

**DRAFT FINAL  
MRS-BLM UNIT 25  
MUNITIONS AND EXPLOSIVES OF CONCERN  
REMEDIAL ACTION REPORT  
FORMER FORT ORD, CALIFORNIA**

**February 2019  
Draft Final**

*Prepared For:*



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## ***Acronyms and Abbreviations***

ARARs	applicable or relevant and appropriate requirements
Army	U.S. Department of the Army
ASCII	American Standard Code for Information Interchange
BLM	Bureau of Land Management
BO	Biological Opinion
BRAC	Base Realignment and Closure
CAR	corrective action request
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
cm	centimeter
CMC	central maritime chaparral
CQCSM	Contractor Quality Control Systems Manager
DDESB	Department of Defense Explosives Safety Board
DGM	Digital Geophysical Mapping
DMM	discarded military munitions
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FFA	Federal Facility Agreement
FS	feasibility study
FWV	Field Work Variance
GPS	global positioning system
HMP	Habitat Management Plan
KEMRON	KEMRON Environmental Services
LUC	Land Use Control
MC	munitions constituents
MD	munitions debris
MDAS	material documented as safe
MDEH	material documented as an explosive hazard
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 objective
MR	munitions response
MRA	munitions response area
MRS	munitions response site
OE	ordnance and explosives
OESS	ordnance and explosives safety specialist
QA	quality assurance
QC	quality control

### ***Acronyms and Abbreviations (continued)***

RAO	remedial action objective
RAR	Remedial Action Report
RD/RA	Remedial Design/Remedial Action
RI	remedial investigation
ROD	Record of Decision
RRD	range-related debris
RTK	real-time kinematic
SSWP	Site-Specific Work Plan
SUXOS	Senior Unexploded Ordnance Supervisor
TM	Technical Memorandum
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
UXO	unexploded ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist
WERS	Worldwide Environmental Remediation Services

## *Definitions*

**Construction Support:** Assistance provided by 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 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: (7).

**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: (7).

**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).

**Historical 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: (6).

**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: (7).

**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):** 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: (7).

**Material Documented as an Explosive Hazard (MDEH):** 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: (7).

**Material Potentially Presenting an Explosive Hazard (MPPEH):** 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: (7).

**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 (MMRP):** 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: (7).

**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: (7). 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: (7).

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

**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: (7).

**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: (7).

**Technology-Aided Surface MEC Removal:** A removal of UXO, DMM, or 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: (7).

**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.

**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: (7).

**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: (7).

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, Engineer Manual 200-1-15, U.S. Army Corps of Engineers, dated October 30, 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) Evaluation of Statistical Methodologies used in U.S. Army Ordnance and Explosive Work. September 1999. Ostrouchov, George, Zimmerman, Gregory P., Beauchamp, John J., Federov, Valerii V., and Downing, Darryl J. Prepared by Oak Ridge National Laboratory for the U.S Army Engineering and Support Center.

(6) 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.

(7) Department of Defense Manual Number DoDM 6055.09, Volume 8, February 29, 2008, Administratively Reissued August 4, 2010. Incorporating Change 2, Effective January 24, 2018.



## 1.0 Introduction

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This Remedial Action Report (RAR) describes the work elements and results for the munitions and explosives of concern (MEC) remedial action conducted at Munitions Response Site (MRS) - Bureau of Land Management (BLM) Unit 25 (Unit 25) ([Figure 1](#)) at the former Fort Ord, California. The work in Unit 25 was performed by KEMRON Environmental Services (KEMRON) with Gilbane as a subcontractor for the U.S. Army Corps of Engineers (USACE) under the Worldwide Environmental Remediation Services (WERS) Contract # W912DY-10-D-0027, Task Order No. CM 01. The major event milestones of this remedial action are shown in [Table 1](#). This work has been completed in accordance with the:

- *Final Track 3 Record of Decision Impact Area Munitions Response Area Track 3 Munitions Response Site Former Fort Ord, California* (Track 3 ROD; U.S. Department of the Army [Army], 2008),
- *Final Work Plan Remedial Design/Remedial Action, Track 3 Impact Area Munitions Response Area Munitions and Explosives of Concern Removal Former Fort Ord, California* (Final RD/RA Work Plan; USACE, 2009),
- *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31) Former Fort Ord, California* (Final Unit 23 SSWP; KEMRON, 2015a), and
- *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Units 25 and 31 Former Fort Ord, California* (Final Units 25/31 SSWP; KEMRON, 2016a).

Unit 25 vegetation clearance was initially intended to be performed by prescribed burning. Following a determination by the Fort Ord Prescribed Burn Team that the unit was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#). In this document, the "project area" does not include the permanent fuel breaks surrounding the unit.

## 1.1 Purpose and Scope

This RAR describes the remedial action conducted in MRS-BLM Unit 25, within the Impact Area Munitions Response Area (MRA). The general scope of the remedial action, as defined in the Track 3 ROD (Army, 2008), is to manage “the potential risk to future land users from MEC at the Impact Area MRA.”

Track 3 sites are areas at the former Fort Ord where MEC is known or suspected to be present, but MEC investigations have not yet been completed. The Track 3 site, known as the Impact Area MRA, consists of the 6,560-acre portion of the 8,000-acre historical Impact Area that is entirely within the natural resources management area described in the *Installation-Wide Multispecies Habitat Management Plan (HMP) for Former Fort Ord, California* (HMP; USACE, 1997) and is currently identified for transfer to the BLM. The Impact Area MRA is designated as a habitat reserve in the Fort Ord Reuse Authority Base Reuse Plan.

The scope of this project, as defined in the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a) and approved field work variances (FWVs), entailed the following:

- Vegetation clearance (manual or mechanical cutting),
- Technology-aided surface MEC removal, and
- Digital Geophysical Mapping (DGM) surveys.

The site-specific work plans did not identify any subsurface MEC removal area within the Unit 25 project area. No additional MEC remediation was identified in the *MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum Former Fort Ord, California* (Unit 25 TM; KEMRON, 2018a), which is provided in [Appendix F](#). A joint Army-BLM inspection summary is provided in [Appendix F](#). This summary describes areas such as erosion features that appear to have naturally stabilized, and currently do not require subsurface MEC removal. Figures detailing these areas are included as part of [Appendix F](#).

This RAR details the work completed as part of the MRS-BLM Unit 25 MEC remedial action and provides discussion of the following tasks:

- Mobilization and site setup,
- Vegetation clearance,
- MEC removal area grid and boundary survey,
- Technology-aided surface MEC removal,
- DGM, and
- Preparation of a TM.

## 1.2 Approval Documents

The work was conducted in accordance with the Final RD/RA Work Plan (USACE, 2009) governing the Track 3 Impact Area MRA. The Final Unit 23 SSWP (KEMRON, 2015a), and the Final Units 25/31 SSWP (KEMRON, 2016a), detailed the scope and site-specific procedures for the MEC remedial action within the project area. Two FWVs are included as [Appendix A](#) and are described below:

- [006](#) (AR# OE-0880A.2) Documents that Unit 25 vegetation removal would be performed mechanically instead of prescribed burning as originally planned due to terrain negatively impacting firefighter's ability to control the fire. Additionally, documents an approximate eight acre area of difficult terrain in Unit 25 that precluded vegetation removal during prescribed burn containment line preparation.
- [011](#) (AR# OE-0880A.8) Documents area within Unit 25 where steep terrain precludes completion of surface MEC removal activities (approximately nine acres), and area within Unit 25 where steep terrain or dense oak tree stands preclude completion of DGM survey.

After completing MEC remediation and DGM in Unit 25, the Unit 25 TM (KEMRON, 2018a) was prepared providing an evaluation of the work completed. The TM is included in [Appendix F](#). No additional MEC remediation was identified in the Unit 25 TM.

## 1.3 Project Personnel and Subcontractors

MEC removal work was performed with qualified Unexploded Ordnance (UXO) technicians who met or exceeded the requirements of *Technical Paper 18, Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern Related Activities* (Department of Defense Explosives Safety Board [DDESB], 2015, 2016), which were the controlling documents at the different times the work was performed. The key personnel for this project were:

- Senior Unexploded Ordnance Supervisor (SUXOS): Brad Olson (KEMRON)
- UXO Quality Control (QC) Specialist (UXOQCS): Bruce McClain (KEMRON)
- UXO Safety Officer: Val Valdez (KEMRON)

- Contractor QC Systems Manager (CQCSM): Chuck Clyde (Gilbane)
- QC Geophysicist: Alex Kostera (NAEVA)
- Project Manager: Steve Crane (KEMRON)
- Deputy Project Manager: Erin Caruso (Gilbane)
- Task Manager: Kevin Siemann (Gilbane)
- Project Geophysicist: Andrew Gascho (Gilbane)

The following tasks were subcontracted:

- Mechanical vegetation clearance (Woolery Timber Management)
- Manual vegetation clearance (High Sierra Fire and Firestorm)
- Recycling of metallic target debris (A & S Metals)
- Disposal/recycling of munitions debris (MD) (Demil Metals)

## ***1.4 Health and Safety***

Work performed at the site was conducted and completed in accordance with the *Accident Prevention Plan – Munitions and Explosives of Concern Removal and Soil Remediation Project Former Fort Ord, California* (KEMRON, 2015b).

## ***1.5 Report Organization***

This RAR was prepared in accordance with the Track 3 RD/RA Work Plan (USACE, 2009) and is consistent with previous RARs for units within the Impact Area MRA at the former Fort Ord. The report also incorporates elements of U.S. Environmental Protection Agency (EPA) guidance for an RAR.

Sections of this RAR are organized as follows:

- Section 1.0 Introduction
- Section 2.0 Site Background
- Section 3.0 Overview of Remedial Action
- Section 4.0 Site Preparation
- Section 5.0 Analog MEC Removal
- Section 6.0 Digital Geophysical Mapping
- Section 7.0 Quality Control/Quality Assurance (QC/QA)

Section 8.0	MEC and MD Removal
Section 9.0	Munitions Constituents (MC) Characterization
Section 10.0	Environmental Protection
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Appendix G	Responses to Comments

## ***1.6 Applicable or Relevant and Appropriate Requirements***

Applicable or relevant and appropriate requirements (ARARs) were outlined in the Track 3 ROD (Army, 2008). The performance of this remedial action was in compliance with the ARARs outlined in that document.

## ***2.0 Site Background***

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### ***2.1 Site Location***

Fort Ord is a former military installation that comprises approximately 46 square miles in northwestern Monterey County, California and is located approximately 120 miles south of San Francisco. Monterey Bay forms the western boundary of the former Fort Ord, and the Santa Lucia Range bounds the former Fort Ord to the south. The cities of Marina, Seaside, and Salinas are northwest, southwest, and east of the former Fort Ord, respectively. [Figure 1](#) shows the location of the project area in the southeastern portion of the Impact Area MRA.

Unit 25 is approximately 95 acres and is located in the southeastern portion of the Impact Area MRA, within the MRS-BLM. Unit 25 lies to the east of Riso Ridge Road, west of Impossible Canyon Road, and north/northeast of Mercury Road. These roads are part of the permanent fuel break network and are not included as part of Unit 25. [Figure 2](#) shows road locations around Unit 25.

## 2.2 *Population, Proximity, and Access*

The project area is within the Impact Area MRA, which is currently enclosed by a four-strand barbed wire fence with concertina wire along critical locations. Access is restricted to authorized personnel only. The project area is located on land that is planned to be transferred to the BLM. Danger signs are posted at the perimeters of the Impact Area MRA. Existing access deterrents, such as fencing posted with warning signs approximately every 500 feet, discourage, but do not prevent, entry into the area. Personnel from the Fort Ord Base Realignment and Closure (BRAC) office and BLM routinely check the Impact Area MRA fences to ensure that they remain in good condition and to identify/complete needed repairs in a timely manner. The fences are maintained through a services support agreement with the BLM. Potential exposure to MEC by unauthorized persons could occur through intentional trespassing incidents. A *Munitions Response Site (MRS) Security Program Former Fort Ord, California* (Army, 2016) to mitigate such incidents is currently being implemented by the Army.

## 2.3 *Reuse*

The project area is currently designated for transfer to BLM as habitat reserve under the HMP (USACE, 1997) which describes special land restrictions and habitat management requirements within habitat reserve areas. Habitat reserve areas support special-status plant and animal species that require implementation of mitigation measures during Army cleanup activities as identified in the HMP (USACE, 1997). These mitigation measures ensure compliance with the Endangered Species Act and minimize potential adverse impacts to listed species during Army cleanup activities. Based on information provided by BLM, the reuse of the area as a habitat reserve is anticipated to include a variety of activities including:

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

### 2.3.1 *Vegetation and Habitat Type*

Central maritime chaparral (CMC) is the dominant habitat type within the project area. CMC is a dominant habitat type at Fort Ord and is identified as a protected plant community in the HMP (USACE, 1997). Additionally, limited areas of coast live oak woodland and grassland are present.

The dominant shrub species observed within the project area during the baseline monitoring include shaggy-barked manzanita (*Arctostaphylos tomentosa* ssp. *tomentosa*), and chamise (*Adenostoma fasciculata*) (Tetra Tech, Inc., 2015). These shrub species contribute most of the overall vegetative cover. HMP-listed shrub species present include Monterey manzanita (*Arctostaphylos montereyensis*), sandmat manzanita (*A. pumila*), Hooker's manzanita (*A. hookeri*), and Monterey ceanothus (*Ceanothus rigidus*) (Tetra Tech, Inc., 2015). Baseline surveys conducted for HMP herbaceous annual species identified populations of Monterey spineflower (*Chorizanthe pungens*) and sand gilia (*Gilia tenuiflora arenaria*) within openings in the CMC (Tetra Tech Inc., 2015). No Seaside bird's beak (*Cordylanthus rigidus littoralis*) was identified during the baseline surveys. Although not identified during baseline surveys, Yadon's piperia (*Piperia yadonii*), a federally endangered HMP species, was identified within Unit 25 along Hawkeye Road in 2016 by the Project Biologist.

The habitats within Unit 25 may also support special-status wildlife species identified in the HMP. Black legless lizards (*Anniella pulchra [nigra]*) could be encountered in any areas with sandy soils. Additionally, suitable upland and dispersal habitat for California tiger salamander (CTS; *Ambystoma californiense*) is present within Unit 25. No CTS breeding ponds are present within Unit 25; however, several are present in the vicinity, including Pond 16, located immediately adjacent within Unit 13.

Chapter 3 of the HMP (USACE, 1997) describes mitigation measures that must be implemented during MEC investigation and remediation. In addition to the HMP, base closure and reuse activities conducted at the former Fort Ord are required to follow specific protocols approved by the U.S. Fish and Wildlife Service (USFWS) as detailed in the *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California*. (PBO, USFWS, 2015). The PBO contains additional conservation measures and recommendations relating to environmental remediation at former Fort Ord cleanup sites which are described in further detail in [Section 10.0](#) of this RAR.

## 2.4 *Regulatory Status*

Since 1917 until base closure in 1994, Fort Ord primarily served as a training and staging facility for infantry troops. From 1947 to 1974, Fort Ord was a basic training center. The 7th Infantry Division was activated at Fort Ord on October 21, 1974 and was based at Fort Ord until base closure.

Fort Ord was placed on the National Priorities List of Superfund sites by the 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 the Regional Water Quality Control Board, a part of the California EPA. The FFA established procedures and schedules for conducting remedial investigations (RIs) and feasibility studies (FSs) and requires remedial actions be completed as expeditiously as possible. Fort Ord was selected in 1991 for BRAC under the Defense BRAC Act of 1990, and the base was officially closed in September 1994. The Army began investigating and removing MEC at the former Fort Ord after the BRAC listing, and a munitions response (MR) RI/FS began in 1998. In April 2000, an agreement was signed between the Army, EPA, and DTSC to evaluate MEC at the former Fort Ord subject to the provisions of the FFA.

Following completion of the *Final Track 3 Impact Area MRA Munitions Response Remedial Investigation/Feasibility Study Former Fort Ord, California* (MACTEC Engineering and Consulting, Inc., 2007), the Army prepared the Track 3 ROD (Army, 2008), which is the decision document presenting the selected remedial action for MEC in the Impact Area MRA. The remedy was selected following a 60-day public comment period for the *Superfund Proposed Plan Remedial Action is Proposed for Impact Area Munitions Response Area, Track 3 Munitions Response Remedial Investigation / Feasibility Study, Former Fort Ord, California* (Army, 2007). The remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan.

The decision documented in the Track 3 ROD (Army, 2008) is undertaken pursuant to the President's authority under CERCLA Section 104, as delegated to the Army in accordance with Executive Order 12580, and in compliance with the process set out in CERCLA Section 120. The selection of the remedy is authorized pursuant to CERCLA Section 104, and the selected remedy is being carried out in accordance with CERCLA Section 121. The Army and the EPA jointly selected the remedy. The California EPA, as represented by the DTSC, had an opportunity to review and comment on the Track 3 ROD.

## ***2.5 Site Features and History of Military Munitions Use***

The Army currently retains the Ord Military Community and the U.S. Army Reserve Center located at the former Fort Ord. The remainder of Fort Ord was identified for transfer to federal, state, and local government agencies and other organizations. Since the base was selected in 1991 for BRAC, site visits, historical and archival investigations, military munitions sampling, and removal actions have been performed and documented in preparation for transfer and reuse of the former Fort Ord property.



Since 1917 until base closure in 1994, portions of former Fort Ord were used by cavalry, field artillery, and infantry units for maneuvers, target ranges, and other purposes. Military munitions were fired and used on the facility, including artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials.

Fort Ord was selected in 1991 for decommissioning, but troop reallocation was not completed until 1993, and the base was not officially closed until September 1994. The property remaining in the Army's possession was designated as the Presidio of Monterey Annex on October 1, 1994, and subsequently renamed the Ord Military Community. Although Army personnel still operate parts of the base, no active Army division is stationed at the former Fort Ord.

The Impact Area MRA is a complex of numerous former military ranges with a variety of historical uses, designs, and characteristics. Over the years, various types of munitions were used during training activities within the Impact Area MRA including artillery and mortar projectiles, rockets and guided missiles, rifle and hand grenades, land mines, pyrotechnics, bombs, and demolition materials. Select ranges were used for small arms training activities only, while other ranges were characterized as multi-use. In general, the firing points of the ranges were located near the perimeter of the MRA, and firing was directed toward the interior portion of the range complex. Training activities at the Impact Area MRA ceased after the closure of Fort Ord in 1994. The former ranges within the MRA contain expended munitions and MEC. The Impact Area MRA is fenced, warning signs are posted, and access is controlled by the Army. The perimeter of the Impact Area MRA is patrolled to detect and prevent trespassing.

The project area is located in the southeastern portion of the Impact Area MRA and MRS-BLM. Unit 25 does not include the 45-foot wide permanent fuel breaks surrounding the unit.

[Table 2](#) provides a list of former ranges which were identified in the Final Units 25/31 SSWP (KEMRON, 2016a) to be at least partially contained within, or overlap with, the project area.

## ***2.6 Summary of MEC-Related Activities and Data Collected Prior to the Remedial Action***

MEC investigation and removal work completed within the project area prior to the work addressed in this report resulted in the recovery of 119 MEC items. These items are shown in [Table 3](#). [Figure 2](#) shows MEC items recovered from within the project area prior to the remedial action.

## 3.0 *Overview of Remedial Action*

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### 3.1 *Remedial Action Objective*

The remedial action objective (RAO) for the Track 3 remedy is to protect human health and the environment in a manner that complies with the ARARs. The RAO will be achieved by implementing the selected remedy of Technology-Aided Surface MEC Remediation, with Subsurface MEC Remediation in Selected Areas and Land Use Controls (LUCs). The selected remedy is designed to achieve both substantial risk reduction through MEC remediation and risk management through implementation of LUCs. The selected remedy best balances risk reduction and associated environmental impacts in supporting the anticipated future use of the site as a habitat reserve. The presence of MEC in the Impact Area MRA was not identified as a concern in terms of explosives safety risks to ecological receptors.

Further statements regarding the RAO are provided in the Final RD/RA Work Plan (USACE, 2009):

- “The selected remedy addresses current or potential explosives safety risks to human health and the environment from MEC within the Impact Area MRA.”
- “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 by supplementing the remedial action with appropriate institutional controls that will effectively manage risk from any potentially residual MEC after the remedial action is completed.”

The selected remedy for the Impact Area MRA identified in the Track 3 ROD (Army, 2008) includes the following components:

- Vegetation clearance, primarily by planned prescribed burning, to provide access for MEC remediation,
- Technology-aided surface MEC removal. The method consists of a technology-aided visual search to identify MEC at the ground surface. Technology aids include Schonstedt magnetometers to facilitate detection of surface MEC in areas where the ground surface is not visible. Recovered MEC would be detonated, using engineering controls,
- DGM 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 activities involving ground disturbance or intrusive work,

- Subsurface MEC removal in selected areas. Areas of subsurface MEC removal include regularly maintained fuel breaks and access roads, a minimum 100-foot buffer area between habitat and development areas, and 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 of anomalies associated with impact areas where military munitions with sensitive fuzes were fired. Recovered MEC would be detonated, using engineering controls,
- And, implementation of LUCs, including 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 maintenance of fences and signs, helicopter support for future prescribed burns in selected areas for future habitat management purposes, weed abatement support, and property transfer documentation that outlines land use restrictions, including prohibition of unrestricted land use.

## 3.2 *MEC Remedial Action*

### 3.2.1 *Remedial Action Chronology*

As outlined in the Final RD/RA Work Plan (USACE, 2009), Final Unit 23 SSWP (KEMRON, 2015a), and Final Units 25/31 SSWP (KEMRON, 2016a), the following field activities were conducted to implement the MEC remedial action within the project area:

- Vegetation clearance within the Unit,
- Grid and border survey,
- Technology-aided surface MEC removal,
- DGM survey,
- MEC detonation, and
- MD disposal.

[Table 1](#) provides a summary of major events associated with the remedial action within the project area.

### 3.2.2 *Variations from the Site-Specific Work Plan*

Two variances ([Appendix A](#)) to the planned methods and areas described in the Final Units 25/31 SSWP (KEMRON, 2016a) occurred in response to unanticipated conditions or to improve the efficiency of MEC remedial activities.

### ***3.2.3 Summary of Remedial Action Methods***

Vegetation clearance in the western portion of Unit 25, approximately 26 acres, to support planned prescribed burns in Units 11 and 12 began in June 2015 and was completed in September 2015. Vegetation clearance in the remainder of Unit 25, approximately 60 acres, was completed in August 2016. All but 24 acres of Unit 25 were cut to prepare for prescribed burns in Units 11, 12 and 25. Following a determination by the Fort Ord Prescribed Burn Team that Unit 25 was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#) (FWV 006).

Technology-aided surface MEC removal in the western portion of Unit 25 to support planned prescribed burns in Units 11 and 12 began in July 2015 and was completed in October 2015. Technology-aided surface MEC removal in the remainder of Unit 25 started in July 2016 and was completed in July 2017. [Figure 3](#) depicts the extent of technology-aided surface MEC removal performed in Unit 25.

DGM survey was conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in support of prescribed burns planned for Units 11 and 12) and was completed in August 2017 (remainder of Unit 25). [Figure 4](#) depicts the DGM data collected in Unit 25.

## ***4.0 Site Preparation***

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### ***4.1 Vegetation Clearance***

Vegetation clearance in the western portion of Unit 25, approximately 26 acres, to support planned prescribed burns in Units 11 and 12 began in June 2015 and was completed in September 2015. Vegetation clearance in the remainder of Unit 25, approximately 60 acres, was completed in August 2016. All but 24 acres of Unit 25 were cut to prepare for prescribed burns in Units 11, 12 and 25. Following a determination by the Fort Ord Prescribed Burn Team that the Unit 25 was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#) (FWV 006). Mechanical mastication was performed in all accessible areas, approximately 86 acres. In areas where mechanical mastication could not be performed, manual vegetation removal was performed in accessible areas. Due to extreme terrain, approximately eight acres did not receive vegetation removal. Approximately one acre within Unit 25, although inaccessible due to terrain, did not require vegetation clearance due to the lack of vegetation. Vegetation clearance teams, with escort support from UXO-qualified personnel, cut vegetation to a height of six inches or less. Where mechanical equipment was used in areas with dense vegetation that obscured visual inspection of the ground surface, a first cut was made to a height between 18 and 24 inches above the ground. After visual inspection for MEC by UXO-qualified personnel, a second cut was made to a

height of six inches or less above ground. In areas with medium-to-light vegetation where the ground surface could be observed before cutting, the vegetation was cut in one stage to a height of no more than six inches above ground. Manual tools (e.g., chain saws and trimmers) were used in areas where the mechanical cutter could not gain access and to trim tree branches.

Manually cut vegetation was either removed or chipped on site. Mechanically cut vegetation was left on site but was reduced to the maximum extent possible to minimize visual impairment of the ground surface. A representative photo of manual vegetation clearance operations is included as [Photograph 1](#).

UXO-qualified personnel provided UXO escort support during vegetation clearance, conducting a visual survey of the ground surface with the aid of Schonstedt magnetometers. When MD or suspected MEC was encountered, vegetation clearance personnel would stop operations until UXO-qualified personnel could determine if any hazard was associated with the item and remove the item if necessary.

## ***4.2 Debris and Target Removal***

During and after vegetation clearance activities, targets and other range-related debris (RRD) were removed from the project area. The quantity of recovered RRD was recorded on a per grid basis. Metal debris was recycled at a local recycler, and other debris was disposed of at a local municipal landfill.

## ***4.3 Grid and Border Survey***

UXO personnel, performing anomaly avoidance, established a 100-foot by 100-foot grid system across the project area. The grid system was tied into the Fort Ord Master Grid System. The grid nodes were marked with wooden stakes, and each was labeled with a unique identification marked on the southwestern corner stake.

## ***5.0 Analog MEC Removal***

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Analog methods were used for surface MEC removal within the project area. [Tables 4](#) and [6](#) list the MEC items recovered during analog MEC surface removal.

### ***5.1 Technology-Aided Surface MEC Removal***

Technology-aided surface MEC removal in the western portion of Unit 25 to support planned prescribed burns in Units 11 and 12 began in July 2015 and was completed in October 2015. Technology-aided surface MEC removal in the remainder of Unit 25 started in July 2016 and was completed in July 2017. This technology-aided surface MEC removal included containment lines for the prescribed burn within Unit 25,

and the remainder of the unit when a determination was made to mechanically cut the remainder of the unit. Surface MEC removal operations are shown in [Photograph 2](#). Lanes approximately ten feet in width were placed across grids and UXO personnel used Schonstedt magnetometers to conduct technology-aided surface MEC removal. UXO personnel searched (swept) a five foot lane with magnetometers immediately adjacent to one rope marker, turned at the end of the 100-foot grid boundary, and searched a five foot lane immediately adjacent to the other rope marker. Prior to the RA, 119 MEC (UXO) items were recovered from within Unit 25 and are shown in [Table 3](#) and [Figure 2](#). During vegetation clearance and technology-aided surface MEC removal, 324 MEC items were recovered and are shown in [Tables 4](#) and [6](#) and [Figure 5](#).

Statistical results for the Unit 25 RA are shown in [Tables 5](#) and [7](#). Quality control/quality assurance (QC/QA) processes were implemented in accordance with the Final Unit 23 SSWP (KEMRON, 2015a), and Final Unit 25/31 SSWP (KEMRON, 2016a). Approximately nine acres of Unit 25 were determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain (See [Figure 1](#) of [FWV 011](#)). The surface MEC removal grids are shown in [Figure 3](#). Representative photographs of surface MEC removed are included as [Photographs 3](#) through [7](#).

During technology-aided surface MEC removal, UXO teams utilized Schonstedt magnetometers in addition to visual survey in search for MEC. UXO personnel walked in 5-foot wide parallel lanes across the removal grid to achieve complete Schonstedt and visual coverage. In general, metallic debris greater than 2 inches in any dimension identified on the ground surface was removed from the project area. Material Potentially Presenting an Explosive Hazard (MPPEH) and MEC were treated in accordance with standard operating procedures. The easting and northing location of MPPEH was recorded from the southwest corner stake of the grid to acquire the geo-referenced location at which it was found. During technology-aided surface MEC removal operations in Unit 25, 324 MEC items were removed. These items are shown in [Tables 4](#) and [6](#) and [Figure 5](#). MD was tracked by weight on a grid-by-grid basis.

A total of 324 MEC items were found during vegetation clearance and surface MEC removal. All 324 MEC items were classified as UXO. All MEC items encountered and removed as part of the Unit 25 RA are summarized in [Tables 4](#) and [6](#).

## ***5.2 Subsurface MEC Removal***

Subsurface MEC removal was not conducted within Unit 25 as part of the work covered in this RAR. The site-specific work plans did not identify any subsurface MEC removal area within the Unit 25 project area. No additional MEC remediation was identified in the Unit 25 TM ([Appendix F](#)).

## 6.0 *Digital Geophysical Mapping*

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DGM survey operations were conducted in all accessible areas within Unit 25. DGM survey was conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in containment areas of prescribed burns planned for Units 11 and 12) and was completed in August 2017 (remainder of Unit 25). [Figure 4](#) depicts the DGM data collected in Unit 25. Cumulative results for the Unit 25 RA are shown in [Tables 5](#) and [7](#). Measurement quality objectives were met and QC/QA processes were implemented in accordance with the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31SSWP (KEMRON, 2016a) and the *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action. Former Fort Ord, California* (MEC QAPP; KEMRON, 2016b). Measurement performance criteria were evaluated according to the standards specified in the MEC QAPP and the Final SSWPs. Specific criteria that were evaluated included Global Positioning System (GPS) accuracy, static background and response tests, dynamic background and response tests (IVS), velocity, minimum along track sampling and across track coverage, accurate detection of Blind Seeds with respect to both response and positioning, surveillance of field methods, and reprocessing of field data. Each of these criteria were evaluated separately with results recorded in the project database and subsequently reviewed by the QC Geophysicist. [Appendix F](#) includes the USACE DGM QA Approval and Discussion for Unit 25.

Due to extreme terrain within Unit 25, approximately 20 acres were inaccessible to DGM survey. These areas are shown on [Figure 4](#) and were documented in [FWV 011](#) included in [Appendix A](#) of this document. DGM survey operations are shown in [Photograph 8](#).

### 6.1 *DGM Surveys*

DGM surveys were used as the primary method to record the presence of subsurface anomalies within Unit 25. DGM surveys were conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in containment areas of prescribed burns planned for Units 11 and 12) and were completed in August 2017 (remainder of Unit 25).

#### 6.1.1 *Instrumentation*

As described in previous sections, EM61-MK2A sensors (towed array unit) were utilized to obtain DGM data at the project area. A Leica Real-Time Kinematic (RTK) GPS was used in conjunction with the EM61-MK2A sensors for navigation data.

### ***6.1.1.1 EM61-MK2A***

The EM61-MK2A is a four-channel, high-sensitivity time delay electro-magnetic sensor designed to detect shallow ferrous and nonferrous metallic objects with good spatial resolution and minimal interference from adjacent metallic features. The EM61-MK2A has two rectangular (1 x 0.5 meters) source/receiver coils vertically stacked 40 cm apart. A square wave electro-magnetic pulse is generated during “time on” (positive and negative) and “time off” cycles. This induces subsurface eddy currents with an associated secondary magnetic field. The decay of the secondary magnetic fields is measured during “time off” cycles and stored as a millivolt response. By measuring the decay at “late times,” the system can distinguish between natural earth materials and buried metal (ferrous and nonferrous) due to the slower rate of decay in the secondary field from metallic objects compared to that from earth materials. The EM61-MK2A can measure a differential, which is calculated as the voltage difference between the top and bottom coils. During this project, data were recorded at four time gates from the bottom coil. The responses at these four specified time gates are recorded and displayed by an integrated system data logger.

### ***6.1.1.2 Leica GPS***

RTK GPS requires known coordinates to establish a base station. Once the base station is established, it determines its location using satellites and applies a correction based on the offset from the known coordinates. The correction is used by a rover that is in direct communication with the base station through a radio link. RTK GPS is capable of taking survey-grade measurements in real time and providing immediate accuracy within 1 to 4 cm.

A permanent base station maintained by USACE and located in Ranges 43-48 was used for project area operations.

## ***6.1.2 Data Collection Procedures***

EM61-MK2A surveys utilized the four time gate readings from the bottom coil. Readings were sampled at a minimum rate of 10 readings per second. GPS readings were logged at a rate of 1 reading per second. All data collection activities were recorded in both field logs and personal digital assistants, and were later synchronized into the project database. The field notes were monitored by data processors and the QC Geophysicist, and they are included in the data delivery forms.

### ***6.1.2.1 Towed Array***

The towed array system consisted of three EM61-MK2A coils mounted on a wheeled platform. The three units were mounted in parallel, wide end forward, such that the center-to-center coil spacing was 2.0 feet,



and the bottoms of the coils were set at the standard Geonics height of 42 cm above the ground. The wheeled platform was pulled with a bulldozer. Survey lanes were marked using a biodegradable foam-marking system mounted to the bulldozer. The EM61-MK2A and GPS data were streamed together and recorded using Geometrics MagLogNT software. Data collection on the towed array was controlled remotely by a wireless transmitter from a remote computer. This allowed the tractor or bulldozer driver to concentrate on coverage. The remote computer was operated by a field geophysicist. The remote computer controlled the functions of the field computer mounted to the towed array system. The remote computer operator monitored the data collection.

### *6.1.2.2 Single Unit/Manual*

A single EM61-MK2A unit was not required during DGM data collection in Unit 25.

### *6.1.2.3 Daily Functional QC Checks*

To insure the instruments met project QC requirements, tests were performed daily. As described in project quality control documents, the following instrument tests were performed:

- Static Background Test
- Static Spike Test
- Personnel Test
- Cable Shake Test
- Repeat Data/Lag Line
- Static GPS Location Test
- Dynamic GPS Location Test (added)

On days that the instruments were in use, QC tests were performed at the beginning and the end of each day. If the instruments did not meet QC standards, the field crew would resolve the issue before commencing with the survey. In the event that the instrument was deemed faulty at the end of the day, QC Geophysicists were notified and proper steps were taken to verify survey data met QC standards.

In addition to the first six standard tests, two dynamic GPS location tests were conducted. One test consisted of placing a hitch-ball in the field area that was to be surveyed. The location of the hitch-ball was measured with GPS prior to obtaining data. The hitch-ball was run over by the EM61-MK2A system several times in one day. After the data were processed, the location was checked to verify that the location was within specification (2 feet).

### ***6.1.3 Data Processing***

Geophysical data were processed using Geosoft's Oasis Montaj and vendor-supplied software. Oasis Montaj processing included several steps:

1. Transforming raw data to American Standard Code for Information Interchange (ASCII) xyz files: Using vendor-supplied software, data were converted from the native file format to ASCII data files suitable for import into Oasis Montaj.
2. Initial data review: Once raw xyz files were imported into Oasis Montaj, the coordinates were converted to the project coordinate system. Data coverage and quality were assessed by the data processors. If it was determined that data quality and coverage were acceptable, then the data proceeded to the next step. If coverage and/or data quality objectives were not met, then field teams were sent to either fill in data gaps or re-collect data where necessary.
3. Correcting for instrument latency: Using the results of the daily repeat data test, geophysical data were shifted to account for the time lag inherent in the data logging system.
4. Leveling data: Data were leveled to the same background values removing the effects of instrument drift. The leveled data were added together to create the 4-channel sum.

Data processing procedures remained consistent for the project area. Data processing activities were logged in data processing forms. A detailed description of the processing steps was outlined in the project quality control documents.

### ***6.1.4 Data Delivery***

Survey data were broken down into separate grids and/or grid blocks prior to delivery. The delivery schedule was consistently met throughout the project. Any exceptions were noted on the processing forms, and the QA Geophysicist was informed. Raw and processed data were submitted as one package within five days of data collection. Raw data deliveries included the raw data in binary format, raw data in ASCII xyz format, and the field notes saved in portable document format form. Processed data included the processed data in ASCII xyz format, the final targets lists, and the appropriate data processing forms. Examples of the data forms included in the data delivery are contained in [Appendix C](#).

## ***6.2 Measurement Quality Objectives***

The DGM surveys for the project area were conducted with Category B MQOs based on the post-DGM activities planned for the site.

The following items were monitored throughout the project according to MQOs specified in the Final Unit 23 SSWP (KEMRON, 2015a), and the Final Units 25/31 SSWP (KEMRON, 2016a):

- Background noise
- Mean speed
- Along track spacing
- Across track spacing
- Instrument latency corrections
- Data leveling
- Systematic noise
- Anomaly selection
- Positioning errors
- Known location QC items
- Blind seed/QC items
- Reacquisition

According to the geophysical QC plan, the QC Geophysicist is required to monitor all MQOs. The QC Geophysicist reviewed every grid. If any aberrations were found within the MQOs, actions were taken to assure the specific metric was corrected before passing the grid. These actions were documented in weekly QC reports and sent to the USACE QA Geophysicist. During the project surveys, the USACE QA Geophysicist reviewed grids only after they passed geophysical QC. Any comments or concerns were addressed and issues were resolved between the Project Geophysicist and the USACE QA Geophysicist. The *Unit 25 Final Quality Assurance Report, Digital Geophysical Operations*, is included as an appendix to the Unit 25 TM (KEMRON, 2018a). The Unit 25 TM (KEMRON, 2018a) is provided in [Appendix F](#).

### **6.3 Subsurface MEC Removal**

DGM-based subsurface MEC removal was not conducted within Unit 25 as part of the Final Unit 23 SSWP (KEMRON, 2015a) or Final Units 25/31 SSWP (KEMPRON, 2016a). The site-specific work plans did not identify any subsurface MEC removal area within the Unit 25 project area. No additional MEC remediation was identified in the Unit 25 TM.

## ***7.0 Quality Control/Quality Assurance (QC/QA)***

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This section discusses the QC and QA procedures that were used at the project area.

### ***7.1 QC***

QC is conducted by the Contractor. All QC measures were conducted by the UXOQCS and by the QC Geophysicist. A discussion of the pertinent QC measures and procedures is included in the following sections.

#### ***7.1.1 Analog QC***

##### ***7.1.1.1 Field Activities***

During surface MEC removal operations in Unit 25, the UXOQCS was responsible for visually observing teams and conducting periodic spot checks to ensure grids were receiving complete coverage during the surface MEC removal phase. The UXOQCS performed analog QC survey of at least 10% of completed surface MEC removal grids. All grids passed 10% analog QC surveys performed by the UXOQCS.

Additionally, surface blind seeds were emplaced by the UXOQCS before and during technology-aided surface MEC removal field operations. All surface blind seeds were located in the field by the UXO teams.

##### ***7.1.1.2 Database Activities***

The UXOQCS reviewed every entry received from personnel in the field during each phase of work prior to entry in the database. Each entry was reviewed for completion of field QC, MEC and MD nomenclature, completion of a given grid, and ultimate disposition of MEC items.

#### ***7.1.2 DGM QC***

The DGM QC standards and procedures were outlined in the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a) and subsequent project quality documents.

The QC Geophysicist was responsible for planning and executing QC oversight of geophysical activities and ensuring compliance with geophysical QC requirements. Specifically, the QC Geophysicist was responsible for the following:

- Reviewing and approving the qualifications of geophysical staff,
- Planning and ensuring the acceptable performance and completion of all geophysical QC activities,

- Reviewing the geophysical QC and DGM data, target lists, and dig results as specified in the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a), and subsequent updates,
- Establishing the known and blind seed item and location control program,
- Identifying quality problems and verifying that appropriate corrective actions were implemented for geophysical activities, and
- Ensuring that the requisite geophysical QC records, including submittals, were generated and retained as prescribed.

In order to keep track of weekly events and statistics, a weekly QC report was delivered to the Project Geophysicist and the QA Geophysicist. This included all pertinent information for the week as well as cumulative information about the project including, but not limited to, information such as grids surveyed, personnel, average acreage per day, and QC blind seeds located.

The QC Geophysicist had daily access to all geophysical QC and DGM data and was on site intermittently as needed after the completion of the initial inspections for geophysical activities. The QC Geophysicist was also on site as needed for meetings and seeding, reported to the CQCSM and supported the UXOQCS.

## ***7.2 Quality Assurance***

QA is conducted by the USACE Ordnance and Explosives Safety Specialist (OESS) and the USACE QA Geophysicist.

### ***7.2.1 Analog Quality Assurance***

USACE Surface MEC Removal Quality Assurance Documentation is provided in [Appendix D](#). This appendix includes a table documenting when work grids in Unit 25 were subjected to surface MEC removal quality assurance surveys. The USACE OESS independently conducted analog survey of at least 10% of each completed surface MEC removal grid. All completed surface MEC removal grids passed QA surveys and were accepted by USACE.

### ***7.2.2 DGM Quality Assurance***

The TM for Unit 25 is provided in [Appendix F](#). The *Unit 25 Final Quality Assurance Report, Digital Geophysical Operations*, is included as an appendix to the TM for Unit 25. All DGM data for Unit 25 has been reviewed and approved by the USACE QA Geophysicist.

### **7.2.3 Corrective Action Requests**

During the course of the project area field operations, the USACE issued no Corrective Action Requests (CARs).

## **8.0 MEC and MD Removal**

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This section provides summaries of the MEC and MD removed from the project area. [Table 3](#) provides data for MEC items recovered within the project area during previous investigations.

### **8.1 Remedial Action**

Statistical information for the Unit 25 MEC remedial action was recorded, tracked, and reported by removal grid, individual item, and date.

The statistical results for the remedial action are provided in [Tables 5](#) and [7](#).

#### **8.1.1 MEC Removal**

MEC was recovered and subjected to detonation during the course of the project RA. As shown in [Table 4](#), a total of 324 MEC items were found and removed during vegetation clearance and surface MEC removal operations for the project area. A summary of the type and quantity of MEC recovered during the RA is provided in [Tables 4](#) and [6](#).

#### **8.1.2 MD Removal**

Recovered MD was characterized by weight on a grid-by-grid basis. [Figure 6](#) summarizes the estimated weight of MD removed from each removal grid. A total estimated quantity of MD removed during the RA is provided in [Table 5](#).

MD was initially classified as MPPEH. Following initial classification, the MPPEH was certified by the SUXOS, UXOQCS, and USACE OESS as either material documented as safe (MDAS) or material documented as an explosive hazard (MDEH). All MDEH was detonated as described further in [Section 8.1.3](#). MDAS was certified free from explosive material, and stored in lockable roll-off containers. MDAS was demilitarized as appropriate. MDAS was inspected, certified and transported to a recycling facility. DD Form 1348-1A documentation accompanied the MDAS. A DD Form 1348-1A for this project is provided in [Appendix B](#). Additional MDAS from other Fort Ord MEC sites is included in the total amount of MD documented in [Appendix B](#).

### ***8.1.3 Detonation of Munitions and Explosives of Concern***

During the course of the Unit 25 remedial action, 324 MEC items were destroyed by detonation. Explosives Accountability forms with dates of demolition operations are included in [Appendix E](#). All procedures for demolition operations included in the Final Unit 23 SSWP (KEMRON, 2015a) and Final Units 25/31 SSWP (KEMRON, 2016a) were followed. All items were destroyed by detonation, and details, such as the date and result of this operation, have been reported in the Fort Ord Military Munitions Response Program database.

### ***8.1.4 Disposition of Munitions Debris***

The MDAS was transported to Demil Metals for smelting and eventual recycling. DD Form 1348-1A documentation accompanied the MDAS. A DD Form 1348-1A for this project is provided in [Appendix B](#).

## ***8.2 Conceptual Site Model***

The distribution of all MEC items found and removed as part of this remedial action within Unit 25 is shown on [Figure 5](#). The observed distribution of surface MEC throughout Unit 25 is consistent with the expected distribution within this unit based on historical information. Unit 25 includes a number of partial or complete range fans that were most likely used for mixed-use training. The MEC items found and removed from Unit 25 included MEC items that are consistent with the centralized location of Unit 25 within the main impact area of the former Fort Ord. Munitions with sensitive fuzes were expected in Unit 25. During the remedial action, eight munition items with sensitive fuzes (all M383 high explosive 40mm projectiles) were encountered and removed. MEC items with sensitive fuzes are shown in [Figure 7](#). All MEC items with sensitive fuzes except one removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The single MEC item with a sensitive fuze not encountered and removed near these intersections occurred in the extreme southern end of Unit 25. The two boxed areas shown on [Figure 7](#) are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on [Figure 4](#). DGM data collection in the vicinity of the intersection of Steep Road and Hawkeye Road was limited due to steep terrain. The boxed areas consist of the grid(s) in which the items were located and an additional two grids (200 feet) in all directions from those locations. The areas were extended only to the unit boundary.

Surface MEC removal and DGM data were evaluated in the Unit 25 TM (KEMRON, 2018a) ([Appendix F](#)). No additional MEC remediation was identified in the Unit 25 TM (KEMRON, 2018a).

## ***9.0 Munitions Constituents (MC) Characterization***

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### ***9.1 Previous Site Characterization***

Explosive ordnance target areas located within the Impact Area MRA were sampled as part of the Site 39 RI. Results are presented in the *Final Basewide Remedial Investigation/Feasibility Study Fort Ord, California* (Harding Lawson Associates [HLA], 1995). Based on the available information at that time, a biased sampling program was developed to focus on the target areas, which were the areas most likely to contain detectable amounts of ordnance-related chemical residues and metals. Soil remediation in specific areas within the Impact Area MRA identified in the Site 39 ROD Amendment occurred with appropriate UXO support as described in the *Final Remedial Action Completion Report Site 39 Inland Ranges Habitat Reserve, former Fort Ord, California* (Gilbane, 2014).

