum, Former Fort Ord, California (OE-0704) • Draft Final, Prescribed Burn 2008, Munitions Response Site-Bureau of Land Management Units 18 and 22, After Action Report, Former Fort Ord, Monterey County, California (OE-0683D) • Final, Prescribed Burn Air Monitoring Report, Munitions Response Site-Bureau of Land Management Burn Units 18 and 22, Former Fort Ord, California, Revision 0 (OE-0689G) • Final, Munitions Response Site-Bureau of Land Management Units 18 and 22, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0721B)
<p>Unit 23</p>	<ul style="list-style-type: none"> • Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes Portions of 5A, 9, 25, and 31), Former Fort Ord, California (OE-0862B) • Munitions Response Site-Bureau of Land Management Unit 23 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0893A)

Units 25 and 31	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 25 and 31, Former Fort Ord, California (OE-0880B) • Final, Munitions Response Site-Bureau of Land Management Units 25 and 31 Prescribed Burn Plan, Former Fort Ord, California (OE-0881B) • Munitions Response Site-Bureau of Land Management Unit 25, Technical Memorandum, Former Fort Ord, California (OE-0915A)
Unit 28	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern, Remedial Action Munitions Response Site-Bureau of Land Management Unit 28, Former Fort Ord, California (OE-0859B) • Munitions Response Site-Bureau of Land Management Unit 28, Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0910A) • Draft Final, Munitions Response Site-Bureau of Land Management Units 28, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California (OE-0928A)
Watkins Gate Burn Area	<ul style="list-style-type: none"> • Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Watkins Gate Burn Area, Former Fort Ord, California (OE-0794B) • Munitions Response Site-Bureau of Land Management Watkins Gate Burn Area Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California (OE-0832A)

Appendix C
Summary of Completed Actions

Summary of Completed Actions

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List of Acronyms

Army	United States Department of the Army
AR	Administrative Record
BCT	Base Realignment and Closure Cleanup Team
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
CMC	Central Maritime Chaparral
DGM	digital geophysical mapping
DTSC	Department of Toxic Substances Control
EOD	Explosive Ordnance Disposal
EPA	United States Environmental Protection Agency
FWV	Field Work Variance
HA	Historical Area
HE	high explosives
KEMRON	KEMRON Environmental Services, Inc.
IA	interim action
MD	munitions debris
MEC	munitions and explosives of concern
mm	millimeter
MOUT	Military Operations Urban Terrain
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
ODDS	Ordnance Detection and Discrimination Study
POMFD	Presidio of Monterey Fire Department
RAR	Remedial Action Report
RD/RA	Remedial Design/Remedial Action
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
SSWP	Site-Specific Work Plan
TCRA	Time Critical Removal Action
TM	Technical Memorandum
USACE	United States Army Corps of Engineers
UXO	unexploded ordnance
WGBA	Watkins Gate Burn Area

Non-Burn Areas

Non-Burn Areas are permanent fuel breaks, designated 100-foot buffer areas, and areas identified as those not dominated by Central Maritime Chaparral (CMC) vegetation types, where prescribed burning is not required. Work is being conducted in accordance with the *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Non-Burn Areas, Former Fort Ord, California* (Non-Burn Areas SSWP; Shaw Environmental, Inc. [Shaw], 2010a).

The Non-Burn Areas were subdivided into three groups:

- Group 1 provides a 100-foot buffer area along the habitat and development border 1) around the Bureau of Land Management (BLM) compound (Parcel F1.12); 2) around the Military Operations in Urban Terrain (MOUT) site (Parcel F1.7.2); and 3) the western and southern Impact Area Munitions Response Area (MRA) boundary. Subsurface MEC removal was completed in Group 1. Remediation for the 100-foot buffer is complete, as described in the *Letter from the Army to EPA documenting that 100-foot buffer is complete* (United States Department of the Army [Army], 2015).
 - The 100-foot buffer around the BLM Work Center was reconfigured to provide a complete 100-foot wide subsurface removal area that surrounds the original BLM Headquarters parcel/current BLM Work Center parcel. Further detail is provided in the *Final BLM HQ South Buffer, Munitions and Explosives of Concern Remedial Action Technical Information Paper Former Fort Ord California* (ITSI-Gilbane, 2014c).
 - MEC remedial actions associated with the 100-foot buffer around the MOUT site are documented in the *Draft Final MOUT Site Buffer, Munitions and Explosives of Concern, Remedial Action Technical Information Paper, Former Fort Ord, California* (ITSI-Gilbane, 2014d).
 - The Impact Area MRA 100-foot buffer was extended to the east along South Boundary Road at the request of BLM and as documented in Field Work Variance (FWV) 03-013. Details are provided in the *Draft Final, Impact Area MRA 100-Foot Buffer, Munitions and Explosives of Concern, Remedial Action, Technical Information Paper, Former Fort Ord, California* (Gilbane, 2015c).

- Group 2 includes 45-foot wide permanent fuel breaks within the Impact Area MRA. The MEC remedial action for Group 2 includes subsurface removal. Permanent fuel breaks have generally had technology-aided surface MEC removal, DGM, and subsurface removal.
 - Subgroup 2A includes fuel breaks that have undergone subsurface removal.
 - Subgroup 2B includes fuel breaks that require subsurface removal.

The permanent fuel break system was originally outlined in the Non-Burn Areas SSWP (Shaw, 2010a). The subsurface removal field work has been implemented over the course of the remedial actions within the Impact Area MRA, with modifications (documented in field work variances [FWVs]) based on project needs and with input from BLM. A report will be developed to document the remedial actions completed.

- Group 3 entails technology-aided surface MEC removal across approximately 365 acres of grasslands, oak woodlands, and wetland areas. MEC remedial actions for Group 3 include vegetation cutting, technology-aided surface MEC removal, and DGM. Remedial action at Ranges 26 and 34, in support of soil remediation activities, was conducted under the Non-Burn Areas SSWP (Shaw, 2010a). MEC removal in other Group 3 areas was performed under unit site-specific work plans (SSWPs).

Units 1, 2, and 3

Units 1, 2, and 3 are located in the southwestern section of the Impact Area MRA. Units 1, 2, and 3 are located adjacent to the western boundary of the Impact Area MRA. Unit 3 is the northern most unit of these three Units and is separated along its southern boundary from Unit 2 by Nowhere Road. Unit 2 is separated along its southern boundary from Unit 1 by Austin Road. The MEC remedial action in Units 1, 2, and 3 was conducted based on the *Final, Work Plan, Munitions Response Site (MRS)-BLM Burn Units 1-5 Munitions and Explosives of Concern Removal, Former Fort Ord, California* (Shaw, 2008a).

The *MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON Environmental Services, Inc. [KEMRON], 2016a) details the completed MEC remedial action. Portions of the units addressed in this Technical Memorandum included 125 acres of Unit 1, 166 acres of Unit 2, and 142 acres of Unit 3 (these acreages do not include the 100-foot buffer within the units). Vegetation in Units 1, 2, and 3 was masticated in their entirety. Surface MEC removal and DGM survey occurred in all grids within Units 1, 2, and 3 as part of the remedial action with the exception of 24 grids in Unit 2 that included target boxes, soil backstops, and military targets that precluded the completion

of surface MEC removal and DGM survey until Basewide Range Assessment (BRA) evaluation could be completed. The Technical Memorandum (TM) recommended limited subsurface anomaly investigation/removal within a portion of Unit 3, completion of field work in the 24 grids in Unit 2, and subsurface removal in identified areas (e.g., administrative roads and access areas) that support planned reuse by the BLM.

Surface MEC removal and DGM in Range 26, spanning approximately 50 acres of Units 1 and 2, had been completed under the Non-Burn Areas SSWP and documented in *Range 26 MEC Remedial Action technical Memorandum, Former Fort Ord, California* (Shaw, 2011c). No additional work was recommended for the Range 26 work area.

All work identified in the TMs has been completed in Units 1, 2, and 3. A description and discussion of the details of the work completed in Units 1, 2, and 3 are provided in *Final, Munitions Response Site-Bureau of Land Management Units 1, 2, 3 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (KEMRON, 2018b).

Units 4, 11, and 12

Unit 4 is located in the south-central portion of the Impact Area MRA, adjacent to the southern boundary. Unit 4 is bordered to the north by Unit 5 and to the east by Unit 5A. Unit 4 lies to the north of South Boundary Road, and to the east of Evolution Road. Units 11 and 12 are centrally located in the Impact Area MRA. Unit 12 is separated from Unit 11 along its eastern boundary by Orion Road. Some of the Ordnance Detection and Discrimination Study (ODDS) field test grids are located in Units 11 and 12. The ODDS is a phased evaluation of geophysical instruments specific to the site conditions at the former Fort Ord, California. The study is documented in *Final Ordnance Detection & Discrimination Study (ODDS) Report, Volumes I-VI* (Parsons, 2002). The MEC remedial action in Units 4, 11, and 12 was conducted based on the *Final Site Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 4, 5A, 9, 11 and 12 Former Fort Ord California* (ITSI-Gilbane, 2011).

The *MRS-BLM Units 4, 11, and 12 MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* (ITSI-Gilbane, 2013c) details the completed MEC remedial action. Prescribed burns initially planned in 2011 at Units 11 and 12 were cancelled due to the discovery of large MEC items on the ground surface during burn preparation activities. Units 4, 11, and 12 were masticated in their entirety. Surface MEC removal and DGM survey occurred in all grids within Units 4, 11, and 12 as part of the remedial action with the exception of 8 acres in Unit 12 due to a thick grove of oak trees. The completion of the

surface MEC removal resulted in several unexploded ordnance (UXO) items containing sensitive fuzes being located and removed from Units 11 and 12. The DGM survey indicated high density subsurface anomalies in most of these locations. In addition, approximately 15 acres of Unit 23 were included in this remedial action as containment lines for the planned prescribed burn of Units 11 and 12. The TM recommended subsurface removal prior to grading in areas of planned reuse by BLM in Units 11, 12, and in the 100-foot wide area adjacent to South Boundary Road (Unit 4). Although no additional subsurface MEC removal is recommended for areas where MEC items with sensitive fuzes were located during surface MEC removal activities, it was recommended that these areas be closely monitored as part of the Track 3 annual surface monitoring program.

A description and discussion of the details of the work completed in Units 4, 11, and 12 are provided in *Final MRS-BLM Units 4, 11, and 12, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (ITSI-Gilbane, 2014b). Unit 4 totals approximately 145 acres, Unit 11 totals approximately 273 acres, and Unit 12 totals approximately 203 acres. An additional 15 acres within the northern portion of Unit 23 was also addressed in the Remedial Action Report.

The Army received a United States Environmental Protection Agency (EPA) concurrence letter regarding completion of the Units 4, 11, and 12 MEC remedial action in September 2014. *Letter from the EPA to the Army, Final MRS-BLM Units 4, 11, and 12 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California July 2014* (EPA, 2014).

In addition to the remedial action described above, a MEC risk reduction was also completed at Units 11 and 12. The United States Army Corps of Engineers (USACE) Ordnance and Explosives Safety Specialist (OESS) determined that removal of 155-millimeter (mm) and 8-inch projectiles to one and two foot depths within Units 11 and 12 was required to reduce risk of detonation during future prescribed burning. Existing DGM data was utilized to identify anomalies that could represent 155mm and 8-inch projectiles. Advanced geophysical classification was used to evaluate the anomalies. Anomalies classified as a source that potentially could have been 155-mm projectiles or 8-inch projectiles were investigated removed to one foot depth in the interior of Units 11 and 12 (436 feet or more from the perimeter of the 45-foot wide fuel break) and to a two foot depth in the outer zone of each unit (within 436 feet of the perimeter of the 45-foot wide fuel break). This work is described in the *Final Units 11 and 12 MEC Risk Reduction Technical Memorandum, Former Fort Ord, California* (KEMRON, 2016c). The Army attempted to burn Units 11 and 12 during the 2015-2017 burn seasons; however, the required combination of weather conditions and other factors did not occur, and the burns were postponed for a future burn season.

Units 5A and 9

Units 5A and 9 are located in the southeastern section of the Impact Area MRA. Unit 5A is separated from Unit 9 along its eastern boundary by Orion Road. Units 5A and 9 are adjacent to the southern boundary of the Impact Area MRA. The MEC remedial action in Units 5A and 9 was conducted under the *Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes Portions of 5A, 9, 25, and 31), Former Fort Ord, California* (KEMRON, 2015c).

The *MRS-BLM Units 5A and 9, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2016d) details the remedial action. Portions of the units addressed in this Technical Memorandum included 30 acres of Unit 5A and 68 acres of Unit 9 (these acreages do not include the 100-foot buffer within the units). Units 5A and 9 were masticated in their entirety. Surface MEC removal and DGM survey occurred in all grids within Units 5A and 9 as part of the remedial action with the exception of nine acres in Unit 9 being inaccessible to DGM survey due to the presence of a significant stand of oak trees in the eastern portion of the unit. Subsurface removal to the depth of instrument detection was completed within the 100-foot buffer in Units 5A and 9 as previously reported in *Draft Final, Impact Area MRA 100-Foot Buffer, Munitions and Explosives of Concern, Remedial Action, Technical Information Paper, Former Fort Ord, California* (Gilbane, 2015c).

Approximately 1.2 acres of subsurface removal in Unit 5A was completed as recommended in the TM. A description and discussion of the details of the work completed in Units 5A and 9 MEC remedial action are provided in the *Draft Final MRS-BLM Units 5A and 9 Munitions and Explosives of Concern Remedial Action Report, Former Fort Ord, California* (KEMRON, 2017e).

The Army received EPA concurrence letter regarding completion of the Units 5A and 9 MEC remedial action in December 2017. *Letter from the EPA to the Army, MRS-BLM Units 5A and 9 MEC Remedial Action Report, Former Fort Ord, California* (EPA, 2017).

Units 6, 7, 10, and 33

Unit 6 is located in the southwestern portion of the Impact Area MRA, adjacent to the southern boundary. Units 7, 10, and 33 are located in the southwestern portion of the Impact Area MRA. Unit 10 is the northern most unit of these four Units and is separated along its southern boundary from Unit 7 by Nowhere Road. Unit 7 is separated along its southern boundary from Unit 33 by Phoenix Road. Unit 33 is bordered to the south by Unit 6. The MEC remedial action in Units 6, 7, 10, and 33 was conducted based on the *Final,*

Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 6, 7, and 10, Former Fort Ord, California (ITSI, 2012). The prescribed burns within Units 7 and 10 were conducted in October 2013. Unit 33 was unintentionally burned during the prescribed burn of Unit 7. Remedial action activities in Unit 33 were included as part of the field work following the unintended burning.