### ***9.2 Reconnaissance***

Reconnaissance for Unit 25 was conducted in August 2017. Features mapped and recorded with a GPS as a general field practice across all site reconnaissance areas include targets, berms, craters or mounds, MD, trash pits, debris, and RRD. The data collected was evaluated to determine location of soil samples required to further characterize an area with possible soil contamination. The *Final Site Evaluation Results and Work Plan for Additional Investigation Basewide Range Assessment Investigation Units 25 and 28 Former Fort Ord, Monterey County, California* (KEMRON, 2018b) was prepared to identify the sample locations for Unit 25.

### ***9.3 Site Characterization***

Prior to the initiation of field operations, UXO field personnel were trained to recognize and report evidence of potential soil contamination. Any such evidence was noted within the project area and was incorporated into the Basewide Range Assessment evaluation of the units. Areas characterized for soil remediation include berms, craters, and areas with little or no vegetation.

### ***9.4 Observations of Evidence of Potential Soil Contamination***

Samples were collected from 12 locations in Unit 25. Laboratory analyses included evaluation of lead in samples from 5 locations in Unit 25 and evaluation of explosive residues (HMX, RDX and TNT) in samples from 12 locations in Unit 25. Explosives were not detected in any samples. Lead was detected in samples from all analyzed locations at concentrations ranging from 7.0 mg/kg to 16.3 mg/kg in Unit 25, which are



below the threshold criterion of 225 mg/kg for lead specified in the *Final Record of Decision Amendment Site 39 Former Fort Ord, California* (Army, 2009).

## 10.0 Environmental Protection

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### 10.1 Description of Impacts and Mitigation Measures

The project area is within the Natural Resource Management Area which is designated for transfer to BLM as undeveloped habitat reserve as described in the HMP (USACE, 1997). The HMP describes special land restrictions and habitat management requirements within habitat reserve areas. Habitat reserve areas support plant and animal species protected under the Endangered Species Act; implementation of mitigation measures identified in the HMP are required to minimize potential adverse impacts to listed species. Vegetation in the project area consists primarily of CMC and contains numerous species listed as protected in the HMP. Please refer to Section 2.3.1 for a description of the vegetation and HMP species present within Unit 25.

Mitigation measures to reduce impacts to protected species during MEC remedial actions are described in the HMP (USACE, 1997) and the PBO (USFWS, 2015). Mitigation and other environmental protection measures that were implemented during this project are summarized below:

**Minimize Disturbance Associated with MEC Removal:** Disturbances were limited to those required for the above-mentioned activities. As required by the HMP, existing roads were used with the exception of where it was necessary to traverse the site using tracked vehicles in order to remove piles of debris, remove vegetation, and conduct the DGM portion of the field work. Access roads, staging areas, and other appurtenant facilities were sited to avoid impacts to HMP plant and wildlife species. Additionally, coast live oak trees (*Quercus agrifolia*) were avoided during vegetation removal activities.

**Avoid Disturbance of HMP Annual Plant Populations:** Populations of sand gilia and Monterey spineflower were identified within openings in the CMC in Unit 25 (Tetra Tech, Inc., 2015) (See Section 10.2 Biological Monitoring). Additionally, a population of Yadon's piperia was observed by the Project Biologist within Unit 25 in 2016. While MEC removal and DGM activities were necessary within the HMP annuals plant population areas, no equipment or personnel were permitted within these areas from March (approximate time of germination) through June (approximate time of seed-set) for Monterey spineflower, and sand gilia, and through approximately September for Yadon's piperia.

**Conduct Employee Education Program:** Training for all supervisors and field personnel was conducted by the Project Biologist. Any new personnel also received biological training prior to working on the

site. Training included information on rare, threatened, and endangered species on the site, including a description of the species, their protected status, a list of measures to be implemented to avoid and reduce impacts to these species and their habitat, and contact information to report unforeseen impacts to HMP species. Additionally, a Habitat Checklist was prepared by the Project Biologist prior to each activity that outlined specific avoidance and minimization measures, which were communicated to the project supervisors prior to work initiation.

**Minimize Impacts to Black Legless Lizard:** Supervisors and field personnel were trained during the Employee Education Program to identify black legless lizard and were informed of the potential for this species to occur within the project site and the established protocol if any individuals were encountered. No black legless lizards were observed during the course of this work.

**Minimize Impacts to California Linderiella, California Tiger Salamander, and California Red-legged frog:** Supervisors and field personnel were trained during the Employee Education Program to identify CTS and California Red-legged frog, and were informed of the potential for these species to occur within the project site and the established protocol if any individuals were encountered. No CTS or California Red-legged frogs were observed during the course of this work. No habitat for California linderiella is present within Unit 25.

In order to reduce the spread of invasive weeds, existing roads were used to the greatest extent feasible. To reduce erosion concerns normal vehicle access was restricted to existing roads and established access routes. Tracked vehicles were used to conduct vegetation removal and DGM surveys over the site. KEMRON monitored the work site for potential erosion problems and a final inspection was conducted by the Project Biologist.

## ***10.2 Biological Monitoring***

Prior to the initiation of work, baseline studies were conducted within the project area to document the location and abundance of HMP shrub and annual plant species and habitats; the results of these surveys are presented in the *2014 Biological Monitoring Report for Units 25 and 31; Units 06, 07, 10, 33, WGBA and MOUT; Units 04, 11, 12 and 23N; Units 14 and 19; and MRS-16 Former Fort Ord* (Tetra Tech, Inc., 2015). Follow-up monitoring was conducted by Burluson Consulting in 2017; results of these surveys are presented in the *2017 Annual Report Biological Monitoring for Unit 17; Unit 25 and Units 13, 20, and 31 Containment Lines; Units 1 West, 2 West, and 3 West; Units 2 East and 3 East; and Units 14 and 19* (Burluson Consulting, 2018). Monitoring within these units will continue according to the 2017 Programmatic BO (USFWS, 2017) to document the recovery of HMP species and habitat.

## 11.0 *Protectiveness Assessment*

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The protectiveness of the remedial action was evaluated against the requirements of the Track 3 ROD (Army, 2008). The remedial action performed in Unit 25 was consistent with the Final Unit 23 SSWP (KEMRON, 2015a), Final Units 25/31 SSWP (KEMRON, 2016a), and Track 3 RD/RA Work Plan (USACE, 2009), and no conditions contrary to these documents were encountered at the site.

The TM included in [Appendix F](#) applies to the project area of Unit 25. No additional MEC remediation was identified in the Unit 25 TM (KEMRON, 2018a). Regulatory agencies have reviewed the TM and approved the recommendations included. No additional MEC removal is recommended for Unit 25.

The DGM survey identified anomalies within the project area ([Figure 4](#)) which were not subject to reacquisition and subsurface MEC removal, suggesting the possible presence of subsurface MEC.

The MEC remedial action for the project area is complete. During the remedial action, 324 MEC items were encountered and removed. Eight munition items with sensitive fuzes (all M383 high explosive 40mm projectiles) were encountered and removed. MEC items with sensitive fuzes are shown in [Figure 7](#). All MEC items with sensitive fuzes except one removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The single MEC item with a sensitive fuze not encountered and removed near these intersections occurred in the extreme southern end of Unit 25. The two boxed areas shown on [Figure 7](#) are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on [Figure 4](#). DGM data collection in the vicinity of the intersection of Steep Road and Hawkeye Road was limited due to steep terrain. The boxed areas consist of the grid(s) in which the items were located and an additional two grids (200 feet) in all directions from those locations. The areas were extended only to the unit boundary.

The Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface MEC removal could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study and the short term recommendations for the areas of concern in Unit 25 are as follows:

- Areas where MEC with sensitive fuzes were located will be monitored with enhanced procedures during annual surface area monitoring,

- All future MEC removal actions in the vicinity of these areas will be monitored for indications of subsurface MEC with sensitive fuzes,
- Authorized personnel entering Unit 25 will initially receive updated munitions recognition and safety training.

All surface MEC remediation areas passed QC/QA. Based on the Track 3 ROD (Army, 2008) and the Track 3 RD/RA Work Plan (USACE, 2009), the following actions will occur until all remedial actions within the Track 3 Impact Area MRA are complete:

- Annual inspection of surface MEC removal areas until the site is stabilized,
- Site security of the Impact Area MRA will be maintained,
- Unauthorized public access to or within the Impact Area MRA will continue to be prohibited,
- Munitions recognition and safety training as needed prior to property transfer and during the implementation of the remedial action,
- Provision of UXO-qualified personnel support for intrusive work, and
- Follow-up habitat monitoring.

At the completion of the remedial action within the Impact Area MRA, the Army will evaluate the work completed against planned reuse activities and the suitability of the LUCs that were selected as part of the remedy. The results of this evaluation will be included in a Remedial Action Completion Report. A detailed LUC implementation plan will also be developed prior to property transfer, in coordination with the future landowner and the regulatory agencies.

## 12.0 References

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Burleson Consulting, 2018. *2017 Annual Report Biological Monitoring for Unit 17; Unit 25 and Units 13, 20, and 31 Containment Lines; Units 1 West, 2 West, and 3 West; Units 2 East and 3 East; and Units 14 and 19, Former Fort Ord.* (AR# BW-2845)

Department of Defense Explosives Safety Board (DDESB), 2015, 2016\*. *Technical Paper 18, Minimum Qualifications for Personnel Conducting Munitions and Explosives of Concern Related Activities.*

Gilbane Building Company (Gilbane), 2014. *Final Remedial Action Completion Report Site 39 Inland Ranges Habitat Reserve Former Fort Ord, California.* (AR# RI-047C)

Harding Lawson Associates, (HLA), 1995. *Final Basewide Remedial Investigation/Feasibility Study, Fort Ord, California Volumes I through VI* (October, 1995). (AR# BW-1283A)

KEMRON Environmental Services (KEMRON), 2015a. *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31) Former Fort Ord, California.* (AR# OE-0862B)

KEMRON, 2015b. *Accident Prevention Plan – Munitions and Explosives of Concern Removal and Soil Remediation Project, Former Fort Ord, California.*

KEMRON, 2016a. *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action MRS-BLM Units 25 and 31 Former Fort Ord, California.* (AR# OE-0880B)

KEMRON, 2016b. *Final, Quality Assurance Project Plan, Superfund Response Actions, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action. Former Fort Ord, California.* (AR# OE-0884A)

KEMRON, 2018a. *MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum Former Fort Ord, California.* (AR# OE-0915A)

KEMRON, 2018b. *Final Site Evaluation Results and Work Plan for Additional Investigation Basewide Range Assessment Investigation Units 25 and 28 Former Fort Ord, Monterey County, California.* (BW-2838B)

MACTEC Engineering and Consulting, Inc., 2007. *Final Track 3 Impact Area Munitions Response Area Munitions Response Remedial Investigation/Feasibility Study Former Fort Ord, California.* (AR# OE-0596R)

Tetra Tech, Inc., (Tetra Tech), 2015. *2014 Biological Monitoring Report for Units 25 and 31; Units 06, 07, 10, 33, WGBA and MOUT; Units 04, 11, 12 and 23N; Units 14 and 19; and MRS-16 Former Fort Ord.* (AR# BW-2739)

U.S. Army Corps of Engineers (USACE), 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California.* (AR# BW-1787)

USACE, 2009. *Final Work Plan Remedial Design/Remedial Action Track 3 Impact Area Munitions Response Area Munitions and Explosives of Concern Removal Former Fort Ord, California.* (AR# OE-0660K)

U.S. Department of the Army (Army), 2007. *Superfund Proposed Plan Remedial Action is Proposed for Impact Area Munitions Response Area, Track 3 Munitions Response Remedial Investigation / Feasibility Study, Former Fort Ord, California.* (AR# OE-0623)

Army, 2008. *Final Track 3 Record of Decision, Impact Area Munitions Response Area Track 3 Munitions Response Site Former Fort Ord, California.* (AR# OE-0647)

Army, 2009. *Final Record of Decision Amendment, Site 39 Inland Ranges Former Fort Ord, California.* (AR# RI-041E)

Army, 2016. *Munitions Response Site (MRS) Security Program Former Fort Ord, California.* (AR# OE-0422P)

U.S. Fish and Wildlife Services (USFWS), 2015. *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California.* (8-8-09-F-74). (AR# BW-2747)

USFWS, 2017. *Programmatic Biological Opinion.* (AR# BW-2747A)

*Tables*

**Table 1**  
**Major Event Milestones, Unit 25 Remedial Action**

<b>Major Event</b>	<b>Date Started</b>	<b>Date Completed</b>
Signature of Track 3 Record of Decision		May 2008
Completion of Final Remedial Design/Remedial Action Work Plan		August 2009
Completion of Final Site Specific Work Plan (Units 25/31)		November 2016
Vegetation clearance, target and debris removal in Unit 25	June 2015	August 2016
Grid and border survey in Unit 25	July 2015	August 2016
Surface removal in Unit 25	July 2015	July 2017
Digital geophysical survey in Unit 25	November 2015	August 2017
Munitions and explosives of concern detonation	August 2015	September 2017
Technical Memorandum Unit 25		April 2018



**Table 2**  
**Ranges Associated with Unit 25**

<b>Range</b>	<b>Military History and Training Activities</b>
Range 68-Sub Machine Gun DSMTD (Dismounted)	Range is only shown on the July 1958 training map. The use of the range is unknown, but based on the size of the range it may have been used for small arms.
Range 70 – Small Arms Firing Course	Range only shown after the 1953 and 1958 training maps. Course is not shown on any other reviewed training maps. Initial visit by Harding Lawson Associates in March 1999 indicated small arms use in the area.

Note: Source of information is the Basewide Range Assessment (BRA) report (BW-2300L).

**Table 3**

**MEC Items Encountered and Removed Prior to Remedial Action Operations**

<b>Date Found</b>	<b>Item Type</b>	<b>Quantity</b>	<b>Description</b>	<b>Depth (inches)</b>	<b>Unit</b>
11/10/1997	UXO	23	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/12/1997	UXO	24	Projectile, 81mm, mortar, high explosive, M43 series	0	25
2/18/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/19/1998	UXO	2	Projectile, 81mm, mortar, high explosive, M43 series	10	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	18	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	16	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	14	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
1/27/1998	UXO	2	Projectile, 81mm, mortar, high explosive, M43 series	16	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	15	25
2/18/1998	UXO	6	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	6	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	13	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	5	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	8	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	12	25
2/19/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	10	25
2/19/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	10	25
2/19/1998	UXO	2	Projectile, 81mm, mortar, high explosive, M43 series	12	25
2/19/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	12	25
11/27/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/27/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/27/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/28/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/28/2001	UXO	1	Projectile, 40mm, high explosive, M381	0	25
11/28/2001	UXO	1	Projectile, 75mm, shrapnel, MK I	0	25
11/29/2001	UXO	1	Projectile, 4.2inch, mortar, high explosive, M3 series	0	25

**Total = 119**

**Table 4**  
**MEC Items Found During Surface Removal**

Description	Number of Items	
	Unit 25	
	UXO	DMM
Grenade, rifle, smoke, M19A1	1	0
Projectile, 105mm, high explosive, M1	1	0
Projectile, 37mm, high explosive, MK II	3	0
Projectile, 37mm, low explosive, MK I	36	0
Projectile, 37mm, low explosive, MK II	5	0
Projectile, 4.2inch, mortar, high explosive, M3 series	2	0
Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series	1	0
Projectile, 40mm, high explosive, M383	8	0
Projectile, 60mm, mortar, high explosive, M49 series	11	0
Projectile, 75mm, high explosive, M48	2	0
Projectile, 75mm, high explosive, MK I	5	0
Projectile, 75mm, shrapnel, MK I	8	0
Projectile, 81mm, mortar, high explosive, M362	2	0
Projectile, 81mm, mortar, high explosive, M43 series	235	0
Projectile, 81mm, mortar, illumination, M301 series	1	0
Rocket, 2.36inch, high explosive antitank, M6	1	0
Rocket, 35mm, subcaliber, practice, M73	1	0
Signal, illumination, ground parachute, M131	1	0
	<b>324</b>	<b>0</b>

DMM = Discarded Military Munitions

MEC = Munitions and Explosives of Concern

UXO = Unexploded Ordnance

**Table 5**  
**Statistical Results**

<b>Parameter</b>	<b>Unit 25</b>
Surface removal acreage	86
DGM survey acreage	75
MEC items	324
Total estimated MD (lbs) for all areas	58,091
Total estimated RRD and OD (lbs) for all areas	34,842

DGM = Digital Geophysical Mapping

MD = Munitions Debris

MEC = Munitions and Explosives of Concern

OD = Other Debris

RRD = Range-Related Debris

\* Unit is 95 acres in total

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
7/30/2015	25	A3J5F5	2111595	5749910	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/5/2015	25	B3B5B9	2113135	5750375	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/10/2015	25	B3B5A8	2113035	5750215	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/17/2015	25	A3J5I3	2111870	5749760	Surface Removal	0	UXO	1	Signal, illumination, ground parachute, M131
8/18/2015	25	A3J5I5	2111840	5749960	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, MK I
8/18/2015	25	A3J5I5	2111880	5749985	Surface Removal	0	UXO	1	Projectile, 37mm, high explosive, MK II
8/18/2015	25	A3J5I5	2111815	5749920	Surface Removal	0	UXO	1	Projectile, 37mm, high explosive, MK II
8/19/2015	25	A3J5I6	2111810	5750020	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/19/2015	25	A3J5I6	2111850	5750080	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/19/2015	25	B3B5G6	2113682	5750073	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/20/2015	25	B3B5G9	2113632	5750314	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/24/2015	25	B3B5H8	2113778	5750277	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/24/2015	25	B3B5H9	2113724	5750353	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/25/2015	25	B3B5H6	2113711	5750075	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
8/25/2015	25	B3B5H7	2113722	5750162	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK II
8/25/2015	25	B3B5I6	2113806	5750039	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, M48
8/26/2015	25	B3B5I8	2113816	5750288	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/18/2015	25	B3A5B8	2112160	5750255	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/18/2015	25	B3A5H8	2112727	5750295	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/18/2015	25	B3A5H9	2112780	5750361	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, MK I
9/18/2015	25	B3A5H9	2112758	5750395	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/22/2015	25	B3A5D0	2112312	5750475	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/22/2015	25	B3A6I1	2112824	5750532	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/24/2015	25	B3C5A7	2114062	5750150	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK II
9/25/2015	25	B3A6G1	2112690	5750540	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK II
9/25/2015	25	B3C5A8	2114086	5750239	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/25/2015	25	B3C5B8	2114158	5750296	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/28/2015	25	B3A5G9	2112615	5750370	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
9/28/2015	25	B3A5G9	2112615	5750308	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
9/28/2015	25	B3C5B6	2114124	5750052	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
9/29/2015	25	B3C5C6	2114245	5750072	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2015	25	B3C5C6	2114287	5750080	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2015	25	B3C5C7	2114201	5750112	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
9/29/2015	25	B3C5C7	2114234	5750117	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/1/2015	25	B3C5D8	2114304	5750203	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/1/2015	25	B3C5D8	2114361	5750252	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/2/2015	25	B3C5D6	2114305	5750035	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
7/26/2016	25	A3J5F7	2111595	5750123	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
7/26/2016	25	A3J5G7	2111696	5750172	Surface Removal	0	UXO	1	Projectile, 37mm, high explosive, MK II
7/26/2016	25	A3J5G7	2111655	5750144	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, MK I
7/27/2016	25	A3J5H7	2111720	5750191	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/1/2016	25	A3J5J8	2111927	5750279	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/3/2016	25	A3I6E5	2110450	5750955	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/3/2016	25	A3I6E5	2110420	5750914	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/4/2016	25	A3I6F5	2110541	5750925	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/4/2016	25	A3I6F5	2110577	5750967	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/8/2016	25	A3I6G5	2110680	5750920	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110670	5750950	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110650	5750940	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110670	5750940	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110668	5750915	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110623	5750981	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M362
8/8/2016	25	A3I6G5	2110651	5750950	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110690	5750950	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110669	5750910	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/8/2016	25	A3I6G5	2110630	5750960	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/9/2016	25	A3I6G6	2110630	5751042	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/9/2016	25	A3I6G6	2110679	5751032	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/9/2016	25	A3I6G6	2110695	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/10/2016	25	A3I6F6	2110596	5751007	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/10/2016	25	A3I6F6	2110545	5751071	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/10/2016	25	A3J7A1	2111050	5751515	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/10/2016	25	A3J7C1	2111220	5751505	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/11/2016	25	A3J7D1	2111380	5751515	Surface Removal	0	UXO	1	Grenade, rifle, smoke, M19A1
8/15/2016	25	A3I6D4	2110382	5750833	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/16/2016	25	A3I6E3	2110453	5750783	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/16/2016	25	A3I6F4	2110572	5750822	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/16/2016	25	A3I6F4	2110532	5750883	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/16/2016	25	A3I6F4	2110551	5750830	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/16/2016	25	A3I6F4	2110563	5750872	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/16/2016	25	A3I6I7	2110892	5751125	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/17/2016	25	A3I6G3	2110674	5750723	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/17/2016	25	A3I6G4	2110640	5750850	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
8/17/2016	25	A3I6G4	2110645	5750825	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/17/2016	25	A3I6G4	2110641	5750835	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/17/2016	25	A3I6G4	2110623	5750868	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
8/18/2016	25	A3I6G2	2110640	5750610	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/18/2016	25	A3I6H2	2110705	5750609	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/18/2016	25	A3I6H2	2110778	5750612	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/18/2016	25	A3I6H2	2110750	5750608	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/18/2016	25	A3I6H9	2110795	5751306	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/18/2016	25	A3I5D0	2111360	5750480	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/18/2016	25	A3I5D0	2111370	5750400	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H4	2110725	5750870	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H4	2110735	5750874	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H4	2110744	5750842	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H7	2110785	5751180	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H7	2110735	5751110	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H7	2110762	5751170	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H8	2110705	5751220	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H8	2110732	5751245	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6H8	2110765	5751270	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/22/2016	25	A3I6I4	2110847	5750850	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
8/23/2016	25	A3I6I4	2110821	5750868	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/24/2016	25	A3I6I3	2110855	5750774	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/25/2016	25	A3I6F7	2110567	5751195	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
8/25/2016	25	A3I6F9	2110575	5751332	Surface Removal	0	UXO	1	Rocket, 35mm, subcaliber, practice, M73
8/25/2016	25	A3I5I9	2111950	5750370	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
8/30/2016	25	A3I5G9	2111680	5750390	Surface Removal	0	UXO	1	Projectile, 105mm, high explosive, M1
9/1/2016	25	A3I5C7	2111202	5750103	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/1/2016	25	A3I5D8	2111310	5750280	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/1/2016	25	A3I5D9	2111305	5750375	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/12/2016	25	A3I6I3	2110895	5750705	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/12/2016	25	B3A6J5	2112972	5750930	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
9/12/2016	25	B3A6J6	2112980	5751030	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
9/12/2016	25	B3A6J6	2112970	5751090	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
9/13/2016	25	A3I6H5	2110704	5750990	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/13/2016	25	A3I6H5	2110706	5750984	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/13/2016	25	A3I6H5	2110703	5750989	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M362
9/13/2016	25	B3A6J4	2112940	5750880	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
9/19/2016	25	A3I6J6	2110932	5751012	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/19/2016	25	A3I6F1	2111510	5750550	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/20/2016	25	A3I6D8	2111315	5751230	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
9/20/2016	25	A3I6D8	2111345	5751210	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
9/20/2016	25	A3J6D9	2111350	5751330	Surface Removal	0	UXO	1	Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series
9/20/2016	25	A3J6F2	2111550	5750625	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6C8	2111215	5751290	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6C8	2111255	5751250	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6C8	2111219	5751288	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6C8	2111233	5751285	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6D8	2111372	5751250	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6E3	2111420	5750775	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	A3J6E3	2111440	5750725	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/21/2016	25	B3A6D0	2112302	5751405	Surface Removal	0	UXO	1	Rocket, 2.36inch, high explosive antitank, M6
9/22/2016	25	A3J6C8	2111218	5751293	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/22/2016	25	A3J6C8	2111233	5751275	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/22/2016	25	A3J6C8	2111258	5751245	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/22/2016	25	A3J6C8	2111245	5751295	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/26/2016	25	A3J6C9	2111208	5751392	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
9/26/2016	25	A3J6D1	2111330	5750520	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/26/2016	25	A3J6D4	2111303	5750890	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/26/2016	25	A3J6D4	2111305	5750835	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/26/2016	25	A3J6D4	2111325	5750880	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
9/27/2016	25	A3J6B0	2111108	5751485	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/27/2016	25	A3J6C1	2111210	5750525	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/27/2016	25	A3J6D4	2111350	5750875	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/27/2016	25	B3B6C2	2113270	5750640	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK II
9/28/2016	25	A3J6A2	2111005	5750680	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
9/28/2016	25	A3J6B9	2111105	5751395	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6B9	2111150	5751318	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6D5	2111311	5750955	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6D5	2111333	5750961	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6D5	2111310	5750978	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
9/28/2016	25	A3J6D5	2111333	5750959	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6D5	2111312	5750903	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6D5	2111339	5750951	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/28/2016	25	A3J6D5	2111383	5750977	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
9/29/2016	25	A3J6B2	2111190	5750680	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6B8	2111148	5751265	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6B8	2111125	5751295	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6B8	2111148	5751235	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6B8	2111125	5751201	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series



**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
9/29/2016	25	A3J6B8	2111185	5751200	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6B8	2111165	5751245	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6C5	2111281	5750945	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
9/29/2016	25	A3J6C5	2111249	5750901	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111240	5750895	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111245	5750890	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111275	5750882	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111275	5750855	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111240	5750885	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111280	5750885	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	A3J6C4	2111241	5750899	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/3/2016	25	B3B6A5	2113050	5750970	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
10/3/2016	25	B3B6A5	2113010	5750945	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
10/3/2016	25	B3B6A6	2113010	5751060	Surface Removal	0	UXO	1	Projectile, 40mm, high explosive, M383
10/4/2016	25	A3J6A0	2111020	5751435	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A5	2111090	5750910	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A9	2111015	5751320	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A9	2111095	5751375	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A9	2111085	5751360	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A9	2111050	5751375	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A9	2111035	5751325	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6A9	2111040	5751335	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6C4	2111230	5750895	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6C4	2111225	5750830	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	A3J6C4	2111213	5750840	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
10/4/2016	25	A3J6C4	2111207	5750805	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/4/2016	25	B3B5J9	2113925	5750370	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/5/2016	25	A3J6A7	2111090	5751105	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	A3J6A7	2111075	5751190	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	A3J6A7	2111010	5751115	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
10/5/2016	25	A3J6A7	2111080	5751115	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	A3J6A7	2111035	5751185	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	A3J6B4	2111160	5750870	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	A3J6B4	2111150	5750820	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	A3J6B5	2111170	5750950	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/5/2016	25	B3B5C0	2113280	5750465	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/5/2016	25	B3B5D0	2113335	5750440	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, MK I
10/5/2016	25	B3B6A1	2113035	5750570	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
10/6/2016	25	A3J6B3	2111180	5750720	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/6/2016	25	A3J6E4	2111408	5750899	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/6/2016	25	A3J6E4	2111442	5750832	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/6/2016	25	A3J6E4	2111442	5750850	Surface Removal	0	UXO	1	Projectile, 4.2inch, mortar, high explosive, M3 series
10/6/2016	25	A3J6E4	2111430	5750830	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/6/2016	25	A3J6J8	2111930	5751257	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/6/2016	25	B3B5E0	2113430	5750430	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, MK I
10/6/2016	25	B3B5J0	2113985	5750415	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/11/2016	25	A3J6D6	2111387	5751041	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/11/2016	25	A3J6D6	2111396	5751020	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/11/2016	25	A3J6E4	2111433	5750816	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/11/2016	25	A3J6E4	2111415	5750860	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/11/2016	25	B3C5A0	2114070	5750408	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/12/2016	25	A3J6D6	2111350	5751028	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/12/2016	25	A3J6D6	2111350	5751015	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
10/12/2016	25	A3J6D6	2111320	5751060	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/12/2016	25	A3J6D6	2111301	5751050	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
10/12/2016	25	A3J6D6	2111395	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/12/2016	25	B3B6F2	2113575	5750665	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/12/2016	25	B3C5A9	2114065	5750306	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/13/2016	25	A3J6D6	2111380	5751065	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/13/2016	25	A3J6D6	2111352	5751064	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/13/2016	25	A3J6D6	2111390	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/13/2016	25	A3J6D6	2111345	5751087	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/13/2016	25	A3J6D6	2111330	5751085	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/13/2016	25	A3J6D6	2111356	5751065	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
10/13/2016	25	A3J6D6	2111350	5751070	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/13/2016	25	A3J6D6	2111301	5751089	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111273	5750960	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111255	5750964	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111230	5750932	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111280	5750955	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111268	5750948	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111261	5750995	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/17/2016	25	A3J6C5	2111282	5750925	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C5	2111208	5750933	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C5	2111205	5750930	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111219	5751019	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
10/24/2016	25	A3J6C6	2111280	5751008	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111260	5751055	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111266	5751065	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111270	5751062	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111248	5751025	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111245	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/24/2016	25	A3J6C6	2111255	5751050	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
10/25/2016	25	B3B5G0	2113645	5750445	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/25/2016	25	B3B5G0	2113630	5750460	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
10/27/2016	25	B3A6I3	2112810	5750795	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/9/2016	25	A3J6B6	2111144	5751026	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/9/2016	25	A3J6B6	2111125	5751015	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/9/2016	25	A3J6B6	2111160	5751090	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/9/2016	25	A3J6B6	2111105	5751067	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/14/2016	25	A3J6A6	2111075	5751087	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/14/2016	25	A3J6A6	2111085	5751086	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/14/2016	25	A3J6A6	2111070	5751068	Surface Removal	0	UXO	1	Projectile, 4.2inch, mortar, high explosive, M3 series
11/14/2016	25	A3J6A6	2111070	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/21/2016	25	A3J6B7	2111141	5751112	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
11/21/2016	25	A3J6B7	2111182	5751156	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/21/2016	25	A3J6B7	2111106	5751105	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/21/2016	25	A3J6B7	2111132	5751168	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/21/2016	25	A3J6B7	2111141	5751156	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, illumination, M301 series
11/22/2016	25	A3J6C7	2111250	5751178	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/22/2016	25	A3J6C7	2111265	5751168	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/22/2016	25	A3J6C7	2111205	5751125	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/22/2016	25	A3J6C7	2111225	5751165	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/22/2016	25	A3J6C7	2111290	5751125	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111330	5751162	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111362	5751170	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111375	5751169	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111380	5751167	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111390	5751155	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111365	5751162	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/28/2016	25	A3J6D7	2111315	5751188	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111325	5751118	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111375	5751135	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111360	5751105	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
11/29/2016	25	A3J6D7	2111355	5751112	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111355	5751146	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111350	5751125	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111380	5751131	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111310	5751118	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111370	5751110	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/29/2016	25	A3J6D7	2111368	5751121	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
11/30/2016	25	B3A6F4	2112570	5750810	Surface Removal	0	UXO	1	Projectile, 75mm, high explosive, M48
12/6/2016	25	B3A6E3	2112480	5750735	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/13/2016	25	A3J6E6	2111415	5751020	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/13/2016	25	A3J6E6	2111415	5751045	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/13/2016	25	A3J6E6	2111420	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/13/2016	25	A3J6E6	2111410	5751070	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/13/2016	25	A3J6E6	2111490	5751030	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/13/2016	25	A3J6E6	2111405	5751035	Surface Removal	0	UXO	1	Projectile, 60mm, mortar, high explosive, M49 series
12/14/2016	25	A3J6E7	2111402	5751105	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/20/2016	25	A3J6F7	2111541	5751116	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
12/27/2016	25	A3J6G3	2111690	5750790	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
1/5/2017	25	A3J6G7	2111698	5751150	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
1/17/2017	25	A3J6I3	2111840	5750740	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
4/26/2017	25	B3A5B0	2112163	5750412	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
4/26/2017	25	B3A5B9	2112145	5750315	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
4/27/2017	25	A3J6I1	2111820	5750515	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
4/27/2017	25	B3A5A0	2112041	5750435	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/2/2017	25	A3J6J1	2111955	5750505	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/4/2017	25	B3A6B1	2112103	5750593	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/4/2017	25	B3A6B1	2112165	5750578	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/4/2017	25	B3A6B1	2112150	5750576	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/4/2017	25	B3A6B1	2112168	5750577	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/4/2017	25	B3A6B1	2112185	5750592	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/10/2017	25	B3A6B2	2112108	5750678	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/10/2017	25	B3A6B2	2112114	5750607	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/11/2017	25	B3A6A2	2112085	5750660	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/11/2017	25	B3A6A2	2112065	5750668	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/11/2017	25	B3A6B2	2112132	5750635	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/11/2017	25	B3A6B2	2112165	5750645	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/15/2017	25	A3J6J2	2111980	5750649	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/15/2017	25	A3J6J2	2111969	5750658	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Table 6**  
**MEC Recovered During Remedial Action**

Date Found	Unit	Grid	Northing	Easting	Operation Type	Depth (in)	Item Type	Qty	Description
5/15/2017	25	A3J6J3	2111945	5750775	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	A3J6J3	2111950	5750750	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
5/16/2017	25	B3A6A3	2112007	5750704	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112012	5750778	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112050	5750712	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112085	5750712	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112009	5750725	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112085	5750745	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK II
5/16/2017	25	B3A6A3	2112041	5750765	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112035	5750707	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112035	5750712	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/16/2017	25	B3A6A3	2112015	5750705	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
5/25/2017	25	B3A6C5	2112236	5750929	Surface Removal	0	UXO	1	Projectile, 75mm, Shrapnel, MK I
6/7/2017	25	B3A6A6	2112050	5751085	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
6/7/2017	25	B3A6A6	2112008	5751095	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
6/7/2017	25	B3A6A6	2112010	5751040	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
6/7/2017	25	B3A6A6	2112080	5751055	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
6/13/2017	25	A3J6G8	2111670	5751255	Surface Removal	0	UXO	1	Projectile, 37mm, low explosive, MK I
7/13/2017	25	A3J6J7	2111950	5751150	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series
7/13/2017	25	A3J6J7	2111950	5751120	Surface Removal	0	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series

**Total = 324**

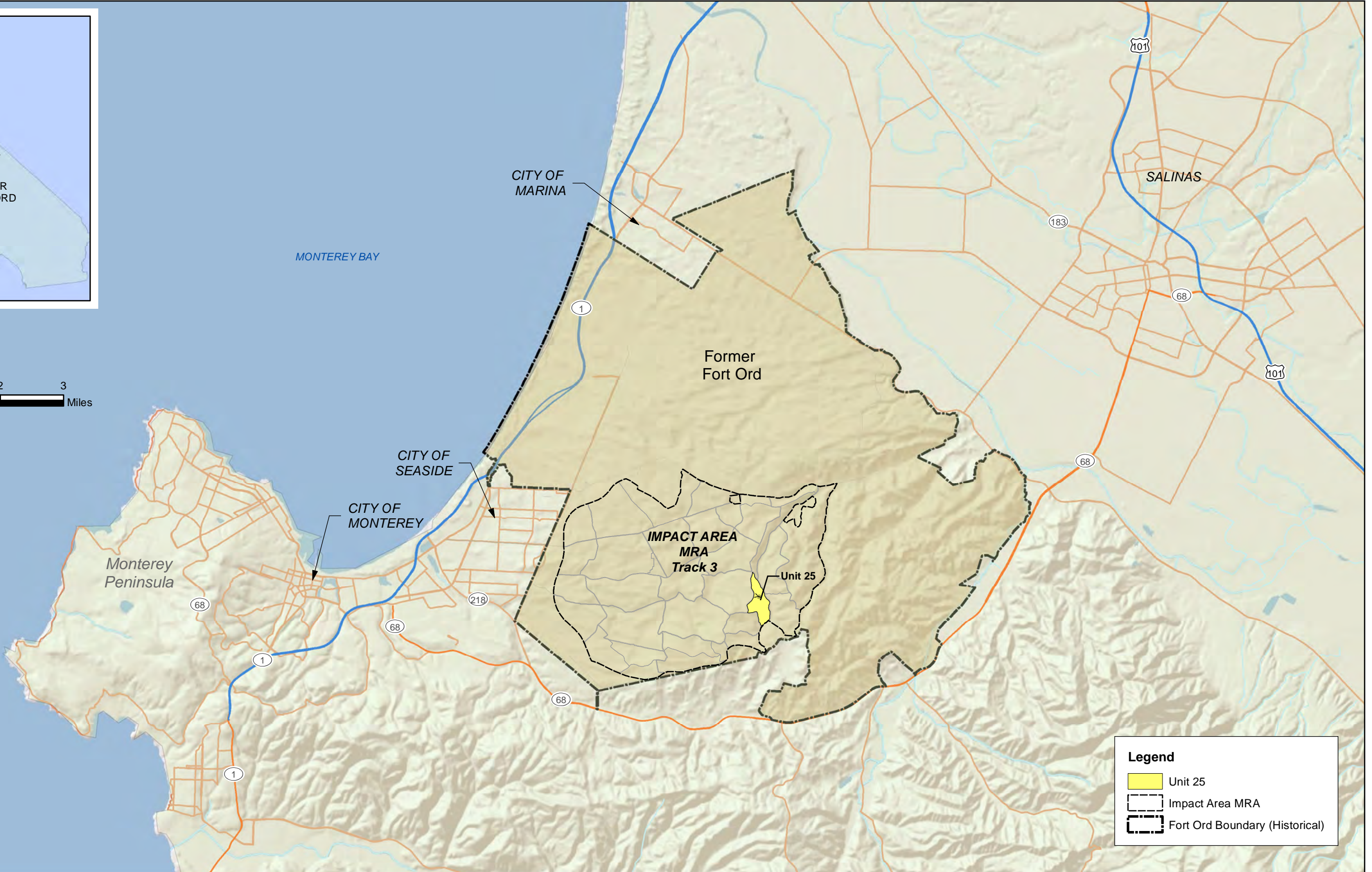
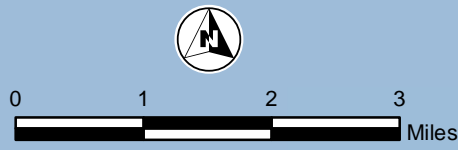
**Table 7**  
**Summary of Survey and Removal Methods by Grids**

<b>Activity</b>	<b>Unit 25 Grids</b>	<b>% of Total Grids</b>
Surface Removal	521	100%
DGM Survey	480	92%

DGM = Digital Geophysical Mapping

*Figures*





**Legend**

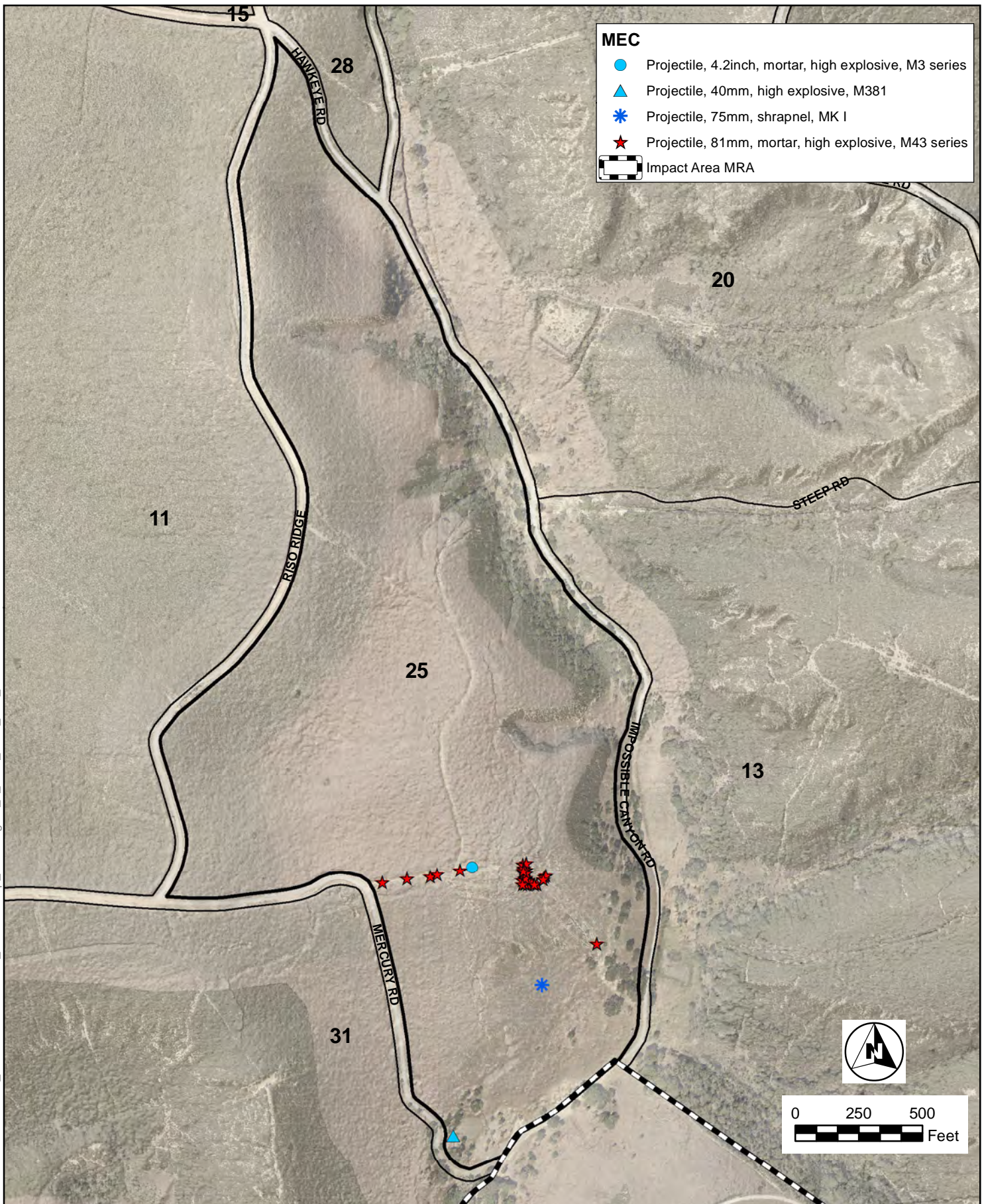
- Unit 25
- Impact Area MRA
- Fort Ord Boundary (Historical)



Remedial Action Report  
 Unit 25  
 Munitions and Explosives of Concern (MEC) Removal  
 ImpactArea MRA  
 Former Fort Ord, California

**Figure 1**  
 Track 3 Impact Area MRA  
 Regional Location Map





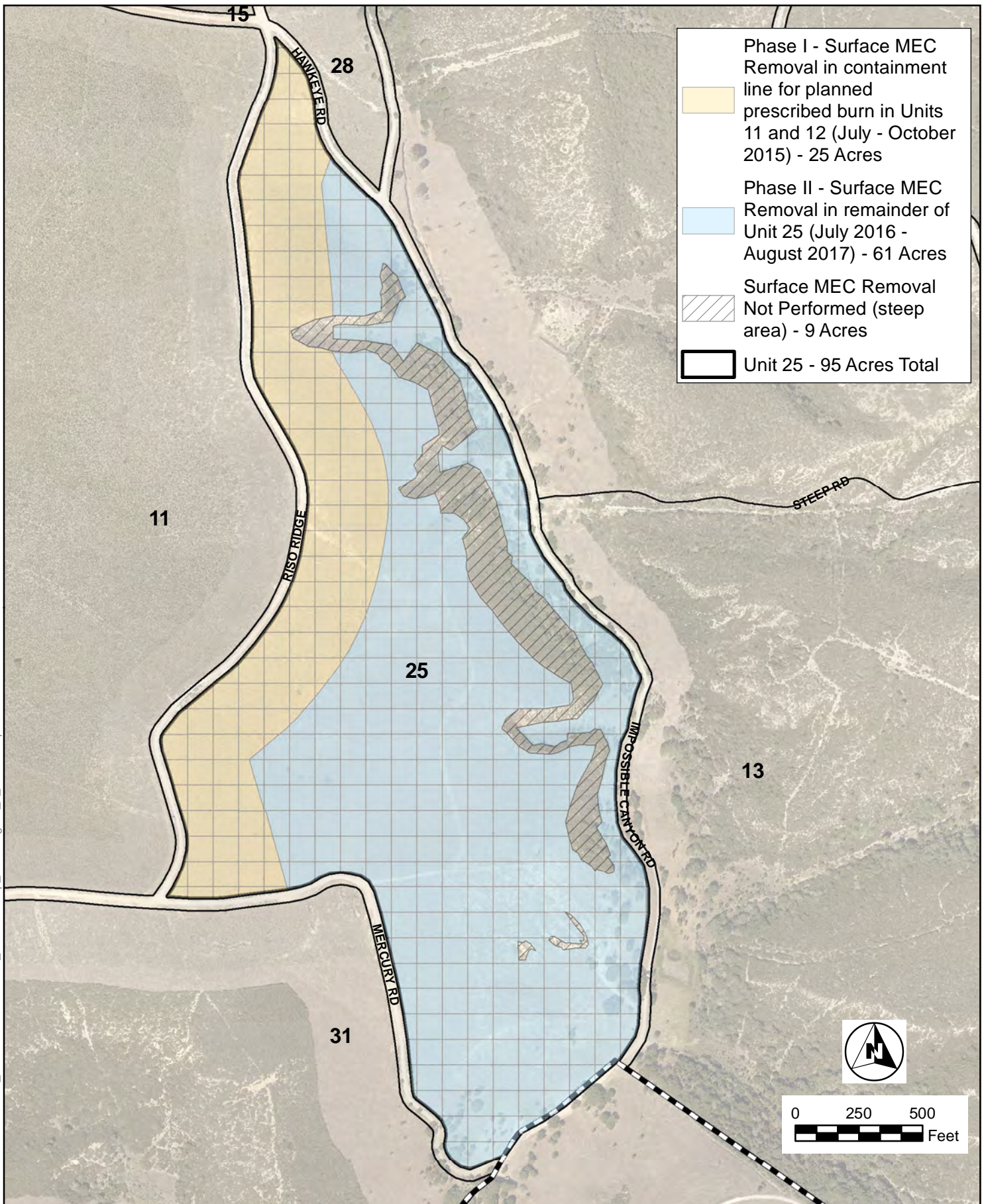
**KEMRON**  
ENVIRONMENTAL SERVICES



Remedial Action Report  
Unit 25  
Munitions and Explosives of Concern  
Former Fort Ord, California