The *Final, MRS-BLM Unit 6 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California* (ITSI-Gilbane, 2014a) details the Unit 6 MEC remedial action. Unit 6 was masticated in its entirety. Surface MEC removal and DGM survey are complete. Surface MEC removal was not conducted in the footprint of Historical Area (HA) 27A since DGM based subsurface removal was conducted in the footprint of HA-27A as described in the *Draft Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (Gilbane, 2014b). Limited DGM data gaps occurred as a result of obstacles preventing access to conduct surveys, such as gullies, berms, trees and in areas that previously were surveyed as part of completed soil remediation activities at HA 27A. The TM did not recommend any additional work.

The *Munitions Response Site-Bureau of Land Management Units 7, 10, and 33 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California* (Gilbane, 2015a) details the Unit 7, 10, and 33 MEC remedial action. Surface MEC removal and DGM survey are complete. Limited DGM data gaps occurred as a result of obstacles preventing access to conduct surveys, such as gullies, berms, tree and stands of oak trees. No work was conducted in the footprint of Range 26 since remedial work was completed under a separate work plan. Remedial action for Range 26 is described in the *Range 26 MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* (Shaw, 2011c). The TM for Units 6, 7, and 10 identified areas where subsurface disturbance or construction support would be required to conduct erosion control measures, prior to grading. The TM did not recommend any additional work or subsurface removal.

Remedial action at Units 6, 7, 10, and 33 is complete. A description and discussion of the details of the work completed in Units 6, 7, 10, and 33 MEC remedial action are provided in the *Draft Final, MRS-BLM Units 6, 7, 10, and 33, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California* (KEMRON, 2015a). The Remedial Action Report addressed approximately 73 acres of Unit 6, approximately 341 acres of Unit 7, approximately 327 acres of Unit 10, and approximately 124 acres of Unit 33.

The Army received an EPA concurrence letter regarding completion of the Units 6, 7, 10, and 33 remedial action in September 2015. *Letter from the EPA to the Army, MRS-BLM Units 6, 7, 10, and 33 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, July 2015* (EPA, 2015b).

Units 14 and 19

Units 14 and 19 are located in the northern portion of the Impact Area MRA. Unit 14 is separated from Unit 19 along its eastern boundary by Orion Road. The MEC remedial action in Units 14 and 19 was conducted based on the *Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 14 and 19, Former Fort Ord, California, Revision 0* (Shaw, 2009a). The prescribed burns for Units 14 and 19 were conducted in October and November 2009, respectively.

The *Final, MRS-BLM Units 14 and 19, Technical Memorandum, Former Fort Ord, California* (Shaw, 2011e) details the Units 14 and 19 MEC remedial action. During the prescribed of Unit 14, additional acreage was burned immediately west of the unit. As a result, an area of approximately 27.5 acres was added to the remediation scope as Unit 14A. Surface MEC removal was performed across the entirety of Units 14, 14A, and 19. The completion of the surface MEC removal resulted in two separate areas where UXO 40mm high explosive (HE) projectiles were located in Unit 19. The DGM of those areas indicate high density of subsurface anomalies also occur there. After surface MEC removal activities were complete, DGM occurred over the entire project area, with the exception of areas where DGM activities were precluded due to heavy tree cover or unsafe terrain. The TM did not recommend any additional work. Although no additional subsurface MEC removal is recommended for areas where MEC items with sensitive fuzes were located during surface MEC removal activities, it is recommended that these areas be closely monitored as part of the Track 3 annual surface monitoring program.

A description and discussion of the details of the work completed as in Units 14, 14A, and 19 MEC remedial action are provided in the *Final MRS-BLM Units 14 and 19 MEC Remedial Action Report, Former Fort Ord, California* (Shaw, 2011f). The Remedial Action Report addressed approximately 522 acres of Units 14 and 19, as well as Unit 14A, an approximate 27.5 acre-area adjacent to Unit 14.

The Army received an EPA concurrence letter regarding completion of the Units 14 and 19 MEC remedial action in August 2012. *Letter from the EPA to the Army, Final MRS-BLM Units 14 and 19 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, Revision 1* (EPA, 2012).

Units 15, 21, 32, and 34

Unit 15 is located in the northeastern quadrant of the Impact Area MRA. Unit 21 is also located in the northeastern quadrant of the Impact Area MRA. The MEC remedial action in Units 15, 21, 32, and 34 was conducted based on the *Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 15, 21, 32, and 34, Former Fort Ord, California Revision 0* (Shaw, 2010b). The prescribed burns for Units 15 and 21 were conducted in October 2010.

The *Final MRS-BLM Units 15 and 21 MEC Remedial Action Technical Memorandum Former Fort Ord, California* (ITSI-Gilbane, 2012) details the remedial action for Units 15 and 21. Surface MEC removal and DGM are complete. During surface MEC removal operations, 32 grids in Unit 21 contained significant amounts of munitions debris (MD) associated with 3.5-inch rockets. The probability for the 3.5-inch rockets to be present below the surface presented a hazard to Presidio of Monterey Fire Department (POMFD) personnel conducting prescribed burn operations. A change was made to the SSWP through *Field Work Variance TII-042* (Shaw, 2011a) to conduct a limited subsurface removal in the 32 grids located in Unit 21 along the Riso Ridge permanent fuel break. No MEC items were located during limited subsurface removal. Also, during surface MEC removal, several MEC items containing sensitive fuzes were located in areas of high density subsurface anomalies in Units 15 and 21. Surface MEC removal occurred in all grids with the exception of the grids located within the extent of the vernal pool in Unit 21. Approximately 8 acres within Unit 21 planned for DGM survey were inaccessible due to steep slopes, washouts, a vernal pool, sensitive habitat, HA-37 remediation activities, asphalt, a building, and Armored Personnel Carriers. The TM did not recommend any additional work. Although no additional subsurface MEC removal is recommended for areas where MEC items with sensitive fuzes were located during surface MEC removal activities, it is recommended that these areas be closely monitored as part of the Track 3 annual surface monitoring program.

In 2014 the vernal pool, which was previously inaccessible to the DGM, became sufficiently dry and DGM data collection was conducted. Approximately 2.4 acres of a 3.3 acre (approximate) vernal pond within Unit 21 was surveyed in 2014. This area was not surveyed previously because it was underwater (inaccessible). The Unit 21 vernal pool area that was not surveyed in 2014 includes a large stand of vegetation in the central portion of the vernal pool. DGM survey results for the vernal pool area were reported in the *Unit 21 Vernal Pool Remedial Action, Letter Report, Former Fort Ord, California* (Gilbane, 2015b).

The *MRS-BLM Units 32 and 34 MEC Remedial Action Technical Memorandum Former Fort Ord, California* (Shaw, 2011d) details remedial action for Units 32 and 34. Thirty-three acres of MRS-BLM Unit 32 were masticated; the remaining areas could not be masticated due to steep slopes, standing water, and biological constraints. Unit 34 was masticated in its entirety as part of the preparation for prescribed burn operations. Approximately 23 acres within Unit 32 did not receive surface MEC removal due to restricted access as a result of poison oak, steep terrain, and standing water in a vernal pool. Approximately 36 acres in the northeastern portion of Unit 32 did not receive DGM survey due to a combination of steep slopes, standing water in a vernal pool, as well as large contiguous stands of oak trees and poison oak.

It was determined from surface MEC removal in adjacent areas and historical records that the eastern portion of Unit 32 exhibited a low probability of containing MEC items. Due to inaccessibility and the low probability of finding MEC neither surface MEC remediation nor DGM survey were performed in this area. The TM did not recommend any additional work.