Figure 2  
MEC Finds Prior to  
Remedial Action





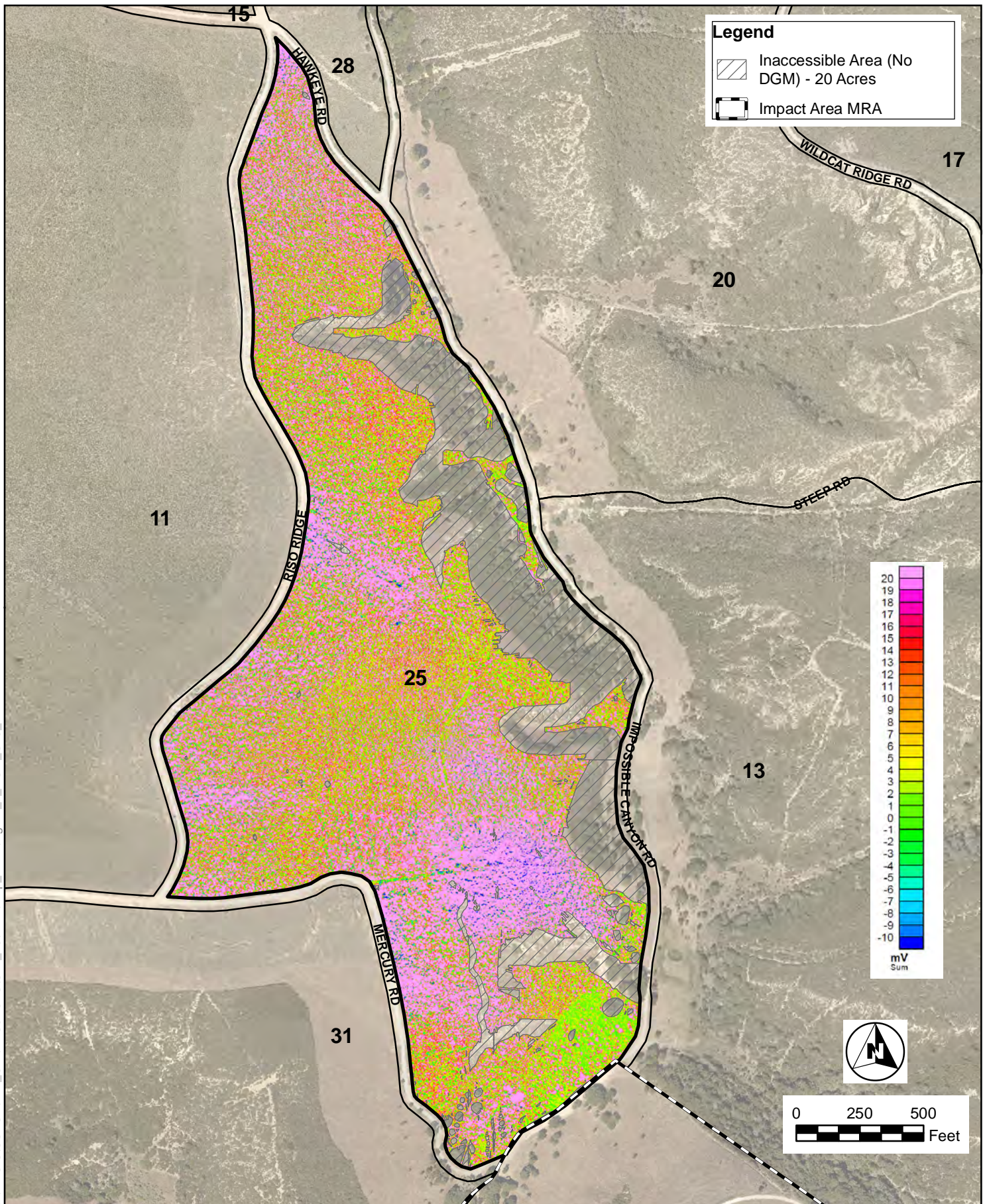
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Remedial Action Report  
Unit 25  
Munitions and Explosives of Concern  
Former Fort Ord, California

Figure 3  
Surface MEC Removal  
Operations





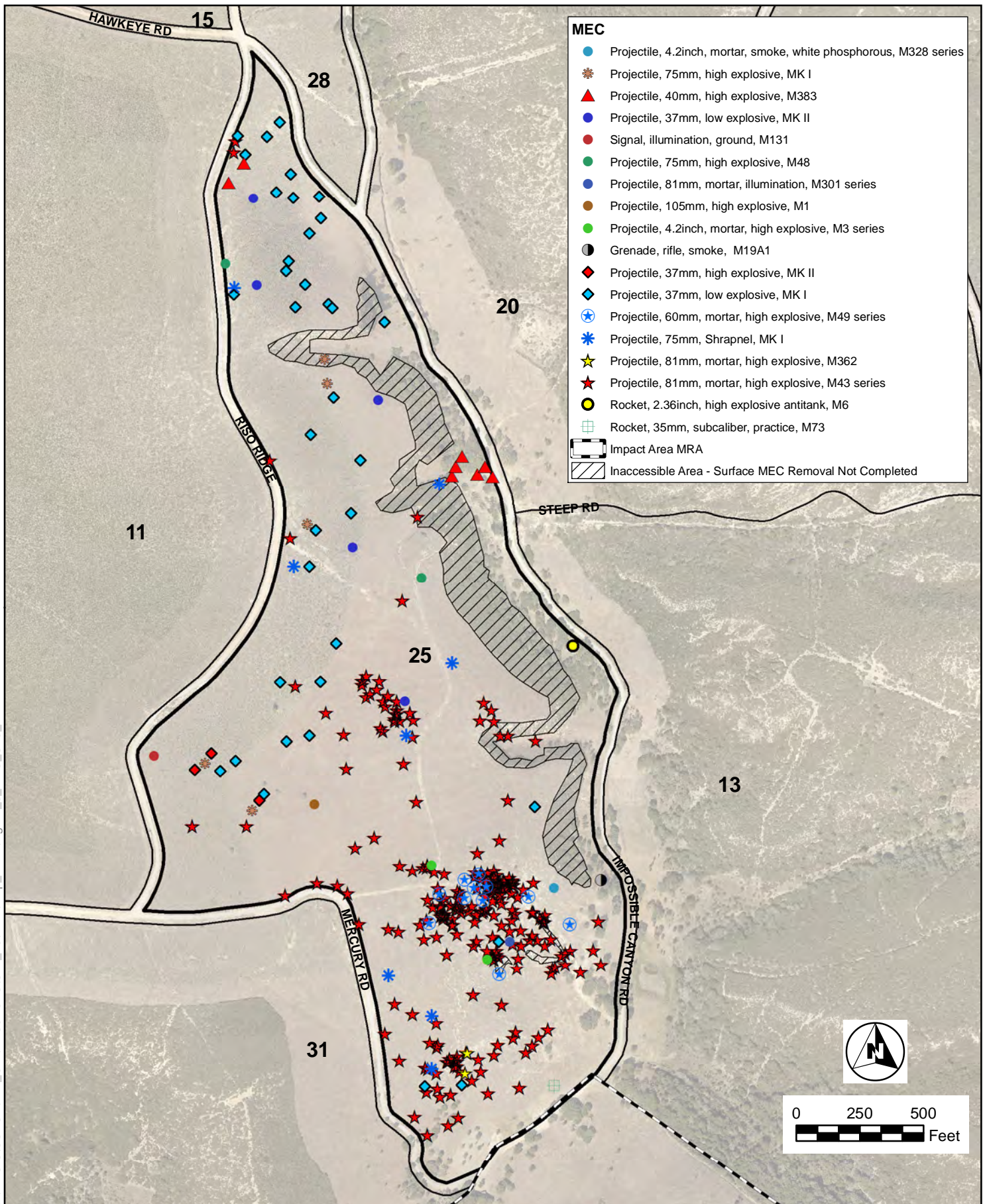
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Munitions and Explosives of Concern  
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Figure 4  
Geophysical Data Map





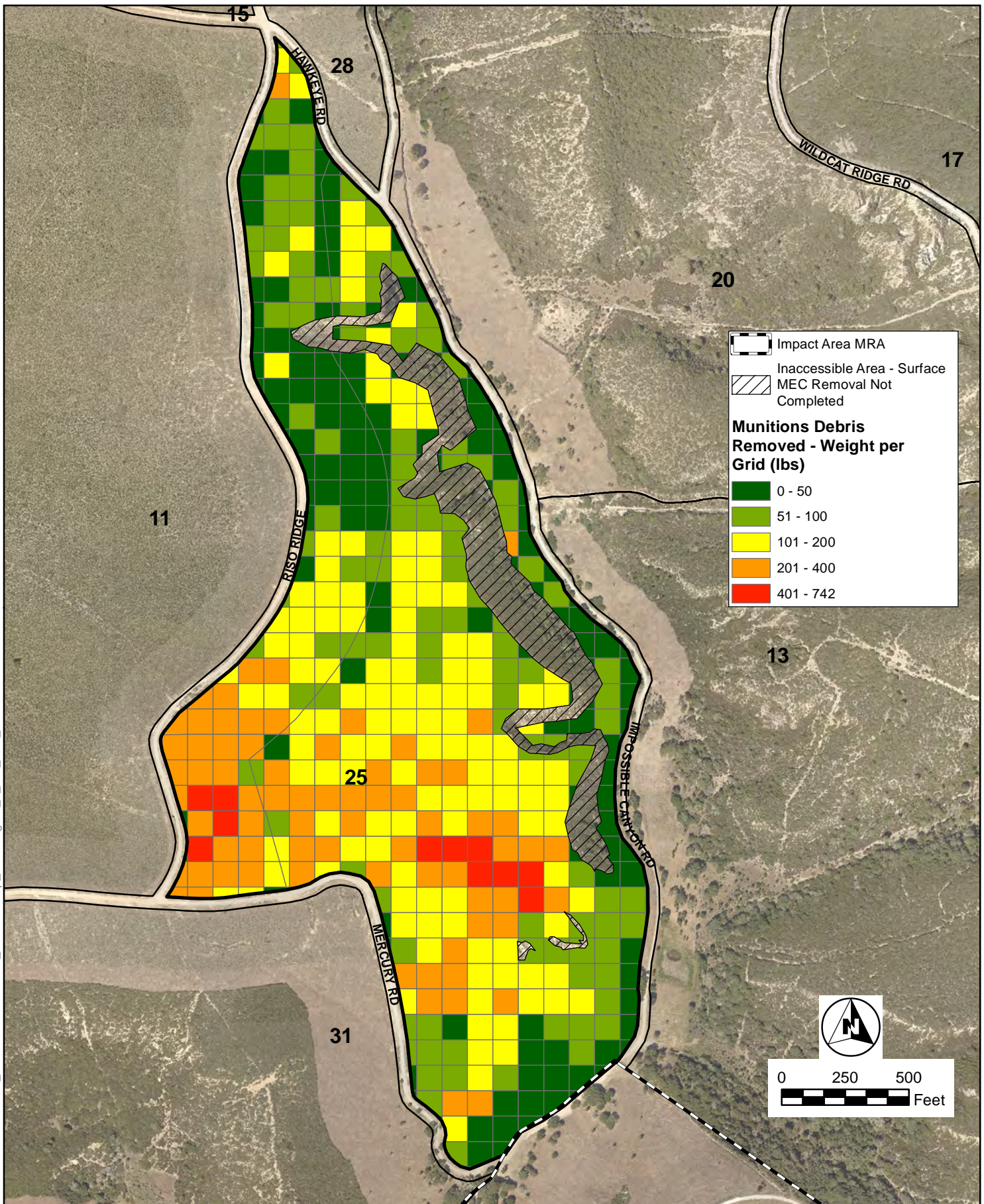
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Remedial Action Report  
Unit 25  
Munitions and Explosives of Concern  
Former Fort Ord, California

Figure 5  
MEC Removed During  
Remedial Action





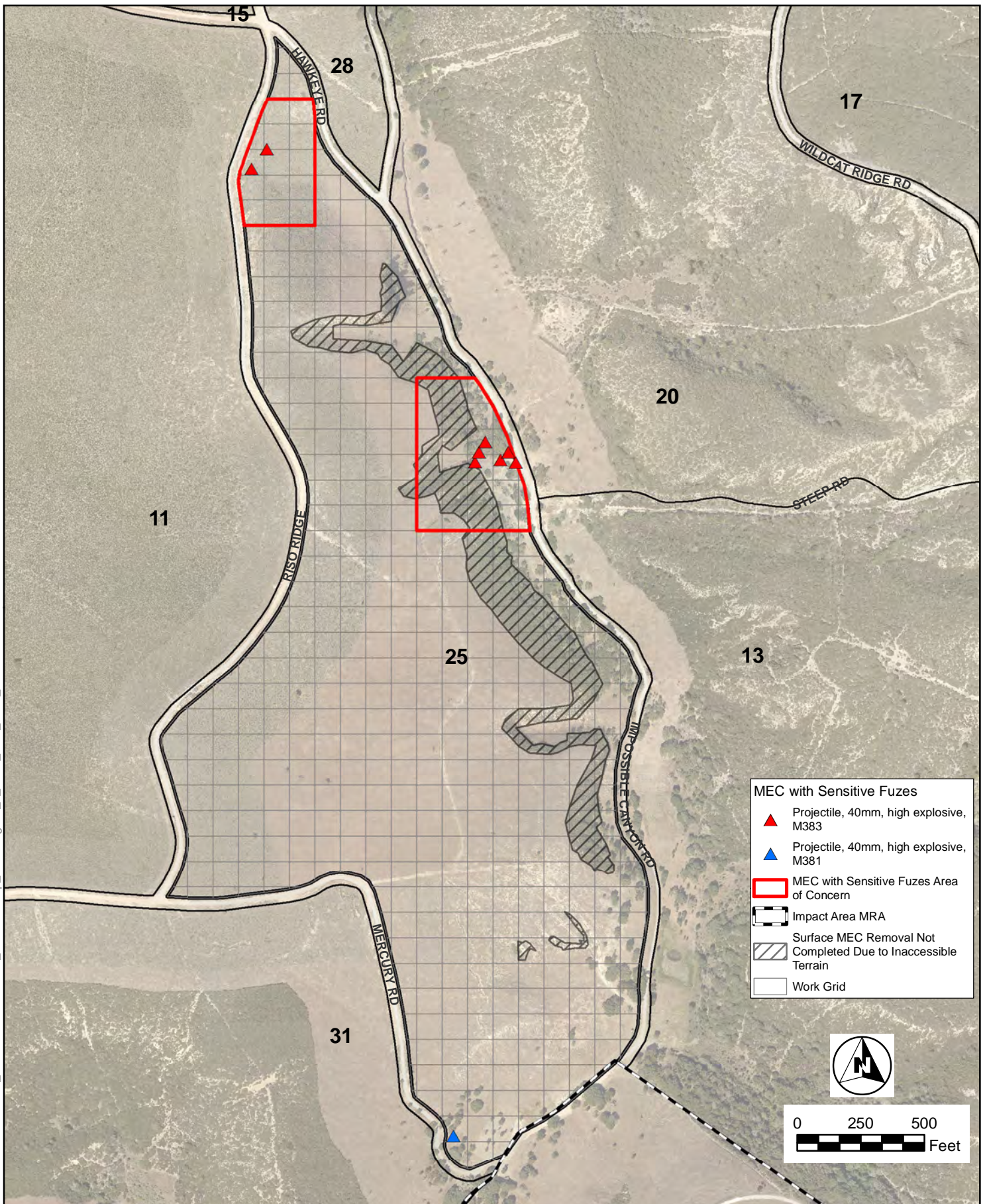
**KEMRON**  
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Unit 25  
Munitions and Explosives of Concern  
Former Fort Ord, California

Figure 6  
Munitions Debris Removed





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Remedial Action Report  
Unit 25  
Munitions and Explosives of Concern  
Former Fort Ord, California

Figure 7  
MEC with Sensitive Fuzes  
Removed

## *Photographs*





**Photograph 1 - Manual Vegetation Clearance Operations**



**Photograph 2 - Surface MEC Removal Operations**





Photograph 3 - M43 81mm Mortars



Photograph 4 - M19 Rifle Grenade





**Photograph 5 - MK1 Low Explosive 37mm Projectile**



**Photograph 6 - Additional M43 81mm Mortars**





**Photograph 7** – M1 High Explosive 105mm Projectile



**Photograph 8** – DGM Survey Operations

## *Appendices*

*Appendix A*  
*Field Work Variances*

## FIELD WORK VARIANCE

<b>Project Name/Number</b>	Fort Ord	<b>WP</b>	8
<b>Applicable Document</b>	Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A)	<b>Date</b>	August 8, 2016

### Problem Description:

The *Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California* (KEMRON, 2016) (OE-0880A) identifies an approximate 24 acre area in the center of Unit 25 where prescribed burning is planned for vegetation removal. This area is also shown on the attached [Figure 1](#). The planned vegetation cutting in Unit 25 was completed where accessible. Steep and difficult terrain exists in portions of the containment area (approximately 8 acres). Due to safety concerns vegetation cutting was not conducted in the areas of difficult terrain and surface MEC removal will not be conducted.

The terrain issues preclude firefighter's ability to control the fire from the perimeter of the unit. A determination was made that Unit 25 would be masticated instead of prescribed burned for vegetation removal.

### Recommended solution:

Masticate the approximately 24 acre area within Unit 25 as shown on [Figure 1](#) and perform MEC remediation activities in this area as outlined in the *Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California* (KEMRON, 2016) (OE-0880A).

Document the areas of difficult terrain (approximately 8 acres) in the Technical Memorandum.

### Impact on present and completed work:

No impact on current or completed work.

### Recommended solution/disposition:

Incorporate this FWV as an appendix to the existing Draft Final Work Plan.

Clarification  Minor Change  Major Change

Affects Budget Yes  No

Affects Schedule Yes  No

Signature Kevin J. Siemann Digitally signed by Kevin J. Siemann  
DN: c=US,  
ou=KEMRON, ou=Environmental Services, ou=Former Ft. Ord, email=bolson@kemron.com, c=US  
Date: 2016.08.08 09:36:23 -0700 Date \_\_\_\_\_  
**MEC Task  
Manager**

Signature Bradley J. Olson Digitally signed by Bradley J. Olson  
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o=KEMRON, ou,  
email=bolson@kemron.com, c=US  
Date: 2016.08.08 09:36:23 -0700 Date \_\_\_\_\_  
**SUXOS**

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celyde@gilbaneco.com  
DN: cn=clyde@gilbaneco.com,  
c=US  
Date: 2016.08.08 09:55:03 -0700 Date \_\_\_\_\_  
**CQCSM**

Signature Bruce McClain Digitally signed by Bruce McClain  
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Ord, email=bmccclain@kemron.com,  
c=US  
Date: 2016.08.08 15:36:43 -0700 Date \_\_\_\_\_  
**UXOQCS**

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DN: cn=Steve Crane, o=KEMRON,  
ou=Environmental Services,  
c=US  
Date: 2016.08.08 15:51:57 -0700 Date \_\_\_\_\_  
**Project Manager**

Signature Erin K. Caruso Digitally signed by Erin K. Caruso  
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o=KEMRON, ou=Environmental Services,  
c=US  
Date: 2016.08.08 15:51:57 -0700 Date \_\_\_\_\_  
**Deputy Project  
Manager**



Field Work Variance No. 006

Page 2 of 3

**USACE Approval: If Major Change:**

Signature MEEK.SHAWN.MIC  
HAEI.1115801739  
OE Safety Specialist

Digitally signed by  
MEEK.SHAWN.MICHAEL.1115801739  
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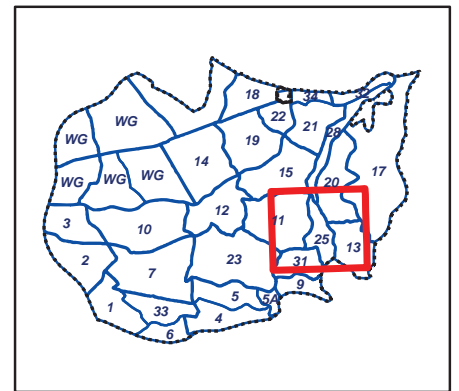
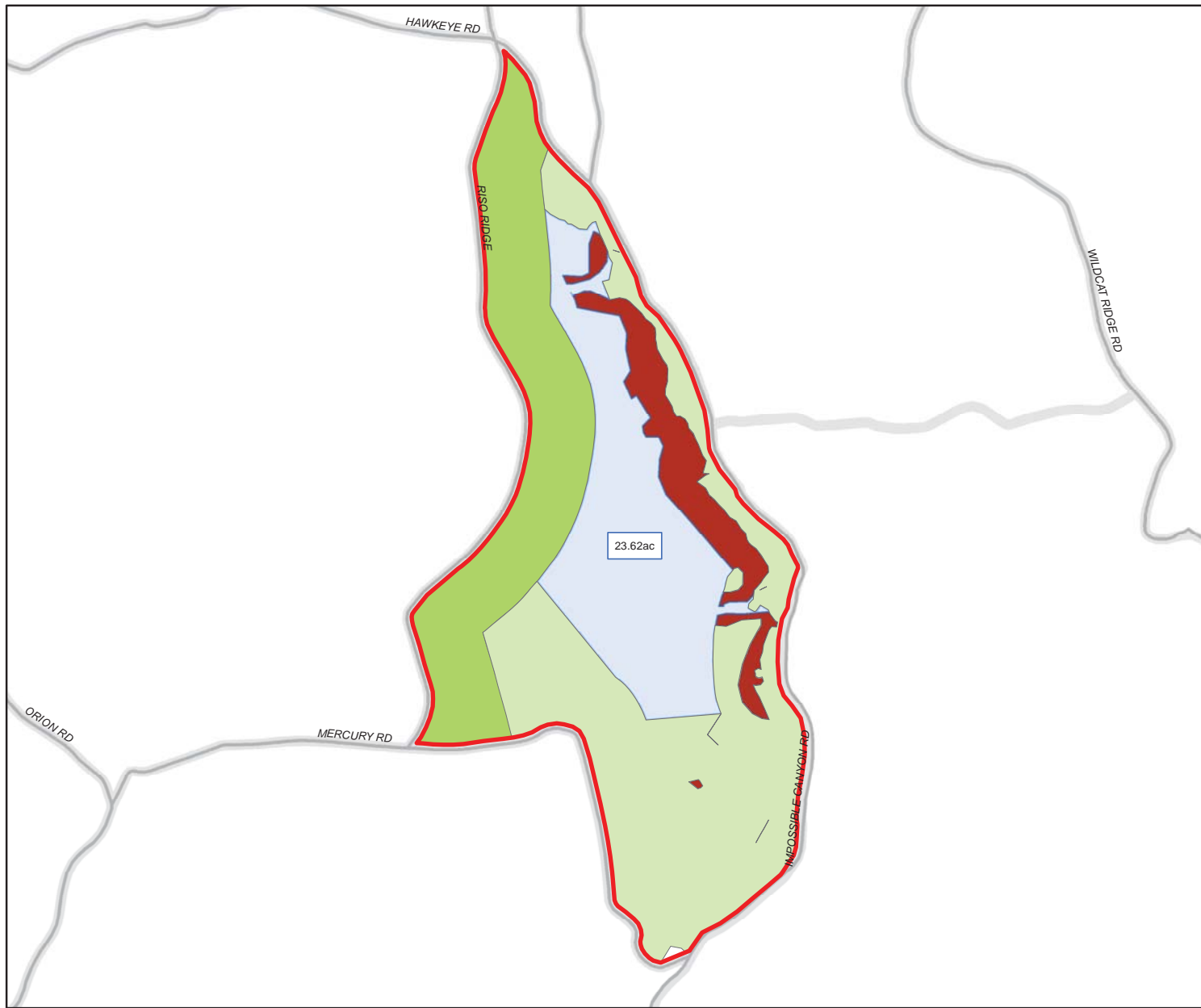
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Date \_\_\_\_\_

USACE COR  
or TM

Signature \_\_\_\_\_ Date \_\_\_\_\_  
USACE Project  
Geophysicist



### Legend

- Planned Interior Mastication (23.62 Acres)
- Mastication Complete 2016 (56.18 Acres)
- Mastication Complete 2015 (25.28 Acres)
- No Cut Due to Steep Terrain (8.05 Acres)
- Roads
- Unit Boundary
- Fuel Breaks

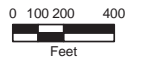


Figure 1

U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT
FORT ORD Unit 25 Mastication Status
Operations Completed Through: 07/28/2016





**FIELD WORK VARIANCE**

<b>Project Name/Number</b>	Fort Ord	<b>WP</b>	07
<b>Applicable Document</b>	Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California (OE- 0880)	<b>Date</b>	November 14, 2017

**Problem Description:**

The *Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (Kemron, 2016), specifies the following:

- Section 2.5.6, Technology-Aided Surface MEC Removal: “Due to the presence of some extremely steep terrain as shown on Figure 2 (not shown), some areas may not have technology-aided surface removal performed. The determination to not conduct technology-aided surface removal may result from personnel safety issues. Areas where technology-aided surface removal is not conducted will be documented and evaluated during the TM process for the potential for MEC items to be present on the surface.”
- Section 2.5.7, Digital Geophysical Mapping (DGM): “Following surface MEC removal, DGM survey will be conducted in accessible areas. Site conditions (e.g. difficult terrain) may prevent digital geophysical survey from being conducted in certain areas; these areas will be documented in the TM.”

Field Work Variance 006 (AR # OE-0880A.2) detailed approximately eight acres within Unit 25 where steep and difficult terrain precluded vegetation cutting. This area corresponds to the area where surface MEC removal was not performed due to extremely difficult terrain. Areas where surface MEC removal was and was not completed are shown on [Figure 1](#). Approximately nine acres of Unit 25 was determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain. Approximately 20 acres of Unit 25 ([Figure 2](#)) was determined by UXO safety personnel to be inaccessible to DGM survey due to extreme terrain, or where dense oak tree stands precluded access.

**Recommended solution:**

Document these areas in the TM. Conduct an evaluation in the TM based on the results of the surface MEC removal and DGM data to determine the likelihood of surface MEC remaining in the 9 acres shown on [Figure 1](#).

**Impact on present and completed work:**

No impact on present and completed work.

**Recommended solution/disposition:**

Incorporate this FWV as an appendix to the existing Draft Final Work Plan.

Clarification Minor Change Major Change Affects Budget Yes  No Affects Schedule Yes  No 

Signature Kevin J. Siemann Digitally signed by Kevin J. Siemann  
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e=ksiemann@gilbane.com,  
o=Gilbane Company, ou=Gilbane  
Company, cn=Kevin J. Siemann  
Date: 2017.11.14.10:36:02-0800' Date \_\_\_\_\_  
Task Manager

Signature Bradley Olson Digitally signed by  
Bradley Olson  
Date: 2017.11.14  
10:43:17 -08'00' Date \_\_\_\_\_  
SUXOS

Signature Steve Crane Date 11/14/17  
Project Manager

Signature Chad Clyde Digitally signed by  
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CQCSM

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DN: c=US,  
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o=Gilbane, ou=Federal Services,  
cn=Erin K. Caruso  
Reason: I am approving this  
document  
Date: 2017.11.16.09:05:18-0800' Date \_\_\_\_\_  
Deputy Project  
Manager

Signature Bruce McClain Digitally signed  
by Bruce McClain  
Date: 2017.11.14  
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UXOQCS

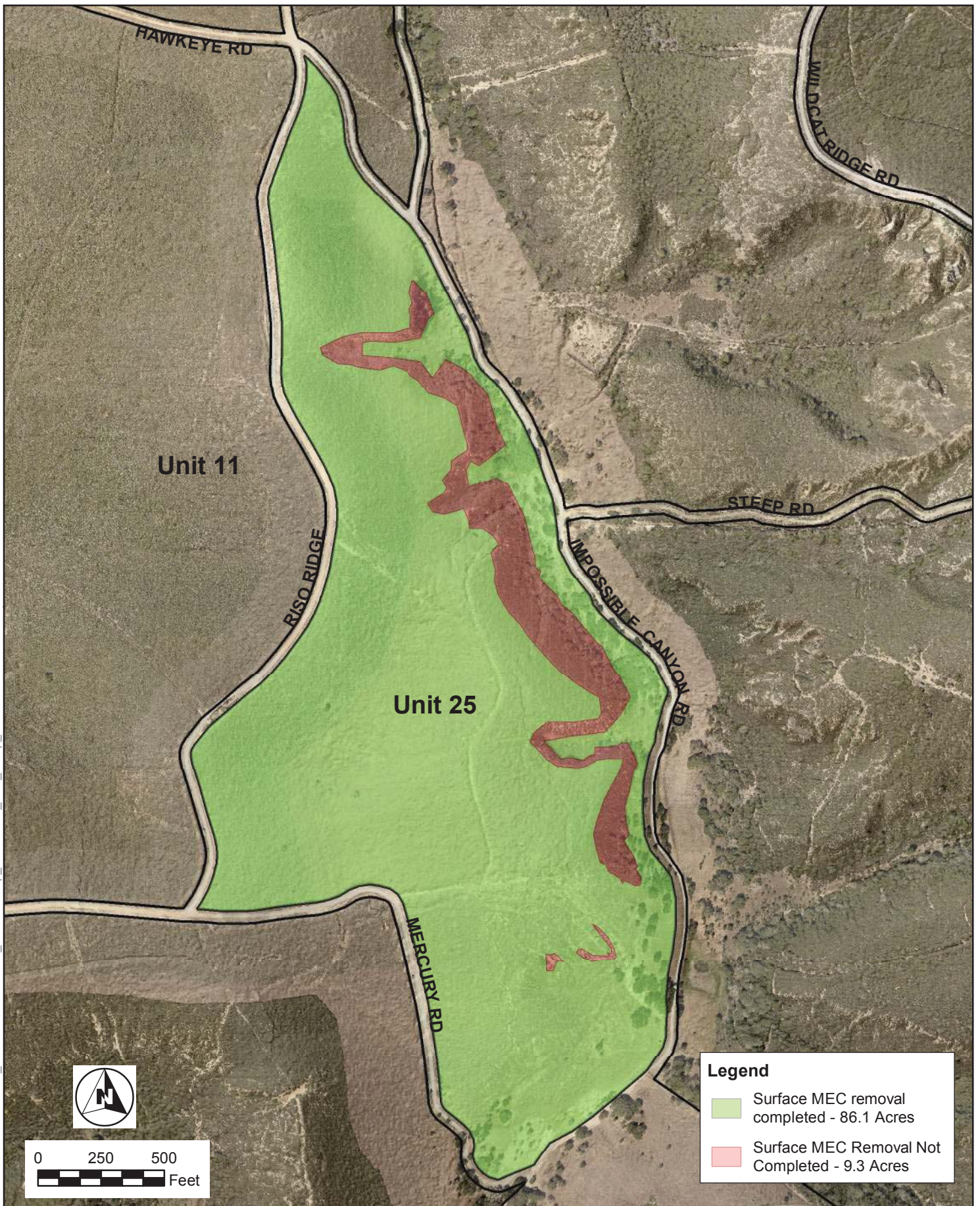
**USACE Approval: If Major Change:**

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OE Safety Specialist

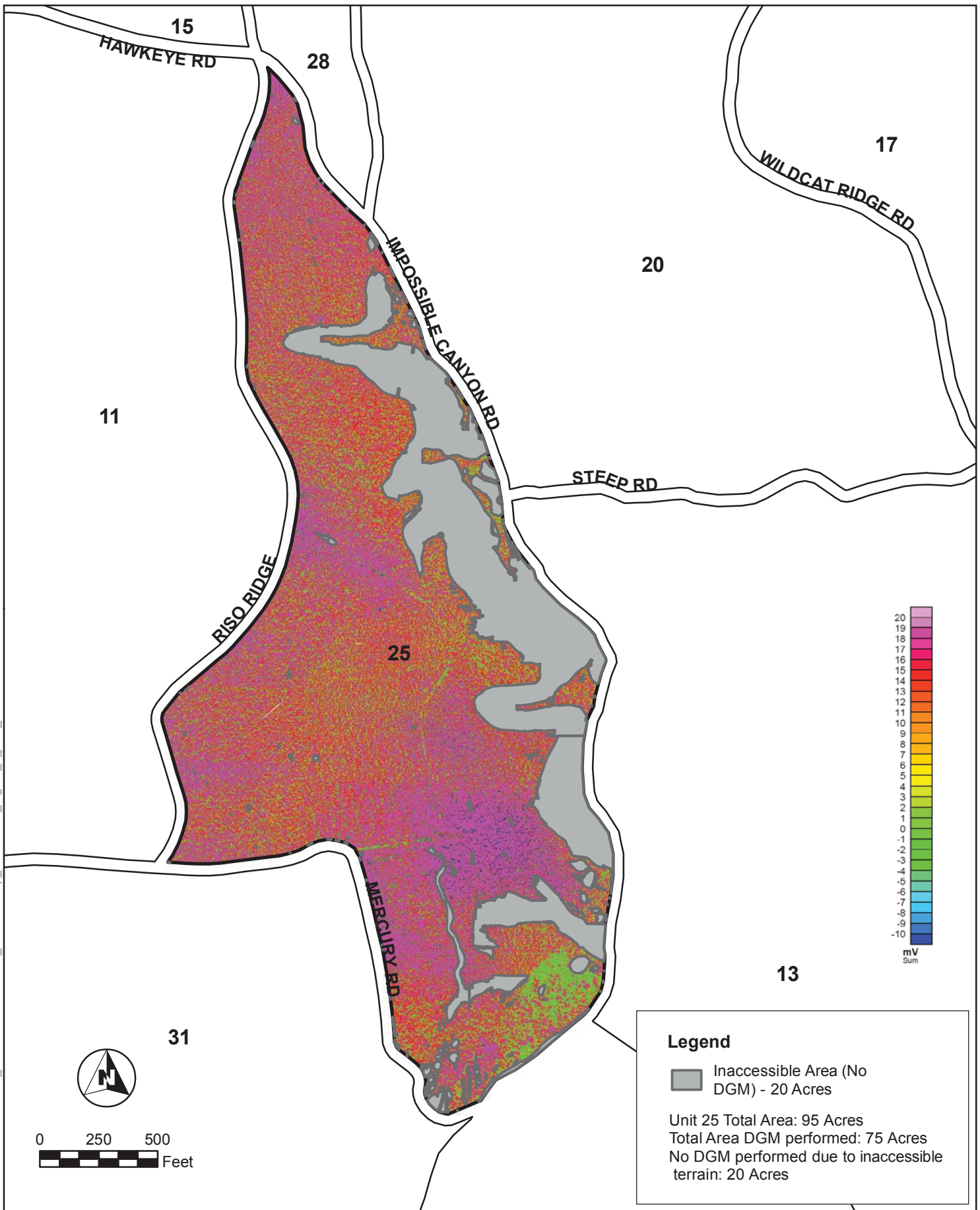
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USACE COR  
or TM

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USACE Project  
Geophysicist









**Distribution List: FWV 011, Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action,  
MRS-BLM Units 25 and 31, Former Fort Ord, California**

Email	Paper/CD	Name	Organization	Address	City, State	Zip
1		Mr. Duane Balch	Department of the Army USACE	1325 J Street	Sacramento, CA	95814
1		Mr. Michael Wheeler	Department of the Army USACE	1325 J Street	Sacramento, CA	95814
1		Mr. John Jackson	Department of the Army USACE	1325 J Street	Sacramento, CA	95814
1		Mr. Kyle Lindsay	Department of the Army USACE	1325 J Street	Sacramento, CA	95814
1		Mr. Therman Franks	Department of the Army USACE	4101 Jefferson Plaza NE	Albuquerque, NM	87109
1		Mr. David Eisen	Department of the Army USACE	4463 Gigling Road	Seaside, CA	93955
1		Mr. James Britt	Department of the Army USACE	4463 Gigling Road	Seaside, CA	93955
1		Mr. William Collins	Department of the Army, Fort Ord BRAC	4463 Gigling Road	Seaside, CA	93955
1		Ms. Natalie Gordon	Chenega Corporation	4463 Gigling Road	Seaside, CA	93955
1		Ms. Chieko Nozaki	Chenega Corporation	4463 Gigling Road	Seaside, CA	93955
1		Mr. Eric Morgan	Bureau of Land Management, Fort Ord National Monument	940 2 <sup>nd</sup> Avenue	Marina, CA	93933
1		Ms. Maeve Clancy	U.S. Environmental Protection Agency, Region IX	75 Hawthorne Street, Mail SFD-8-3	San Francisco, CA	94105
1		Mr. Tom Hall	Tech Law, Inc.	7 Shore Point	North Little Rock, AR	72116
1		Mr. Robert Young	Tech Law, Inc.	235 Montgomery Street, Suite 717	San Francisco, CA	94104
1		Mr. Vlado Arsov	California Department of Toxic Substances Control (DTSC)	8800 California Center Drive	Sacramento, CA	95826
1		Mr. Steve Crane	KEMRON Environmental Services	4522 Joe Lloyd Way	Monterey, CA	93944
1	1	Ms. Audrey Johnson	KEMRON Environmental Services	4522 Joe Lloyd Way	Monterey, CA	93944
	1	Mr. Mike Weaver	Fort Ord Community Advisory Group (FOCAG)	52 Corral De Tierra Road	Salinas, CA	93908
	1	Ms. LeVonne Stone	Fort Ord Environmental Justice Network (FOEJN)	P.O. Box 361	Marina, CA	93933
1	1	Admin Record	Fort Ord BRAC	4463 Gigling Road	Seaside, CA	93955

Approved:   
 David Eisen  
 USACE Project Manager

***Appendix B***  
***DD Form 1348-1A***  
***(MD and Metal Debris Documentation)***



		INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP			Trailer Load No
GENERAL	1 Releasing Generators (RG) Name and Mailing Address KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944		1a RG's Phone No 831.905.9960	2 RG's Site Manager Bradley J. Olson	
	3 Releasing Generators (RG) Project Name and Location KEMRON - Fort Ord MEC Removal and Soil Remediation 4522 Joe Lloyd Way, Monterey, CA 93944		3a RG Project Phone No 831-824-2311	4 RG's SUXOS Bradley J. Olson	
	5 Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benebek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1		5a Transporter Phone No 312-724-5874	6 Dispatcher Name Jakub Benebek	
RELEASING GENERATOR	7 Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062		7a QR Phone 847-929-9650	8 QROC's Manager Mike Schaffer	
	9 Trailer No 1GRAP0621GJ654847	10 Seal No's #162132 N/A N/A	11 Gross Weight	12 Tare Weight	13 Net Weight 40,640 LBS.
	14 Description 22 Gaylord Boxes containing mixed steel.	15 Material Type Munitions Debris, Inert - Mixed steel. (Expended)	16 Units (Wt. Volume) 40,640 LBS.		
	Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"				
	17 Inspector / Certifier Project UXO/QC Print/Type Name Bruce McClain		Signature 	Month/Day/Year 8/9/2016	
18 Inspector / Certifier Site Senior UXO Supervisor (SUXOS) Print/Type Name Bradley J. Olson		Signature 	Month/Day/Year 8/9/2016		
19 Material Released to the Transporter By RG's Site Manager RELEASED BY Print/Type Name Bradley J. Olson		Signature 	Month/Day/Year 8/9/2016		
TRANSPORTER	20 Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY Print/Type Name / Company Jose L. Rosales		Signature 	Month/Day/Year 8 / 11 / 16	
	21 Material Released to FACT CRRRT By Transporter RELEASED BY Print/Type Name / Company		Signature	Month/Day/Year	
RECEIVING PROCESSOR - RECYCLER	22 Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY Print/Type Name / Company Rick McClosky		Signature 	Month/Day/Year 8 / 15 / 16	
	23 Material Released CRRRT to new CRRRT (if needed) RELEASED BY Print/Type Name		Signature	Month/Day/Year	
	24 Current CRRRT I ACKNOWLEDGE THE RECEIPT OF MATERIAL RECEIVED BY Print/Type Name		DEMIL METALS, INC P.O. BOX 126 GLENCOE, IL 60022		Month/Day/Year
	Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1.				
25 Qualified Recycling Manager Print/Type Name Mike Schaffer		Signature 	Month/Day/Year 8 / 22 / 16		
26 List Discrepancy Indication Here					

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DATE	TIME	FROM	TO	QUANTITY	UNIT	DESCRIPTION	PROJ. TITLE	CONSTRUCTION	SUPPLIER'S ADDRESS	SHIP TO	SHIP FROM	SHIP TO	UNIT PRICE	DOLLARS	CY'S	7. FRT RATE	8. TYPE CARGO	9. PS	10. QTY RECD	11. UP	12. UNIT WEIGHT	13. UNIT CUBE	14. UFC	15. SL
01	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
<p>24 DOCUMENT NUMBER &amp; SUFFIX (00-44)</p> <p>25 NATIONAL STOCK NO &amp; ADD (R 23)</p> <p>26 R/C (4-9) U1 (23-28) OTY (25-29) CON CODE (71) D/S (65-58) U# (174-80)</p> <p>27 ADDITIONAL DATA</p> <p>28 NATIONAL STOCK NO &amp; ADD (R 23)</p> <p>29 ITEM NOMENCLATURE</p> <p>30 Munitions Debris Inert - Mixed Steel</p> <p>31 TY CONT 15: RD CONT 40: 640 lbs MID</p> <p>32 RECEIVED BY <i>[Signature]</i> 23. DATE RECEIVED 8/11/16</p> <p>33 DEMIL METALS, INC P.O. BOX 126 GLENCOE, IL 60022</p> <p>34 TRL Vm HGRAP062161654847, 53 Ft. Box Body Trailer, 22 GAYLORD Boxes, USACT Fort Ord, CA KEMRON/08023</p> <p>35 This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, is free of explosive hazards, engine fluids, illuminating dials and other visible liquid hazardous, toxic, and radioactive waste materials.</p> <p>36 Certified By <i>Brad Olson</i> Brad Olson Senior UXO Supervisor - KEMRON MEC Removal and Soil Remediation Project Fort Ord, CA Phone 831-915-9960</p> <p>37 Verified By <i>Shawn Meek</i> Shawn Meek OESS USACE - Sacramento</p> <p>38 PREVIOUS EDITION MAY BE USED</p>																								



DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

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EA00001

24 DOCUMENT NUMBER & SUFFIX (30-4A)

25 NATIONAL STOCK NO & ADD (8-22)

26 RIC (4-8)  
 U.I. (23-24)  
 QTY (25-29)  
 CON CODE (71)  
 DIST (55-56)  
 UP (74-80)

27 ADDITIONAL DATA

5 DOC DATE	6 NMFC	7 FRT RATE	8 TYPE CARGO	9 PS	
10 QTY RECD	11 UP	12 UNIT WEIGHT	13 UNIT CUBE	14 UFC	15 SL
16 FREIGHT CLASSIFICATION NOMENCLATURE					
17 ITEM NOMENCLATURE					
Munitions Debris Inert - Mixed Steel					
18 TY CONT	19 NO CONT	20 TOTAL WEIGHT	21 TOTAL CUBE		
		40,640 LBS MD			
22 RECEIVE	23 DATE RECEIVED				
	12-1-16				

DEMIL METALS, INC

P.O. BOX 1215

GLENGOLE, CA 94022

This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, is free of explosive hazards, engine fluids, illuminating fluids, and other visible liquid hazards, toxic, and radioactive waste materials.