A description and discussions of the details of the work completed in Units 15, 21, 32, and 34 remedial action are provided in the *Final MRS-BLM Units 15, 21, 32, and 34 Munitions and Explosives of Concern Remedial Action Report Former Fort Ord, California* (ITSI-Gilbane, 2013b). The Remedial Action Report addressed approximately 238 acres of Unit 15, approximately 167 acres of Unit 21, approximately 55 acres of Unit 32, and approximately 37 acres of Unit 34.

The Army received an EPA concurrence letter regarding the completion of Units 15, 21, 32 and 34 remedial action in September 2013. *Letter from the EPA to the Army, Final MRS-BLM Units 15, 21, 32 and 34 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, June 2013* (EPA, 2013).

Units 18 and 22

Units 18 and 22 are located adjacent to the northern boundary of the Impact Area MRA and the BLM Work Center. Unit 18 is separated from Units 19 and 22 along its southeastern border by Broadway Ave. The MEC remedial action in Units 18 and 22 was conducted based on the *Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, Units 18 and 22, Former Fort Ord, California* (Shaw, 2008b). In December 2008, a prescribed burn was conducted in Units 18 and 22.

The *Munitions Response Site-Bureau of Land Management Units 18 and 22, Technical Memorandum, Former Fort Ord, California* (Shaw, 2009b) details the remedial action for Units 18 and 22. Surface

MEC removal and DGM were completed with the exception of areas where DGM activities were precluded due to heavy oak tree cover or slopes. A total subsurface removal of 15.8 acres was completed in Units 18 and 22. Subsurface removal activities included: future BLM habitat restoration areas (7.5 acres), BLM 100-foot buffer subsurface removal (5.1 acres), lead remediation area (0.6 acres), and Range 42 pad area (2.1 acres). Based on the work conducted, an approximately 20.2 acres of future BLM habitat restoration area was determined to have low risk for encountering MEC. The TM recommended no additional subsurface MEC remediation for the site.

A description and discussions of the details of the work completed in Units 18 and 22 remedial action are provided in the *Final MRS-BLM Units 18 and 22 Munitions and Explosives of Concern Remedial Action Report, Former Fort Ord California* (Shaw, 2011b). The Remedial Action Report addressed approximately 209 acres across Units 18 and 22.

The Army received an EPA concurrence letter regarding completion of the Units 18 and 22 MEC remedial action in September 2011. *Letter from the EPA to the Army, Final MRS-BLM Units 18 and 22 Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, March 29, 2011* (EPA, 2011).

Unit 23

Unit 23 is located in the south-central section of the Impact Area MRA. Unit 23 lies to the south of Nowhere Road, to the west of Orion Road, to the north of Darwin Road, and the east of Evolution Road. The MEC remedial action in Unit 23 was conducted based on the *Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes Portions of 5A, 9, 25, and 31), Former Fort Ord, California* (KEMRON, 2015c).

The *MRS-BLM Unit 23, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2017a) details the MEC remedial action for Unit 23. The Technical Memorandum addressed 347 acres of Unit 23. The same large MEC items that precluded prescribed burning in Units 11 and 12 were found in Unit 23; therefore, Unit 23 was masticated in its entirety. Subsurface removal was completed to a depth of one foot on temporary vehicle access routes to provide emergency access during work and to reduce transit times to the interior of the unit. The TM recommended an evaluation to address munitions with sensitive fuzes; limited subsurface removal to remove large projectiles at shallow depths to support future prescribed burning; and limited subsurface removal to support future subsurface activities associated with habitat restoration or erosion control. The limited subsurface removal to remove large projectiles at

shallow depths to support future prescribed burning is planned for 2018.

Remedial action in approximately 15 acres within the northern portion of Unit 23 had been previously completed and reported in *MRS-BLM Units 4, 11, and 12 MEC Remedial Action Report, Former Fort Ord, California* (ITSI Gilbane, 2014b). Remedial action in approximately 5 acres in the western portion of Unit 23 was addressed in *MRS-BLM Units 7, 10, and 33 MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* (Gilbane, 2015a).

The Army is conducting a field study according to *Final, Work Plan, Munitions with Sensitive Fuzes Field Study, Former Fort Ord, California* (KEMRON, 2017b), with an objective of demonstrating the performance and capabilities of DGM systems, including advanced geophysical classification technologies, for the identification of subsurface munitions, specifically those with sensitive fuzes. Some field study activities occurred in Unit 23. This information will be documented in a report at the completion of the field study.

Units 25 and 31

Unit 25 is located in the southeastern portion of the Impact Area MRA. Unit 25 lies to the east of Riso Ridge Road, west of Impossible Canyon Road, and north/northeast of Mercury Road. Unit 31 lies to the southwest of Unit 25. The MEC remedial action in Unit 25 was conducted based on the *Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (KEMRON, 2016e). The preparation of prescribed burn containment areas for Unit 31 was completed in 2016 and the prescribed burn is pending.

The *MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2018a) details the completion of the MEC remedial action. Unit 25 is approximately 95 acres. Steep and difficult terrain existed in portions of Unit 25. Unit 25 was masticated to the extent feasible. Due to terrain, nine acres of vegetation cutting was not conducted. The same nine acres of Unit 25 has been determined by UXO safety personnel to be inaccessible for surface MEC removal due to extreme terrain. Approximately 20 acres of Unit 25 has been determined to be inaccessible to DGM. Based on the results of the surface MEC removal performed in adjacent areas and the limited DGM data collected in these same areas, the likelihood of MEC remaining in this acreage is considered low. No additional work is recommended for Unit 25. The TM recommended an evaluation to address munitions with sensitive fuzes.

Unit 28

Unit 28 is located in the northeastern portion of the Impact Area MRA. Unit 28 lies to the east of Riso Ridge Road, west of Impossible Canyon Road, north of Hawkeye Road, and ends south of Tongue Ridge. The MOUT Site abuts Unit 28 to the east. The MEC remedial action was conducted based on the *Final, Site-Specific Work Plan, Munitions and Explosives of Concern, Remedial Action MRS-BLM Unit 28, Former Fort Ord, California* (KEMRON, 2016b). Prescribed burning is not planned at Unit 28 due to the shape, size, and terrain of the unit; therefore, Unit 28 was masticated manually and mechanically, where accessible.

The *MRS-BLM Unit 28 MEC Remedial Action Technical Memorandum Former Fort Ord, California* (KEMRON, 2017f) details the MEC remedial action. Unit 28 is approximately 107 acres. The Technical Memorandum addressed 102 acres of Unit 28 excluding the 100-ft MOUT Site buffer. Approximately 12 acres has been determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain. Approximately 39 acres has been determined by UXO safety personnel to be inaccessible to DGM survey due to extreme terrain. Based on the results of the surface MEC removal performed, the likelihood of MEC remaining in the 12-acre area where surface MEC removal was not performed is considered low. No additional work is recommended. Subsurface removal that will support the realignment of Impossible Canyon Road fuel break, identified in the joint Army-BLM inspection, will be conducted under the Non-Burn Areas SSWP. The TM recommended an evaluation to address munitions with sensitive fuzes.

A description and discussions of the details of the work completed in Unit 28 remedial action are provided in the *Draft Final, MRS-BLM Units 28 Munitions and Explosives of Concern Remedial Action Report Former Fort Ord, California* (KEMRON, 2018c).