Certified By: *Brad Olson*  
 Brad Olson  
 Senior UXO Supervisor - KEMERON  
 M/C Removal and Soil Remediation Project  
 Fort Ord, CA Phone 831-905-9960

Verified By: *Shawn Meek*  
 Shawn Meek  
 OFSS  
 USACE - Sacramento  
 Fort Ord, CA Phone 831-824-2324

# INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP

Load No

5

GENERAL

1 Releasing Generator (RG) Name and Mailing Address  
**KEMRON Environmental Services**  
**4522 Joe Lloyd Way, Monterey, CA 93944**

1a RG's Phone No  
**831-905-9960**

2 RG's Site Manager  
**Bradley J Olson**

3 Releasing Generator (RG) Project Name and Location  
**KEMRON Environmental Services**  
**4522 Joe Lloyd Way, Monterey, CA 93944**

3a RG Project Phone No  
**831-824-2311**

4 RG's SUXOS  
**Bradley J. Olson**

5 Transporter Name and Mailing Address  
**Magna Transport Solutions - Jakub Benebek**  
**2704 W. Armitage Ave., Chicago, IL 60647, Suite 1**

5a Transporter Phone No  
**312-724-5874**

6 Dispatcher Name  
**Jakub Benebek**

RELEASING GENERATOR

7 Processor / Recycler / Demilitarization - Qualified Recycler  
**Demil Metals, Inc.**  
**601 N. Skokie Blvd., #207, Northbrook, IL 60062**

7a QR Phone  
**847-929-9650**

8 QRCC's Manager  
**Mike Schaffer**

9 Box No  
**1UYVS253X7P224233**

10 Seal No's

162138	N/A
N/A	N/A
N/A	N/A

11 Gross Weight  
**40,640**

12 Tare Weight

13 Net Weight

14 Description  
**22 Gaylord Boxes containing mixed steel**

15 Material Type  
**Munitions Debris, Inert - Mixed Steel (Expended)**

16 Units (W/ Volume)

Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"

17 Inspector / Certifier KEMRON Project UO/OC  
 Print/Type Name: **Christopher Light**  
 Signature: *[Signature]*  
 Month/Day/Year: **12/1/16**

18 Inspector / Certifier Site KEMRON Service UO Supervisor SUXOS  
 Print/Type Name: **Bradley J. Olson**  
 Signature: *[Signature]*  
 Month/Day/Year: **12/1/16**

19 Material Released to the Transporter By KEMRON RG's Site Manager  
 RELEASED BY Print/Type Name: **Bradley J Olson**  
 Signature: *[Signature]*  
 Month/Day/Year: **12/1/16**

TRANSPORTER

20 Transporter ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact)  
 RECEIVED BY Print/Type Name / Company: **MESSILLA VALLEY SEPARATION**  
 Signature: *[Signature]*  
 Month/Day/Year: **12, 1, 16**

21 Material Released to DEMIL Metals By Transporter  
 RELEASED BY Print/Type Name / Company: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Month/Day/Year: \_\_\_\_\_

RECEIVING PROCESSOR - RECYCLER

22 Storage Manager ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact)  
 RECEIVED BY Print/Type Name / Company: \_\_\_\_\_  
 Signature: **Rick McCloskey**  
 Month/Day/Year: **12, 5, 16**

23 Material Released CRRRT to new CRRRT (if needed)  
 RELEASED BY Print/Type Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Month/Day/Year: \_\_\_\_\_

24 Current CRRRT ACKNOWLEDGE THE RECEIPT OF MATERIAL  
 RECEIVED BY Print/Type Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Month/Day/Year: \_\_\_\_\_

Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1.

25 Qualified Recycling Manager  
 Print/Type Name: **Mike Schaffer**  
 Signature: *[Signature]*  
 Month/Day/Year: **12, 12, 16**

26 List Discrepancy Indication Here

DEMIL METALS INC  
 P.O. BOX 125  
 GLENCOE, IL 60022

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DOC	RI	FR	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU
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NO	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU	QU

EA 00001

24. DOCUMENT NUMBER & SUFFIX (30-44)

1. TOTAL PRICE

2. SHIP FROM

3. SHIP TO

4. MARK FOR

5. DOC DATE

6. NMFC

7. FRT RATE

8. TYPE CARGO

9. PS

10. QTY RECD

11. UP

12. UNIT WEIGHT

13. UNIT CUBE

14. UFC

15. SL

16. FREIGHT CLASSIFICATION NOMENCLATURE

17. ITEM NOMENCLATURE

18. TYCONT

19. NO CONT

20. TOTAL WEIGHT

21. TOTAL CUBE

22. RECEIVED BY

23. DATE RECEIVED

25. NATIONAL STOCK NO & ADD (8-22)

26. RIC (4-6)  
 U (23-24)  
 QTY (25-29)  
 CON CODE (71)  
 DIST (55-56)  
 UP (74-80)

TRL Van JLV332W27L973336, 53 Ft. Box Body Trailer, 22 GAYLORD Boxes. USACE/Fort Ord, CA/KEMRON/00025  
 Seal # 162148

Munitions Debris Inert - Mixed Steel

DEMIL METALS, INC  
 P.O. BOX 125  
 GLENCOE, IL 60022

27. ADDITIONAL DATA

This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, is free of explosive hazards, engine fluids, illuminating dials and other visible liquid hazardous, toxic, and radioactive waste materials.

Certified By: *Brad Olson*  
 Brad Olson  
 Senior UXO Supervisor - KEMRON  
 MEC Removal and Soil Remediation Project  
 Fort Ord, CA Phone 831-905-9960

Verified By: *James C. Bess*  
 James C. Bess  
 OESS  
 USACE - Sacramento  
 Fort Ord, CA Phone 831-824-2324

Active Design 8 0

PREVIOUS EDITION MAY BE USED



# INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP

Trailer Load No  
**6**


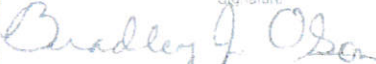
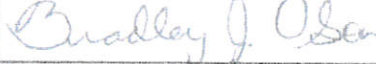
GENERAL

1. Releasing Generators (RG) Name and Mailing Address <b>KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944</b>		1a. RG's Phone No <b>831.905.9960</b>	2. RG's Site Manager <b>Bradley J. Olson</b>
3. Releasing Generators (RG) Project Name and Location <b>KEMRON - Fort Ord MEC Removal and Soil Remediation 4522 Joe Lloyd Way, Monterey, CA 93944</b>		3a. RG Project Phone No <b>831-824-2311</b>	4. RG's SUXOS <b>Bradley J. Olson</b>
5. Transporter Name and Mailing Address <b>Magna Transport Solutions - Jakub Benbenek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1</b>		5a. Transporter Phone No <b>312-724-5874</b>	6. Dispatcher Name <b>Jakub Benebek</b>

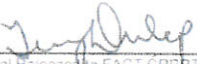
RELEASING GENERATOR

7. Processor / Recycler / Demilitarization - Qualified Recycler <b>Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062</b>		7a. QR Phone <b>847-929-9650</b>	8. QRQC's Manager <b>Mike Schaffer</b>							
9. Trailer No <b>1JV532W27L973536</b>	10. Seal No's <table border="1" style="width: 100%;"><tr><td>#162148</td><td>N/A</td></tr><tr><td>N/A</td><td>N/A</td></tr><tr><td>N/A</td><td>N/A</td></tr></table>	#162148	N/A	N/A	N/A	N/A	N/A	11. Gross Weight	12. Tare Weight	13. Net Weight <b>40,690 LBS</b>
#162148	N/A									
N/A	N/A									
N/A	N/A									
14. Description <b>22 Gaylord Boxes containing mixed steel.</b>		15. Material Type <b>Munitions Debris, Inert - Mixed steel. (Expended)</b>		16. Units (Wt., Volume) <b>40,690 LBS</b>						


**Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"**

17. Inspector / Certifier Project UOX/OC <b>Bruce McClain</b>		Signature 	Month/Day/Year <b>12/20/2016</b>
18. Inspector / Certifier Site, Senior UOX Supervisor (SUXOS) <b>Bradley J. Olson</b>		Signature 	Month/Day/Year <b>12/20/2016</b>
19. Material Released to the Transporter By RG's Site Manager <b>Bradley J. Olson</b>		Signature 	Month/Day/Year <b>12/20/2016</b>

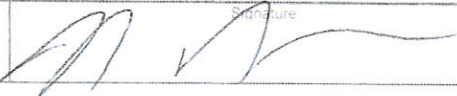
TRANSPORTER

20. Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) <b>TERRY DUNLAP / mtr</b>		Signature 	Month/Day/Year <b>12 / 21 / 16</b>
21. Material Released in FACT CRRRT By Transporter <b>RELEASED BY</b>		Signature	Month/Day/Year

RECEIVING PROCESSOR - RECYCLER

22. Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) <b>RECEIVED BY</b>		Signature	Month/Day/Year
23. Material Released CRRRT to new CRRRT if needed <b>Jason Spears</b>		Signature 	Month/Day/Year <b>1, 2, 17</b>
24. Current CRRRT I ACKNOWLEDGE THE RECEIPT OF MATERIAL <b>DEMIL METALS, INC P.O. BOX 125 BLENCOE, IL 60022</b>		Signature	Month/Day/Year

**Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1."**

25. Qualified Recycling Manager <b>Mike Schaffer</b>		Signature 	Month/Day/Year <b>1, 9, 17</b>
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26. List Discrepancy Indication Here



# INERT / DEMILITARIZATION / CHAIN OF CUSTODY CERTIFICATION FOR NON-HAZARDOUS AEDA / RANGE RESIDUE SCRAP

Trailer Load No. 7


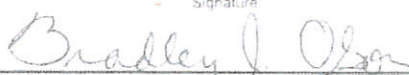
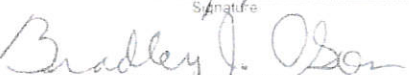
GENERAL

1. Releasing Generators (RG) Name and Mailing Address KEMRON Environmental Services 4522 Joe Lloyd Way, Monterey, CA 93944		1a. RG's Phone No. 831.905.9960	2. RG's Site Manager Bradley J. Olson
3. Releasing Generators (RG) Project Name and Location KEMRON - Fort Ord MEC Removal and Soil Remediation 4522 Joe Lloyd Way, Monterey, CA 93944		3a. RG Project Phone No. 831-824-2311	4. RG's SUXOS Bradley J. Olson
5. Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benebek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1		5a. Transporter Phone No. 312-724-5874	6. Dispatcher Name Jakub Benebek


RELEASING GENERATOR

7. Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062		7a. QR Phone 847-929-9650	8. OROC's Manager Mike Schaffer
9. Trailer No. 1GRAP0623GJ654624	10. Seal No.'s #162144 N/A N/A	11. Gross Weight	12. Tare Weight 13. Net Weight 25,670 LBS
14. Description 13 Gaylord Boxes containing mixed Aluminium. 4 ea 55 gal drums containing mixed small arms.		15. Material Type Munitions Debris, Inert - Mixed Aluminium.	16. Units (Wt./Volume) 25,670 LBS

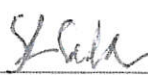
**Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"**

17. Inspector / Certifier (Print/Type Name) Bruce McClain		Signature 		Month/Day/Year 1/24/2017
18. Inspector / Certifier Site - Senior UXO Supervisor (SUXOS) (Print/Type Name) Bradley J. Olson		Signature 		Month/Day/Year 1/24/2017
19. Material Released to the Transporter By (RG's Site Manager) (Print/Type Name) Bradley J. Olson		Signature 		Month/Day/Year 1/24/2017

TRANSPORTER

20. Transporter - I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) (Print/Type Name / Company) Jose Luna / M/T		Signature 		Month/Day/Year 1, 24, 17
21. Material Released to FACT CRRRT By (Transporter) (Print/Type Name / Company)		Signature		Month/Day/Year

RECEIVING PROCESSOR - RECYCLER

22. Storage Manager - I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) (Print/Type Name / Company)		Signature		Month/Day/Year
23. Material Released CRRRT to new CRRRT (if needed) (Print/Type Name) Steve CADKIN		Signature 		Month/Day/Year 1, 30, 17

24. Current CRRRT - I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Print/Type Name)		Signature DEMIL METALS, INC		Month/Day/Year
---	--	--------------------------------	--	----------------

25. Qualified Recycling Manager (Print/Type Name) Mike Schaffer		Signature 		Month/Day/Year 1, 31, 17
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26. List Discrepancy Indication Here

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

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UNIT	FROM	TO	QUANTITY	SUPPLIER	DISPATCH	PROJ	RECEIVED	DATE	TIME	PRICE	UNIT	WEIGHT	CUBE	UFC	SL	MARK FOR	SHIP FROM	SHIP TO																																																																																																															
45664	48485051	525334	55565706	5960	616263	646566	67686970	71727374	757677787980	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00

PREVIOUS EDITION MAY BE USED

24 DOCUMENT NUMBER & SUFFIX (30-44)

25 NATIONAL STOCK NO. & ADD (18-22)

26 RIC (4-6)  
 U (23-24)  
 QTY (25-26)  
 CON CODE (7)  
 DIST (55-56)  
 UP (74-80)

27 ADDITIONAL DATA

IRI Via IRR APPROX 5021 5311 Box Park Trade (FRONT) ORD BROS (SACT) Fort Ord CAL MIRON 900026  
 Seal # 162144

5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
17 ITEM NOMENCLATURE																	18 TOTAL PRICE																																																																														
Munitions Debris Inert Mixed Aluminum																	1 TOTAL PRICE																																																																														
19 NO CONT																	20 TOTAL WEIGHT																																																																														
DEMIL METALS, INC																	21 TOTAL CUBE																																																																														
P.O. BOX 126																	22 RECEIVED BY																																																																														
GLNCOE, TL 60022																	23 DATE RECEIVED																																																																														
1-24-17																																																																																															

This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, is free of explosive hazards, engine fluids, illuminating fluids and other visible liquid hazardous, toxic, and radioactive waste materials.

Certified By: *Brad Olson*  
 Senior (SM) Supervisor - K1 MIRON  
 M/C Removal and Soil Remediation Project  
 Fort Ord, CA Phone 831-905-0960

Verified By: *James Britt*  
 SACT - Sacramento  
 Fort Ord, CA Phone 831-824-2324



DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00

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24 DOCUMENT NUMBER & SUFFIX (30-44)

25 NATIONAL STOCK NO. & ADD (18-22)

26 RIC (4-6)  
U (23-24)  
QTY (25-29)  
CON CODE (71)  
DIST (55-56)  
LP (74-80)

TR1 Vin (GRA)P06236d654624 8311 Box Hawk No NSN 53 Gal Dump 88802 UNACT Fort Ord CA KI MRON 0002  
Seal # 162118

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00

27 ADDITIONAL DATA

This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, contains only miscellaneous small arms ammunition 50 caliber and below related magazines.

certified by *Bradley Olson*  
Senior UXO Supervisor - KI MRON  
MHC Removal and Soil Remediation Project  
Fort Ord CA Phone 831-824-2311

Verified by *James Boer*  
OLSN  
1 SACT - Sacramento  
Phone 831-824-2324

DEMAIL METALS INC  
P.O. BOX 126-24-1a  
GLENCOE, IL 60022



DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

27 ADDITIONAL DATA	26 R/C (4-6) U (23-24) QTY (25-29) CON CODE (71) DIST (65-66) UP (74-80)	25 NATIONAL STOCK NO & ADD (6-22)	24 DOCUMENT NUMBER & SUFFIX (30-44)
<p>This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief contains only miscellaneous small arms ammunition 50 caliber and below related materials</p> <p>Certified by: <i>Bradley Olson</i> Senior I XO Supervisor - KAMRON MTC Removal and Soil Remediation Project Fort Ord, CA Phone: 834-824-2314</p> <p>Verified by: <i>James Hott</i> OISS Fort Ord, CA Phone: 834-824-2324</p>	<p>FRI, Van (GRAP) 60236061624, 53 FT BOX BATH, NO SSN, 53 GAL DRUM #0003, ENSAC/PORT ORD, CA, KAMRON/0003 Serial # 162114</p>		
<p>1 ITEM NOMENCLATURE Misc Small Arms Ammunition</p>	<p>18 FT CONT 19 NO CONT 20 TOTAL WEIGHT 21 TOTAL CUBE</p> <p>575 lbs SAA</p>	<p>22 DATE RECEIVED 1-24-17</p>	<p>23 DATE RECEIVED</p>
<p>10 QTY RECD 11 UNIT WEIGHT 12 UNIT CUBE 13 UFC 14 UFC 15 SL</p>	<p>16 FREIGHT CLASSIFICATION NOMENCLATURE</p>	<p>17 ITEM NOMENCLATURE</p>	<p>18 DATE 19 NMFC 20 TYPE CARGO 21 PS</p>
<p>1 UNIT PRICE 2 DOLLARS CTS 3 TOTAL PRICE</p>	<p>4 MARK FOR</p>	<p>5 SHIP FROM</p>	<p>6 SHIP TO</p>
<p>7 SUPPLIER'S NAME AND ADDRESS 8 DISTRICT 9 PROJEC 10 PRIORITY 11 DATE 12 TIME 13 TO C M P D</p>	<p>14 MARK FOR</p>	<p>15 SHIP FROM</p>	<p>16 SHIP TO</p>
<p>17 SUPPLIER'S NAME AND ADDRESS 18 DISTRICT 19 PROJEC 20 PRIORITY 21 DATE 22 TIME 23 TO C M P D</p>	<p>24 MARK FOR</p>	<p>25 SHIP FROM</p>	<p>26 SHIP TO</p>

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
27 ADDITIONAL DATA This certifies and verifies that the material listed has been 100 percent inspected and to the best of our knowledge and belief, contains only miscellaneous small arms ammunition so caliber and below related materials. Certified By: <i>Bradley Olson</i> Senior UNO Supervisor - KIAMRON MFC Removal and Soil Remediation Project Fort Ord, CA Phone 831-824-2311 Verified By: <i>James Butt</i> OJSS USAC - Sacramento Phone 831-824-2323												25 NATIONAL STOCK NO. & ADD (8-22) IRI 40D FOR APAC 26 JPS 54 21 53 EL Box Body Trailer No NSN 55 Gal Drum and 1 SACT Fort Ord, CA KIAMRON 0004 Seal # 162146												24 DOCUMENT NUMBER & SUFFIX (30-44) 494641464905041525354555657581595016102634460566768697071727374767767767980																																																							
26 RIC (4-6) U/I (23-24) QTY (25-29) CON CODE (71) DIST (55-56) UP (74-80)												17 ITEM NOMENCLATURE Misc. Small Arms Ammunition												22 RECEIPT METAL INC P.O. BOX 126 GLENVIEW, IL 60022 1-27-17																																																							
18 FROM & ISS 19 QUANTITY 20 SUPPLEMENTARY ADDRESS 21 STATION 22 DIS. TRI. BU. TION 23 FREQ. FECT 24 FREQ. FECT 25 FREQ. FECT 26 FREQ. FECT 27 FREQ. FECT 28 FREQ. FECT 29 FREQ. FECT 30 FREQ. FECT 31 FREQ. FECT 32 FREQ. FECT 33 FREQ. FECT 34 FREQ. FECT 35 FREQ. FECT 36 FREQ. FECT 37 FREQ. FECT 38 FREQ. FECT 39 FREQ. FECT 40 FREQ. FECT 41 FREQ. FECT 42 FREQ. FECT 43 FREQ. FECT 44 FREQ. FECT 45 FREQ. FECT 46 FREQ. FECT 47 FREQ. FECT 48 FREQ. FECT 49 FREQ. FECT 50 FREQ. FECT 51 FREQ. FECT 52 FREQ. FECT 53 FREQ. FECT 54 FREQ. FECT 55 FREQ. FECT 56 FREQ. FECT 57 FREQ. FECT 58 FREQ. FECT 59 FREQ. FECT 60 FREQ. FECT 61 FREQ. FECT 62 FREQ. FECT 63 FREQ. FECT 64 FREQ. FECT 65 FREQ. FECT 66 FREQ. FECT 67 FREQ. FECT 68 FREQ. FECT 69 FREQ. FECT 70 FREQ. FECT 71 FREQ. FECT 72 FREQ. FECT 73 FREQ. FECT 74 FREQ. FECT 75 FREQ. FECT 76 FREQ. FECT 77 FREQ. FECT 78 FREQ. FECT 79 FREQ. FECT 80 FREQ. FECT												16 FREIGHT CLASSIFICATION NOMENCLATURE 17 ITEM NOMENCLATURE 18 FROM & ISS 19 QUANTITY 20 SUPPLEMENTARY ADDRESS 21 STATION 22 DIS. TRI. BU. TION 23 FREQ. FECT 24 FREQ. FECT 25 FREQ. FECT 26 FREQ. FECT 27 FREQ. FECT 28 FREQ. FECT 29 FREQ. FECT 30 FREQ. FECT 31 FREQ. FECT 32 FREQ. FECT 33 FREQ. FECT 34 FREQ. FECT 35 FREQ. FECT 36 FREQ. FECT 37 FREQ. FECT 38 FREQ. FECT 39 FREQ. FECT 40 FREQ. FECT 41 FREQ. FECT 42 FREQ. FECT 43 FREQ. FECT 44 FREQ. FECT 45 FREQ. FECT 46 FREQ. FECT 47 FREQ. FECT 48 FREQ. FECT 49 FREQ. FECT 50 FREQ. FECT 51 FREQ. FECT 52 FREQ. FECT 53 FREQ. FECT 54 FREQ. FECT 55 FREQ. FECT 56 FREQ. FECT 57 FREQ. FECT 58 FREQ. FECT 59 FREQ. FECT 60 FREQ. FECT 61 FREQ. FECT 62 FREQ. FECT 63 FREQ. FECT 64 FREQ. FECT 65 FREQ. FECT 66 FREQ. FECT 67 FREQ. FECT 68 FREQ. FECT 69 FREQ. FECT 70 FREQ. FECT 71 FREQ. FECT 72 FREQ. FECT 73 FREQ. FECT 74 FREQ. FECT 75 FREQ. FECT 76 FREQ. FECT 77 FREQ. FECT 78 FREQ. FECT 79 FREQ. FECT 80 FREQ. FECT												15 UNIT PRICE 16 DOLLARS 17 CTS 18 DOLLARS 19 CTS 20 DOLLARS 21 CTS 22 DOLLARS 23 CTS 24 DOLLARS 25 CTS 26 DOLLARS 27 CTS 28 DOLLARS 29 CTS 30 DOLLARS 31 CTS 32 DOLLARS 33 CTS 34 DOLLARS 35 CTS 36 DOLLARS 37 CTS 38 DOLLARS 39 CTS 40 DOLLARS 41 CTS 42 DOLLARS 43 CTS 44 DOLLARS 45 CTS 46 DOLLARS 47 CTS 48 DOLLARS 49 CTS 50 DOLLARS 51 CTS 52 DOLLARS 53 CTS 54 DOLLARS 55 CTS 56 DOLLARS 57 CTS 58 DOLLARS 59 CTS 60 DOLLARS 61 CTS 62 DOLLARS 63 CTS 64 DOLLARS 65 CTS 66 DOLLARS 67 CTS 68 DOLLARS 69 CTS 70 DOLLARS 71 CTS 72 DOLLARS 73 CTS 74 DOLLARS 75 CTS 76 DOLLARS 77 CTS 78 DOLLARS 79 CTS 80 DOLLARS												14 DOC DATE 15 RFBFC 16 FRT RATE 17 TYPE CARGO 18 PS 19 UNIT WEIGHT 20 UNIT CUBE 21 UFC 22 SI 23 DATE RECEIVED 24 MARK FOR 25 FROM 26 TO 27 FROM 28 TO 29 FROM 30 TO 31 FROM 32 TO 33 FROM 34 TO 35 FROM 36 TO 37 FROM 38 TO 39 FROM 40 TO 41 FROM 42 TO 43 FROM 44 TO 45 FROM 46 TO 47 FROM 48 TO 49 FROM 50 TO 51 FROM 52 TO 53 FROM 54 TO 55 FROM 56 TO 57 FROM 58 TO 59 FROM 60 TO 61 FROM 62 TO 63 FROM 64 TO 65 FROM 66 TO 67 FROM 68 TO 69 FROM 70 TO 71 FROM 72 TO 73 FROM 74 TO 75 FROM 76 TO 77 FROM 78 TO 79 FROM 80 TO																																											

PREVIOUS EDITION MAY BE USED

DD FORM 1348-1A, JUL 91 (EG) ISSUE RELEASE/RECEIPT DOCUMENT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00
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EA00001

1. TOTAL PRICE	2. SHIP FROM	3. SHIP TO
DOLLARS CTS	KEMRON; Fort Ord 4522 Joe Lloyd Way Monterey, CA 93944	Demit Metal, Inc. 601 N. Skokie Blvd #207, Northbrook, IL 60062
4. MARK FOR		
5. DOC DATE	6. N/RC	7. FRT RATE
		8. TYPE CARGO
9. PS	10. QTY. RECD	11. U/P
	12. UNIT WEIGHT	13. UNIT CUBE
	14. UFC	15. SL
16. FREIGHT CLASSIFICATION NOMENCLATURE		
17. ITEM NOMENCLATURE		
Munitions Debris Inert -Mixed Aluminum		
18. TT' CONT	19. NO CONT	20. TOTAL WEIGHT
		38,820 Lbs MD
22. RECEIVED BY	23. DATE RECEIVED	
JAMES HILL	6/12/17	
21. TOTAL CUBE		
24. NATIONAL STOCK NO. & ADD (8-22)		
TRL Vin IUYVS2364P 179514, 53 Ft. Box Body Trailer; 22 GAYLORD Boxes; USACE/Fort Ord, CA/KEMRON/00027		
25. RIC (4-6) UI (23-24) QTY (25-29) CON CODE (7-1) DIST (55-58) UP (7-4-80) Seal # 162145		
27. ADDITIONAL DATA		
This certifies that the material listed has been 100 percent properly inspected and, to the best of our knowledge and belief, is free of explosive hazards, engine fluids, illuminating dials and other visible liquid hazardous, toxic, and radioactive waste materials.		
Certified By: Brad Olson <i>Bradley J. Olson</i> Senior UXO Supervisor - KEMRON MEC Removal and Soil Remediation Project Fort Ord, CA Phone 831-905-9960		
Verified By: James Hill <i>James Hill</i> OESS USACE - Sacramento Fort Ord, CA Phone 831-824-2324		

PREVIOUS EDITION MAY BE USED

JUN 14 2017

RELEASING GENERATOR	4522 Joe Lloyd Way, Monterey, CA 93944		031-024-2311	Bradley J. Olson		
	5. Transporter Name and Mailing Address Magna Transport Solutions - Jakub Benbenek 2704 W. Armitage Ave., Chicago, IL 60647, Suite 1		5a. Transporter Phone No. 312-724-5874	6. Dispatcher Name Jakub Benebek		
	7. Processor / Recycler / Demilitarization - Qualified Recycler Demil Metals, Inc. 601 N. Skokie Blvd., #207, Northbrook, IL 60062		7a. QR Phone 847-929-9650	8. QRQC's Manager Mike Schaffer		
	9. Trailer No. 1UYVS25364P179514	10. Seal No.'s #162145      N/A N/A      N/A N/A      N/A		11. Gross Weight	12. Tare Weight	13. Net Weight 38,820
	14. Description 22 Gaylord Boxes containing mixed steel.		15. Material Type Munitions Debris, Inert - Mixed steel.		16. Units (Wt., Volume) 38,820	
	Inert Certification: "I CERTIFY AND VERIFY THAT THE AEDA RESIDUE, RANGE RESIDUE AND/OR EXPLOSIVE CONTAMINATED PROPERTY LISTED HAS BEEN 100 PERCENT INSPECTED BY ME AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, ARE INERT AND/OR FREE OF EXPLOSIVES OR OTHER DANGEROUS MATERIALS"					
	17. Inspector / Certifier Project UXO/QC Print/Type Name: Bruce McClain		Signature: <i>Bruce McClain</i>		Month/Day/Year: 5/25/2017	
	18. Inspector / Certifier Site Senior UXO Supervisor (SUXOS) Print/Type Name: Bradley J. Olson		Signature: <i>Bradley J. Olson</i>		Month/Day/Year: 5/25/2017	
	19. Material Released to the Transporter By QRQC's Site Manager RELEASED BY: Print/Type Name: Bradley J. Olson		Signature: <i>Bradley J. Olson</i>		Month/Day/Year: 5/25/2017	
	20. Transporter I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY: Print/Type Name / Company: LAIS MORALET MVT		Signature: <i>Lais Moralet</i>		Month/Day/Year: 6, 12, 17	
21. Material Released to FACT CRRRT By Transporter RELEASED BY: Print/Type Name / Company:		Signature:		Month/Day/Year: 1, 1		
22. Storage Manager I ACKNOWLEDGE THE RECEIPT OF MATERIAL (Receiving Signature Verifies that Seals are Intact) RECEIVED BY: Print/Type Name / Company:		Signature:		Month/Day/Year: 1, 1		
23. Material Released CRRRT to new CRRRT (if needed) RELEASED BY: Print/Type Name: Mike Sclatan		Signature: <i>Mike Sclatan</i>		Month/Day/Year: 6, 16, 17		
24. Demil QRQC I ACKNOWLEDGE THE RECEIPT OF MATERIAL RECEIVED BY: Print/Type Name: P.O. BOX 126 GLENCOE, IL 60022		Signature:		Month/Day/Year: 1, 1		
Demilitarization / Destruction Certification: "I CERTIFY THAT EACH ITEM OR ITEMS LISTED HEREON WERE DEMILITARIZED / DESTROYED, SO AS TO NO LONGER RESEMBLE AEDA / ORDNANCE, BEYOND THE REQUIREMENTS LISTED IN DoD 4160.21-M-1.						
25. Qualified Recycling Manager Print/Type Name: Mike Sclatan		Signature: <i>Mike Sclatan</i>		Month/Day/Year: 6, 30, 17		
26. List Discrepancy Indication Here						

*Appendix C*  
*Examples of DGM Data Forms*

## Grid Block Processing Report

<b>Grid Block ID:</b>	A316E21	<b>Grids Collected:</b>	A316E2,A316F2,A316G2,A316H2,A316I2,A316J2,A3J5D0,A3J5D9,A3J5E0,A3J5E9,A3J6A1,A3J6A2,A3J6B1,A3J6B2,A3J6C1,A3J6C2,A3J6D1,A3J6D2,A3J6E1,A3J6E2		
<b>Date of Survey:</b>	4/20/2017	<b>Survey Instrument:</b>	Array 2	<b>Re-Survey?:</b>	N
<b>Start Time:</b>	4/20/2017 9:30:00 AM	<b>Team ID:</b>	GEO_1	<b>QC Survey?:</b>	N
<b>End Time:</b>	4/20/2017 2:40:00 PM	<b>Unit ID:</b>	25	<b>Percent Covered in QC Survey:</b>	0

### Processing Information

<b>Processing Date:</b>	5/1/2017	<b>Processing Operator:</b>	James Hayslett
<b>Processed with Oasis montaj</b>	Yes	<b>Geosoft Database Name</b>	A316E21.gdb
<b>Lag Correction Performed?</b>	Yes	<b>Lag Correction Value:</b>	5
<b>Drift Correction Performed?</b>	Yes	<b>Drift Correct Method:</b>	Windowed statistical leveling (Channel/High % texcluded/Low % excluded/Window length): Ch1/80/0/75-250, Ch2/75/0/75-250, Ch3/70/0/75-250, Ch4/65/0/75-250
<b>De-Spiking Performed?</b>	Yes	<b>De-Spiking Info:</b>	Performed as needed.
<b>Line Breaking Performed?</b>	Yes	<b>Line Breaking Info:</b>	75-250
<b>Data Coordinates Translated?</b>	Yes	<b>Data Projection:</b>	NAD83 / California zone 4 (ftUS)

#### Processing Comments:

Sections of data without GPS RTK fix are DGPS and the positional data is useable. High levels of response across entire grid block. Saturated response areas present.

**Data Package Files:** **Header Added to Processed File?** Yes

A316E2.gdb, A316E2.map, A316E2.pdf, A316E2.ply, A316E2.tif, A316E2\_AOI.ply, A316E2\_Ch\_Sum.grd, A316E2\_Processed.XYZ, Gaps\_A316E2.cpg, Gaps\_A316E2.dbf, Gaps\_A316E2.prj, Gaps\_A316E2.shp, Gaps\_A316E2.shp.GeosoftMeta, Gaps\_A316E2.shx, A316F2.gdb, A316F2.map, A316F2.pdf, A316F2.ply, A316F2.tif, A316F2\_AOI.ply, A316F2\_Ch\_Sum.grd, A316F2\_Processed.XYZ, Gaps\_A316F2.cpg, Gaps\_A316F2.dbf, Gaps\_A316F2.prj, Gaps\_A316F2.shp, Gaps\_A316F2.shp.GeosoftMeta, Gaps\_A316F2.shx, A316G2.gdb, A316G2.map, A316G2.pdf, A316G2.ply, A316G2.tif, A316G2\_AOI.ply, A316G2\_Ch\_Sum.grd, A316G2\_Processed.XYZ, Gaps\_A316G2.cpg, Gaps\_A316G2.dbf, Gaps\_A316G2.prj, Gaps\_A316G2.shp, Gaps\_A316G2.shp.GeosoftMeta, Gaps\_A316G2.shx, A316H2.gdb, A316H2.map, A316H2.pdf, A316H2.ply, A316H2.tif, A316H2\_AOI.ply, A316H2\_Ch\_Sum.grd, A316H2\_Processed.XYZ, Gaps\_A316H2.cpg, Gaps\_A316H2.dbf, Gaps\_A316H2.prj, Gaps\_A316H2.shp, Gaps\_A316H2.shp.GeosoftMeta, Gaps\_A316H2.shx, A316I2.gdb, A316I2.map, A316I2.pdf, A316I2.ply, A316I2.tif, A316I2\_AOI.ply, A316I2\_Ch\_Sum.grd, A316I2\_Processed.XYZ, Gaps\_A316I2.cpg, Gaps\_A316I2.dbf, Gaps\_A316I2.prj, Gaps\_A316I2.shp, Gaps\_A316I2.shp.GeosoftMeta, Gaps\_A316I2.shx, A316J2.gdb, A316J2.map, A316J2.pdf, A316J2.ply, A316J2.tif, A316J2\_AOI.ply, A316J2\_Ch\_Sum.grd, A316J2\_Processed.XYZ, Gaps\_A316J2.cpg, Gaps\_A316J2.dbf, Gaps\_A316J2.prj, Gaps\_A316J2.shp, Gaps\_A316J2.shp.GeosoftMeta, Gaps\_A316J2.shx, A3J5D0.gdb, A3J5D0.map, A3J5D0.pdf, A3J5D0.ply, A3J5D0.tif, A3J5D0\_AOI.ply, A3J5D0\_Ch\_Sum.grd, A3J5D0\_Processed.XYZ, Gaps\_A3J5D0.cpg, Gaps\_A3J5D0.dbf, Gaps\_A3J5D0.prj, Gaps\_A3J5D0.shp, Gaps\_A3J5D0.shp.GeosoftMeta, Gaps\_A3J5D0.shx, A3J5D9.gdb, A3J5D9.map, A3J5D9.pdf, A3J5D9.ply, A3J5D9.tif, A3J5D9\_AOI.ply, A3J5D9\_Ch\_Sum.grd, A3J5D9\_Processed.XYZ, Gaps\_A3J5D9.cpg, Gaps\_A3J5D9.dbf, Gaps\_A3J5D9.prj, Gaps\_A3J5D9.shp, Gaps\_A3J5D9.shp.GeosoftMeta, Gaps\_A3J5D9.shx, A3J5E0.gdb, A3J5E0.map, A3J5E0.pdf, A3J5E0.ply, A3J5E0.tif, A3J5E0\_AOI.ply, A3J5E0\_Ch\_Sum.grd, A3J5E0\_Processed.XYZ, A3J5E9.gdb, A3J5E9.map, A3J5E9.pdf, A3J5E9.ply, A3J5E9.tif, A3J5E9\_AOI.ply, A3J5E9\_Ch\_Sum.grd, A3J5E9\_Processed.XYZ, A3J6A1.gdb, A3J6A1.map, A3J6A1.pdf, A3J6A1.ply, A3J6A1.tif, A3J6A1\_AOI.ply, A3J6A1\_Ch\_Sum.grd, A3J6A1\_Processed.XYZ, Gaps\_A3J6A1.cpg, Gaps\_A3J6A1.dbf, Gaps\_A3J6A1.prj, Gaps\_A3J6A1.shp, Gaps\_A3J6A1.shp.GeosoftMeta, Gaps\_A3J6A1.shx, A3J6A2.gdb, A3J6A2.map, A3J6A2.pdf, A3J6A2.ply, A3J6A2.tif, A3J6A2\_AOI.ply, A3J6A2\_Ch\_Sum.grd, A3J6A2\_Processed.XYZ, A3J6B1.gdb, A3J6B1.map, A3J6B1.pdf, A3J6B1.ply, A3J6B1.tif, A3J6B1\_AOI.ply, A3J6B1\_Ch\_Sum.grd, A3J6B1\_Processed.XYZ, Gaps\_A3J6B1.cpg, Gaps\_A3J6B1.dbf, Gaps\_A3J6B1.prj, Gaps\_A3J6B1.shp, Gaps\_A3J6B1.shp.GeosoftMeta, Gaps\_A3J6B1.shx, A3J6B2.gdb, A3J6B2.map, A3J6B2.pdf, A3J6B2.ply, A3J6B2.tif, A3J6B2\_AOI.ply, A3J6B2\_Ch\_Sum.grd, A3J6B2\_Processed.XYZ, A3J6C1.gdb, A3J6C1.map, A3J6C1.pdf, A3J6C1.ply, A3J6C1.tif, A3J6C1\_AOI.ply, A3J6C1\_Ch\_Sum.grd, A3J6C1\_Processed.XYZ, Gaps\_A3J6C1.cpg, Gaps\_A3J6C1.dbf, Gaps\_A3J6C1.prj, Gaps\_A3J6C1.shp, Gaps\_A3J6C1.shp.GeosoftMeta, Gaps\_A3J6C1.shx, A3J6C2.gdb, A3J6C2.map, A3J6C2.pdf, A3J6C2.ply, A3J6C2.tif, A3J6C2\_AOI.ply, A3J6C2\_Ch\_Sum.grd, A3J6C2\_Processed.XYZ, A3J6D1.gdb, A3J6D1.map, A3J6D1.pdf, A3J6D1.ply, A3J6D1.tif, A3J6D1\_AOI.ply,

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Measurement Performance Criteria

<b>Coverage:</b> Category:	Cat B TA							
Lane Spacing (ft):	3	Requirement (%)	98	% at Lane Spacing:	100	Status: Pass		
Design Spacing (ft)	2	Requirement (%)	95	% at Project Design Spacing:	99.22	Status: Pass		
<b>Along Track Sampling:</b>	98	% <=	0.65	ft Mean :	0.19	ft % within Tolerance:	100	Status: Pass
<b>Velocity:</b>	95	% not to exceed	4	mph Mean:	2.26	mph % within Tolerance:	100	Status: Pass
<b>GPS Quality:</b>	Percent RTK Fix:	99.76				Status: Pass		
<b>Repeat Lines:</b>	Line Numbers:	None				Status: Pass		

Daily Measurement Performance Criteria

<b>Static</b>	<b>98</b>	% of background readings within +/-	<b>2</b>	mV for ALL channels
	<b>98</b>	% of spike readings within +/-	<b>10</b>	% of expected baseline mV for ALL channels
<b>Cable Shake</b>	<b>98</b>	% of readings within +/-	<b>2</b>	mV for ALL channels
<b>Personnel</b>	<b>98</b>	% of readings within +/-	<b>2</b>	mV for ALL channels
<b>Towed Vehicle</b>	<b>98</b>	% of readings within +/-	<b>2</b>	mV for ALL channels
<b>IVS</b>	<b>98</b>	% of background readings within +/-	<b>3</b>	mV for ALL channels
		Item response within +/-	<b>25</b>	% of expected value for ALL channels
		Item position within	<b>0.8202</b>	ft of actual location
<b>GPS Check</b>		GPS measurement within	<b>0.25</b>	ft of control point location

DateCollected: 4/20/2017 Team ID: GEO\_1 Survey Instrument: Array 2 Instrument Warm-up Time: 15  
 Weather: fog;humid;overcast Static Tests File Name: 0420171QC1  
 IVS Test File Name: 0420171IVS1 IVS Location: Unit 25 IVS Mod2 GPS Check File Name: 0420171GPS  
 QC Survey Notes: 12.6/12.7/12.4

QC Tests

	Response (mV)				Percent in Tolerance				Status					
	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4		
<b>Sensor ID: 1</b>														
Static Pre-Line ID:	0	0.33	0.16	0.08	0	100	100	100	100					
Static Spike-Line ID:	1	1175.33	843.07	516.3	255.43	100	100	100	100					
Static Post-Line ID:	2	0.72	0.29	0.13	0.02	100	100	100	100					
Comments:											Pass	Pass	Pass	Pass
<b>Sensor ID: 2</b>														
Static Pre-Line ID:	0.1	0.35	0.1	0.08	0.02	100	100	100	100					
Static Spike-Line ID:	1.1	1201.88	865.6	531.13	265.38	100	100	100	100					
Static Post-Line ID:	2.1	0.57	0.24	0.2	0.07	100	100	100	100					
Comments:											Pass	Pass	Pass	Pass
<b>Sensor ID: 3</b>														
Static Pre-Line ID:	0.2	-0.19	-0.14	0.01	0.06	100	100	100	100					
Static Spike-Line ID:	1.2	1224.58	875.66	536.14	266.03	100	100	100	100					
Static Post-Line ID:	2.2	-0.18	-0.51	-0.31	-0.29	100	100	100	100					
Comments:											Pass	Pass	Pass	Pass
<b>Sensor ID: 1</b>														
Cable Shake Line ID:	3	0.52	0.11	0.04	-0.03	100	100	100	100					
Comments:											Pass	Pass	Pass	Pass
<b>Sensor ID: 2</b>														
Cable Shake Line ID:	3.1	0.69	0.21	0.18	0.04	100	100	100	100					
Comments:											Pass	Pass	Pass	Pass
<b>Sensor ID: 3</b>														
Cable Shake Line ID:	3.2	-0.2	-0.62	-0.37	-0.3	100	100	100	100					
Comments:											Pass	Pass	Pass	Pass

**Sensor ID: 1**

<b>Tow Vehicle Line ID:</b>	4	0.17	-0.22	-0.14	-0.13	100	100	100	100
<b>Comments:</b>									

Pass Pass Pass Pass

**Sensor ID: 2**

<b>Tow Vehicle Line ID:</b>	4.1	0.61	0.16	0.22	0.05	100	100	100	100
<b>Comments:</b>									

Pass Pass Pass Pass

**Sensor ID: 3**

<b>Tow Vehicle Line ID:</b>	4.2	-0.51	-0.85	-0.49	-0.32	100	100	100	100
<b>Comments:</b>									

Pass Pass Pass Pass

**IVS Tests**

	Response (mV)								Percent in Tolerance				Status			
	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4				
	<b>Sensor ID: 1</b>															
Background Line ID:	1	2.58	1.05	0.53	0.39	100	100	100	100	Pass	Pass	Pass	Pass			
Comments:																

<b>Sensor ID: 2</b>													
Background Line ID:	1.1	1.09	0.54	0.25	0.26	100	100	100	100	Pass	Pass	Pass	Pass
Comments:													

<b>Sensor ID: 3</b>													
Background Line ID:	1.2	6.35	3.28	1.43	0.56	100	100	100	100	Pass	Pass	Pass	Pass
Comments:													

	Item Response (mV)				Delta Response (%)				Item Pos Offset	Status			
	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4		Ch1	Ch2	Ch3	Ch4

<b>Sensor ID: 1</b>															
Test Item: IVS25	Line ID: 0	230.07	162.59	92.53	43.97	14.14	14.40	15.12	14.27	0.28	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS28	Line ID: 0	175.16	123.47	70.35	34.33	10.44	10.61	11.30	12.05	0.19	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS31	Line ID: 0	58.39	44.04	28.47	15.61	6.75	8.45	10.55	12.70	0.34	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS36	Line ID: 0	68.72	41.78	19.21	6.19	16.70	15.86	17.38	20.62	0.25	Pass	Pass	Pass	Pass	Pass
Comments:															

<b>Sensor ID: 2</b>															
Test Item: IVS27	Line ID: 0.1	192.25	134.74	76.84	36.44	7.37	6.84	7.42	7.07	0.12	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS30	Line ID: 0.1	204.35	143.52	81.68	38.65	11.06	10.88	10.61	9.82	0.06	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS33	Line ID: 0.1	38.68	29.20	18.50	10.24	12.53	11.65	6.54	7.88	0.06	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS34	Line ID: 0.1	54.27	33.32	15.94	5.41	11.11	12.94	12.60	15.91	0.24	Pass	Pass	Pass	Pass	Pass
Comments:															

<b>Sensor ID: 3</b>															
Test Item: IVS26	Line ID: 0.2	176.75	123.25	68.22	33.64	5.59	5.83	6.39	8.01	0.52	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS29	Line ID: 0.2	197.69	137.33	76.81	37.02	6.58	6.81	7.35	6.87	0.23	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS32	Line ID: 0.2	37.44	28.94	19.45	11.11	15.99	15.91	19.26	18.27	0.29	Pass	Pass	Pass	Pass	Pass
Comments:															
Test Item: IVS35	Line ID: 0.2	55.08	33.62	16.17	5.22	15.77	16.70	24.49	22.38	0.25	Pass	Pass	Pass	Pass	Pass
Comments:															

**GPS Function Check**

Point Location ID:	Unit 25 IVS	Total Offset (ft):	0.07086	Status:	Pass
Comments:					



DateCollected: 4/20/2017 Team ID: GEO\_1 Survey Instrument: Array 2 Instrument Warm-up Time: 15

Weather: sunny;windy

Static Tests File Name: 0420171QC2

IVS Test File Name: 0420171IVS2

IVS Location: Unit 25 IVS Mod2 GPS Check File Name:

QC Survey Notes: 12.1/12.3/12.0

QC Tests

	Response (mV)				Percent in Tolerance				Status				
	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4	
<b>Sensor ID: 1</b>													
Static Pre-Line ID:	0	0.2	0.05	0.02	-0.01	100	100	100	100				
Static Spike-Line ID:	1	1147.17	822.76	503.48	248.13	100	100	100	100				
Static Post-Line ID:	2	0.89	0.29	0.02	-0.03	100	100	100	100				
Comments:										Pass	Pass	Pass	Pass
<b>Sensor ID: 2</b>													
Static Pre-Line ID:	0.1	0.09	0.08	0.03	-0.03	100	100	100	100				
Static Spike-Line ID:	1.1	1157.96	833.43	510.12	253.17	100	100	100	100				
Static Post-Line ID:	2.1	0.4	0.2	0.07	-0.09	100	100	100	100				
Comments:										Pass	Pass	Pass	Pass
<b>Sensor ID: 3</b>													
Static Pre-Line ID:	0.2	0.14	0.08	-0.01	-0.02	100	100	100	100				
Static Spike-Line ID:	1.2	1157.42	827.64	505.71	249.85	100	100	100	100				
Static Post-Line ID:	2.2	0.75	0.36	-0.01	-0.01	100	100	100	100				
Comments:										Pass	Pass	Pass	Pass

IVS Tests

	Response (mV)				Percent in Tolerance				Status			
	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4

Sensor ID: 1

Background Line ID:	1	2.38	1.39	0.91	0.41	86	100	100	100	Fail	Pass	Pass	Pass
Comments:	Channel 1 fails - readings exceed max allowed.												