Ranges 43-48 South

Ranges 43-48 South is located in the north-central portion of the Impact Area MRA. Broadway Bypass and portions of Felix Road run through Ranges 43-48 South. Interim remedial action was conducted at Ranges 43-48 in 2003-2005 based on the *Record of Decision, Interim Action (IA) for Ordnance and Explosives at Ranges 43-48, Range 30A and Site OE-16, Former Fort Ord, California* (Army, 2002). The interim remedial action included vegetation clearance by prescribed burning, surface and subsurface removal, as well as detonation of MEC using engineering controls. The *Final, MRS-Ranges 43-48, Interim Action, Technical Information Paper, Volume 1* (Parsons, 2007) details the completed IA at MRS-Ranges 43-48.

The southern portion of Ranges 43-48 (hereafter called MRS-Ranges 43-48 South; approximately 273 acres) was subsequently evaluated in the *Final, Track 3 Impact Area Munitions Response Area, Munitions Response, Remedial Investigation/Feasibility Study, Former Fort Ord, California* (MACTEC, 2007). The selected remedy for the Track 3 Impact Area MRA is technology-aided surface MEC removal, with subsurface removal in selected areas, and land use controls (*Final Record of Decision, Impact Area Munitions Response Area, Track 3 Munitions Response Site, Former Fort Ord, California* [Track 3 ROD; Army, 2008]). Surface MEC removal was completed on Ranges 43-48 South during the IA. MRS-Ranges 43-48 South includes areas where subsurface removal was not completed during the IA. Under the Track 3 ROD, surface MEC removal areas will be evaluated and a TM will be prepared to provide an evaluation of the work completed to date and, if necessary, describe additional subsurface removal recommended based on the evaluation.

The Army is conducting a field study according to *Final, Work Plan, Munitions with Sensitive Fuzes Field Study, Former Fort Ord, California* (KEMRON, 2017b), with an objective of demonstrating the performance and capabilities of DGM systems, including advanced geophysical classification technologies, for the identification of subsurface munitions, specifically those with sensitive fuzes. Some field study activities occurred in Ranges 43-48 South. A report will document the field study after it is completed.

Watkins Gate Burn Area (WGBA)

Watkins Gate Burn Area (WGBA) is located in the northwestern section of the Impact Area MRA. WGBA is located adjacent to the northern and western boundary of the Impact Area MRA and totals approximately 1,072 acres. Portions of Austin Road and Broadway Avenue run through WGBA. Approximately 1,000 acres within WGBA were unintentionally burned during a prescribed burn conducted on Ranges 43-48 in October 2003. The fire cleared the dense maritime chaparral vegetation covering WGBA and a surface MEC removal was conducted in the burned area as a time-critical removal action (TCRA). The southern information from the TCRA was included in an evaluation in the *Final, Track 3 Impact Area Munitions Response Area, Munitions Response, Remedial Investigation/Feasibility Study, Former Fort Ord, California* (MACTEC, 2007). Three areas within WGBA were not burned. One of the three areas not burned within the original WGBA was designated as Unit 14A and was included in the remedial action conducted in Unit 14. Please see the section for Units 14 and 19, above, for additional detail concerning Unit 14A. The MEC remedial action in the other two unburned areas was conducted based on the *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Watkins Gate Burn Area Former Fort Ord California* (Gilbane, 2014a).

The *MRS-BLM Watkins Gate Burn Area, MEC Remedial Action, Technical Memorandum, Former Fort Ord, California* (KEMRON, 2015b) details the remedial action for the RA work area (two unburned areas). Mechanical and manual vegetation cutting occurred in all accessible areas. As part of the vegetation cutting, oak trees were limbed up to allow access for surface MEC removal and DGM survey teams. Technology-aided surface MEC removal is complete. The DGM survey was conducted, with the exception of several areas inaccessible to the DGM survey teams. In addition, the TM evaluated the results of the TCRA (burned areas) surface MEC removal, DGM transect sampling, and annual monitoring within the TCRA footprint. Remedial action objectives have been met for WGBA. Based on the evaluation no additional subsurface removal is recommended for WGBA.

The Army received an EPA concurrence letter regarding completion of the WGBA MEC remedial action in February 2015. *Letter from the EPA to the Army, Munitions Response Site-Bureau of Land Management Watkins Gate Burn Area Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California* (EPA, 2015a).

Range 36A

Range 36A was an Explosive Ordnance Disposal (EOD) range and was used for disposal of various types of commercial explosives and military ordnance and ammunition. The range was used until October 1992, when Fort Ord's EOD unit was deactivated as part of the closure of Fort Ord. In January 1994, Range 36A was reactivated for disposal of MEC identified from Fort Ord's TCRA Program for MEC found outside the Inland Ranges. Amended Resource Conservation and Recovery Act (RCRA) closure activities were necessary due to potential contaminants present at the range as a result of past activities and which included explosive compounds and metals.

The amended closure activities were completed in February 2007. The Army conducted a munitions response to address the possibility that MEC may be present at Range 36A (approximately 2 acres). Numerous metallic anomalies identified from DGM 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 field work 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 *Final After Action Report, Range 36A, Former Fort Ord, California. Volume II of the Resource Conservation and Recovery Act (RCRA) Closure Certification Report, Range 36A (Solid Waste Management Unit FTO-016)* (Shaw, 2007).

Approval of the report was provided by Department of Toxic Substances Control (DTSC) in a Closure Certification Acknowledgement for Range 36A in September 2007 (DTSC, 2007). Any access controls that are deemed necessary in the future will be implemented as part of the Track 3 process.

Track 3 Surface Area Monitoring Reports

The Army periodically monitors areas of Track 3 where a MEC surface removal has been completed. The monitoring includes a visual check for surface MEC, changes in area conditions that could increase the possibility of encountering MEC, and of locations where suspected MEC has initiated an incident report within the Track 3 areas of the former Fort Ord. Enhanced procedures are implemented in areas where projectiles with sensitive fuzes were found to be co-located with a high density of subsurface anomalies as part of a completed MEC response.

Of particular interest are exposures of suspected MEC and MD within areas where MEC removal has been completed and MD that retains visual characteristics of MEC since they may be reported as suspect MEC items. The presence of specific surface MD may indicate the potential for related MEC to be similarly present. The confirmation of surface MEC or presence of surface MD within an area where a surface MEC removal has been completed may require adjustment to site security procedures, additional MEC removal, or other actions as deemed appropriate by the Munitions Response (MR) Base Realignment and Closure Cleanup Team (BCT).

The results of the Army's surface monitoring program are recorded separately by corresponding MEC removal areas and consolidated in a surface area monitoring annual report. Track 3 areas where a selected surface MEC removal has been completed are placed in the monitoring program the calendar year after the completion of the MEC removal and remain in the program until it is determined by the BCT that surface monitoring is no longer required.

The data from this surface area monitoring report will be compiled along with security reports, worker observations, and MEC incident reports to be analyzed for the purpose of the Fort Ord Munitions Response Site (MRS) Security Program Annual Report. Monitoring and reporting is conducted in compliance with the following:

- Track 3 ROD (Army, 2008);
- *Final Work Plan Remedial Design (RD)/Remedial Action (RA) Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives or Concern (MEC) Removal Former Fort Ord, California* (USACE, 2009); and

- *Munitions Response Site (MRS) Security Program, Former Fort Ord, California* (Army, 2016).

Monitoring has been conducted since 2009 and is documented in annual reports listed below. No additional response actions have been identified through the monitoring.

- Fort Ord Base Realignment and Closure (Fort Ord BRAC), 2009. *Munitions and Explosives of Concern, Area Monitoring Reports, Fort Ord, California, 2009*. September. (Administrative Record [AR]# OE-0847)
- Fort Ord BRAC, 2010. *Munitions and Explosives of Concern, Area Monitoring Reports, Fort Ord, California, 2010*. September. (AR# OE-0847A)
- Fort Ord BRAC, 2011. *Track 3 Surface Removal Area Munitions and Explosives of Concern Monitoring Reports, Fort Ord, California, 2011*. July. (AR# OE-0847B)
- Fort Ord BRAC, 2012. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Fort Ord, California, 2012*. September. (AR# OE-0847C)
- Fort Ord BRAC, 2013. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Fort Ord, California, 2013*. September. (AR# OE-0847D)
- Fort Ord BRAC, 2014. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2014*. September. (AR# OE-0847E)
- Fort Ord BRAC, 2016. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2015*. January. (AR# OE-0847F)
- KEMRON Environmental Services, Inc. (KEMRON), 2017c. *Munitions and Explosives of Concern Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2016*. March 6. (AR# OE-0847G)
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- Fort Ord BRAC, 2011. *Track 3 Surface Removal Area Munitions and Explosives of Concern Monitoring Reports, Fort Ord, California, 2011*. July. (AR# OE-0847B)
- Fort Ord BRAC, 2012. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Fort Ord, California, 2012*. September. (AR# OE-0847C)
- Fort Ord BRAC, 2013. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Fort Ord, California, 2013*. September. (AR# OE-0847D)
- Fort Ord BRAC, 2014. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2014*. September. (AR# OE-0847E)
- Fort Ord BRAC, 2016. *Munitions and Explosives of Concern, Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2015*. January. (AR# OE-0847F)
- Gilbane, 2014a. *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Watkins Gate Burn Area Former Fort Ord California*. January. (AR# OE-0794B)
- Gilbane, 2014b. *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California*. December. (AR# RI-047C)
- Gilbane, 2015a. *Munitions Response Site-Bureau of Land Management Units 7, 10, and 33 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California*. February. (AR# OE-0842)
- Gilbane, 2015b. *Unit 21 Vernal Pool Remedial Action, Letter Report, Former Fort Ord, California*. January. (AR# OE-0837)
- Gilbane, 2015c. *Draft Final, Impact Area MRA 100-Foot Buffer, Munitions and Explosives of Concern, Remedial Action, Technical Information Paper, Former Fort Ord, California*. September (AR # OE-0854A)
- ITSI, 2012. *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Units 6, 7, and 10 Former Fort Ord, California*. July. (OE-0765B)

- ITSI-Gilbane, 2011. *Final Site Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 4, 5A, 9, 11 and 12 Former Fort Ord California*. September. (AR # OE-0736B)
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- ITSI-Gilbane, 2013c. *MRS-BLM Units 4, 11 and 12 MEC Remedial Action, Technical Memorandum, Former Fort Ord, California*. September. (AR# OE-0790B)
- ITSI-Gilbane, 2014a. *Final, MRS-BLM Unit 6 Munitions and Explosives of Concern Remedial Action, Technical Memorandum, Former Fort Ord, California*. May. (AR# OE-0811A)
- ITSI-Gilbane, 2014b. *Final MRS-BLM Units 4, 11 and 12, Munitions and Explosives of Concern, Remedial Action Report, Former Fort Ord, California*. July. (AR# OE-0799B)
- ITSI-Gilbane, 2014c. *Final BLM HQ South Buffer, Munitions and Explosives of Concern, Remedial Action Technical Information Paper Former Fort Ord California*. September. (AR # OE-0809B)
- ITSI-Gilbane, 2014d. *Draft Final MOUT Site Buffer, Munitions and Explosives of Concern, Remedial Action Technical Information Paper Former Fort Ord California*. March. (AR # OE-0801A)
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- KEMRON, 2015b. *MRS-BLM Watkins Gate Burn Area, MEC Remedial Action, Technical Memorandum, Former Fort Ord, California*. October. (AR # OE-0832A)
- KEMRON, 2015c. *Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes Portions of 5A, 9, 25, and 31), Former Fort Ord, California*. November. (AR# OE-0862B)
- KEMRON, 2016a. *MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California*. February. (AR# OE-0875)
- KEMRON, 2016b. *Final, Site-Specific Work Plan, Munitions and Explosives of Concern, Remedial Action MRS-BLM Unit 28, Former Fort Ord, California*. February. (AR# OE-0859B)

- KEMRON, 2016c. *Final Units 11 and 12 MEC Risk Reduction Technical Memorandum, Former Fort Ord, California*. April. (AR# OE-0877B)
- KEMRON, 2016d. *MRS-BLM Units 5A and 9, MEC Remedial Action Technical Memorandum, Former Fort Ord, California*. August. (AR# OE-0878A)
- KEMRON, 2016e. *Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California*. November. (AR # OE-0880B)
- KEMRON, 2017a. *MRS-BLM Unit 23, MEC Remedial Action Technical Memorandum, Former Fort Ord, California*. February. (AR# OE-0893A)
- KEMRON, 2017b. *Final, Work Plan, Munitions with Sensitive Fuzes Field Study, Former Fort Ord, California*. February. (AR #OE-0888B)
- KEMRON, 2017c. *Munitions and Explosives of Concern Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2016*. March 6. (AR# OE-0847G)
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- Shaw, 2009a. *Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 14 and 19, Former Fort Ord, California, Revision 0*. October. (AR# OE-0688G)
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- Shaw, 2010b. *Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Munitions Response Site-Bureau of Land Management Units 15, 21, 32, and 34, Former Fort Ord, California Revision 0*. July. (AR# OE-0711B)
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- Shaw, 2011c. *Range 26 MEC Remedial Action Technical Memorandum, Former Fort Ord, California*. March. (AR# OE-0738)
- Shaw, 2011d. *MRS-BLM Units 32 and 34 MEC Remedial Action Technical Memorandum, Former Fort Ord, California*. May. (AR # OE-0745)
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Appendix D
Responses to Comments

RESPONSES TO COMMENTS

Document: Draft Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3, Impact Area Munitions Response Area (MRA), Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California, June 2018

Commenting Organization: United States Environmental Protection Agency, Region IX (EPA)

Name: Maeve Clancy

Date of Comments: July 11, 2018

General Comment 1:

The Draft Remedial Design (RD)/Remedial Action (RA) Work Plan Update, Track 3, Impact Area Munitions Response Area (MRA), Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California, dated June 2018 (hereinafter referred to as the “RD/RA WPU Track 3 IA MRA MEC Removal”), contains a list on Figure 6 of “Sensitive Fuze Type MEC” recovered in the Impact Area MRA. Included in this list are the following items:

- Cartridge, 40mm, high explosive, M383
- Cartridge, 40mm, practice, M382
- Cartridge, 40mm, practice, M781

It is unclear as to why these three munitions are included in this list. They are cartridges (i.e., discarded military munitions [DMM]) and have not been fired. In the case of the first two listed items, the fuzes would not have been subjected to the setback and spin required to arm the fuzes. As a result, the fact that they contain sensitive fuzes is irrelevant, unless the intent is to confirm use of these munitions in the area (i.e., an unarmed sensitive fuze generally does not present a hazard greater than any other unarmed fuze). However, the firing of these munitions in the area is already confirmed by the presence in the listing of the fired projectiles of these two munitions.

In the case of the third item listed (i.e., the Cartridge, 40mm, practice, M781), it does not contain a fuze. The only item in that cartridge that presents an energetic material hazard is the 0.38 caliber blank cartridge pressed into the base of the cartridge case to provide the gas pressure needed to propel the projectile down the launcher barrel. In effect, the hazards it presents are somewhat less than those of a small arms blank for a service rifle. This item should not be classed as a “Sensitive Fuze Type MEC.”