Sensor ID: 2

Background Line ID:	1.1	0.78	0.43	0.41	0.16	100	100	100	100	Pass	Pass	Pass	Pass
Comments:													

Sensor ID: 3

Background Line ID:	1.2	5.46	2.42	0.87	0.36	95.38	100	100	100	Fail	Pass	Pass	Pass
Comments:	Channel 1 fails - readings exceed max allowed.												

	Item Response (mV)				Delta Response (%)				Item Pos Offset	Status			
	Ch1	Ch2	Ch3	Ch4	Ch1	Ch2	Ch3	Ch4		Ch1	Ch2	Ch3	Ch4

Sensor ID: 1

Test Item: IVS25	Line ID:	0	186.62	132.95	75.76	36.04	-7.41	-6.45	-5.74	-6.33	0.25	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS28	Line ID:	0	144.50	102.19	58.49	28.43	-8.89	-8.45	-7.47	-7.20	0.28	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS31	Line ID:	0	48.77	36.51	23.44	12.61	-10.84	-10.11	-8.98	-8.95	0.44	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS36	Line ID:	0	57.23	34.64	16.26	5.42	-2.82	-3.92	-0.67	5.63	0.36	Pass	Pass	Pass	Pass	Pass
Comments:																

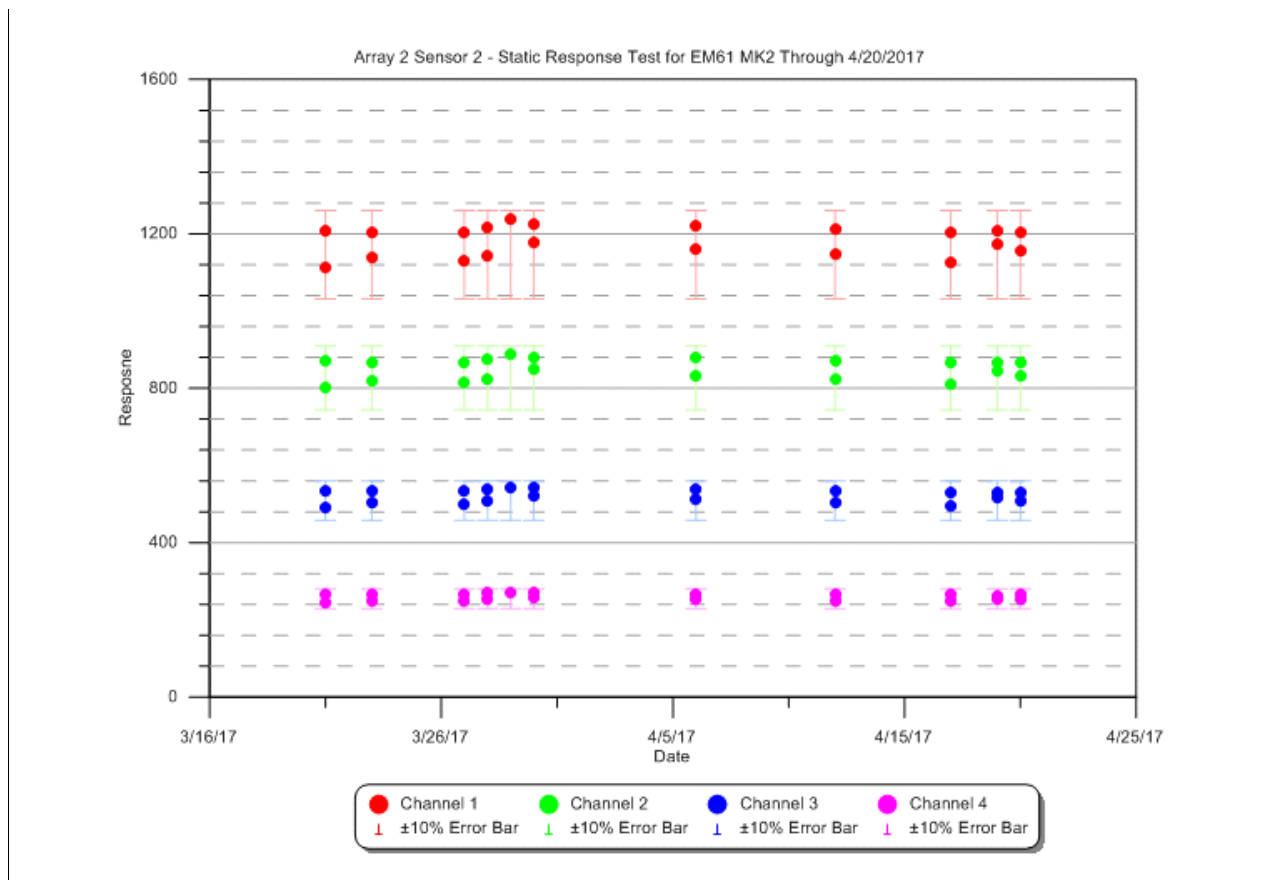
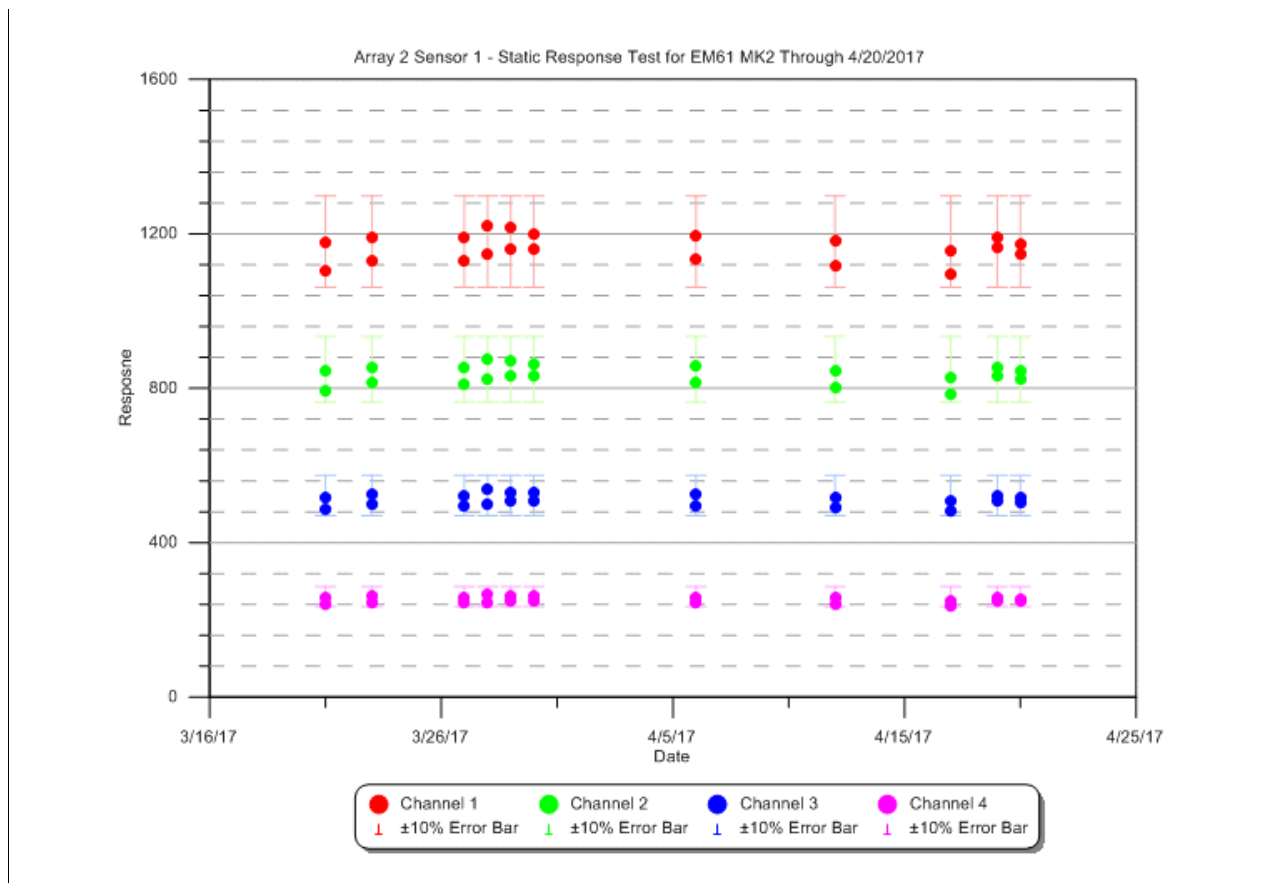
Sensor ID: 2

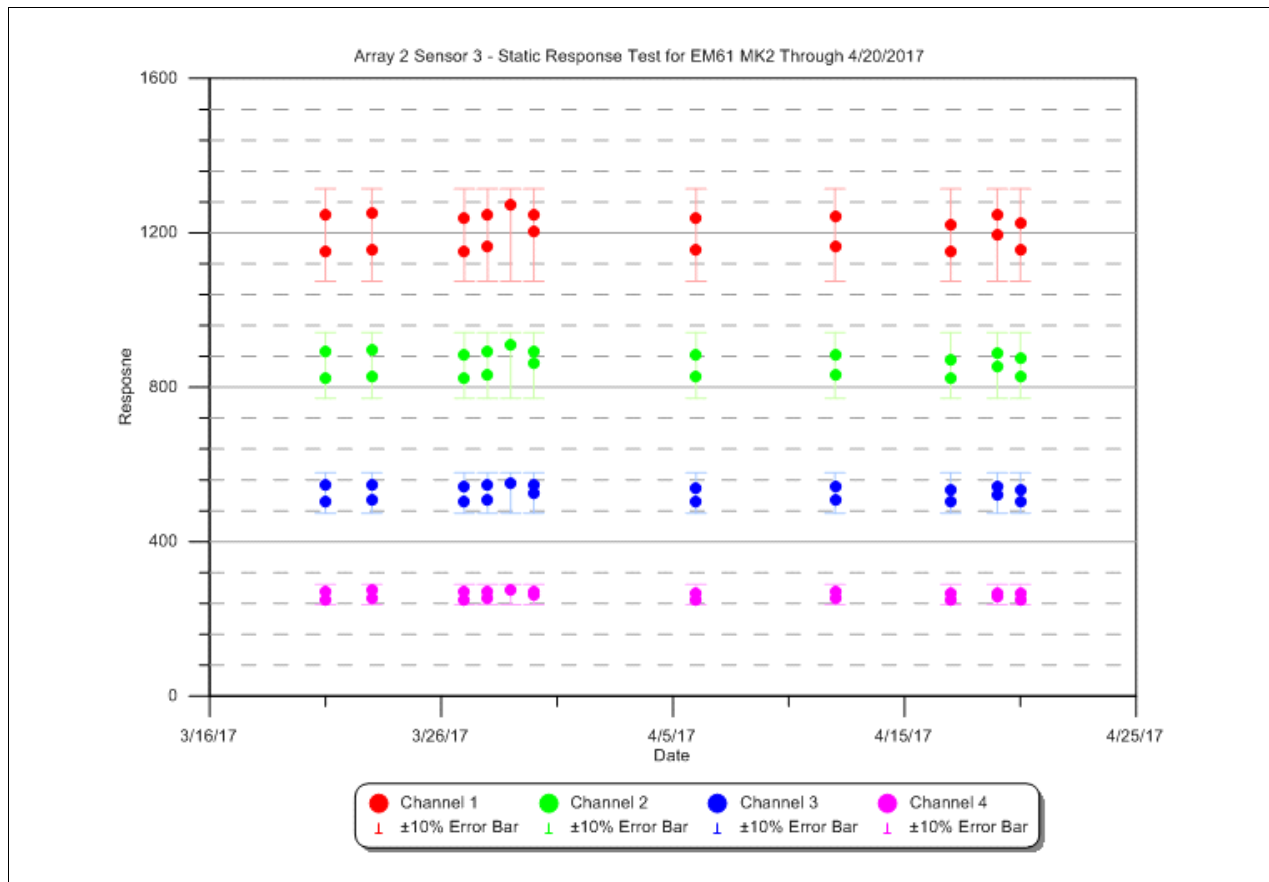
Test Item: IVS27	Line ID:	0.1	154.38	109.37	62.50	30.23	-13.78	-13.27	-12.63	-11.18	0.14	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS30	Line ID:	0.1	173.67	119.84	68.16	32.87	-5.62	-7.41	-7.71	-6.61	0.24	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS33	Line ID:	0.1	40.56	25.45	15.47	8.65	18.01	-2.68	-10.91	-8.82	0.18	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS34	Line ID:	0.1	43.99	26.61	12.93	4.44	-9.93	-9.78	-8.66	-4.83	0.27	Pass	Pass	Pass	Pass	Pass
Comments:																

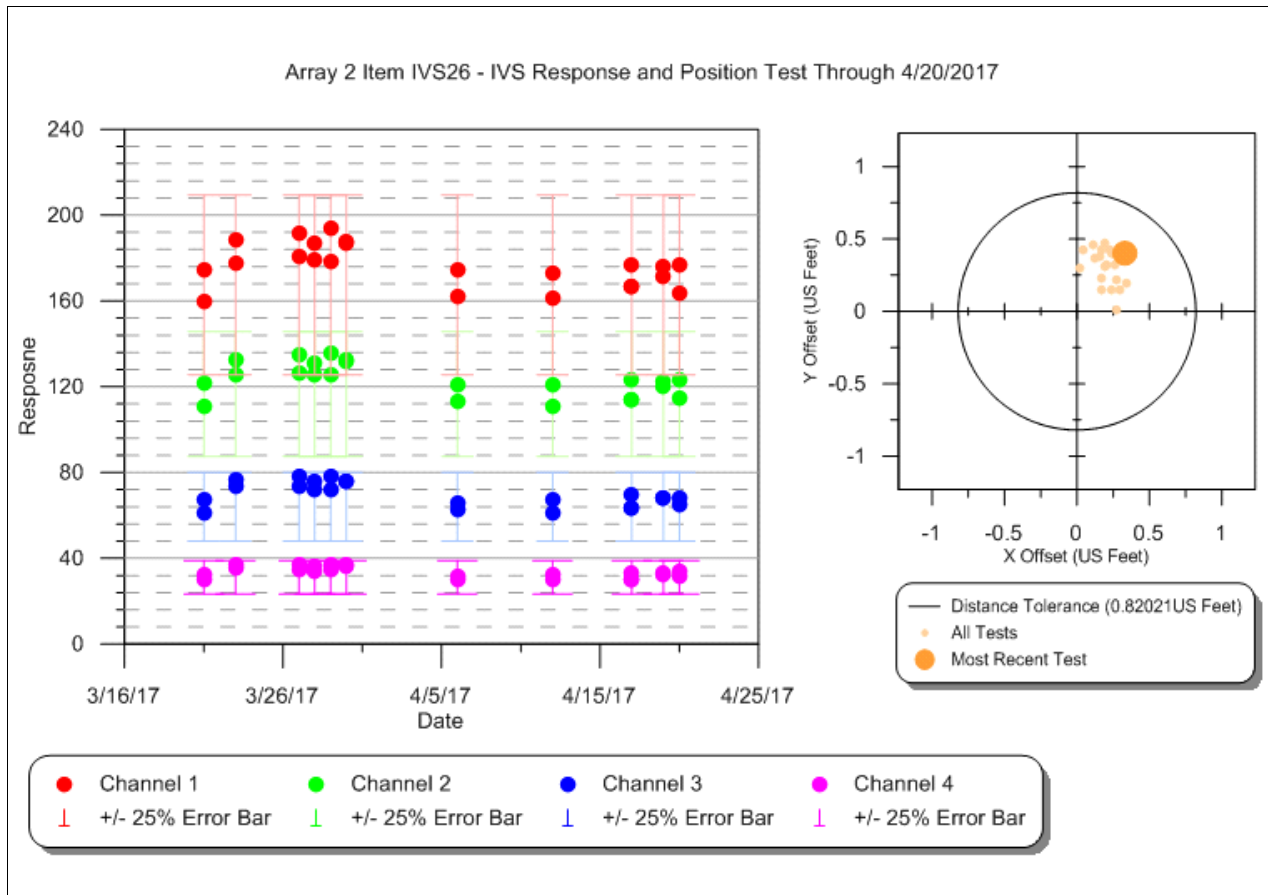
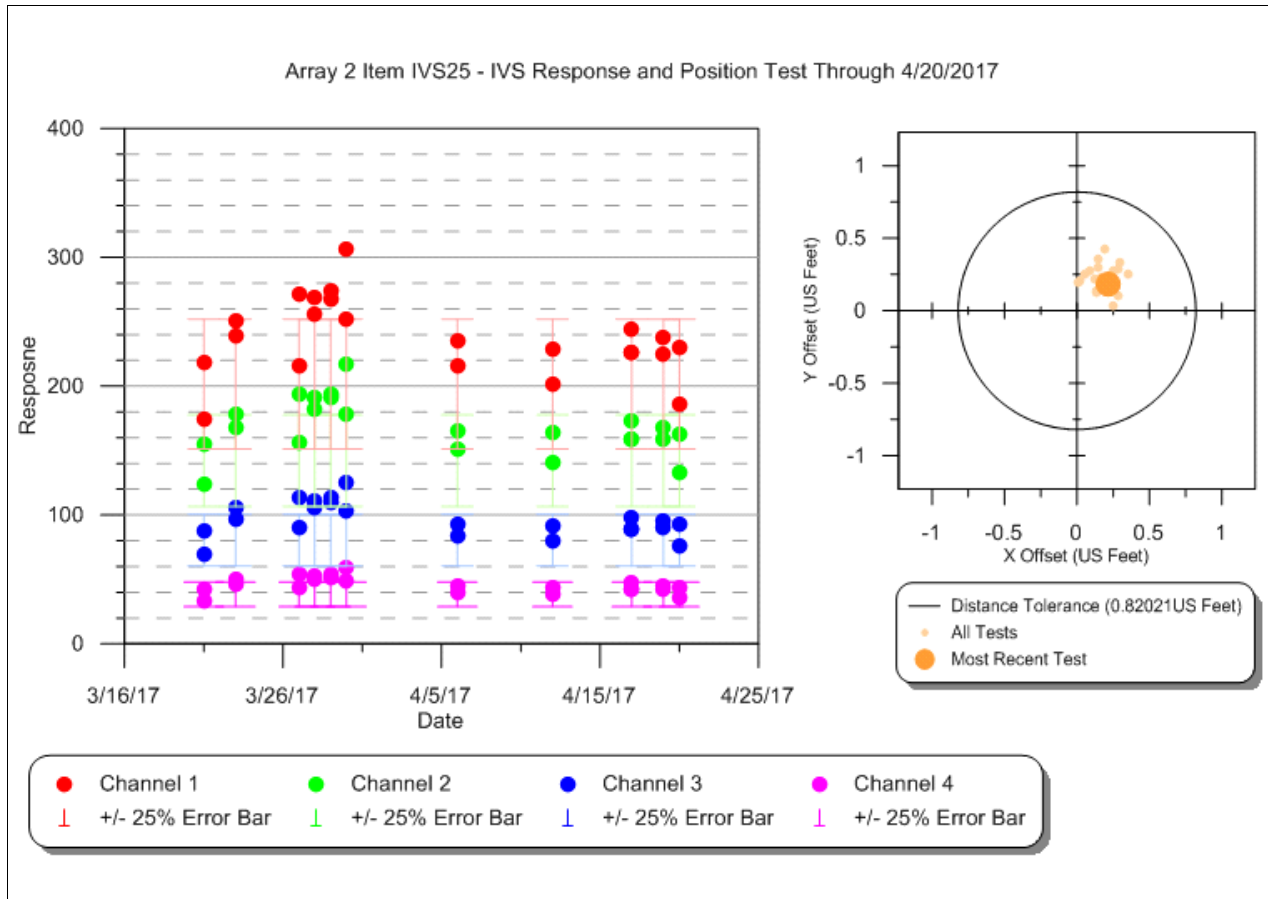
Sensor ID: 3

Test Item: IVS26	Line ID:	0.2	163.27	114.75	64.67	31.61	-2.46	-1.47	0.85	1.49	0.27	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS29	Line ID:	0.2	184.19	127.77	71.08	34.25	-0.70	-0.63	-0.65	-1.11	0.23	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS32	Line ID:	0.2	37.81	27.87	18.14	10.89	17.13	11.62	11.26	15.98	0.47	Pass	Pass	Pass	Pass	Pass
Comments:																
Test Item: IVS35	Line ID:	0.2	55.84	33.14	15.97	5.62	17.36	15.03	22.92	31.89	0.26	Pass	Pass	Pass	Fail	Pass
Comments:	Channel 4 fails - response exceeds tolerance.															

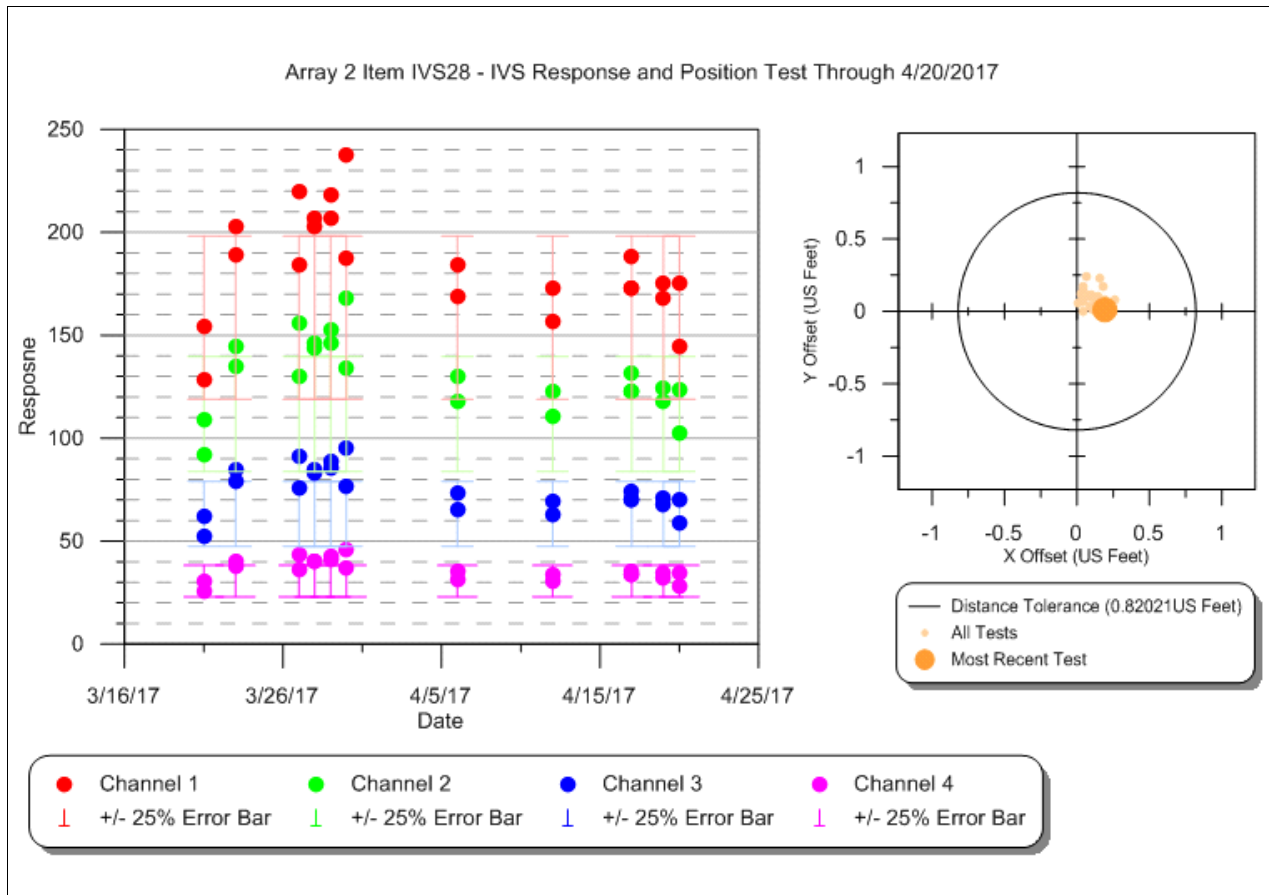
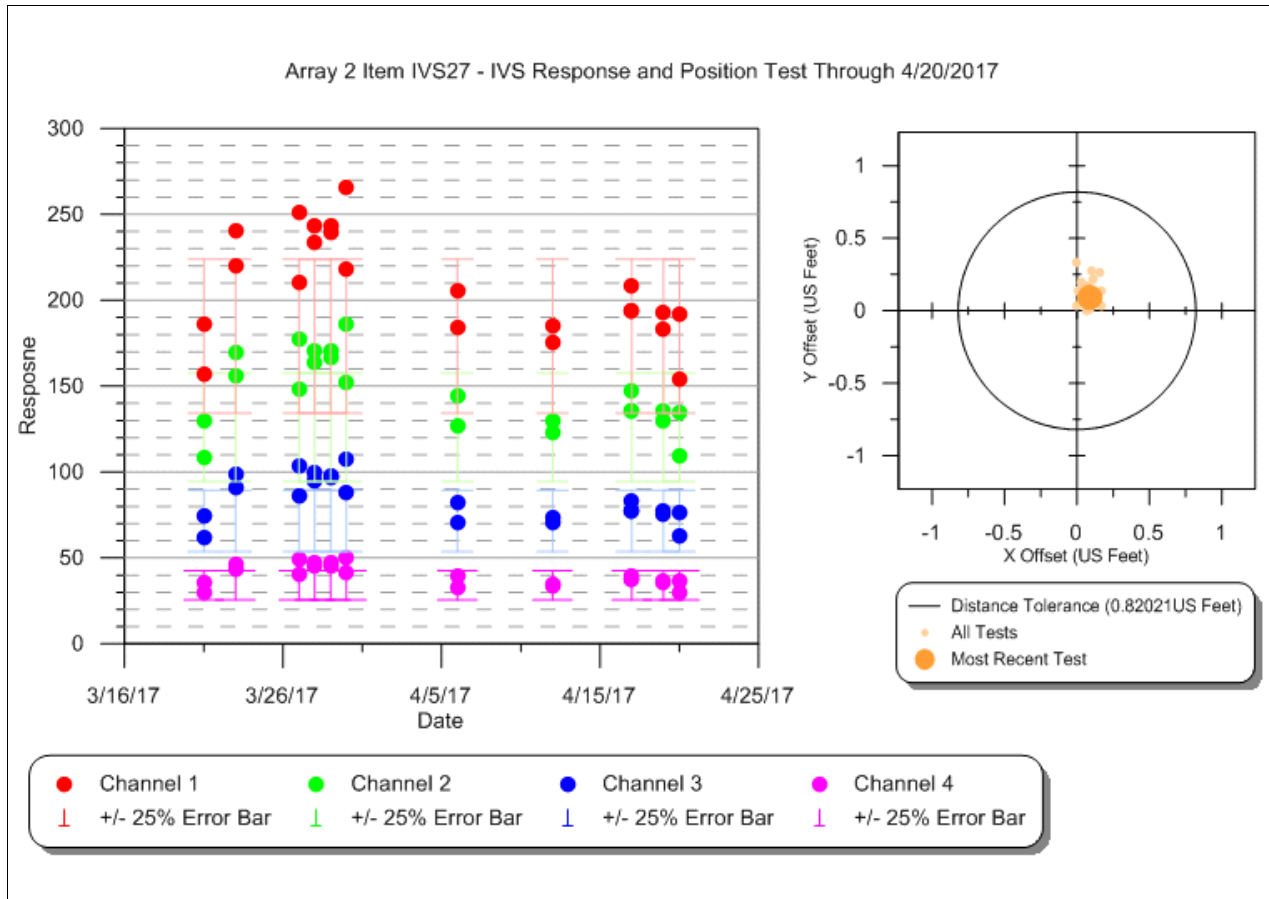
### Cumulative Daily Measurement Performance Criteria

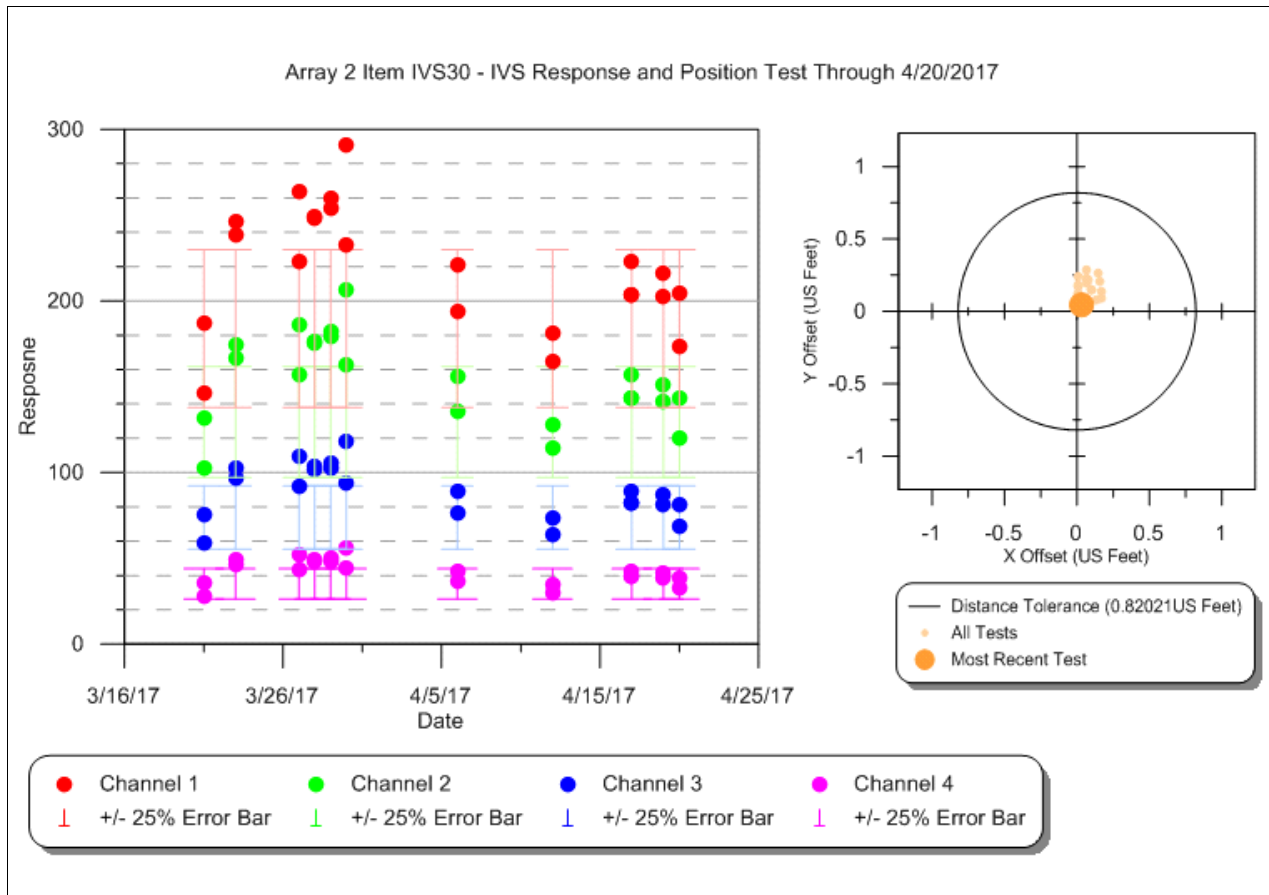
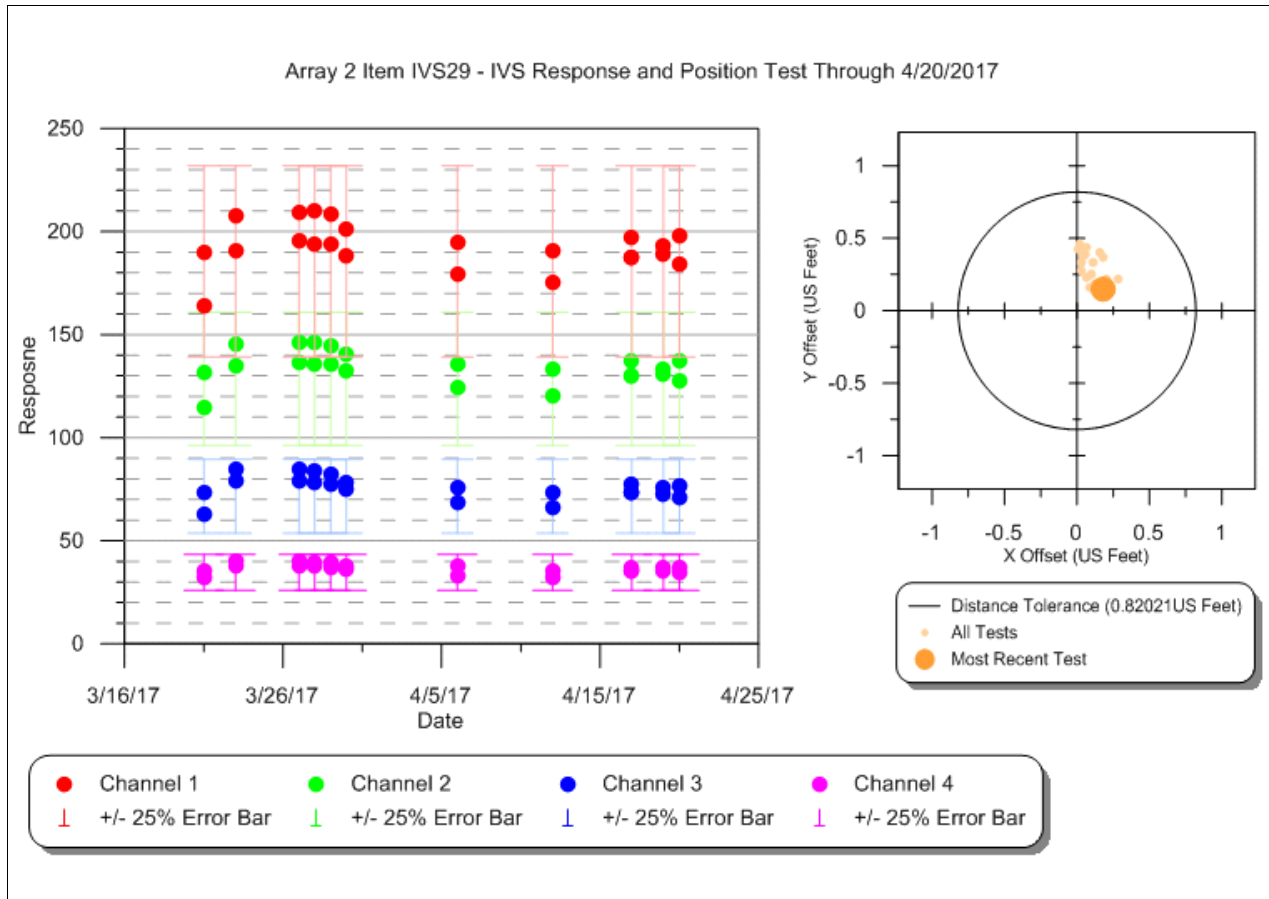


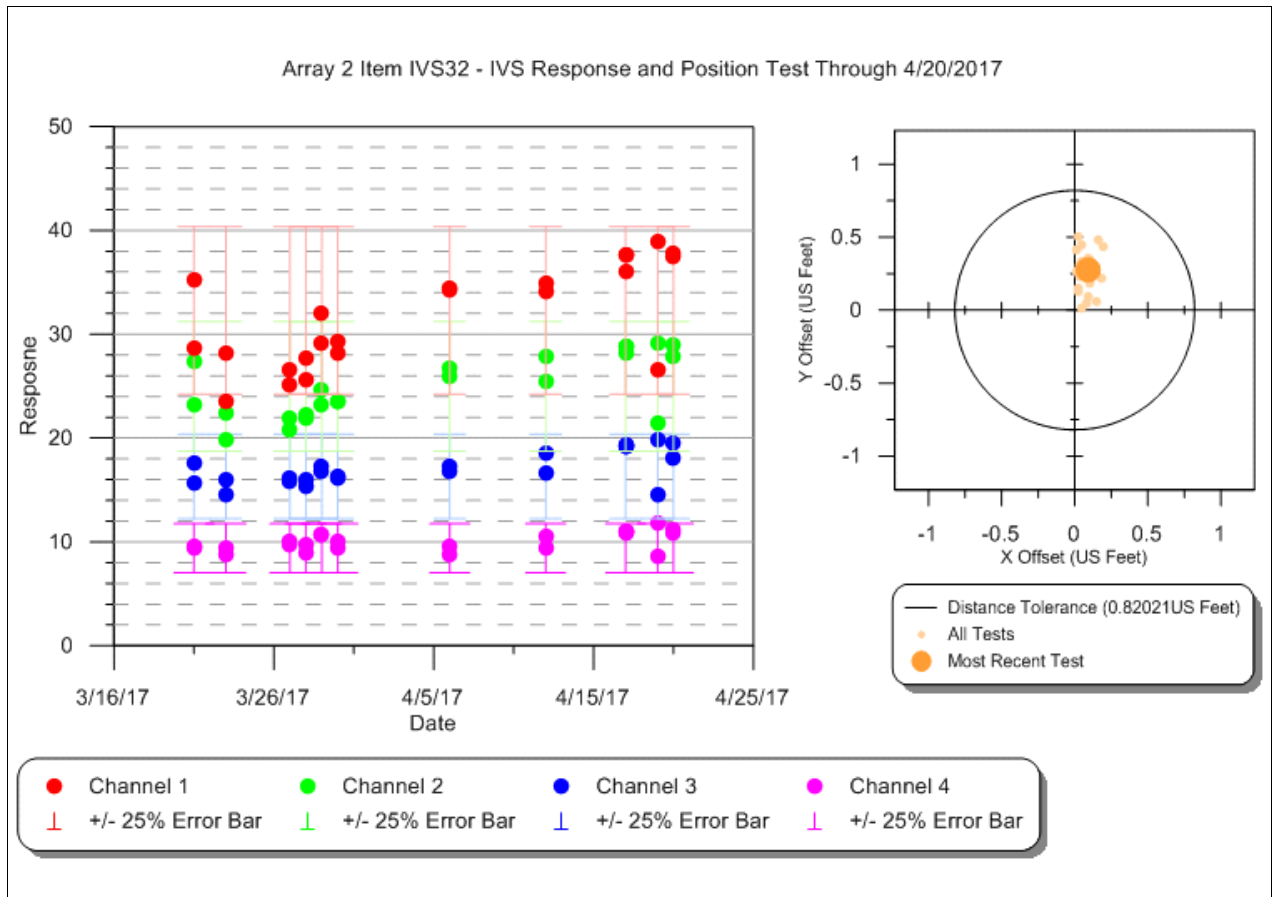
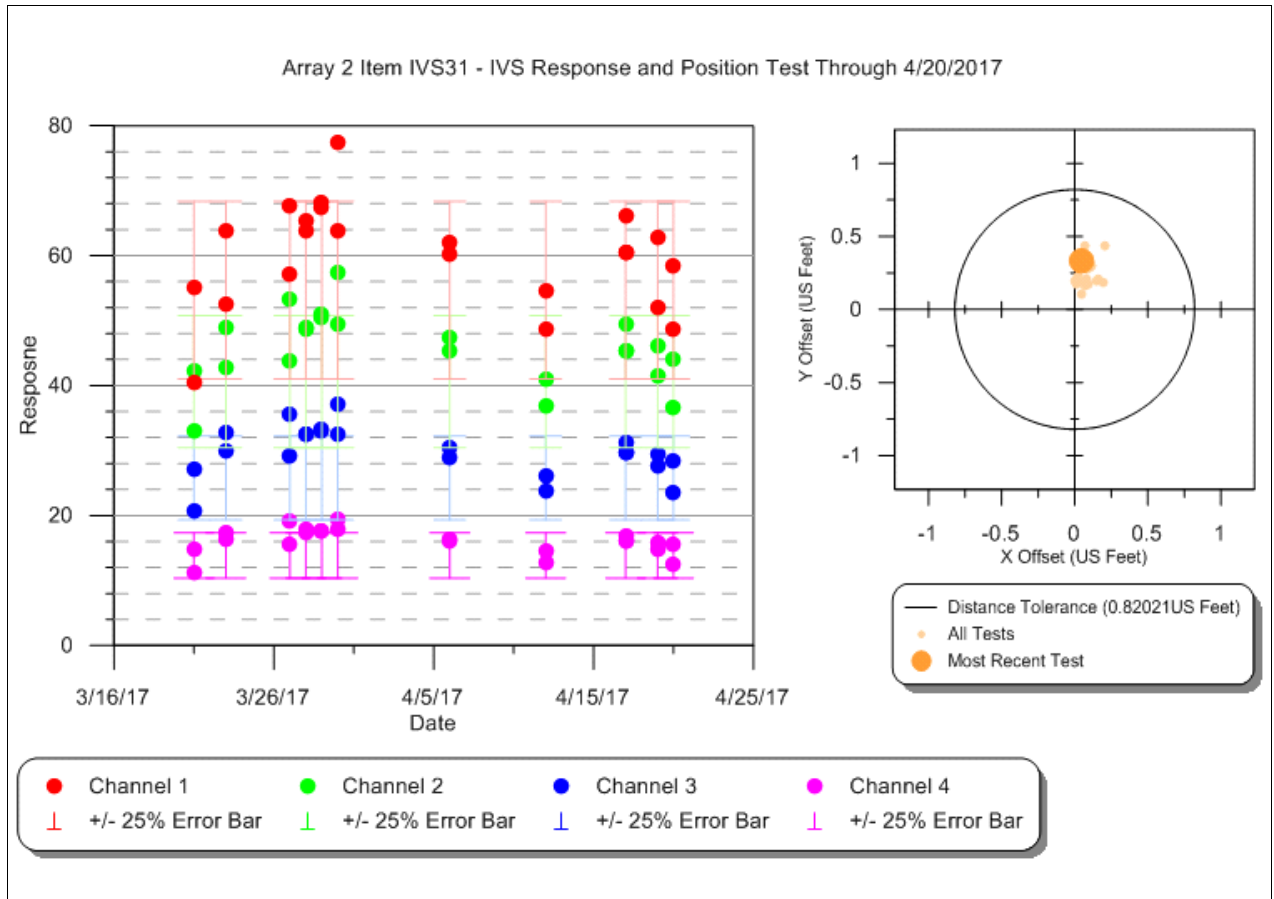