The concentration of the Cartridge, 40mm, practice, M781, and the Cartridge, 40mm, practice, M382, found on the northernmost portion of the impact area as shown on Figure 6 are not collocated with impacted (i.e., fired UXO) projectiles of the same munition. These should not be

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treated as presenting the same hazards as fired munitions with sensitive fuzes, as they have not been fired. As a result, the fuzes on the M382 are not armed, and the M781 has no fuze. These items should be treated as DMM with no other special qualifiers. The same is true for the M382 cartridges found in two clusters on the eastern edges of the impact area.

In addition, various terms are used here and elsewhere in the narrative to describe fired and unfired munitions that contain these sensitive fuzes. These include, but are not limited to, "sensitive fuze type MEC," "sensitive fuze-type UXO," and "sensitive fuze-type munitions." The definition of what constitutes each of the munitions groups described by these terms should be provided to ensure that the threats posed by each are correctly understood.

Please review the cited figure and delete the noted cartridges from the listing. However, if there is a specific reason for including them in the listing, revise the figure to explain the issues noted in the above comment and to ensure that the noted cartridges are not treated as impacted munitions with sensitive fuzes. Also, please note the other issues presented above and correct them as necessary.

Response to General Comment 1:

Cartridge, 40mm, high explosive, M383; will be shown on Figure 6 and is noted as DMM and that these items do not represent the same hazard as fired munitions. Cartridge, 40mm, practice, M382; and cartridge, 40mm, practice, M781 have been removed from Figure 6. Items listed have been entered in the MMRP database as DMM.

General Comment 2:

The RD/RA WP Track 3 IA MRA MEC Removal highlights several areas where MEC removal was not conducted or will not be conducted due to challenging site conditions. Please include a discussion of how this change to the Track 3 remedy will be documented consistent with the CERCLA process (note to file, ESD, or ROD amendment). Please include this in Section 4.0, Schedule and Section 5.4, Remaining Actions.

Response to General Comment 2:

In areas where MEC surface removal was not conducted due to challenging (steep) site conditions, such as in Unit 28, it is anticipated that few people will attempt to enter. Additionally, the low MEC distribution encountered during surface MEC removal activities in the general vicinity of these areas, supports a low potential for encounters. The selected remedy includes land use controls (LUCs) that apply to the Track 3 Impact Area MRA as a whole. These LUCs include access management measures, and as described in this document, the Army will evaluate the suitability of the selected LUCs at the completion of all remedial actions in the Impact Area MRA. The Army understands that changes to the selected remedy should be documented following the

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CERCLA process depending on the significance of the change. The Army will evaluate these areas as a potentially significant change after conducting the remedial actions in the remaining units.

Specific Comment 1:

Section 1.0, Introduction, Page 1: Typo in first sentence. “This document updates the Remedial Design/Remedial Action Workplan (RD/RA WP) for implementation of the remedy selected for the Impact Area Munitions Response **Area** (MRA). . .”

Response to Specific Comment 1:

The first sentence will be edited by adding the word “Area”.

Specific Comment 2:

Section 5.1.1, Surface Munitions and Explosives of Concern Removal, Page 6: The third paragraph of this section states that, “Surface removal (and subsurface removal in portions of the area) was conducted in MRS-Ranges 43-48 South as part of the interim RA in 2003-5. As described in the Track 3 RI/FS (MACTEC, 2007), the site includes an area exhibiting high density of anomalies and where sensitive fuze-type UXO items were recovered during surface removal. A TM will be prepared to provide an evaluation of this area.” No projected date for the TM is provided or referenced in the section. Please revise the cited paragraph to include a projected publication date for the noted TM (if known).

Response to Specific Comment 2:

The MRS-Ranges 43-48 South TM is in development. The projected schedule for submitting this document will be identified in the Federal Facility Agreement schedule in the near future.

Specific Comment 3:

Section 5.1.3, Subsurface Munitions and Explosives of Concern Removal, Page 8: The Large Projectiles Section indicates that, “Anomalies classified as 155mm projectiles, 8-inch projectiles, or larger were removed to a one foot depth in the interior of Units 11 and 12 (436 feet or more from the perimeter of the 45-foot wide fuel break) and 2-foot depth in the outer zone of each prescribed burn area (within 436 feet of the perimeter of the 45-foot wide fuel break).” It is unclear as to what is intended by the word “larger” in the cited statement. This ambiguity is also noted in Appendix C, Summary of Completed Actions, in the Units 4, 11, and 12 Section, where it states that, “In addition to the remedial action described above, a MEC risk reduction was also completed at Units 11 and 12. The United States Army Corps of Engineers (USACE) Ordnance and Explosives Safety Specialist (OESS) determined that removal of 155-millimeter (mm) projectiles, 8-inch projectiles, and larger MEC items to one and two foot depths within Units 11

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and 12 was required to reduce explosive risk during future prescribed burning.” It is unclear as to the intent of the words “and larger MEC items” (i.e., does this mean that an item larger than the 8-inch projectile was a concern, or does this mean that some other size parameter was selected as a removal standard?). Please revise the cited sections to address the noted concerns and, if an additional size parameter was established, provide it in the noted sections.

Response to Specific Comment 3:

An additional parameter size was not established. The text in Section 5.1.3 has been revised as follows: “Anomalies classified as a source that potentially could have been 155mm or 8-inch projectiles were investigated and removed to a one foot depth in the interior of Units 11 and 12 (436 feet or more from the perimeter of the 45-foot wide fuel break) and to a two foot depth in the outer perimeter of each unit (within 436 feet of the perimeter of the 45-foot wide fuel break).” The text in Appendix C, Summary of Completed Actions, in the Units 4, 11, and 12 Section has been revised as follows: “In addition to the remedial action described above, a MEC risk reduction was also completed at Units 11 and 12. The United States Army Corps of Engineers (USACE) Ordnance and Explosives Safety Specialist (OESS) determined that removal of 155-millimeter (mm) and 8-inch projectiles to one and two foot depths within Units 11 and 12 was required to reduce risk of detonation during future prescribed burning.”

Specific Comment 4:

Section 5.1.3, Subsurface Munitions and Explosives of Concern Removal, Page 9: The “Munitions with unknown filler” Subsection makes reference to the potential fillers that these munitions may contain. It states that, “Although all nine items were subsequently confirmed to contain smoke fillers, these items also have the potential to be used for delivery of chemical gas.” The use of the term “chemical gas” should be replaced with “chemical warfare agents” to ensure that the intent of the statement is understood.

This subsection also notes that, “If a munition with an unknown filler is found, or if a MEC item cannot be positively identified, active duty EOD will be contacted.” While this is an appropriate response, it should also be noted here that the discovery of a munition with an unknown filler will result in the cessation of work in the affected area until the identity of the filler is determined.

Please make these changes.

Response to Specific Comment 4:

The text will be modified as requested. It will be noted in Section 5.1.3 that field work will cease if a munition with an unknown filler is discovered unless prior arrangements have been made and approved by the Department of the Army and Defense.

RESPONSES TO COMMENTS

All previously recovered unknown filler munitions at Fort Ord were subsequently confirmed to be smoke-filled. There has been no evidence to indicate that chemical weapons were ever used at Fort Ord.