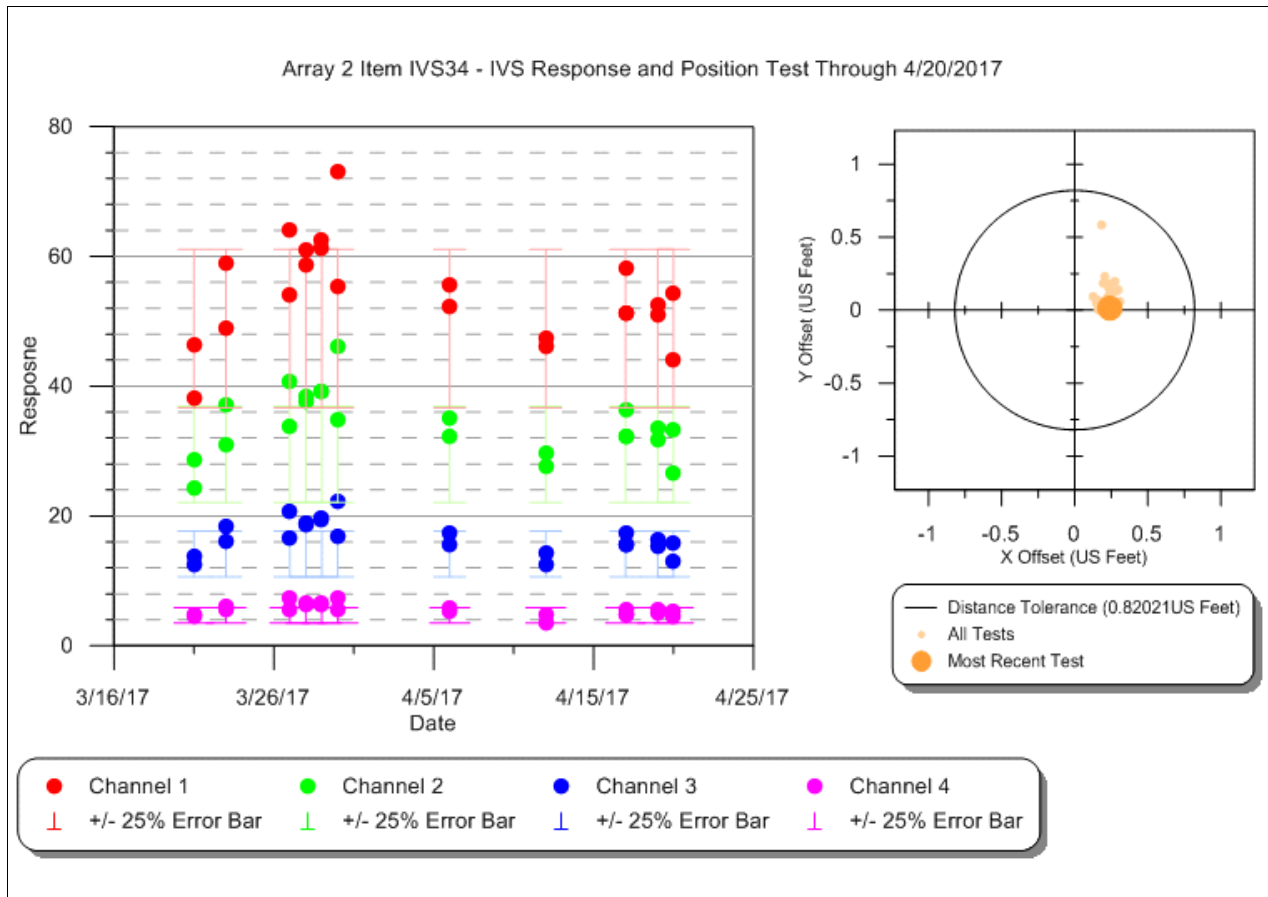
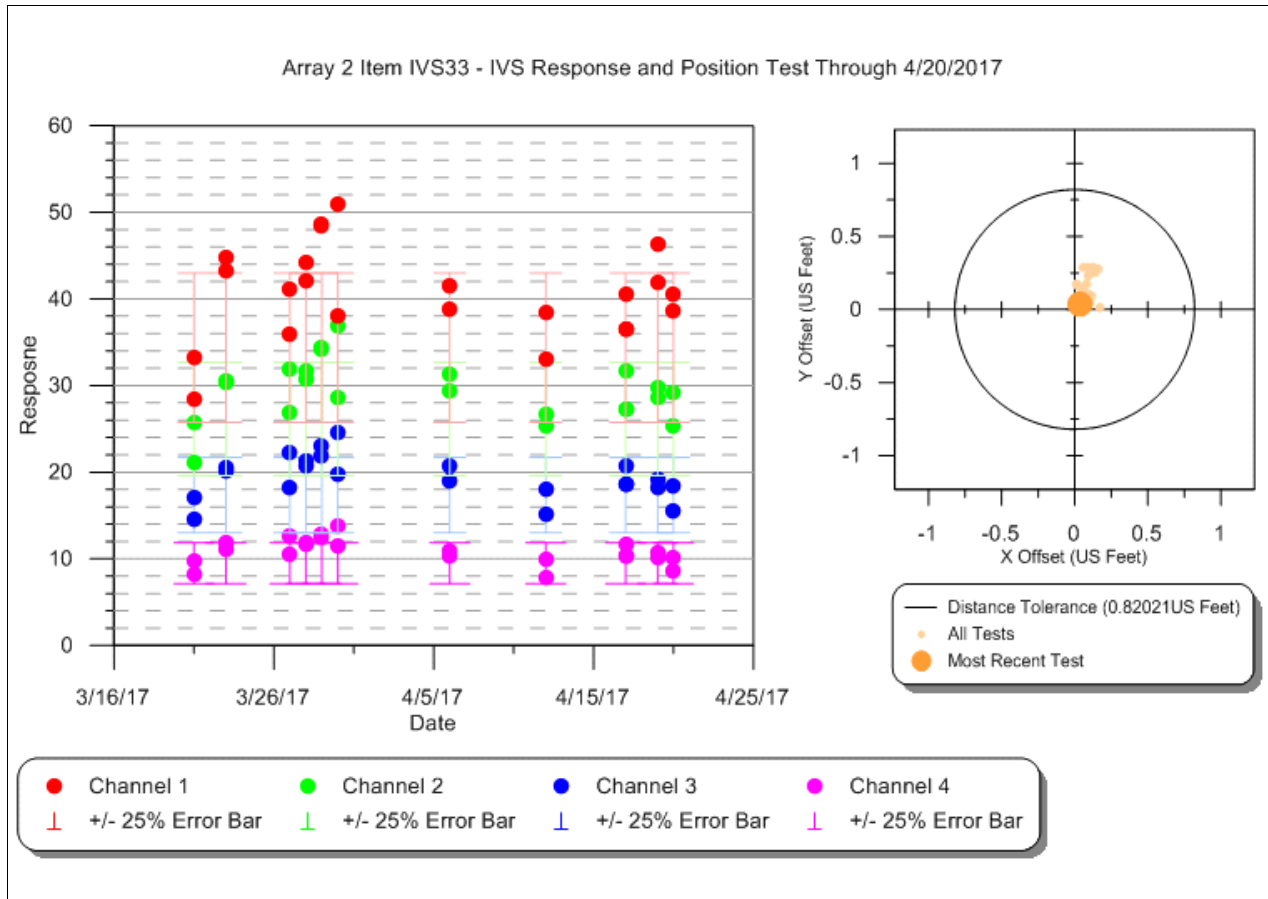


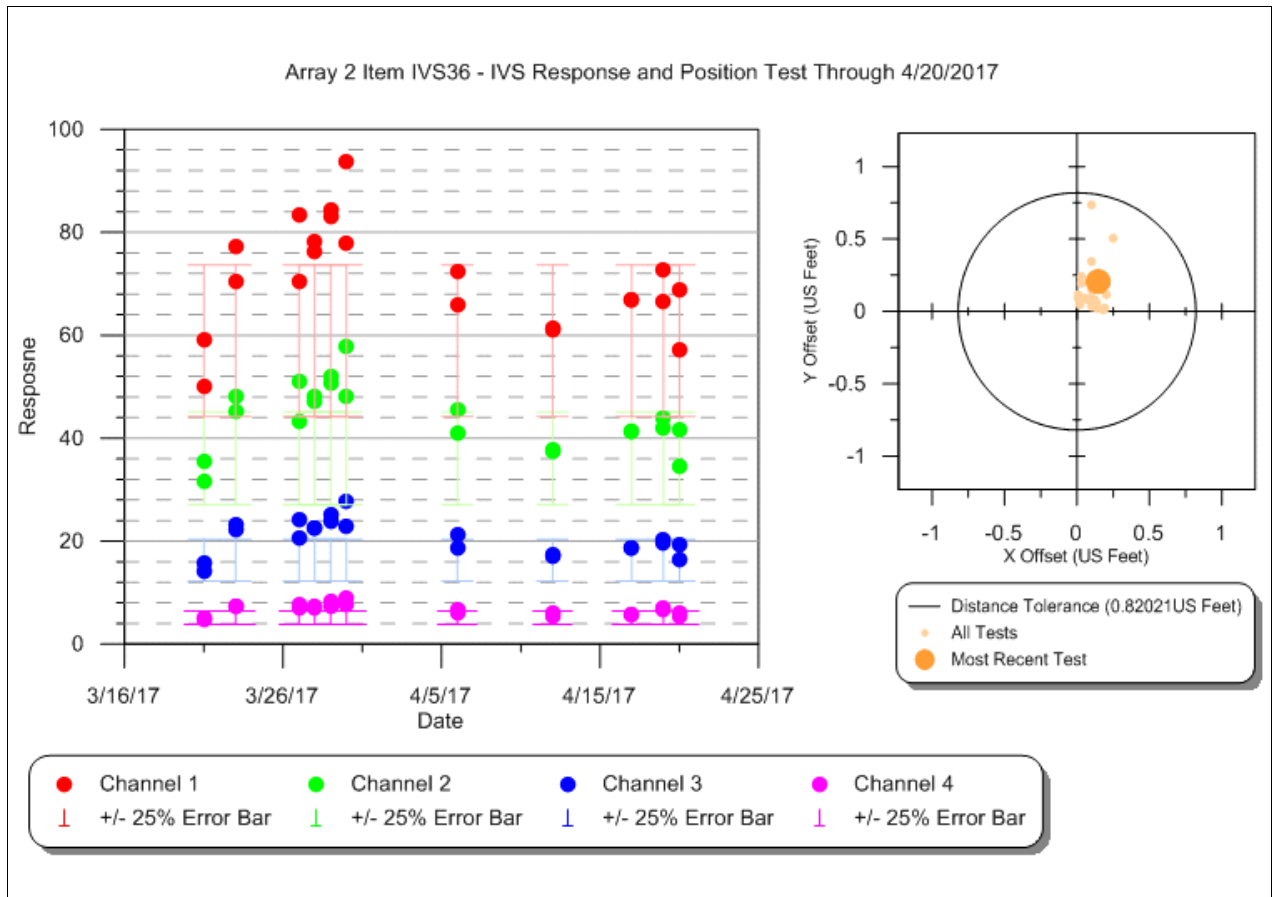
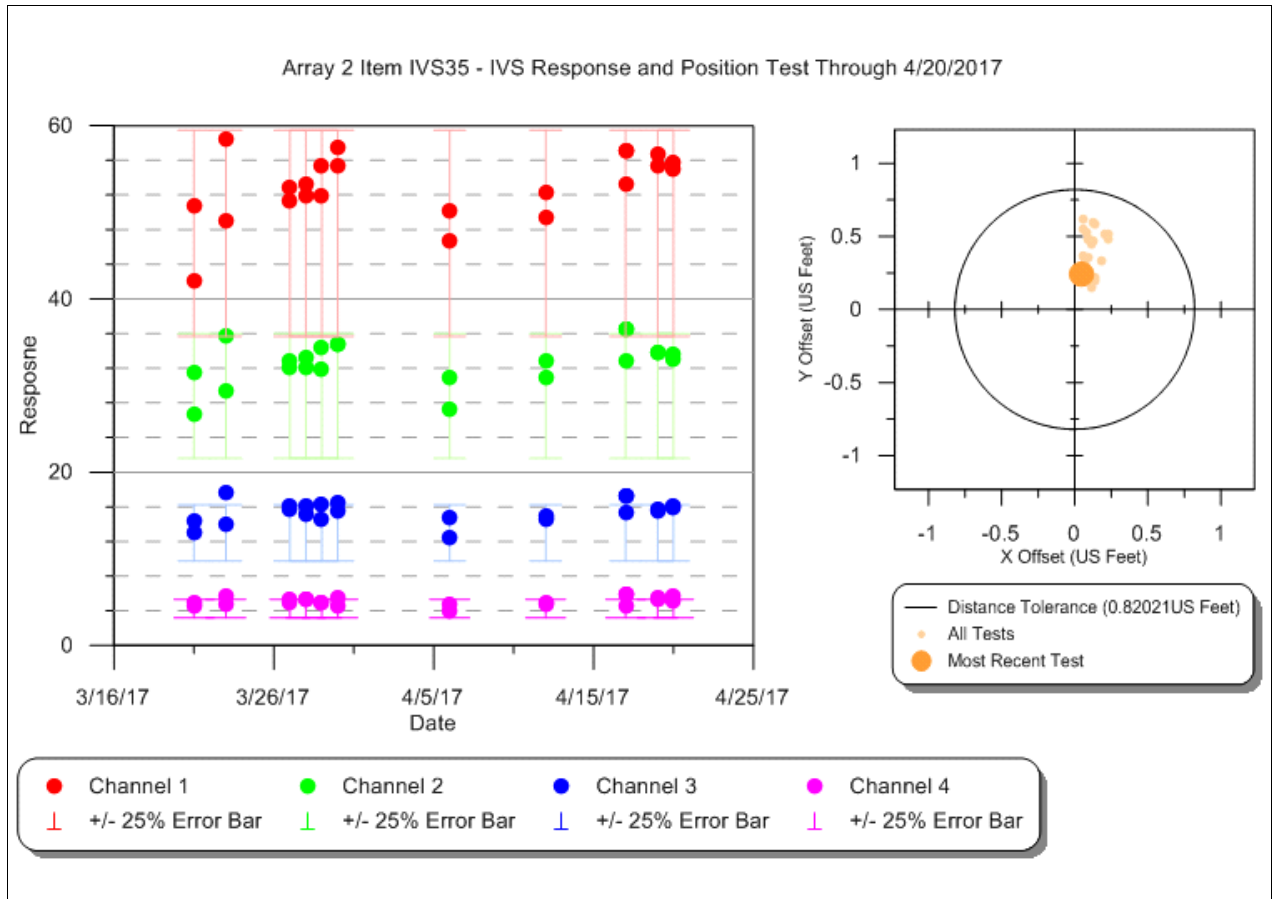




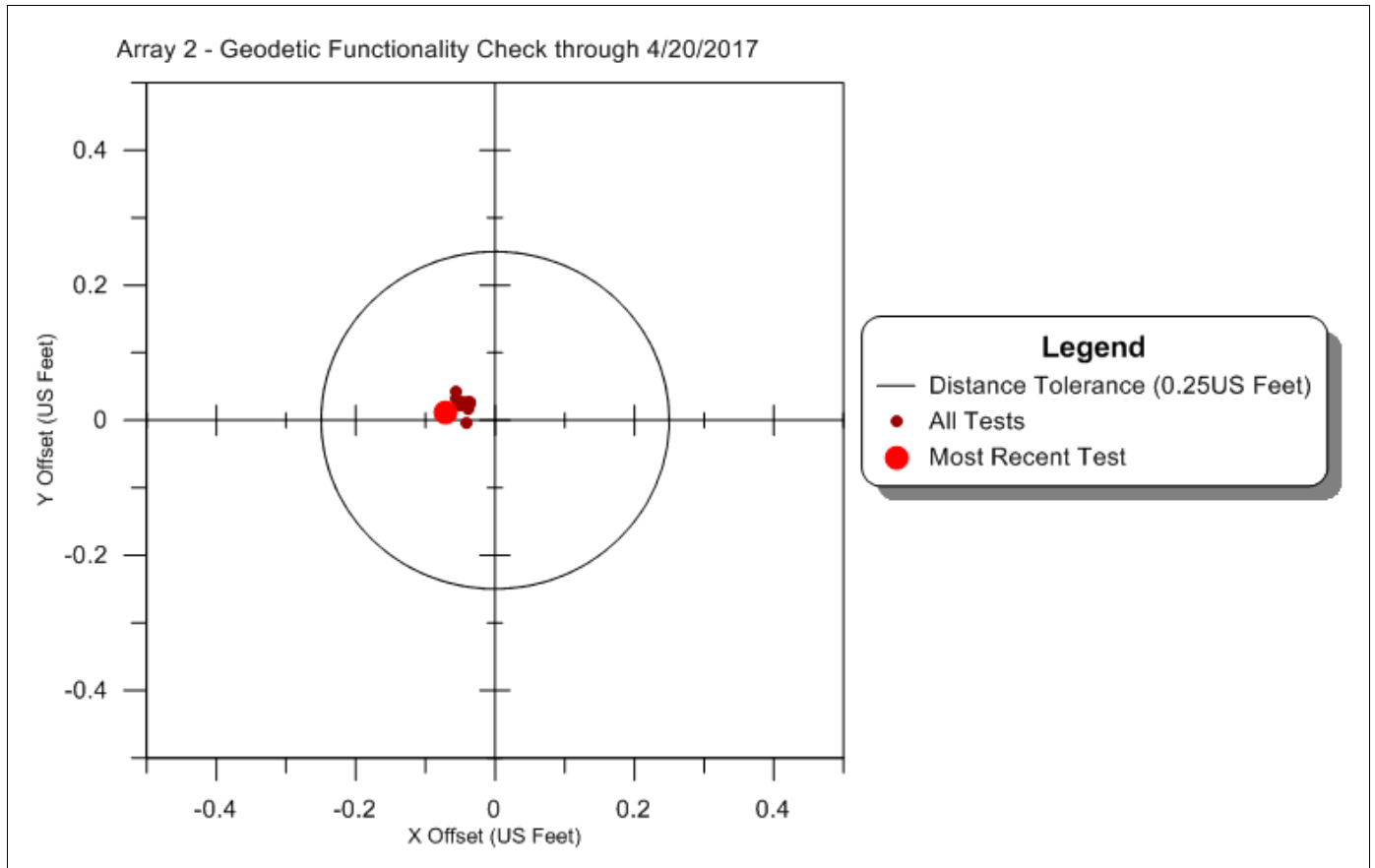












*Appendix D*  
*USACE Surface MEC Removal*  
*Quality Assurance Documentation*

USACE Surface MEC Removal Quality Assurance Documentation

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Containment Line	A3J5C3	0.06	8/18/2015
25	Containment Line	A3J5C4	0.10	8/18/2015
25	Containment Line	A3J5C5	0.09	8/18/2015
25	Containment Line	A3J5C6	0.06	8/18/2015
25	Containment Line	A3J5C7	0.03	8/18/2015
25	Containment Line	A3J5D3	0.08	8/18/2015
25	Containment Line	A3J5D4	0.23	8/18/2015
25	Containment Line	A3J5D5	0.23	8/18/2015
25	Containment Line	A3J5D6	0.23	8/18/2015
25	Containment Line	A3J5D7	0.17	8/18/2015
25	Containment Line	A3J5E3	0.01	8/18/2015
25	Containment Line	A3J5E4	0.23	8/18/2015
25	Containment Line	A3J5E5	0.23	8/18/2015
25	Containment Line	A3J5E6	0.23	8/18/2015
25	Containment Line	A3J5E7	0.11	8/18/2015
25	Containment Line	A3J5F3	0.03	8/18/2015
25	Containment Line	A3J5F4	0.23	8/18/2015
25	Containment Line	A3J5F5	0.23	8/18/2015
25	Containment Line	A3J5F6	0.23	8/18/2015
25	Containment Line	A3J5F7	0.04	8/18/2015
25	Containment Line	B3B5A0	0.23	8/19/2015
25	Containment Line	B3B5A7	0.01	8/19/2015
25	Containment Line	B3B5A8	0.21	8/19/2015
25	Containment Line	B3B5A9	0.23	8/19/2015
25	Containment Line	B3B5B0	0.22	8/19/2015
25	Containment Line	B3B5B7	0.12	8/19/2015
25	Containment Line	B3B5B8	0.23	8/19/2015
25	Containment Line	B3B5B9	0.23	8/19/2015
25	Containment Line	B3B5C0	0.12	8/19/2015
25	Containment Line	B3B5C6	0.03	8/19/2015
25	Containment Line	B3B5C7	0.22	8/19/2015
25	Containment Line	B3B5C8	0.23	8/19/2015
25	Containment Line	B3B5C9	0.23	8/19/2015
25	Containment Line	B3B5D0	0.01	8/19/2015
25	Containment Line	B3B5D6	0.10	8/19/2015
25	Containment Line	B3B5D7	0.23	8/19/2015
25	Containment Line	B3B5D8	0.23	8/19/2015
25	Containment Line	B3B5D9	0.21	8/19/2015
25	Containment Line	B3B6A1	0.12	8/19/2015
25	Containment Line	B3B6B1	0.02	8/19/2015
25	Containment Line	A3J5G3	0.10	8/27/2015
25	Containment Line	A3J5G4	0.23	8/27/2015
25	Containment Line	A3J5G5	0.23	8/27/2015
25	Containment Line	A3J5G6	0.20	8/27/2015
25	Containment Line	A3J5H3	0.17	8/27/2015

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Containment Line	A3J5H4	0.23	8/27/2015
25	Containment Line	A3J5H5	0.23	8/27/2015
25	Containment Line	A3J5H6	0.13	8/27/2015
25	Containment Line	A3J5I2	0.01	8/27/2015
25	Containment Line	A3J5I3	0.22	8/27/2015
25	Containment Line	A3J5I4	0.23	8/27/2015
25	Containment Line	A3J5I5	0.23	8/27/2015
25	Containment Line	A3J5I6	0.19	8/27/2015
25	Containment Line	A3J5I7	0.03	8/27/2015
25	Containment Line	A3J5J3	0.14	8/27/2015
25	Containment Line	A3J5J4	0.23	8/27/2015
25	Containment Line	A3J5J5	0.23	8/27/2015
25	Containment Line	A3J5J6	0.23	8/27/2015
25	Containment Line	A3J5J7	0.21	8/27/2015
25	Containment Line	A3J5J8	0.04	8/27/2015
25	Containment Line	B3B5E6	0.11	9/3/2015
25	Containment Line	B3B5E7	0.23	9/3/2015
25	Containment Line	B3B5F6	0.11	9/3/2015
25	Containment Line	B3B5F7	0.23	9/3/2015
25	Containment Line	B3B5F8	0.23	9/3/2015
25	Containment Line	B3B5F9	0.16	9/3/2015
25	Containment Line	B3B5G6	0.12	9/3/2015
25	Containment Line	B3B5G7	0.23	9/3/2015
25	Containment Line	B3B5G8	0.23	9/3/2015
25	Containment Line	B3B5G9	0.15	9/3/2015
25	Containment Line	B3B5H6	0.14	9/3/2015
25	Containment Line	B3B5H7	0.23	9/3/2015
25	Containment Line	B3B5H8	0.23	9/3/2015
25	Containment Line	B3B5H9	0.13	9/3/2015
25	Containment Line	B3B5I6	0.17	9/3/2015
25	Containment Line	B3B5I7	0.23	9/3/2015
25	Containment Line	B3B5I8	0.23	9/3/2015
25	Containment Line	B3B5I9	0.10	9/3/2015
25	Containment Line	B3B5J6	0.20	9/3/2015
25	Containment Line	B3B5J7	0.23	9/3/2015
25	Containment Line	B3B5J8	0.23	9/3/2015
25	Containment Line	B3B5J9	0.08	9/3/2015
25	Containment Line	B3A5A3	0.00	9/28/2015
25	Containment Line	B3A5A4	0.13	9/28/2015
25	Containment Line	B3A5A5	0.23	9/28/2015
25	Containment Line	B3A5A6	0.23	9/28/2015
25	Containment Line	B3A5A7	0.23	9/28/2015
25	Containment Line	B3A5A8	0.21	9/28/2015
25	Containment Line	B3A5A9	0.03	9/28/2015
25	Containment Line	B3A5B0	0.00	9/28/2015
25	Containment Line	B3A5B5	0.09	9/28/2015

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Containment Line	B3A5B6	0.23	9/28/2015
25	Containment Line	B3A5B7	0.23	9/28/2015
25	Containment Line	B3A5B8	0.23	9/28/2015
25	Containment Line	B3A5B9	0.18	9/28/2015
25	Containment Line	B3A5C0	0.10	9/28/2015
25	Containment Line	B3A5C6	0.10	9/28/2015
25	Containment Line	B3A5C7	0.23	9/28/2015
25	Containment Line	B3A5C8	0.23	9/28/2015
25	Containment Line	B3A5C9	0.23	9/28/2015
25	Containment Line	B3A5H0	0.23	9/28/2015
25	Containment Line	B3A5H8	0.08	9/28/2015
25	Containment Line	B3A5H9	0.23	9/28/2015
25	Containment Line	B3A5I0	0.23	9/28/2015
25	Containment Line	B3A5I8	0.07	9/28/2015
25	Containment Line	B3A5I9	0.23	9/28/2015
25	Containment Line	B3A5J0	0.23	9/28/2015
25	Containment Line	B3A5J8	0.11	9/28/2015
25	Containment Line	B3A5J9	0.23	9/28/2015
25	Containment Line	B3A6H1	0.19	9/28/2015
25	Containment Line	B3A6I1	0.20	9/28/2015
25	Containment Line	B3A6J1	0.18	9/28/2015
25	Containment Line	B3B5E8	0.23	10/8/2015
25	Containment Line	B3B5E9	0.16	10/8/2015
25	Containment Line	B3A5D0	0.20	10/13/2015
25	Containment Line	B3A5D6	0.00	10/13/2015
25	Containment Line	B3A5D7	0.15	10/13/2015
25	Containment Line	B3A5D8	0.23	10/13/2015
25	Containment Line	B3A5D9	0.23	10/13/2015
25	Containment Line	B3A5E0	0.23	10/13/2015
25	Containment Line	B3A5E7	0.03	10/13/2015
25	Containment Line	B3A5E8	0.23	10/13/2015
25	Containment Line	B3A5E9	0.23	10/13/2015
25	Containment Line	B3A5F0	0.23	10/13/2015
25	Containment Line	B3A5F8	0.17	10/13/2015
25	Containment Line	B3A5F9	0.23	10/13/2015
25	Containment Line	B3A5G0	0.23	10/13/2015
25	Containment Line	B3A5G8	0.12	10/13/2015
25	Containment Line	B3A5G9	0.23	10/13/2015
25	Containment Line	B3A6D1	0.00	10/13/2015
25	Containment Line	B3A6E1	0.06	10/13/2015
25	Containment Line	B3A6F1	0.12	10/13/2015
25	Containment Line	B3A6G1	0.16	10/13/2015
25	Containment Line	B3C5A6	0.22	10/13/2015
25	Containment Line	B3C5A7	0.23	10/13/2015
25	Containment Line	B3C5A8	0.23	10/13/2015
25	Containment Line	B3C5A9	0.07	10/13/2015



Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Containment Line	B3C5B6	0.19	10/13/2015
25	Containment Line	B3C5B7	0.23	10/13/2015
25	Containment Line	B3C5B8	0.23	10/13/2015
25	Containment Line	B3C5B9	0.11	10/13/2015
25	Containment Line	B3C5C6	0.11	10/13/2015
25	Containment Line	B3C5C7	0.23	10/13/2015
25	Containment Line	B3C5C8	0.23	10/13/2015
25	Containment Line	B3C5C9	0.04	10/13/2015
25	Containment Line	B3C5D6	0.02	10/13/2015
25	Containment Line	B3C5D7	0.23	10/13/2015
25	Containment Line	B3C5D8	0.22	10/13/2015
25	Containment Line	B3C5D9	0.00	10/13/2015
25	Containment Line	B3C5E7	0.16	10/13/2015
25	Containment Line	B3C5E8	0.18	10/13/2015
25	Containment Line	B3C5F7	0.11	10/13/2015
25	Containment Line	B3C5F8	0.06	10/13/2015
25	Containment Line	B3C5G7	0.02	10/13/2015
25	Interior	A3I6B4	0.00	8/24/2016
25	Interior	A3I6B5	0.00	8/24/2016
25	Interior	A3I6C4	0.16	8/24/2016
25	Interior	A3I6C5	0.21	8/24/2016
25	Interior	A3I6C6	0.09	8/24/2016
25	Interior	A3I6D3	0.00	8/24/2016
25	Interior	A3I6D4	0.21	8/24/2016
25	Interior	A3I6D5	0.23	8/24/2016
25	Interior	A3I6D6	0.23	8/24/2016
25	Interior	A3I6E2	0.01	8/24/2016
25	Interior	A3I6E3	0.17	8/24/2016
25	Interior	A3I6E4	0.23	8/24/2016
25	Interior	A3I6E5	0.23	8/24/2016
25	Interior	A3I6E6	0.23	8/24/2016
25	Interior	A3I6F2	0.05	8/24/2016
25	Interior	A3I6F3	0.23	8/24/2016
25	Interior	A3I6F4	0.23	8/24/2016
25	Interior	A3I6F5	0.23	8/24/2016
25	Interior	A3I6F6	0.23	8/24/2016
25	Interior	A3I6G2	0.07	8/24/2016
25	Interior	A3I6G3	0.23	8/24/2016
25	Interior	A3I6G4	0.23	8/24/2016
25	Interior	A3I6G5	0.23	8/24/2016
25	Interior	A3I6G6	0.23	8/24/2016
25	Interior	A3I6H0	0.23	8/29/2016
25	Interior	A3I6H7	0.23	8/29/2016
25	Interior	A3I6H8	0.23	8/29/2016
25	Interior	A3I6H9	0.23	8/29/2016
25	Interior	A3I6I0	0.23	8/29/2016

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	A3I6I7	0.23	8/29/2016
25	Interior	A3I6I8	0.23	8/29/2016
25	Interior	A3I6I9	0.23	8/29/2016
25	Interior	A3I6J0	0.23	8/29/2016
25	Interior	A3I6J7	0.23	8/29/2016
25	Interior	A3I6J8	0.23	8/29/2016
25	Interior	A3I6J9	0.23	8/29/2016
25	Interior	A3I7H1	0.15	8/29/2016
25	Interior	A3I7I1	0.17	8/29/2016
25	Interior	A3I7J1	0.17	8/29/2016
25	Interior	A3I6D7	0.10	9/8/2016
25	Interior	A3I6D8	0.00	9/8/2016
25	Interior	A3I6E7	0.23	9/8/2016
25	Interior	A3I6E8	0.18	9/8/2016
25	Interior	A3I6E9	0.03	9/8/2016
25	Interior	A3I6F0	0.05	9/8/2016
25	Interior	A3I6F7	0.23	9/8/2016
25	Interior	A3I6F8	0.23	9/8/2016
25	Interior	A3I6F9	0.21	9/8/2016
25	Interior	A3I6G0	0.22	9/8/2016
25	Interior	A3I6G7	0.23	9/8/2016
25	Interior	A3I6G8	0.23	9/8/2016
25	Interior	A3I6G9	0.23	9/8/2016
25	Interior	A3I7G1	0.04	9/8/2016
25	Interior	A3J5D0	0.12	9/13/2016
25	Interior	A3J5D9	0.12	9/13/2016
25	Interior	A3J5E0	0.23	9/13/2016
25	Interior	A3J5E9	0.23	9/13/2016
25	Interior	A3J5F0	0.23	9/13/2016
25	Interior	A3J5F9	0.23	9/13/2016
25	Interior	A3J5G0	0.23	9/13/2016
25	Interior	A3J5G9	0.23	9/13/2016
25	Interior	A3J5H0	0.23	9/13/2016
25	Interior	A3J5H9	0.23	9/13/2016
25	Interior	A3J5I0	0.23	9/13/2016
25	Interior	A3J5I9	0.23	9/13/2016
25	Interior	A3J5J0	0.23	9/13/2016
25	Interior	A3J5J9	0.23	9/13/2016
25	Interior	B3A5A9	0.20	9/13/2016
25	Interior	A3J5C7	0.00	9/20/2016
25	Interior	A3J5C8	0.00	9/20/2016
25	Interior	A3J5D7	0.06	9/20/2016
25	Interior	A3J5D8	0.21	9/20/2016
25	Interior	A3J5E7	0.12	9/20/2016
25	Interior	A3J5E8	0.23	9/20/2016
25	Interior	A3J5F7	0.19	9/20/2016

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	A3J5F8	0.23	9/20/2016
25	Interior	A3J5G6	0.03	9/20/2016
25	Interior	A3J5G7	0.23	9/20/2016
25	Interior	A3J5G8	0.23	9/20/2016
25	Interior	A3J5H6	0.10	9/20/2016
25	Interior	A3J5H7	0.23	9/20/2016
25	Interior	A3J5H8	0.23	9/20/2016
25	Interior	A3J5I6	0.04	9/20/2016
25	Interior	A3J5I7	0.20	9/20/2016
25	Interior	A3J5I8	0.23	9/20/2016
25	Interior	A3J5J7	0.02	9/20/2016
25	Interior	A3J5J8	0.18	9/20/2016
25	Interior	B3A5A8	0.02	9/20/2016
25	Interior	A3J6D0	0.23	9/22/2016
25	Interior	A3J6D9	0.23	9/22/2016
25	Interior	A3J6E0	0.23	9/22/2016
25	Interior	A3J6E9	0.23	9/22/2016
25	Interior	A3J6F0	0.21	9/22/2016
25	Interior	A3J6G0	0.18	9/22/2016
25	Interior	A3J6G9	0.23	9/22/2016
25	Interior	A3J6H0	0.19	9/22/2016
25	Interior	A3J6I0	0.22	9/22/2016
25	Interior	A3J6J0	0.23	9/22/2016
25	Interior	A3J6J9	0.23	9/22/2016
25	Interior	A3J7D1	0.22	9/22/2016
25	Interior	A3J7D2	0.00	9/22/2016
25	Interior	A3J7E1	0.10	9/22/2016
25	Interior	A3J7F1	0.00	9/22/2016
25	Interior	A3J7I1	0.01	9/22/2016
25	Interior	A3J7J1	0.07	9/22/2016
25	Interior	B3A6J1	0.05	10/24/2016
25	Interior	B3A6J2	0.23	10/24/2016
25	Interior	B3A6J3	0.23	10/24/2016
25	Interior	B3A6J4	0.23	10/24/2016
25	Interior	B3A6J5	0.23	10/24/2016
25	Interior	B3A6J6	0.22	10/24/2016
25	Interior	B3A6J7	0.01	10/24/2016
25	Interior	B3B5B0	0.01	10/24/2016
25	Interior	B3B5C0	0.11	10/24/2016
25	Interior	B3B5D0	0.22	10/24/2016
25	Interior	B3B5D9	0.02	10/24/2016
25	Interior	B3B5E0	0.23	10/24/2016
25	Interior	B3B5E9	0.07	10/24/2016
25	Interior	B3B5F0	0.23	10/24/2016
25	Interior	B3B5F9	0.07	10/24/2016
25	Interior	B3B5I0	0.23	10/24/2016

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	B3B5I9	0.13	10/24/2016
25	Interior	B3B5J0	0.23	10/24/2016
25	Interior	B3B5J9	0.15	10/24/2016
25	Interior	B3B6A1	0.11	10/24/2016
25	Interior	B3B6A2	0.23	10/24/2016
25	Interior	B3B6A3	0.23	10/24/2016
25	Interior	B3B6A4	0.23	10/24/2016
25	Interior	B3B6A5	0.23	10/24/2016
25	Interior	B3B6A6	0.14	10/24/2016
25	Interior	B3B6B1	0.20	10/24/2016
25	Interior	B3B6B2	0.23	10/24/2016
25	Interior	B3B6B3	0.23	10/24/2016
25	Interior	B3B6B4	0.23	10/24/2016
25	Interior	B3B6B5	0.23	10/24/2016
25	Interior	B3B6B6	0.04	10/24/2016
25	Interior	B3B6C1	0.23	10/24/2016
25	Interior	B3B6C2	0.23	10/24/2016
25	Interior	B3B6C3	0.23	10/24/2016
25	Interior	B3B6C4	0.23	10/24/2016
25	Interior	B3B6C5	0.14	10/24/2016
25	Interior	B3B6D1	0.23	10/24/2016
25	Interior	B3B6D2	0.23	10/24/2016
25	Interior	B3B6D3	0.23	10/24/2016
25	Interior	B3B6D4	0.19	10/24/2016
25	Interior	B3B6D5	0.01	10/24/2016
25	Interior	B3B6E1	0.23	10/24/2016
25	Interior	B3B6E2	0.23	10/24/2016
25	Interior	B3B6E3	0.23	10/24/2016
25	Interior	B3B6E4	0.03	10/24/2016
25	Interior	B3B6F1	0.23	10/24/2016
25	Interior	B3B6F2	0.23	10/24/2016
25	Interior	B3B6F3	0.18	10/24/2016
25	Interior	B3B6I1	0.23	10/24/2016
25	Interior	B3B6I2	0.07	10/24/2016
25	Interior	B3B6J1	0.16	10/24/2016
25	Interior	B3B6J2	0.00	10/24/2016
25	Interior	B3C5A0	0.16	10/24/2016
25	Interior	B3C5A9	0.16	10/24/2016
25	Interior	B3C5B0	0.01	10/24/2016
25	Interior	B3C5B9	0.06	10/24/2016
25	Interior	B3C6A1	0.01	10/24/2016
25	Interior	A3I6H2	0.10	10/25/2016
25	Interior	A3I6H3	0.23	10/25/2016
25	Interior	A3I6H4	0.23	10/25/2016
25	Interior	A3I6H5	0.23	10/25/2016
25	Interior	A3I6H6	0.23	10/25/2016

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	A3I6I2	0.14	10/25/2016
25	Interior	A3I6I3	0.23	10/25/2016
25	Interior	A3I6I4	0.23	10/25/2016
25	Interior	A3I6I5	0.23	10/25/2016
25	Interior	A3I6I6	0.23	10/25/2016
25	Interior	A3I6J2	0.19	10/25/2016
25	Interior	A3I6J3	0.23	10/25/2016
25	Interior	A3I6J4	0.23	10/25/2016
25	Interior	A3I6J5	0.23	10/25/2016
25	Interior	A3I6J6	0.23	10/25/2016
25	Interior	A3J6A0	0.23	10/25/2016
25	Interior	A3J6A1	0.01	10/25/2016
25	Interior	A3J6A2	0.23	10/25/2016
25	Interior	A3J6A3	0.23	10/25/2016
25	Interior	A3J6A8	0.23	10/25/2016
25	Interior	A3J6A9	0.23	10/25/2016
25	Interior	A3J6B0	0.23	10/25/2016
25	Interior	A3J6B1	0.07	10/25/2016
25	Interior	A3J6B2	0.23	10/25/2016
25	Interior	A3J6B3	0.23	10/25/2016
25	Interior	A3J6B8	0.23	10/25/2016
25	Interior	A3J6B9	0.23	10/25/2016
25	Interior	A3J6C0	0.23	10/25/2016
25	Interior	A3J6C1	0.13	10/25/2016
25	Interior	A3J6C2	0.23	10/25/2016
25	Interior	A3J6C3	0.23	10/25/2016
25	Interior	A3J6C8	0.23	10/25/2016
25	Interior	A3J6C9	0.23	10/25/2016
25	Interior	A3J6D1	0.22	10/25/2016
25	Interior	A3J6D2	0.23	10/25/2016
25	Interior	A3J6D3	0.23	10/25/2016
25	Interior	A3J6D8	0.23	10/25/2016
25	Interior	A3J6E1	0.23	10/25/2016
25	Interior	A3J6E2	0.23	10/25/2016
25	Interior	A3J6E3	0.23	10/25/2016
25	Interior	A3J6F1	0.23	10/25/2016
25	Interior	A3J6F2	0.23	10/25/2016
25	Interior	A3J6F3	0.23	10/25/2016
25	Interior	A3J6G1	0.23	10/25/2016
25	Interior	A3J6G2	0.23	10/25/2016
25	Interior	A3J6H1	0.23	10/25/2016
25	Interior	A3J7A1	0.20	10/25/2016
25	Interior	A3J7B1	0.23	10/25/2016
25	Interior	A3J7B2	0.01	10/25/2016
25	Interior	A3J7C1	0.23	10/25/2016
25	Interior	A3J7C2	0.02	10/25/2016



Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	B3A6A0	0.23	10/25/2016
25	Interior	B3A6A9	0.23	10/25/2016
25	Interior	B3A6B0	0.23	10/25/2016
25	Interior	B3A6B9	0.23	10/25/2016
25	Interior	B3A6C0	0.21	10/25/2016
25	Interior	B3A6C9	0.23	10/25/2016
25	Interior	B3A6D0	0.03	10/25/2016
25	Interior	B3A6D8	0.23	10/25/2016
25	Interior	B3A6D9	0.19	10/25/2016
25	Interior	B3A6E7	0.23	10/25/2016
25	Interior	B3A6E8	0.21	10/25/2016
25	Interior	B3A6E9	0.02	10/25/2016
25	Interior	B3A6F6	0.23	10/25/2016
25	Interior	B3A6F7	0.23	10/25/2016
25	Interior	B3A6F8	0.07	10/25/2016
25	Interior	B3A6G6	0.23	10/25/2016
25	Interior	B3A6G7	0.15	10/25/2016
25	Interior	B3A6H6	0.23	10/25/2016
25	Interior	B3A6H7	0.09	10/25/2016
25	Interior	B3A7A1	0.13	10/25/2016
25	Interior	B3A7B1	0.15	10/25/2016
25	Interior	B3A7C1	0.04	10/25/2016
25	Interior	A3J6A4	0.23	10/26/2016
25	Interior	A3J6A5	0.23	10/26/2016
25	Interior	A3J6B4	0.23	10/26/2016
25	Interior	A3J6B5	0.23	10/26/2016
25	Interior	A3J6C4	0.23	10/26/2016
25	Interior	A3J6C5	0.23	10/26/2016
25	Interior	A3J6D4	0.23	10/26/2016
25	Interior	A3J6D5	0.23	10/26/2016
25	Interior	A3J6E4	0.23	10/26/2016
25	Interior	B3B5G0	0.23	11/2/2016
25	Interior	B3B5G9	0.08	11/2/2016
25	Interior	B3B5H0	0.23	11/2/2016
25	Interior	B3B5H9	0.10	11/2/2016
25	Interior	B3B6G1	0.23	11/2/2016
25	Interior	B3B6G2	0.23	11/2/2016
25	Interior	B3B6G3	0.07	11/2/2016
25	Interior	B3B6H1	0.23	11/2/2016
25	Interior	B3B6H2	0.18	11/2/2016
25	Interior	B3B6H3	0.00	11/2/2016
25	Interior	B3A6F1	0.11	12/14/2016
25	Interior	B3A6F2	0.23	12/14/2016
25	Interior	B3A6F3	0.23	12/14/2016
25	Interior	B3A6F4	0.23	12/14/2016
25	Interior	B3A6F5	0.23	12/14/2016

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	B3A6G1	0.07	12/14/2016
25	Interior	B3A6G2	0.23	12/14/2016
25	Interior	B3A6G3	0.23	12/14/2016
25	Interior	B3A6G4	0.23	12/14/2016
25	Interior	B3A6G5	0.23	12/14/2016
25	Interior	B3A6H1	0.04	12/14/2016
25	Interior	B3A6H2	0.23	12/14/2016
25	Interior	B3A6H3	0.23	12/14/2016
25	Interior	B3A6H4	0.23	12/14/2016
25	Interior	B3A6H5	0.23	12/14/2016
25	Interior	B3A6I1	0.03	12/14/2016
25	Interior	B3A6I2	0.23	12/14/2016
25	Interior	B3A6I3	0.23	12/14/2016
25	Interior	B3A6I4	0.23	12/14/2016
25	Interior	B3A6I5	0.23	12/14/2016
25	Interior	B3A6I6	0.23	12/14/2016
25	Interior	B3A6I7	0.06	12/14/2016
25	Interior	A3J6A6	0.23	12/22/2016
25	Interior	A3J6A7	0.23	12/22/2016
25	Interior	A3J6B6	0.23	12/22/2016
25	Interior	A3J6B7	0.23	12/22/2016
25	Interior	A3J6C6	0.23	12/22/2016
25	Interior	A3J6C7	0.23	12/22/2016
25	Interior	A3J6D6	0.23	12/22/2016
25	Interior	A3J6D7	0.23	12/22/2016
25	Interior	A3J6E5	0.23	12/22/2016
25	Interior	A3J6E6	0.23	12/22/2016
25	Interior	A3J6E7	0.23	12/22/2016
25	Interior	A3J6E8	0.23	12/22/2016
25	Interior	A3J6F4	0.23	12/22/2016
25	Interior	A3J6F5	0.23	12/22/2016
25	Interior	A3J6F6	0.23	12/22/2016
25	Interior	A3J6F7	0.23	12/22/2016
25	Interior	A3J6F8	0.23	12/22/2016
25	Interior	A3J6F9	0.23	12/22/2016
25	Interior	B3A5D0	0.03	3/2/2017
25	Interior	B3A6D1	0.23	3/2/2017
25	Interior	B3A6D2	0.23	3/2/2017
25	Interior	B3A6D3	0.23	3/2/2017
25	Interior	B3A6D4	0.23	3/2/2017
25	Interior	B3A6D5	0.23	3/2/2017
25	Interior	B3A6D6	0.23	3/2/2017
25	Interior	B3A6D7	0.23	3/2/2017
25	Interior	B3A6E1	0.17	3/2/2017
25	Interior	B3A6E2	0.23	3/2/2017
25	Interior	B3A6E3	0.23	3/2/2017



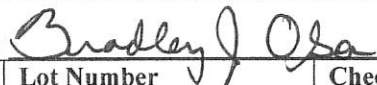
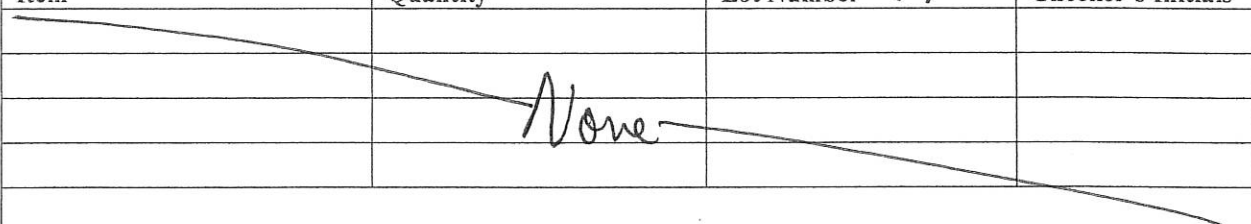
Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
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25	Interior	B3A6E5	0.23	3/2/2017
25	Interior	B3A6E6	0.23	3/2/2017
25	Interior	A3J6G3	0.23	6/1/2017
25	Interior	A3J6G4	0.23	6/1/2017
25	Interior	A3J6G5	0.23	6/1/2017
25	Interior	A3J6H2	0.23	6/1/2017
25	Interior	A3J6H3	0.23	6/1/2017
25	Interior	A3J6H4	0.23	6/1/2017
25	Interior	A3J6H5	0.23	6/1/2017
25	Interior	A3J6I1	0.23	6/1/2017
25	Interior	A3J6I2	0.23	6/1/2017
25	Interior	A3J6I3	0.23	6/1/2017
25	Interior	A3J6I4	0.23	6/1/2017
25	Interior	A3J6I5	0.23	6/1/2017
25	Interior	A3J6J1	0.23	6/1/2017
25	Interior	A3J6J2	0.23	6/1/2017
25	Interior	A3J6J3	0.23	6/1/2017
25	Interior	A3J6J4	0.23	6/1/2017
25	Interior	A3J6J5	0.23	6/1/2017
25	Interior	A3J6G6	0.23	7/24/2017
25	Interior	A3J6G7	0.23	7/24/2017
25	Interior	A3J6G8	0.23	7/24/2017
25	Interior	A3J6H6	0.23	7/24/2017
25	Interior	A3J6H7	0.23	7/24/2017
25	Interior	A3J6H8	0.23	7/24/2017
25	Interior	A3J6H9	0.23	7/24/2017
25	Interior	A3J6I6	0.23	7/24/2017
25	Interior	A3J6I7	0.23	7/24/2017
25	Interior	A3J6I8	0.23	7/24/2017
25	Interior	A3J6I9	0.23	7/24/2017
25	Interior	A3J6J6	0.23	7/24/2017
25	Interior	A3J6J7	0.23	7/24/2017
25	Interior	A3J6J8	0.23	7/24/2017
25	Interior	B3A6A6	0.23	7/24/2017
25	Interior	B3A6A7	0.23	7/24/2017
25	Interior	B3A6A8	0.23	7/24/2017
25	Interior	B3A6B6	0.23	7/24/2017
25	Interior	B3A6B7	0.23	7/24/2017
25	Interior	B3A6B8	0.23	7/24/2017
25	Interior	B3A6C6	0.23	7/24/2017
25	Interior	B3A6C7	0.23	7/24/2017
25	Interior	B3A6C8	0.23	7/24/2017
25	Interior	B3A5A0	0.23	7/25/2017
25	Interior	B3A5B0	0.23	7/25/2017
25	Interior	B3A5B9	0.05	7/25/2017

Unit ID	Grid Type	Grid ID	Acreage	Date QA Completed
25	Interior	B3A5C0	0.13	7/25/2017
25	Interior	B3A6A1	0.23	7/25/2017
25	Interior	B3A6A2	0.23	7/25/2017
25	Interior	B3A6A3	0.23	7/25/2017
25	Interior	B3A6A4	0.23	7/25/2017
25	Interior	B3A6A5	0.23	7/25/2017
25	Interior	B3A6B1	0.23	7/25/2017
25	Interior	B3A6B2	0.23	7/25/2017
25	Interior	B3A6B3	0.23	7/25/2017
25	Interior	B3A6B4	0.23	7/25/2017
25	Interior	B3A6B5	0.23	7/25/2017
25	Interior	B3A6C1	0.23	7/25/2017
25	Interior	B3A6C2	0.23	7/25/2017
25	Interior	B3A6C3	0.23	7/25/2017
25	Interior	B3A6C4	0.23	7/25/2017
25	Interior	B3A6C5	0.23	7/25/2017
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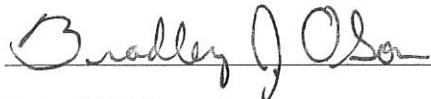
*Appendix E*  
*Explosives Accountability*

## Form M-6

Team Number: UXO-3 Date: September 13, 2017Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
Signature of Team Leader: 			
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	26SE16X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	50 ft.	15MY15B2	NS
Det Cord – 50gr	70 ft.	11JY16B1	NS
19 g Perforators	40 ea.	30NOV16C1	NS
EXPLOSIVES EXPENDED			
Signature of Team Leader: 			
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	26SE16X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	50 ft.	15MY15B2	NS
Det Cord – 50gr	70 ft.	11JY16B1	NS
19 g Perforators	40 ea.	30NOV16C1	NS
EXPLOSIVES RETURNED			
Signature of SUXOS: 			
Item	Quantity	Lot Number	Checker's Initials
 None			

I certify the explosives listed above were used for their intended purpose.

  
Senior UXO Supervisor



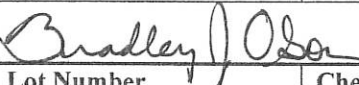
Date: September 13, 2017



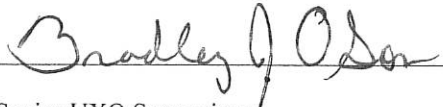
Form M-6

Team Number: UXO-3 Date: May 17, 2017

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	26SE16X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	150 ft.	15MY15B2	NS
Det Cord – 50gr	120 ft.	11JY16B1	NS
19 g Perforators	66 ea.	30NOV16C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	26SE16X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	150 ft.	15MY15B2	NS
Det Cord – 50gr	120 ft.	11JY16B1	NS
19 g Perforators	66 ea.	30NOV16C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

I certify the explosives listed above were used for their intended purpose.



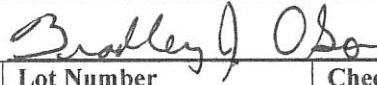
  
 Senior UXO Supervisor

Date: May 17, 2017

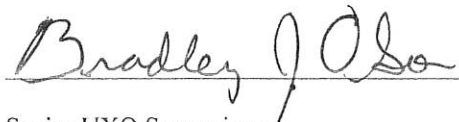
Form M-6

Team Number: UXO-3 Date: February 23, 2017

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	100 ft.	15MY15B2	NS
Det Cord – 50gr	180 ft.	16MY14B1	NS
19 g Perforators	115 ea.	30NOV16C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	100 ft.	15MY15B2	NS
Det Cord – 50gr	180 ft.	16MY14B1	NS
19 g Perforators	115 ea.	30NOV16C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<del>None</del>			

I certify the explosives listed above were used for their intended purpose.



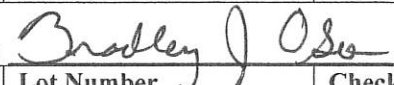
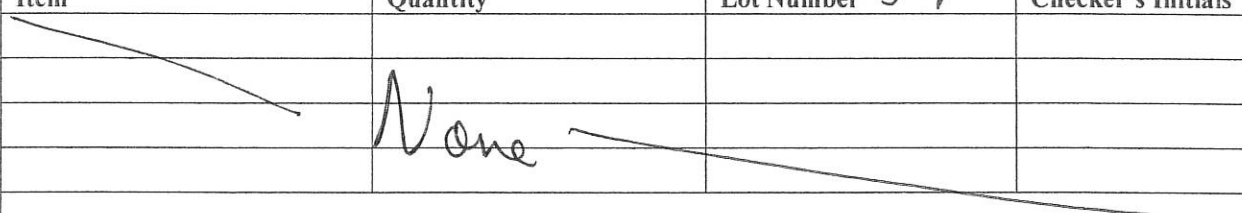
  
 Senior UXO Supervisor

Date: February 23, 2017

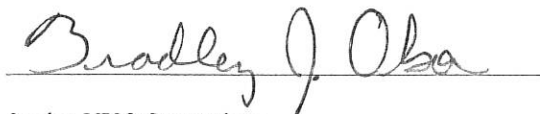
Form M-6

Team Number: UXO-3 Date: February 22, 2017

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	90 ft.	15MY15B2	NS
Det Cord – 50gr	180 ft.	16MY14B1	NS
19 g Perforators	110 ea.	30NOV16C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	90 ft.	15MY15B2	NS
Det Cord – 50gr	180 ft.	16MY14B1	NS
19 g Perforators	110 ea.	30NOV16C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
	None		

I certify the explosives listed above were used for their intended purpose.



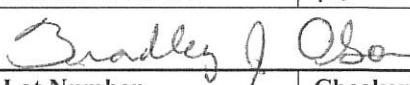
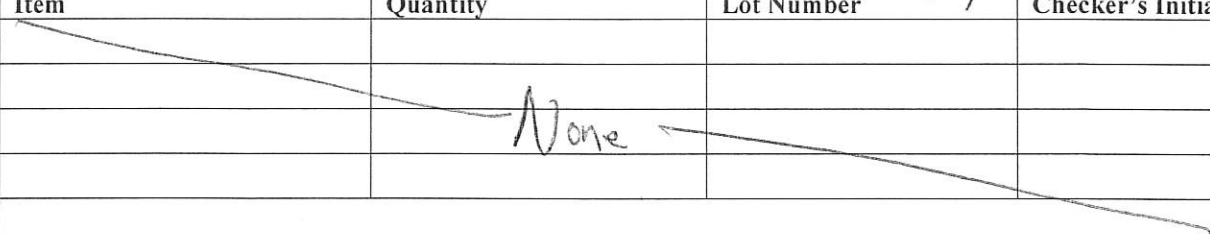
  
 Senior UXO Supervisor

Date: February 22, 2017

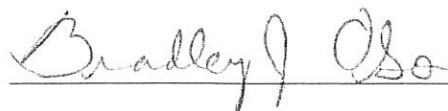
Form M-6

Team Number: UXO-3 Date: December 13, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	100 ft.	15MY15B2	NS
Det Cord – 50gr	150 ft.	16MY14B1	NS
19 g Perforators	174 ea.	24AUG16C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	100 ft.	15MY15B2	NS
Det Cord – 50gr	150 ft.	16MY14B1	NS
19 g Perforators	174 ea.	24AUG16C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
 None			

I certify the explosives listed above were used for their intended purpose.



Date: December 13, 2016

Senior UXO Supervisor

Form M-6

Team Number: UXO-3 Date: November 30, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: <i>[Signature]</i>
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	120 ft.	15MY15B2	NS
Det Cord – 50gr	380 ft.	16MY14B1	NS
19 g Perforators	136 ea.	24AUG16C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: <i>[Signature]</i>
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	120 ft.	15MY15B2	NS
Det Cord – 50gr	380 ft.	16MY14B1	NS
19 g Perforators	136 ea.	24AUG16C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: <i>Bradley J Olson</i>
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

I certify the explosives listed above were used for their intended purpose.



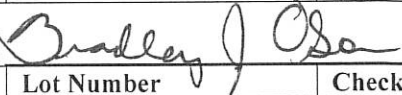
*Bradley J Olson*  
 Senior UXO Supervisor

Date: November 30, 2016


Form M-6

Team Number: UXO-3 Date: November 17, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	100 ft.	15MY15B2	NS
Det Cord – 50gr	200 ft.	16MY14B1	NS
19 g Perforators	113 ea.	24AUG16C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	100 ft.	15MY15B2	NS
Det Cord – 50gr	200 ft.	16MY14B1	NS
19 g Perforators	113 ea.	24AUG16C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<del>None</del>			

I certify the explosives listed above were used for their intended purpose.

  
 Senior UXO Supervisor



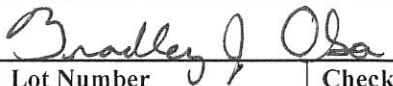
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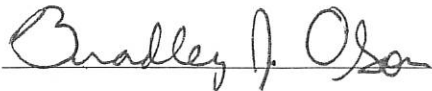
Form M-6

Team Number: UXO-3 Date: November 16, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	85 ft.	15MY15B2	NS
Det Cord – 50gr	190 ft.	16MY14B1	NS
19 g Perforators	26 ea.	24AUG16C1	NS
19 g Perforators	77 ea.	31AUG15C1	NS
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	NS
Nonel (2,500 ft.)	2 roll	07DE16G1	NS
Det Cord – 100gr	85 ft.	15MY15B2	NS
Det Cord – 50gr	190 ft.	16MY14B1	NS
19 g Perforators	26 ea.	24AUG16C1	NS
19 g Perforators	77 ea.	31AUG15C1	NS
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

I certify the explosives listed above were used for their intended purpose.





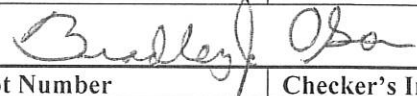
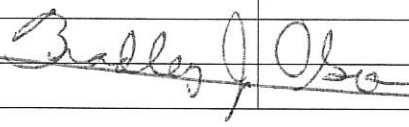
Date: November 16, 2016

Senior UXO Supervisor

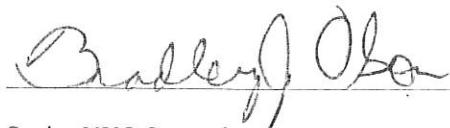
Form M-6

Team Number: UXO-3 Date: November 08, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
Signature of Team Leader: 			
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 each	16MA15X1	3B
Nonel (2,500 ft.)	2 roll	27JY15W1	3B
Det Cord – 100gr	60 feet	15MY15B2	3B
Det Cord – 50gr	150 feet	16MY14B1	3B
19 g Perforators	80 each	26AUG15C1	3B
EXPLOSIVES EXPENDED			
Signature of Team Leader: 			
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 each	16MA15X1	3B
Nonel (2,500 ft.)	2 roll	27JY15W1	3B
Det Cord – 100gr	60 feet	15MY15B2	3B
Det Cord – 50gr	150 feet	16MY14B1	3B
19 g Perforators	80 each	26AUG15C1	3B
EXPLOSIVES RETURNED			
Signature of SUXOS: 			
Item	Quantity	Lot Number	Checker's Initials
Nonel	1,200 feet	27JY15W1	3B
			

I certify the explosives listed above were used for their intended purpose.



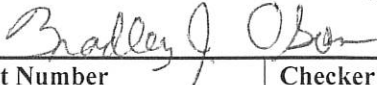
  
 Senior UXO Supervisor

Date: November 08, 2016

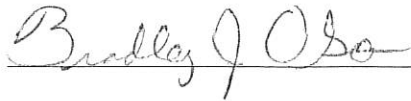
Form M-6

Team Number: UXO-3 Date: November 03, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 each	16MA15X1	301
Nonel (2,500 ft.)	2 roll	27JY15W1	310
Det Cord – 100gr	60 feet	15MY15B2	305
Det Cord – 50gr	150 feet	16MY14B1	305
19 g Perforators	80 each	26AUG15C1	310
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 each	16MA15X1	305
Nonel (2,500 ft.)	2 roll	27JY15W1	310
Det Cord – 100gr	60 feet	15MY15B2	305
Det Cord – 50gr	150 feet	16MY14B1	310
19 g Perforators	80 each	26AUG15C1	310
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

I certify the explosives listed above were used for their intended purpose.



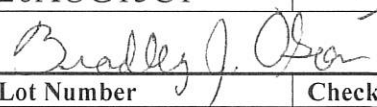


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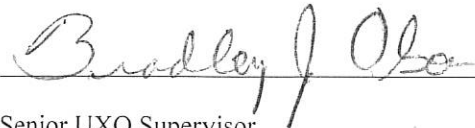
Senior UXO Supervisor

## Form M-6

Team Number: UXO-3 Date: November 02, 2016Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 each	16MA15X1	B/O
Nonel (2,500 ft.)	2 roll	27JY15W1	B/O
Det Cord – 100gr	60 feet	15MY15B2	B/O
Det Cord – 50gr	150 feet	16MY14B1	B/O
19 g Perforators	80 each	26AUG15C1	B/O
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 each	16MA15X1	B/O
Nonel (2,500 ft.)	2 roll	27JY15W1	B/O
Det Cord – 100gr	60 feet	15MY15B2	B/O
Det Cord – 50gr	150 feet	16MY14B1	B/O
19 g Perforators	80 each	26AUG15C1	B/O
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<del>NONE</del>			

I certify the explosives listed above were used for their intended purpose.






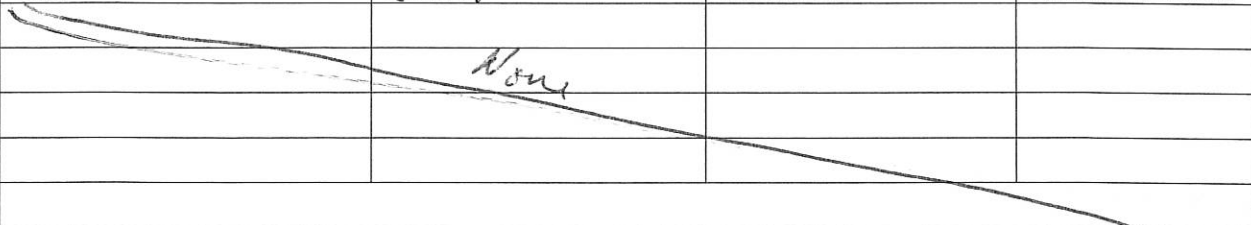
Senior UXO Supervisor

Date: November 02, 2016

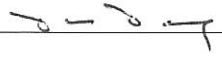
Form M-6

Team Number: UXO-3 Date: October 20, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	VB
Nonel (2,500 ft.)	2 roll	27JY15W1	VB
Det Cord – 100gr	80 feet	15MY15B2	VB
Det Cord – 50gr	170 ft.	16MY14B1	VB
19 g Perforators	22 ea.	26AUG15C1	VB
19 g Perforators	61 ea	31AUG15C1	VB
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 ea.	16MA15X1	VB
Nonel (2,500 ft.)	2 roll	27JY15W1	VB
Det Cord – 100gr	80 feet	15MY15B2	VB
Det Cord – 50gr	170 ft.	16MY14B1	VB
19 g Perforators	22 ea.	26AUG15C1	VB
19 g Perforators	61 ea	31AUG15C1	VB
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
			

I certify the explosives listed above were used for their intended purpose.



  
 Senior UXO Supervisor

Date: October 20, 2016

Form M-6

Team Number: UXO-3 Date: October 12, 2016

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	4 ea.	16MA15X1	30
Nonel (2,500 ft.)	2 roll	27JY15W1	30
Det Cord – 100gr	300 feet	15MY15B2	30
Det Cord – 50gr	440 ft.	16MY14B1	30
19 g Perforators	179 ea.	26AUG15C1	30
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	4 ea.	16MA15X1	30
Nonel (2,500 ft.)	2 roll	27JY15W1	30
Det Cord – 100gr	300 feet	15MY15B2	30
Det Cord – 50gr	440 ft.	16MY14B1	30
19 g Perforators	179 ea.	26AUG15C1	30
EXPLOSIVES RETURNED			
			Signature of SUXOS: <u>Bradley J. Obo</u>
Item	Quantity	Lot Number	Checker's Initials
<u>None</u>			

I certify the explosives listed above were used for their intended purpose.

Bradley J. Obo  
Senior UXO Supervisor

Date: October 12, 2016

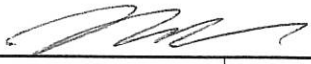
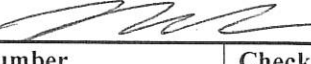
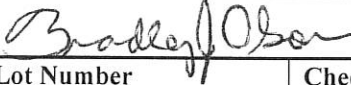


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Form M-6

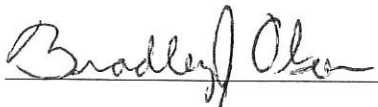
Team Number: UXO-3 Date: October 14, 2015

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 Each	12MA12X1	325
Nonel (2,500 ft.)	2 Roll	27JY15W1	325
Det Cord - 100gr	60 Feet	07MY14B1	325
Det Cord - 50gr	140 Feet	16MY14B1	325
19 g Perforators	88 Each	17AUG15C1	325
19 g Perforators	15 Each	26AUG15C1	325
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 Each	12MA12X1	325
Nonel (2,500 ft.)	2 Roll	27JY15W1	325
Det Cord - 100gr	60 Feet	07MY14B1	325
Det Cord - 50gr	140 Feet	16MY14B1	325
19 g Perforators	88 Each	17AUG15C1	325
19 g Perforators	15 Each	26AUG15C1	325
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

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I certify the explosives listed above were used for their intended purpose.

  
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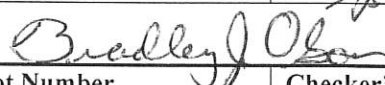
Date: October 14, 2015

Senior UXO Supervisor

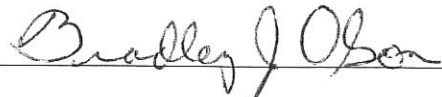
Form M-6

Team Number: UXO-3 Date: October 1, 2015

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
Signature of Team Leader: 			
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	6 Each	12MA12X1	300
Nonel (2,500 ft.)	4 Roll	27JY15W1	300
Det Cord – 100gr	110 Feet	07MY14B1	300
Det Cord – 50gr	650 Feet	16MY14B1	300
19 g Perforators	40 Each	#6	300
19 g Perforators	112 Each	17AUG15C1	300
EXPLOSIVES EXPENDED			
Signature of Team Leader: 			
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	6 Each	12MA12X1	300
Nonel (2,500 ft.)	4 Roll	27JY15W1	300
Det Cord – 100gr	110 Feet	07MY14B1	300
Det Cord – 50gr	650 Feet	16MY14B1	300
19 g Perforators	40 Each	#6	300
19 g Perforators	112 Each	17AUG15C1	300
EXPLOSIVES RETURNED			
Signature of SUXOS: 			
Item	Quantity	Lot Number	Checker's Initials
<del>None</del>			

I certify the explosives listed above were used for their intended purpose.

  
 Senior UXO Supervisor

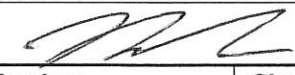

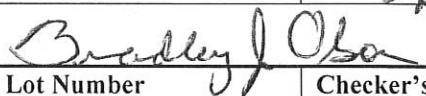
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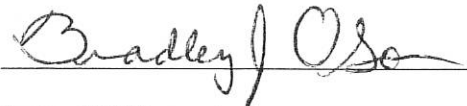
EXPLOSIVES USAGE RECORD

Team Number: UXO-3 Date: September 30, 2015

Team Leader: Sarabia Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	4 Each	12MA12X1	305
Nonel (2,500 ft.)	3 Roll	27MY14IS1	305
Det Cord – 100gr	140 Feet	07MY14B1	305
Det Cord – 50gr	400 Feet	16MY14B1	300
19 g Perforators	6 Each	#5	300
19 g Perforators	210 Each	#6	300
EXPLOSIVES EXPENDED			
			Signature of Team Leader: 
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	4 Each	12MA12X1	305
Nonel (2,500 ft.)	3 Roll	27MY14IS1	305
Det Cord – 100gr	140 Feet	07MY14B1	305
Det Cord – 50gr	400 Feet	16MY14B1	305
19 g Perforators	6 Each	#5	300
19 g Perforators	210 Each	#6	305
EXPLOSIVES RETURNED			
			Signature of SUXOS: 
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

I certify the explosives listed above were used for their intended purpose.

  
 Senior UXO Supervisor

Date: September 30, 2015

Form M-11

EXPLOSIVES USAGE RECORD

Team Number: UXO-5 Date: August 11, 2015

Team Leader: Light Project: Fort Ord MMRP

EXPLOSIVES ISSUED			
			Signature of Team Leader: <i>[Signature]</i>
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 Each	12MA12X1	BAM
Nonel (2,500 ft.)	2 Roll	27MY14IS1	BAM
Det Cord	300 Feet	12268424	BAM
19 g Perforators	150 Each	#6	BAM
19 g Perforators	10 Each	#5	BAM
EXPLOSIVES EXPENDED			
			Signature of Team Leader: <i>[Signature]</i>
Item	Quantity	Lot Number	Checker's Initials
Caps (Detonators)	2 Each	12MA12X1	BAM
Nonel (2,500 ft.)	2 Roll	27MY14IS1	BAM
Det Cord	300 Feet	12268424	BAM
19 g Perforators	150 Each	#6	BAM
19 g Perforators	10 Each	#5	BAM
EXPLOSIVES RETURNED			
			Signature of SUXOS: <i>[Signature]</i>
Item	Quantity	Lot Number	Checker's Initials
<i>None</i>			

I certify the explosives listed above were used for their intended purpose.

*Bradley J. Olson*

Date: August 11, 2015

Senior UXO Supervisor

*Appendix F*  
*MRS-BLM Unit 25 MEC Remedial Action*  
*Technical Memorandum*  
*Former Fort Ord, California*

# **MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum Former Fort Ord, California**

*Prepared for:*



**U.S. Army Corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, California 95814-2922**

*Prepared by:*



**KEMRON Environmental Services, Inc.  
1359A Ellsworth Industrial Blvd.  
Atlanta, GA 30318  
404-636-0928**

**April 2018**



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Appendix C	DGM QA Approval and Discussion
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## 1.0 Introduction

---

This Technical Memorandum (TM) describes the munitions and explosives of concern (MEC) remedial action (RA) [surface MEC remediation and DGM survey] that was performed by KEMRON Environmental Services (KEMRON) with Gilbane as a subcontractor within Munitions Response Site (MRS) - Bureau of Land Management (BLM) Unit 25 ([Figure 1](#)). Field work at the site was initiated in June 2015 (vegetation mastication) and was completed in August 2017 (digital geophysical mapping [DGM]). This TM summarizes the work applicable to Unit 25 that was conducted in accordance with the *Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (Final Units 25/31 SSWP; KEMRON, 2016a) and Field Work Variances (FWV) 006 and 011, which are described further in [Section 3.0](#).

Unit 25 vegetation clearance was initially intended to be performed by prescribed burning. Following a determination by the Fort Ord Prescribed Burn Team that the unit was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A](#). Work completed in the western portion of Unit 25 (26 acres) to support planned prescribed burns in Units 11 and 12 was conducted in accordance with the *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31, Former Fort Ord, California* (Final Unit 23 SSWP; KEMRON, 2015). In this TM, the permanent fuel breaks surrounding the unit are not included as part of Unit 25.

### 1.1 Site Location

Unit 25 is approximately 95 acres and is located in the southeastern portion of the Impact Area Munitions Response Area (MRA), within the MRS-BLM. Unit 25 lies to the east of Riso Ridge Road, west of Impossible Canyon Road, and north/northeast of Mercury Road. These roads are part of the permanent fuel break network and are not included as part of Unit 25. [Figure 1](#) provides a location map of Unit 25.

### 1.2 Purpose

The *Final Work Plan, Remedial Design/Remedial Action (RD/RA), Track 3 Impact Area MRA, Former Fort Ord, California* (U.S. Army Corps of Engineers [USACE], 2009) specifies that the U.S. Department of the Army (Army) will prepare a TM for the U.S. Environmental Protection Agency (EPA) and California Department of Toxic Substances Control (DTSC) to present a review of the results of both the surface remediation and the DGM data.

The TM is to evaluate surface remediation and DGM information to determine if additional subsurface remediation is required, based on information gathered following completion of the Final SSWP (KEMRON, 2016a), or as requested by the future property recipient and identified in coordination with the Army. This TM provides the following information:

- Scope of Work ([Section 2.0](#)) for Unit 25;
- Remedial work completed at Unit 25, and reasons for remedial work modifications for Unit 25, if applicable;
- Summary of MEC and munitions debris (MD) ([Section 4.0](#)) removed from Unit 25 during technology-aided surface MEC removal activities;
- Observation of evidence of potential soil contamination for evaluation under the Site 39/Basewide Range Assessment (BRA) Program ([Section 5.0](#));
- Detail regarding recommendations for subsurface MEC remediation within Unit 25, either specific to portions of the site or as a whole;
- Conclusions/Summary of Recommendations ([Section 7.0](#)) for Unit 25, either specific to portions of the site or as a whole.

## 2.0 *Scope of Work*

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The scope of work for the project addressed in this TM included vegetation clearance, technology-aided surface MEC removal, and DGM survey across Unit 25. Unit 25 totals approximately 95 acres.

[Figure 1](#) provides a general site layout of Unit 25.

### 2.1 *Vegetation Clearance*

Vegetation clearance in the western portion, approximately 26 acres, of Unit 25 to support planned prescribed burns began in June 2015 and was completed in September 2015. Vegetation clearance in the remainder, approximately 60 acres, of Unit 25 was completed in July 2016. All but 24 acres of Unit 25 were cut to prepare for prescribed burns in Units 11, 12 and 25. Following a determination by the Fort Ord Prescribed Burn Team that the Unit 25 was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in [Appendix A \(FWV 006\)](#). Mechanical mastication was performed in all accessible areas, approximately 86 acres. In areas where mechanical mastication could not be performed, manual vegetation removal was performed in accessible areas. Due to extreme terrain, approximately eight acres did not receive vegetation removal. Approximately one acre within Unit 25, although inaccessible due to terrain, did not require vegetation clearance due to the lack of vegetation.

### 2.2 *Technology-Aided Surface Munitions and Explosives of Concern Removal*

Technology-aided surface MEC removal in the western portion of Unit 25 to support planned prescribed burns in Units 11 and 12 began in July 2015 and was completed in October 2015. Technology-aided surface MEC removal in the remainder of Unit 25 restarted in July 2016 and was completed in July 2017. This technology-aided surface MEC removal includes containment lines for the prescribed burn within Unit 25, and the remainder of the unit when a determination was made to mechanically cut the remainder of the unit. Lanes approximately five feet in width were placed across grids and Schonstedt magnetometers were used by unexploded ordnance (UXO) personnel to conduct surface MEC removal. Prior to the RA, 119 MEC (UXO) items were recovered from Unit 25 and are shown in [Table 1](#) and [Figure 2](#). During the technology-aided surface MEC removal, 324 MEC items were recovered and are shown in [Tables 2 and 4](#) and [Figure 5](#). Cumulative results for the Unit 25 RA are shown in [Tables 3 and 5](#). Quality control/quality assurance (QC/QA) processes were implemented in accordance with the Final SSWP (KEMRON, 2016a) and the *Final Quality Assurance Project Plan, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action, Former Fort Ord, California* (MEC QAPP)

(KEMRON, 2016b). Approximately nine acres of Unit 25 has been determined by (UXO) safety personnel to be inaccessible to surface MEC removal due to extreme terrain (See [Figure 1](#) of [FWV 011](#)).

### ***2.3 Digital Geophysical Mapping Survey***

The DGM survey was conducted with vehicle-towed EM61-MK2A arrays starting in November 2015 (western portion of Unit 25 in support of prescribed burns planned for Units 11 and 12) and was completed in August 2017 (remainder of Unit 25). [Figure 3](#) depicts the DGM data collected in Unit 25. Cumulative results for the Unit 25 RA are shown in [Tables 3](#) and [5](#). Measurement quality objectives were met and QC/QA processes were implemented in accordance with the Final SSWP (KEMRON, 2016a) and the MEC QAPP (KEMRON, 2016b). Measurement performance criteria were evaluated according to the standards specified in the MEC QAPP and the Final SSWP. Specific criteria that were evaluated included GPS accuracy, static background and response tests, dynamic background and response tests (IVS), velocity, minimum along track sampling and across track coverage, accurate detection of Blind Seeds with respect to both response and positioning, surveillance of field methods, and reprocessing of field data. Each of these criteria were evaluated separately with results recorded in the project database and subsequently reviewed by the QC Geophysicist. [Appendix C](#) includes the USACE DGM QA Approval and Discussion for Unit 25.

Due to extreme terrain within Unit 25, approximately 20 acres were inaccessible to DGM survey. These areas are shown on [Figure 3](#). These areas were documented in [FWV 011](#) included in [Appendix A](#) of this document.



### *3.0 Approved Changes During Field Work*

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Unit 25 work was performed in accordance with the Final Unit 23 SSWP (KEMRON, 2015) and Final Units 25/31 SSWP (KEMRON, 2016a), with the following exceptions documented by the FWVs included in [Appendix A](#) and outlined below:

- **006** (AR# OE-0880A.2) Documents that Unit 25 vegetation removal would be performed mechanically instead of prescribed burning as originally planned due to terrain negatively impacting firefighter's ability to control the fire. Additionally, documents an approximate eight acre area of difficult terrain in Unit 25 that precluded vegetation removal during prescribed burn containment line preparation.
- **011** (AR# OE-0880A.8) Documents area within Unit 25 where steep terrain precludes completion of surface MEC removal activities (approximately nine acres), and area within Unit 25 where steep terrain or dense oak tree stands preclude completion of DGM survey.

## 4.0 Summary of MEC/MD Removed

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One hundred and nineteen MEC (UXO) items were encountered and removed from Unit 25 as part of activities which occurred prior to the activities described in this TM. These activities are described in the *Final Technical Information Paper, Ordnance and Explosives (OE) Site OE-15 (Mortar Alley), Former Fort Ord, California* (Parsons, 2002). These items are also shown in [Table 1](#) and [Figure 2](#).

Three hundred and twenty four surface MEC items were encountered and removed as part of MEC remediation activities described in this TM. All MEC items removed as part of MEC remediation activities described in this TM are in [Tables 2](#) and [4](#). These MEC items are shown in [Figure 5](#).

The MD removed from Unit 25 as part of MEC remediation activities described in this TM was recorded based on weight per 100-foot by 100-foot grid. An estimated 58,091 pounds of MD were removed. Density of MD weights by grid is shown on [Figure 4](#).

Targets and target debris within Unit 25 were removed and recycled to allow surface MEC removal and DGM to be conducted. No latrine pits were documented as part of this RA. Range-Related Debris (RRD) and Other Debris (OD) removed as part of MEC remediation activities described in this TM was recorded based on weight per 100-foot by 100-foot grid. An estimated 34,842 pounds of RRD and OD were removed as part of MEC remediation activities.

## ***5.0 Observations of Evidence of Potential Soil Contamination***

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During field operations, UXO field personnel noted the presence of features or items that might indicate small arms training, including, but not limited to, mounds and berms, structures, and concentrations of bullets, machine gun links and other munitions-related items. This information has been provided to BRA personnel and is being used as part of the BRA program. Reconnaissance and identification of potential sampling locations is complete. Development of a sampling plan is in progress.

## 6.0 Recommendations for Additional Subsurface MEC Remediation

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The Track 3 Record of Decision (ROD) identifies the types of areas where additional work (e.g., subsurface MEC removal) would be conducted. Other than the network of fuel break roads and 100-foot buffers, subsurface MEC removals can be conducted in areas to address specific risk and/or land use needs, such as BLM restoration sites. These areas are to be identified in the TM and evaluated.

Factors that will be considered when determining whether additional actions are necessary include, but are not limited to: (1) explosive hazards associated with MEC recovered; (2) the proximity to potential receptors; (3) the density of MEC recovered; and (4) consistency with Applicable or Relevant and Appropriate Requirements (e.g., Habitat Management Plan and Biological Opinions).

Based on the Final Units 25/31 SSWP (KEMRON, 2016a), sensitive fuze type munitions were expected in Unit 25. During the RA described in this TM, eight MEC items with sensitive fuzes were encountered and removed. MEC items with sensitive fuzes are shown in [Figure 6](#). All MEC items with sensitive fuzes except one removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The single MEC item with a sensitive fuze not encountered and removed near these intersections occurred in the extreme southern end of Unit 25. The two boxed areas shown on [Figure 6](#) are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on [Figure 3](#). DGM data collection in the vicinity of the intersection of Steep Road and Hawkeye Road was limited due to steep terrain.

The Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface removal could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study and the short term recommendations for the areas of concern in Unit 25 are as follows:

- Areas where MEC with sensitive fuzes were located will be monitored with enhanced procedures during annual surface area monitoring,
- All future MEC removal actions in the vicinity of these areas will be monitored for indications of subsurface MEC with sensitive fuzes,

- Authorized personnel entering Unit 25 will initially receive updated MEC safety and recognition training.

A joint Army-BLM inspection summary is provided in [Appendix B](#). This summary describes areas such as erosion features that appear to have naturally stabilized, and currently do not require subsurface MEC removal. Figures detailing these areas are included as part of [Appendix B](#).

No additional subsurface MEC removal is recommended for Unit 25. This recommendation is based on the joint inspection described above between the Army and BLM and the future planned land reuse. Additionally, the Army is currently conducting a field study designed to provide more information about how risks from MEC items with sensitive fuzes that potentially remain in the subsurface of areas/grids could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study.

Approximately nine acres of Unit 25 did not receive surface MEC removal. 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. The inaccessible areas are marked by extreme terrain that is highly eroded. Munitions items that may have impacted these areas during training activities most likely ended up at the bottom of the slopes. Items remaining on the surface at the bottom of the slope would have been removed during surface MEC removal activities ([Figure 5](#)).

## *7.0 Conclusions/Summary of Recommendations*

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Technology-aided surface MEC removal has been completed in all accessible grids within Unit 25. Areas where technology-aided surface MEC removal was and was not completed are shown on [Figure 4](#). Technology-aided surface MEC removal and DGM survey in Unit 25 occurred as intended within the scope of work. Areas where surface MEC removal and DGM survey were not completed are addressed in [FWV 011](#), included in [Appendix A](#). A summary of survey and removal methods completed by total grids for the Unit 25 RA is shown in [Table 5](#).

RA objectives have been met for this unit. No additional subsurface MEC remediation is recommended for Unit 25. Based on the results of the surface MEC removal performed in Unit 25, the likelihood of MEC remaining in the nine acre area where surface MEC removal was not performed is considered low. No additional surface MEC remediation is recommended for Unit 25.



## 8.0 References

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KEMRON, 2015, *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Unit 23 and in Support of Units 11 and 12 Prescribed Burns (includes portions of Units 5A, 9, 25, 28 and 31, Former Fort Ord, California.* December. (AR# OE-0862B).

KEMRON, 2016a. *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, 2016b. *Field Work Variance No. 006 for Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California.* August. (AR# OE-0880A.2).

KEMRON, 2017. *Field Work Variance No. 011 for Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California.* November. (AR# OE-0880A.8).

Parsons, 2002. *Final Technical Information Paper, Ordnance and Explosives (OE) Site OE-15 (Mortar Alley), Former Fort Ord, California.* January. (AR# OE-0539).

U.S. Army Corps of Engineers (USACE), 2009, *Final Work Plan, Remedial Design/Remedial Action, Track 3 Impact Area Munitions Response Area, Former Fort Ord, California.* August. (AR# OE-0660K).

## *Tables*

**Table 1**

MEC Items Encountered and Removed Prior to Remedial Action Operations

Date Found	Item Type	Quantity	Description	Depth (inches)	Unit
11/29/2001	UXO	1	Projectile, 4.2inch, mortar, high explosive, M3 series	0	25
11/28/2001	UXO	1	Projectile, 40mm, high explosive, M381	0	25
11/28/2001	UXO	1	Projectile, 75mm, shrapnel, MK I	0	25
11/12/1997	UXO	24	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/10/1997	UXO	23	Projectile, 81mm, mortar, high explosive, M43 series	0	25
2/18/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/19/1998	UXO	2	Projectile, 81mm, mortar, high explosive, M43 series	10	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	18	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
2/18/1998	UXO	6	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/19/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	10	25
2/19/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	10	25
2/18/1998	UXO	6	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	13	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/18/1998	UXO	5	Projectile, 81mm, mortar, high explosive, M43 series	8	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	16	25
2/18/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/19/1998	UXO	2	Projectile, 81mm, mortar, high explosive, M43 series	12	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	14	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
2/18/1998	UXO	8	Projectile, 81mm, mortar, high explosive, M43 series	8	25
2/19/1998	UXO	3	Projectile, 81mm, mortar, high explosive, M43 series	12	25
1/27/1998	UXO	2	Projectile, 81mm, mortar, high explosive, M43 series	16	25
2/18/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	12	25
1/27/1998	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	15	25
11/27/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/27/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/27/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25
11/28/2001	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	0	25

**Total = 119**

**Table 2**  
MEC Items Encountered and Removed During Operations Covered in TM

Date Found	Item Type	Qty	Description	Operation	Unit
7/30/2015	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/5/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/10/2015	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/17/2015	UXO	1	Signal, illumination, ground parachute, M131	Surface Removal	25
8/18/2015	UXO	1	Projectile, 37mm, high explosive, MK II	Surface Removal	25
8/18/2015	UXO	1	Projectile, 37mm, high explosive, MK II	Surface Removal	25
8/18/2015	UXO	1	Projectile, 75mm, high explosive, MK I	Surface Removal	25
8/19/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/19/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/19/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/20/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/24/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/24/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/25/2015	UXO	1	Projectile, 75mm, Shrapnel, MK I	Surface Removal	25
8/25/2015	UXO	1	Projectile, 37mm, low explosive, MK II	Surface Removal	25
8/25/2015	UXO	1	Projectile, 75mm, high explosive, M48	Surface Removal	25
8/26/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/18/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/18/2015	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
9/18/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/18/2015	UXO	1	Projectile, 75mm, high explosive, MK I	Surface Removal	25
9/22/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/22/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/24/2015	UXO	1	Projectile, 37mm, low explosive, MK II	Surface Removal	25
9/25/2015	UXO	1	Projectile, 37mm, low explosive, MK II	Surface Removal	25
9/25/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/25/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/28/2015	UXO	1	Projectile, 75mm, Shrapnel, MK I	Surface Removal	25
9/28/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
9/28/2015	UXO	1	Projectile, 40mm, high explosive, M383	Surface Removal	25
9/29/2015	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
9/29/2015	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
9/29/2015	UXO	1	Projectile, 40mm, high explosive, M383	Surface Removal	25
9/29/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
10/1/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
10/1/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
10/2/2015	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
7/26/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
7/26/2016	UXO	1	Projectile, 37mm, high explosive, MK II	Surface Removal	25
7/26/2016	UXO	1	Projectile, 75mm, high explosive, MK I	Surface Removal	25
7/27/2016	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/1/2016	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/3/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/3/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/4/2016	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/4/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25

**Table 2**  
MEC Items Encountered and Removed During Operations Covered in TM

Date Found	Item Type	Qty	Description	Operation	Unit
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M362	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/8/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/9/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/9/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/9/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/10/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/10/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/10/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/10/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/11/2016	UXO	1	Grenade, rifle, smoke, white phosphorous, M19A1	Surface Removal	25
8/15/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/16/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/16/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/16/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/16/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/16/2016	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/16/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/17/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/17/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/17/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/17/2016	UXO	1	Projectile, 75mm, Shrapnel, MK I	Surface Removal	25
8/17/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/18/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/22/2016	UXO	1	Projectile, 75mm, Shrapnel, MK I	Surface Removal	25
8/23/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/24/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/25/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
8/25/2016	UXO	1	Rocket, 35mm, subcaliber, practice, M73	Surface Removal	25
8/25/2016	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
8/30/2016	UXO	1	Projectile, 105mm, high explosive, M1	Surface Removal	25
9/1/2016	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25











**Table 2**  
MEC Items Encountered and Removed During Operations Covered in TM

Date Found	Item Type	Qty	Description	Operation	Unit
5/11/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/11/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/15/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/15/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/15/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 75mm, Shrapnel, MK I	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 37mm, low explosive, MK II	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/16/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
5/25/2017	UXO	1	Projectile, 75mm, Shrapnel, MK I	Surface Removal	25
6/7/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
6/7/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
6/7/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
6/7/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
6/13/2017	UXO	1	Projectile, 37mm, low explosive, MK I	Surface Removal	25
7/13/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
7/13/2017	UXO	1	Projectile, 81mm, mortar, high explosive, M43 series	Surface Removal	25
<b>Totals</b>		<b>324</b>			

**Table 3**  
Cumulative Results of the Remedial Action

<b>Parameter</b>	<b>Unit 25 Totals</b>
Total unit acreage	95
Surface removal acreage	86
Analog subsurface removal acreage	0
Digital Subsurface removal acreage	0
DGM survey acreage	75
MEC items	324
Total Estimated MD Weight (lbs)	58,091
Total Estimated RRD and OD (lbs)	34,842

DGM - Digital Geophysical Mapping  
MEC - Munitions and Explosives of Concern  
MD - Munitions Debris  
RRD - Range Related Debris  
OD - Other Debris

**Table 4**  
MEC Recovered by Type During Remedial Action

<b>Description</b>	<b>Unit 25</b>
Grenade, rifle, smoke, white phosphorous, M19A1	1
Projectile, 105mm, high explosive, M1	1
Projectile, 37mm, high explosive, MK II	3
Projectile, 37mm, low explosive, MK I	36
Projectile, 37mm, low explosive, MK II	5
Projectile, 4.2inch, mortar, high explosive, M3 series	2
Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series	1
Projectile, 40mm, high explosive, M383	8
Projectile, 60mm, mortar, high explosive, M49 series	11
Projectile, 75mm, high explosive, M48	2
Projectile, 75mm, high explosive, MK I	5
Projectile, 75mm, shrapnel, MK I	8
Projectile, 81mm, mortar, high explosive, M362	2
Projectile, 81mm, mortar, high explosive, M43 series	235
Projectile, 81mm, mortar, illumination, M301 series	1
Rocket, 2.36inch, high explosive antitank, M6	1
Rocket, 35mm, subcaliber, practice, M73	1
Signal, illumination, ground parachute, M131	1
<b>Totals</b>	<b>324</b>



**Table 5**

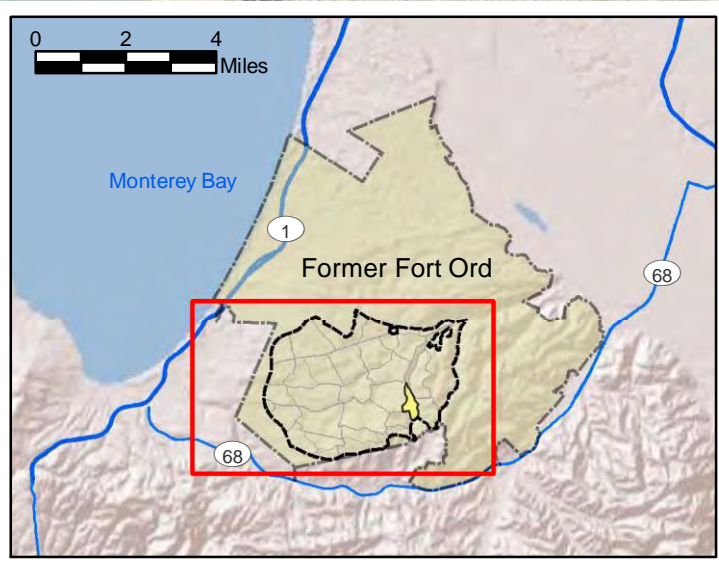
Summary of Survey and Removal Methods by Grids

<b>Activity</b>	<b>Unit 25 Grids</b>
Surface Removal	521
Analog Subsurface Removal	0
Digital Subsurface Removal	0
DGM Survey	480