Specific Comment 5:

Appendix C, Summary of Completed Actions, Page 8: The Units 15, 21, 32, and 34 Section contains a discussion of the clearance of a vernal pool located therein. The third paragraph of the section states, "In 2014 the vernal pool, which was previously inaccessible to the DGM, became sufficiently dry and DGM data collection was conducted in an additional approximately 2.4 acres of the vernal pool area. Based on this statement, it is unclear as to whether the entire vernal pool was geophysically mapped. Please provide a statement as to whether the entire vernal pool was mapped. If it was not, please provide a description of the proposed actions to complete the mapping.

Response to Specific Comment 5:

The following information from the referenced letter report will be added: "Approximately 2.4 acres of a 3.3 acre (approximate) vernal pond within Unit 21 was surveyed in 2014. This area was not surveyed previously because it was underwater (inaccessible). The Unit 21 vernal pool area that was not surveyed in 2014 includes a large stand of vegetation in the central portion of the vernal pool."

It has been recognized that site conditions (e.g., difficult terrain) may prevent digital survey from being conducted in certain areas. The 2009 RD/RA Work Plan (Administrative Record number: OE-0660K) specified that such areas will be documented in the remedial action report and digital mapping records. For clarification, the following sentence will be added to Section 5.1.2: "Areas inaccessible to DGM will be documented in RARs and DGM records."

Specific Comment 6:

Appendix C, Summary of Completed Actions, Page 11: The Units 25 and 31 Section states that, "Approximately 20 acres of Unit 25 has been determined to be inaccessible to DGM. Based on the results of the surface MEC removal performed in adjacent areas and the limited DGM data collected in these same areas, the likelihood of MEC remaining in this acreage is considered low. No additional work is recommended for Unit 25. The TM recommended an evaluation to address munitions with sensitive fuzes." The last two sentences appear to be somewhat contradictory (i.e., Does an evaluation for sensitive fuzes constitute work?). In addition, nothing is stated as to how the potential for MEC in the inaccessible areas will be addressed in the future. Please correct the noted contradiction and provide a statement concerning the MEC hazard in the inaccessible areas.

RESPONSES TO COMMENTS

Response to Specific Comment 6:

Munitions with sensitive fuzes will be evaluated for the entire Track 3 MRA. All munitions with sensitive fuzes located within the MRA to date are shown on Figure 6 (revised based on EPA General Comment 1).

As stated previously, the selected remedy includes LUCs that apply to the Track 3 Impact Area MRA as a whole. These LUCs include access management measures. As described in Section 15 of this document, at the completion of all remedial actions in the Impact Area MRA, the Army will evaluate the work completed against planned reuse activities and the suitability of the selected LUCs. The selected LUCs may be modified, when appropriate, with the approval of the regulatory agencies.



RESPONSES TO COMMENTS

Document: Draft, Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California, June 2018

Commenting Organization: Fort Ord Community Advisory Group (FOCAG)

Name: Mike Weaver

Date of Comments: July 16, 2018

Comment 1:

What is the anticipated future reuse of Area 3 referenced on page 10?

Response to Comment 1:

The Area 3 identified in the comment is Unit 3. This area is part of the Fort Ord National Monument and the anticipated reuse is habitat reserve.

Comment 2:

The 4-inch Stokes Mortar projectiles may contain a filler of chemical gas. On page 9 we learn that if a munition with an unknown filler is found, active duty EOD will be contacted. How many 4-inch Stokes Mortars with unknown filler have been found on former Fort Ord? How many munitions with unknown filler have been found on former Fort Ord? Explain how this might work with the implementation of land use controls. How is a grading contractor to know if a projectile warrants calling Chemical, Biological, Radiological, Nuclear, and explosive (CBRNE) response personnel?

Response to Comment 2:

A total of 29 4-inch Stokes mortars with unknown fillers have been found and removed on the former Fort Ord since MEC remediation activities began. An additional six items (four Livens Projectors and two 4.2-inch mortars) with unknown fillers have been found and removed during the same time period. All previously recovered unknown filler munitions at Fort Ord were subsequently confirmed to be smoke-filled. The selected remedy includes construction support for ground-disturbance activities. In the future, when a suspected munitions item is encountered by a land user such as a grading contractor, the ground-disturbing activity will cease. The standard reporting process will result in a response by an explosive ordnance disposal (EOD) unit. Active duty EOD have the qualifications to determine if a response by CBRNE is required.

RESPONSES TO COMMENTS

Comment 3:

Figure 5 identifies "NAPALM ROAD" next to HA27. What is the history of Napalm Road? Why was it named Napalm Road? What were areas HA27 and HA27A used for? Referencing Figure 5, there are small red dots on both HA27 and HA27A, yet the figure 5 Legend is unclear as to what these may designate. What are they?

Response to Comment 3: The history of Napalm Road does not pertain to the subject of the document and was named after a team member's dog. Historical Area (HA) 27 and 27A were identified for soil remediation based on their uses as small arms ranges. The red dots on Figure 5 represent site 39 soil remediation areas and are identified in the legend as "Site 39 Soil Remediation Areas." In Site 39 soil remediation areas, subsurface MEC removal was conducted in the soil remediation areas after contaminated soil was removed. This work is described in *Final Remedial Action Completion Report, Site 39 Inland Ranges Habitat Reserve, Former Fort Ord, California* (Administrative Record number: RI-047C).



RESPONSES TO COMMENTS

Document: Draft, Remedial Design (RD)/Remedial Action (RA) Work Plan Update Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal, Former Fort Ord, California, June 11, 2018

Commenting Organization: Department of Toxic Substances Control (DTSC)

Name: Vlado Arsov

Date of Comments: July 19, 2018

Comment 1:

Chapter 5.3, last bullet: "Modified the process for demonstrating geophysical system performance (MEC QAPP, KEMRON, 2016a)." Please describe the geophysical system and how the process for demonstration of its performance was modified?

Response to Comment 1:

The 2009 RD/RA Work Plan (Administrative Record [AR] number: OE-0660K) identified the Geonics EM61-MK2 as the geophysical mapping system in use at the Former Fort Ord and stated that any digital geophysical system could be utilized after its functionality was successfully demonstrated and documented via geophysical prove out. The 2009 RD/RA Work Plan also stated that a site-specific remedial action work plan would be prepared for each remedial action area and would include a Quality Control Plan to detail the process for demonstrating and documenting the performance of the geophysical system. A general structure and minimum requirements for the Quality Control Plan was included in Appendix C of the 2009 RD/RA Work Plan.

Much of the quality control process referenced in this RD/RA Work Plan Update has been standardized in *Final Quality Assurance Project Plan (QAPP), Superfund Response Actions, Former Fort Ord, California, Volume II Munitions Response, Appendix A MEC Remedial Action* (the MEC QAPP; AR number: OE-0884A) and *Appendix B Advanced Geophysical Classification for Munitions Response QAPP* (the AGCMR-QAPP; AR number: OE-0868B) to provide consistent requirements across remedial action areas in accordance with current industry and DoD standards and to minimize site-specific procedures, measurement quality objectives, and reporting requirements. These documents provide quality system requirements, measurement quality objectives, and measurement performance criteria for the standard EM61-MK2 digital geophysical mapping system and for advanced geophysical classification systems, including MetalMapper, TEMTADS, and MetalMapper 2x2. Additional digital geophysical systems may be

RESPONSES TO COMMENTS

included in the future after demonstration of their performance through the geophysical system verification process and documentation of system-specific measurement quality objectives in the appropriate QAPP (MEC QAPP or AGCMR-QAPP). Deviations from a geophysical system's standard measurement performance criteria to meet site-specific objectives for a remedial action area will be documented on a case by case basis.