DGM - Digital Geophysical Mapping

## *Figures*

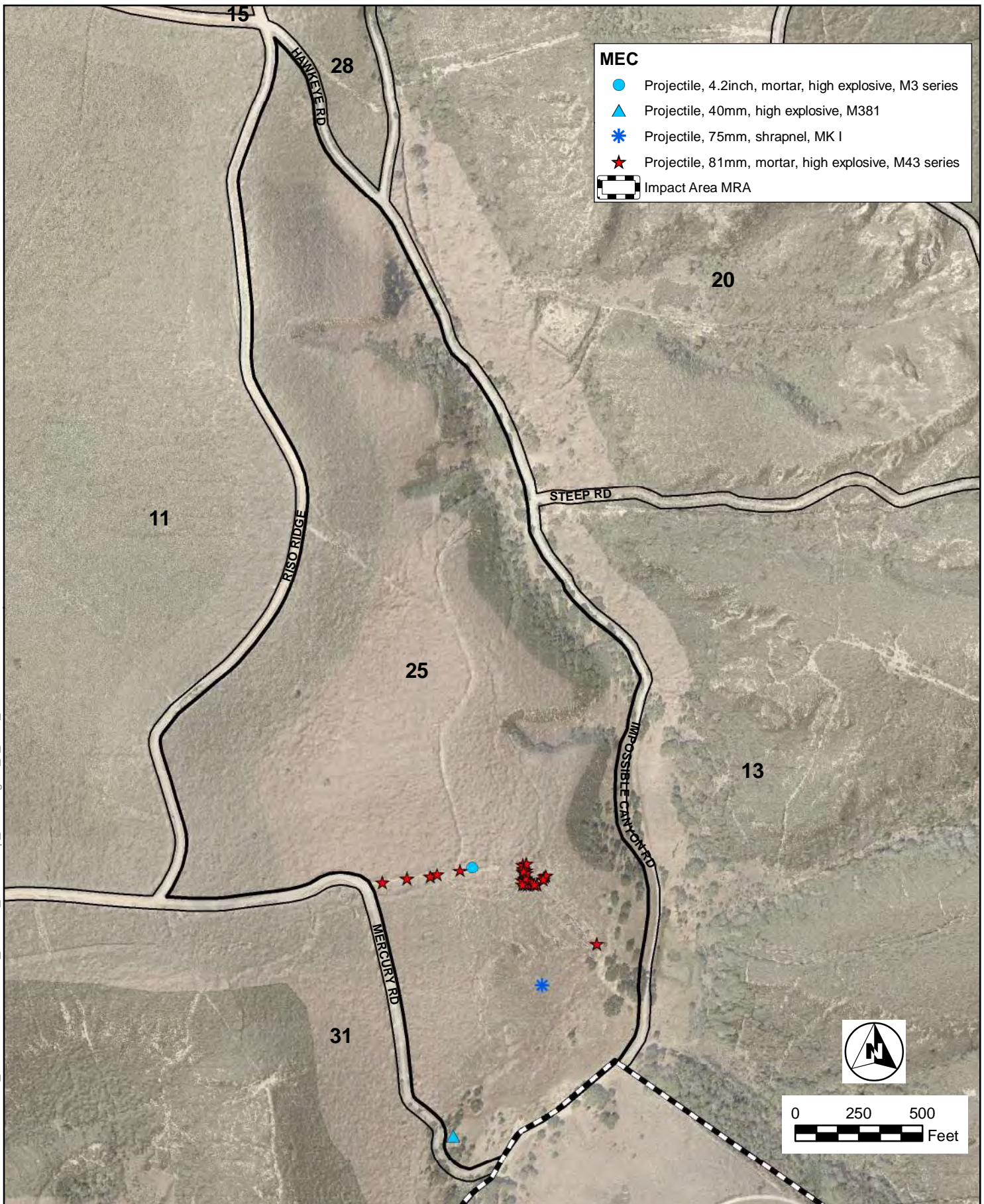




MEC Remedial Action Unit 25  
 Technical Memorandum  
 Munitions and Explosives of Concern  
 Former Fort Ord, California

**Figure 1**  
 Unit 25 Location Map





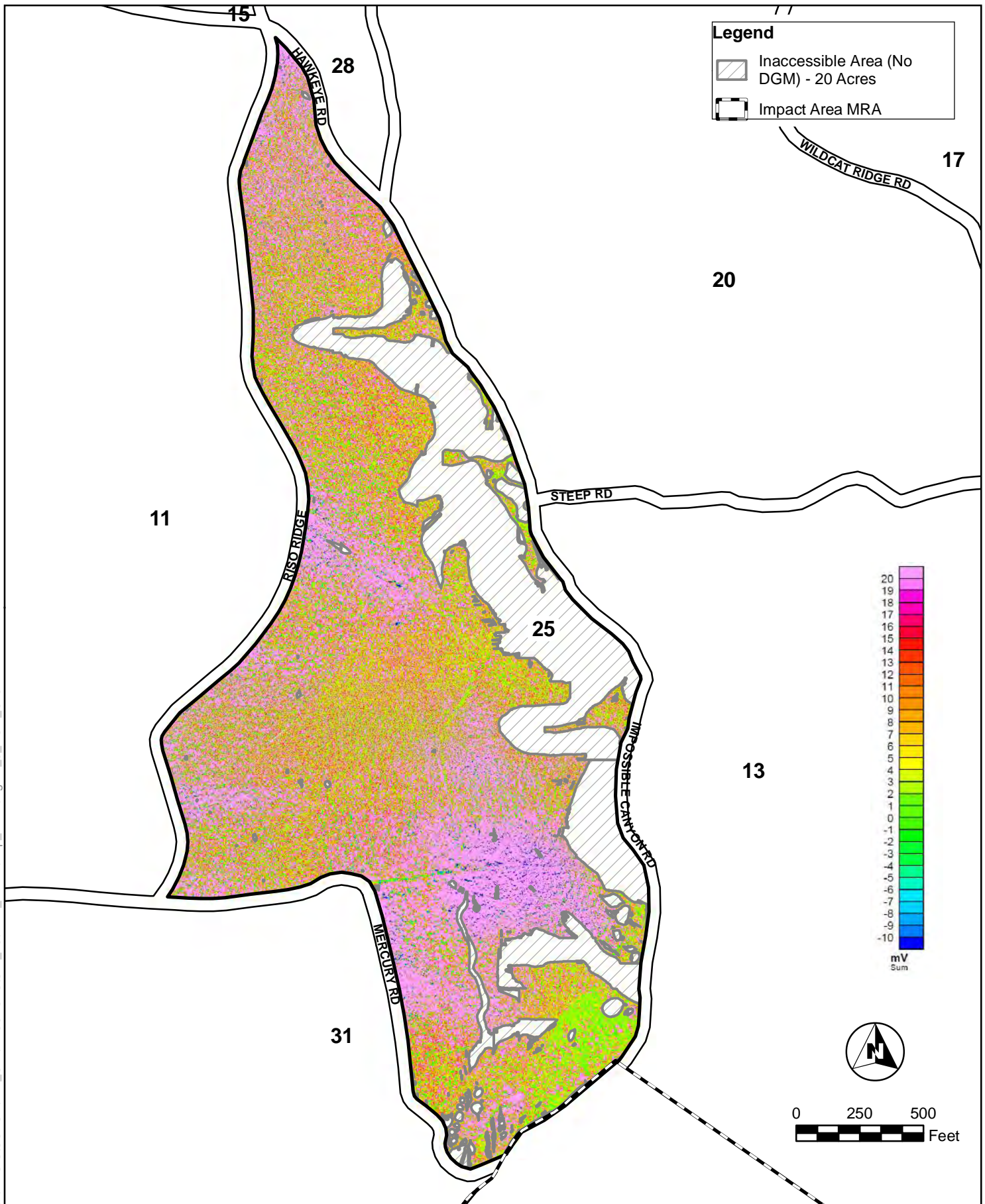
**KEMRON**  
ENVIRONMENTAL SERVICES



**MEC Remedial Action Unit 25  
Technical Memorandum  
Munitions and Explosives of Concern  
Former Fort Ord, California**

**Figure 2  
MEC Finds Prior to  
Remedial Action**



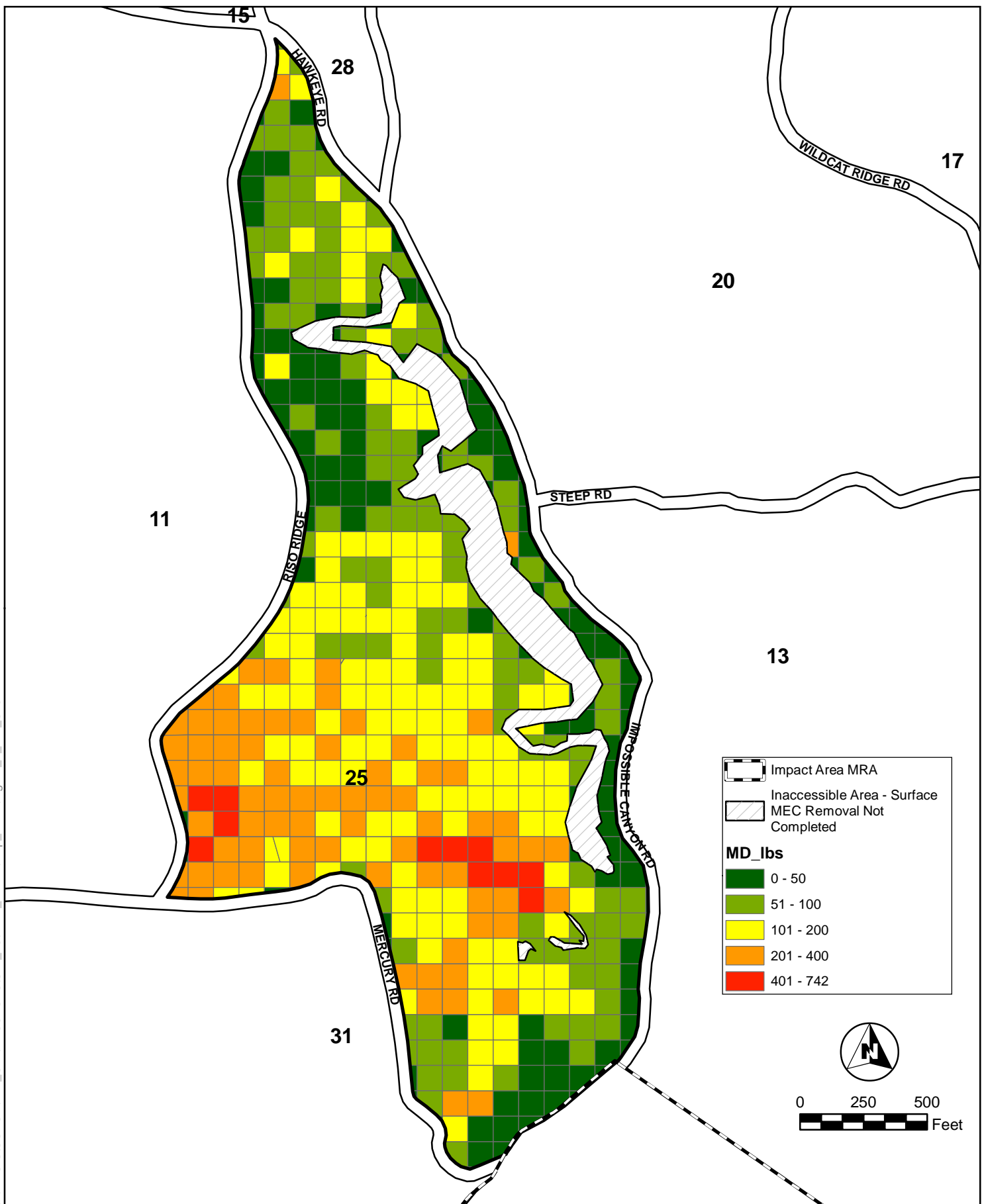


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ENVIRONMENTAL SERVICES



MEC Remedial Action Unit 25  
Technical Memorandum  
Munitions and Explosives of Concern  
Former Fort Ord, California

Figure 3  
DGM Survey Area



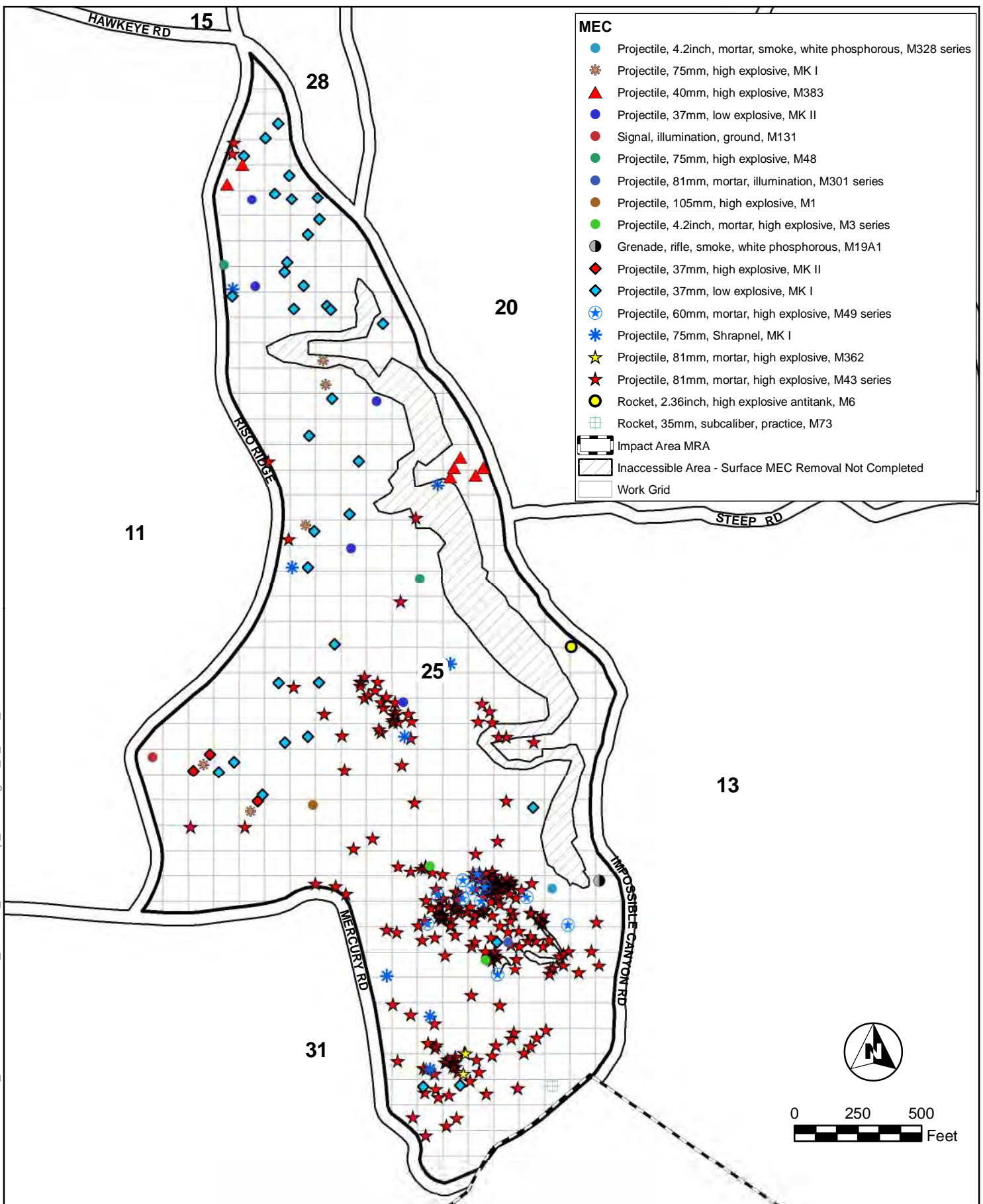
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**MEC Remedial Action Unit 25  
Technical Memorandum  
Munitions and Explosives of Concern  
Former Fort Ord, California**

**Figure 4**

**Weight of Surface MD  
Removed Per Grid**



MEC Remedial Action Unit 25  
Technical Memorandum  
Munitions and Explosives of Concern  
Former Fort Ord, California

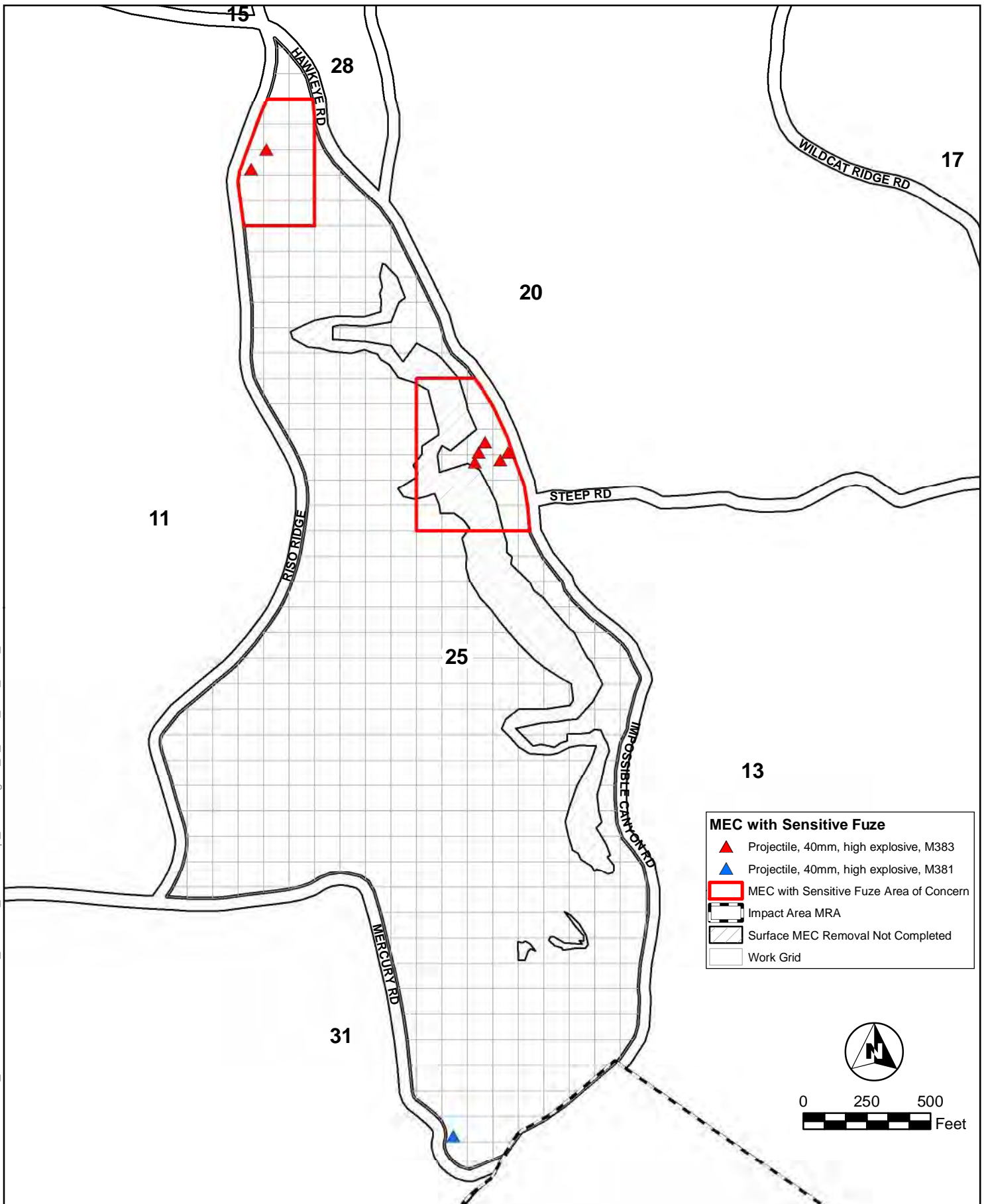
Figure 5  
MEC Finds During  
Remedial Action



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**Gilbane**

**MEC Remedial Action Unit 25  
Technical Memorandum  
Munitions and Explosives of Concern  
Former Fort Ord, California**

**Figure 6  
Location of MEC with  
Sensitive Fuzes**

## *Appendices*

*Appendix A*  
*Field Work Variances*



FIELD WORK VARIANCE

<b>Project Name/Number</b>	Fort Ord	<b>WP</b>	8
<b>Applicable Document</b>	Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A)	<b>Date</b>	August 8, 2016

**Problem Description:**

The Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A) identifies an approximate 24 acre area in the center of Unit 25 where prescribed burning is planned for vegetation removal. This area is also shown on the attached Figure 1. The planned vegetation cutting in Unit 25 was completed where accessible. Steep and difficult terrain exists in portions of the containment area (approximately 8 acres). Due to safety concerns vegetation cutting was not conducted in the areas of difficult terrain and surface MEC removal will not be conducted.

The terrain issues preclude firefighter's ability to control the fire from the perimeter of the unit. A determination was made that Unit 25 would be masticated instead of prescribed burned for vegetation removal.

**Recommended solution:**

Masticate the approximately 24 acre area within Unit 25 as shown on Figure 1 and perform MEC remediation activities in this area as outlined in the Draft Final, Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 25 and 31, Former Fort Ord, California (KEMRON, 2016) (OE-0880A).

Document the areas of difficult terrain (approximately 8 acres) in the Technical Memorandum.

**Impact on present and completed work:**

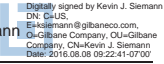
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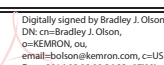
**Recommended solution/disposition:**

Incorporate this FWV as an appendix to the existing Draft Final Work Plan.

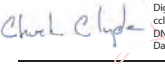
Clarification  Minor Change  Major Change

Affects Budget Yes  No   
Affects Schedule Yes  No


Signature  Kevin J. Siemann Date \_\_\_\_\_  
**MEC Task Manager**

Signature  Bradley J. Olson Date \_\_\_\_\_  
**SUXOS**

Signature  Steve Crane Date \_\_\_\_\_  
**Project Manager**

Signature  Cheryl Ely Date \_\_\_\_\_  
**CQCSM**

Signature  Erin K. Caruso Date \_\_\_\_\_  
**Deputy Project Manager**

Signature  Bruce McClain Date \_\_\_\_\_  
**UXOQCS**



Field Work Variance No. 006

Page 2 of 3

**USACE Approval: If Major Change:**

Signature MEEK.SHAWN.MIC  
HAEI.1115801739  
OE Safety Specialist

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Date \_\_\_\_\_

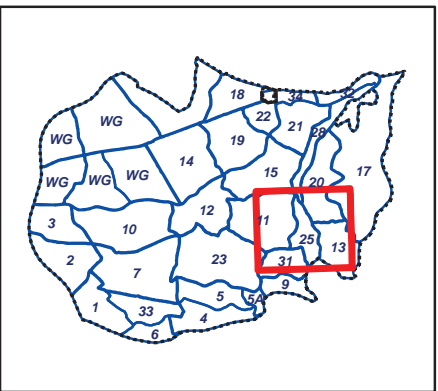
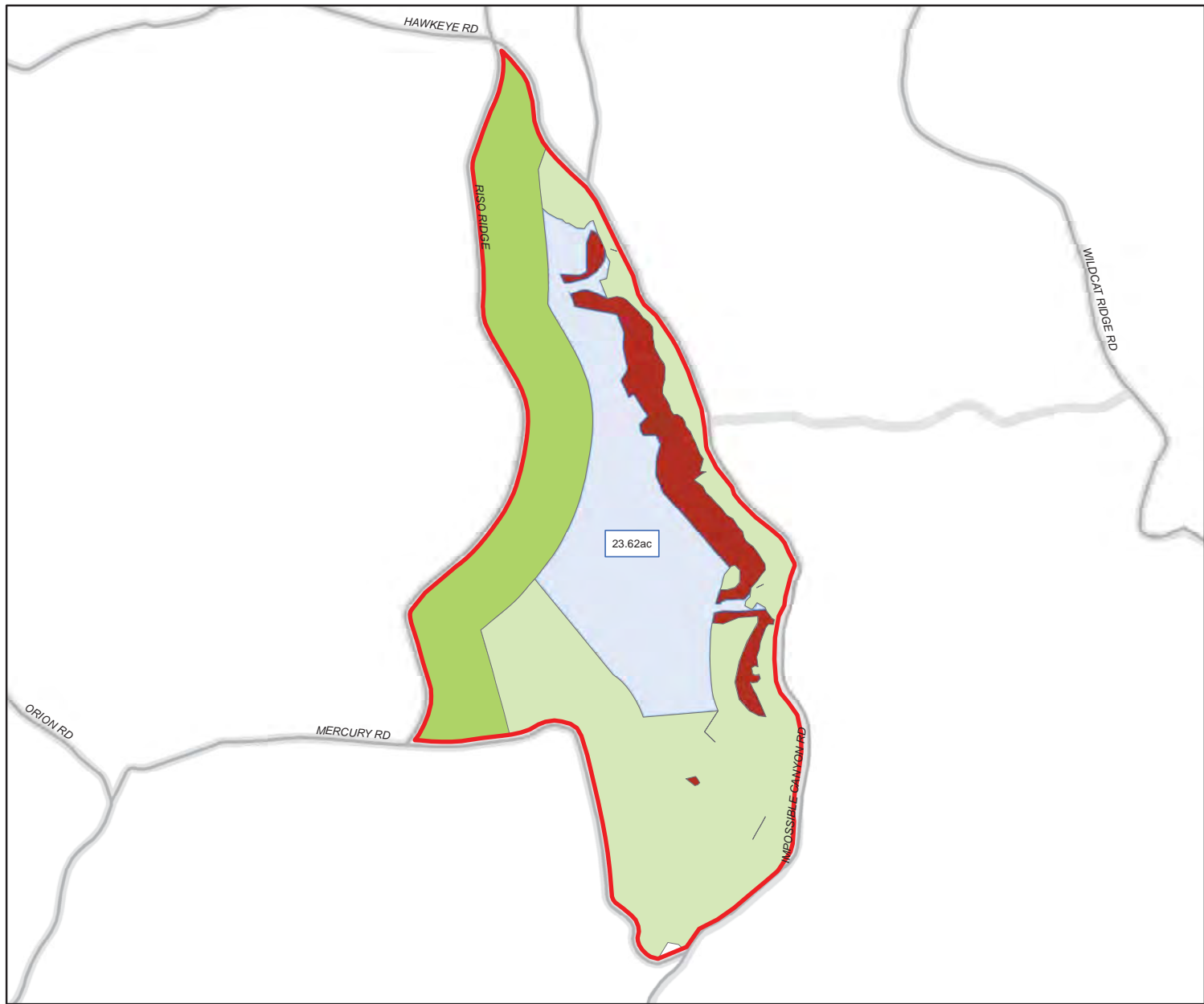
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Date: 2016.08.23 16:41:27 -0700

Date \_\_\_\_\_

USACE COR  
or TM

Signature \_\_\_\_\_ Date \_\_\_\_\_  
USACE Project  
Geophysicist



**Legend**

- Planned Interior Mastication (23.62 Acres)
- Mastication Complete 2016 (56.18 Acres)
- Mastication Complete 2015 (25.28 Acres)
- No Cut Due to Steep Terrain (8.05 Acres)
- Roads
- Unit Boundary
- Fuel Breaks



**Figure 1**

<p>U.S. ARMY CORPS OF ENGINEERS SACRAMENTO DISTRICT</p>
<p>FORT ORD Unit 25 Mastication Status</p>
<p>Operations Completed Through: 07/28/2016</p>



**FIELD WORK VARIANCE**

<b>Project Name/Number</b>	Fort Ord	<b>WP</b>	07
<b>Applicable Document</b>	Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California (OE- 0880)	<b>Date</b>	November 14, 2017

**Problem Description:**

The *Draft Final, Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, California* (Kemron, 2016), specifies the following:

- Section 2.5.6, Technology-Aided Surface MEC Removal: “Due to the presence of some extremely steep terrain as shown on Figure 2 (not shown), some areas may not have technology-aided surface removal performed. The determination to not conduct technology-aided surface removal may result from personnel safety issues. Areas where technology-aided surface removal is not conducted will be documented and evaluated during the TM process for the potential for MEC items to be present on the surface.”
- Section 2.5.7, Digital Geophysical Mapping (DGM): “Following surface MEC removal, DGM survey will be conducted in accessible areas. Site conditions (e.g. difficult terrain) may prevent digital geophysical survey from being conducted in certain areas; these areas will be documented in the TM.”

Field Work Variance 006 (AR # OE-0880A.2) detailed approximately eight acres within Unit 25 where steep and difficult terrain precluded vegetation cutting. This area corresponds to the area where surface MEC removal was not performed due to extremely difficult terrain. Areas where surface MEC removal was and was not completed are shown on [Figure 1](#). Approximately nine acres of Unit 25 was determined by UXO safety personnel to be inaccessible to surface MEC removal due to extreme terrain. Approximately 20 acres of Unit 25 ([Figure 2](#)) was determined by UXO safety personnel to be inaccessible to DGM survey due to extreme terrain, or where dense oak tree stands precluded access.

**Recommended solution:**

Document these areas in the TM. Conduct an evaluation in the TM based on the results of the surface MEC removal and DGM data to determine the likelihood of surface MEC remaining in the 9 acres shown on [Figure 1](#).

**Impact on present and completed work:**

No impact on present and completed work.

**Recommended solution/disposition:**

Incorporate this FWV as an appendix to the existing Draft Final Work Plan.




Clarification  Minor Change  Major Change

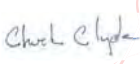
Affects Budget Yes  No

Affects Schedule Yes  No


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 Task Manager

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 SUXOS

Signature  Date 11/14/17  
 Project Manager

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 CQCSM

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 Reason: I am approving this document.  
 Date: 2017.11.16.09:05:18-0800' Date \_\_\_\_\_  
 Deputy Project Manager

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 UXOQCS

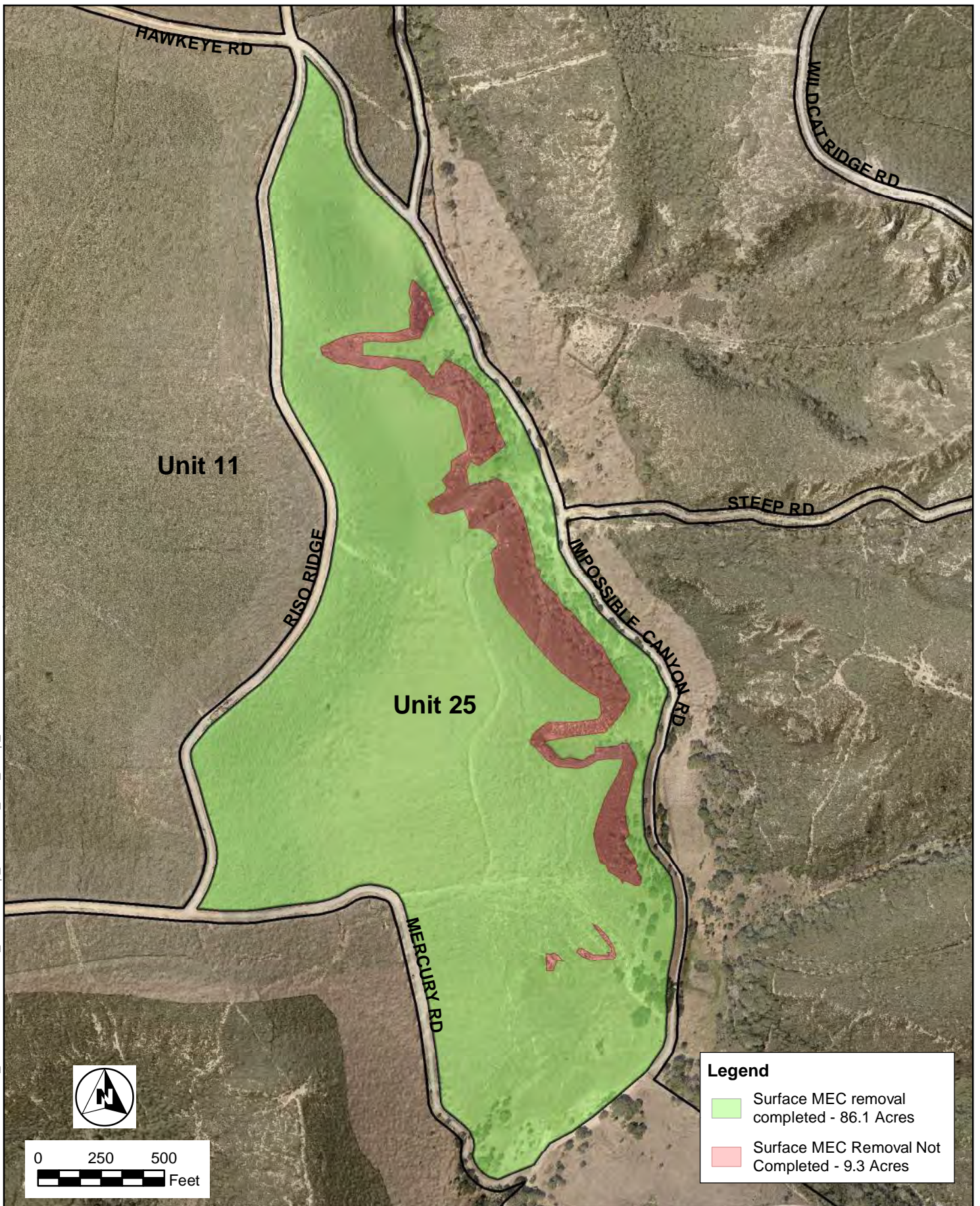
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 OE Safety Specialist

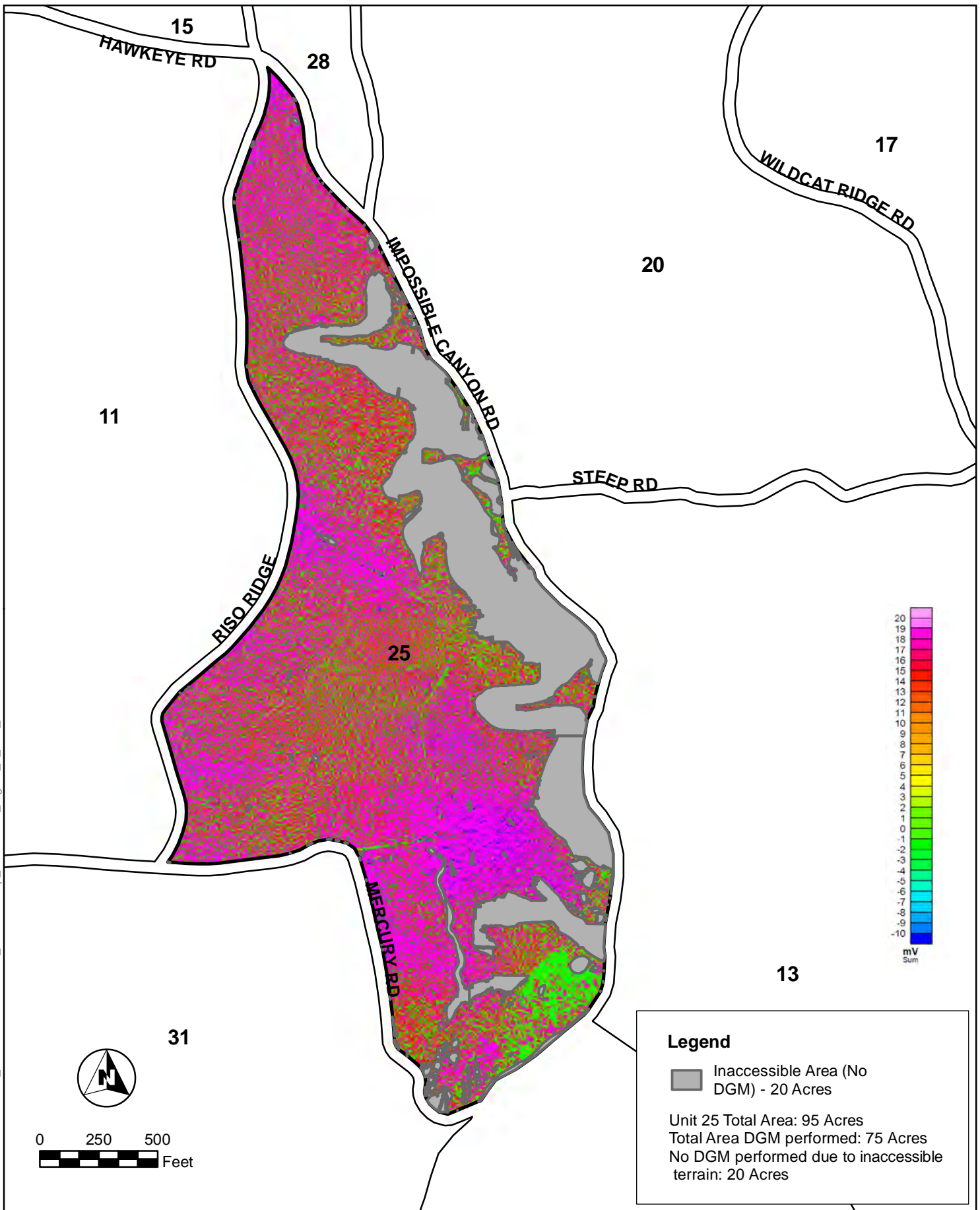
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 USACE Project Geophysicist









## *Appendix B*

### *Army-BLM Joint Inspection Summary*

## **Post-Remediation Inspection Summary**

**Subject:** Joint Post-Remediation Inspection by the Army and Bureau of Land Management (BLM) of Munitions Response Site (MRS) – BLM Unit 25.

**Area of Inspection:** Unit 25

**Date:** 2 August 2017

**Attendees:** Eric Morgan, BLM; Dave Eisen - Program Manager, United States Army Corps of Engineers (USACE); Curtis Payton – Program Manager, USACE; Natalie Gordon, Chenega Support Services, Fort Ord Base Realignment and Closure (BRAC)

### **References:**

1. *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, MRS-BLM Units 25 and 31, Former Fort Ord, CA (Kemron, 2016) (AR#OE-0880B).*
2. *Final Record of Decision (ROD), Impact Area Munitions Response Area (MRA), Track 3 Munitions Response Site (MRS), Former Fort Ord, California (United States Department of the Army [Army], 2008) (AR#OE-0647).*

**Background:** In accordance with the Track 3 ROD, the Army conducted surface MEC removal along with subsurface MEC removal in select areas and Digital Geophysical Mapping (DGM) of Unit 25 within the Impact Area. An inspection by the Army and BLM, the future property recipient and land manager, of Army's completed munitions and explosives of concern (MEC) removal action was conducted to determine areas that may require additional subsurface removal action, or future construction support, based on BLM's planned use (e.g. habitat restoration, erosion control measures, fuel break maintenance, etc).

It is an Army responsibility to conduct remedial actions that prepare the property for BLM's safe management and use. The Army will provide MEC removal and/or construction support for BLM's ground disturbing activities as jointly agreed upon prior to property transfer. It is anticipated that BLM will receive Unit 25 property upon completion of a suitable MEC remediation of all adjoining lands designated Munitions Response Site (MRS)-BLM (anticipated completion 2023). With the transfer of the property, responsibility for construction support of subsurface activities will be in accordance with the ROD.



No comments to the Unit 25 Site-Specific Work Plan (SSWP) were provided by BLM prior to the start of MEC removal actions. The Army has completed the actions described in the SSWP and subsequent Field Work Variance (FWV) for Unit 25. Additional subsurface MEC removal may be required as identified in the Technical Memorandum (TM).

**Objective:** This joint inspection provided an on-site assessment of Unit 25. The inspection included a visual assessment of the unit from the perimeter fuel breaks around the unit, and involved a discussion of the actions necessary to attain MEC safety conditions suitable for subsequent future use as described by the BLM. The current status of vegetation cover and evidence of the impacts of MEC removal operations on topographic features and habitat were also evaluated. BLM intended future use activities within the area, to include potential construction activities and a description of a likely schedule for those activities (pre or post-transfer), were all considered. The Army provided a preliminary assessment of the MEC safety requirements where appropriate for support of any subsurface activities proposed by BLM.

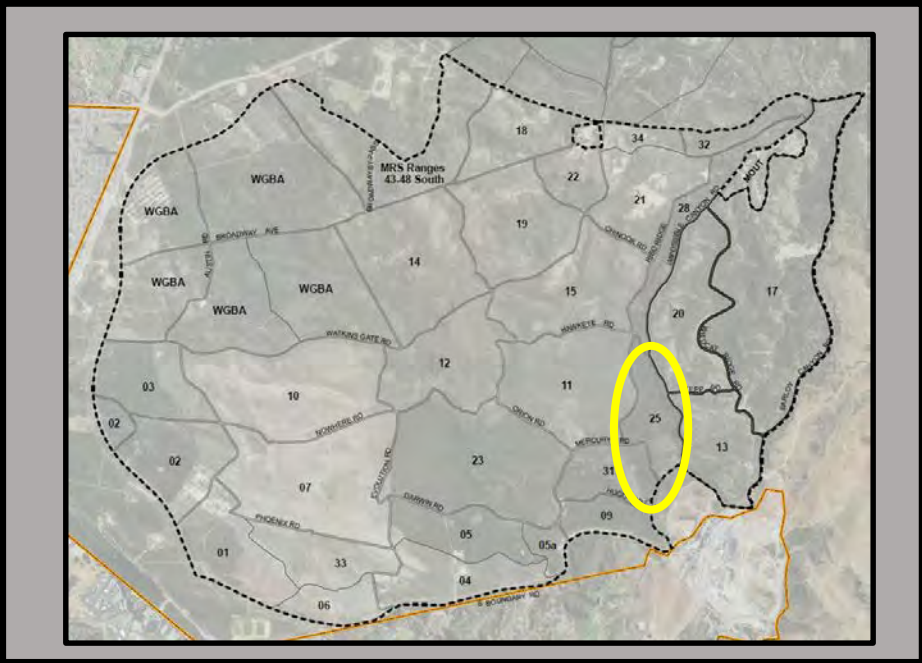
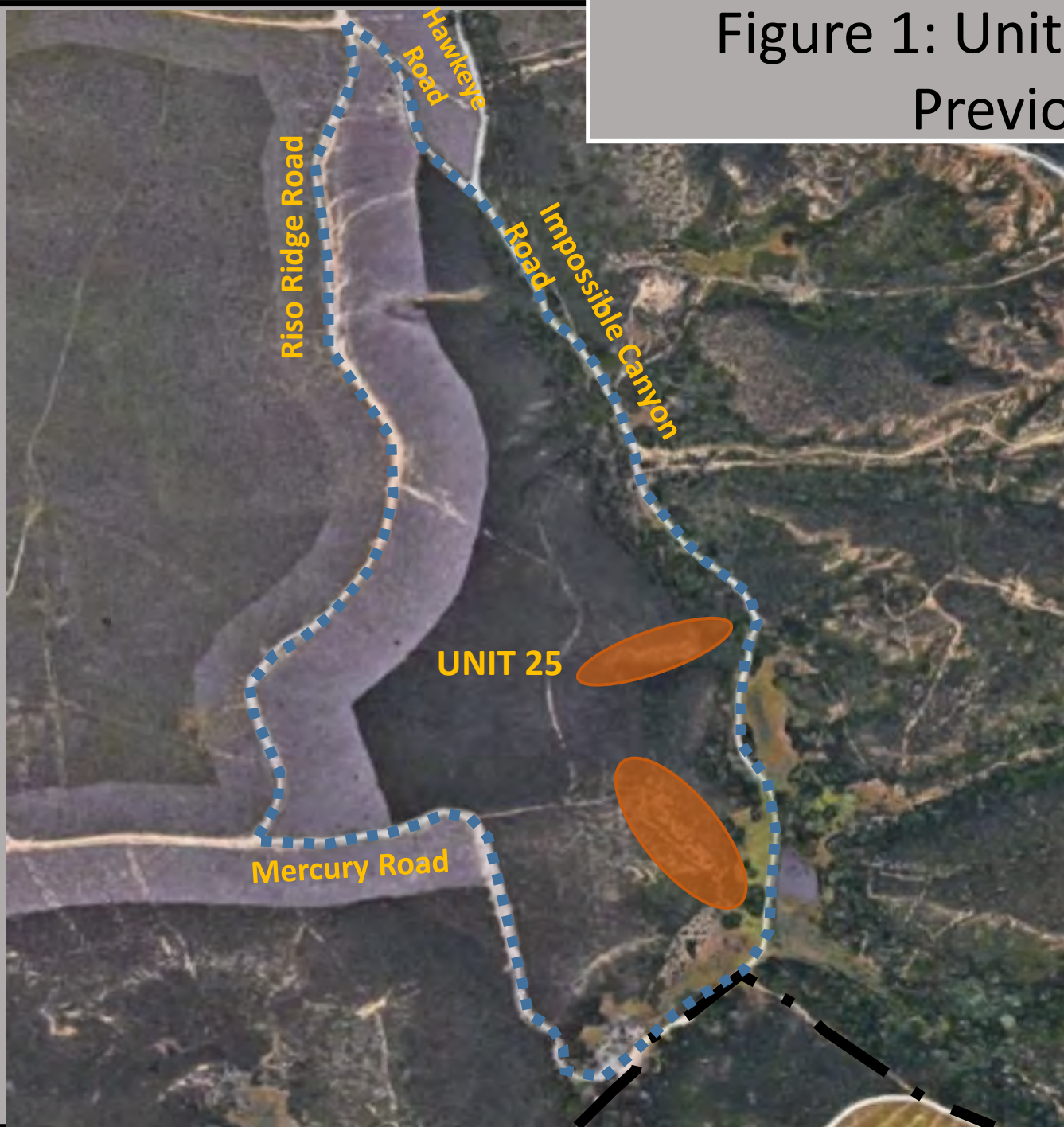
The inspection is intended to determine a mutually acceptable pre-transfer course of action to achieve a suitable MEC safety status for locations of concern within the unit. The Army will evaluate completed MEC removal work, DGM, and surface monitoring data for all comment locations to determine an appropriate level of MEC construction support required for future BLM activities in those areas. An interim determination will be included in the TM and the remedial action report for the subject area and a final determination of construction support requirements will be included in the Track 3 remedial action completion report.

**Comments:** There were no areas identified by BLM as requiring erosion control work, or fuel break or roadway maintenance. Two areas of previous erosion were identified west of Impossible Canyon Road on the steep slopes of the eastern third of Unit 25 (Figure 1). This erosion is believed to be the result of runoff from an old road that ran across the top of the hill in Unit 25; a road that has not been used for several years and from which runoff has been redirected. The erosion areas show there is evidence of soil stabilization and vegetation regrowth and no work on these areas is deemed necessary.

Photo 1: Example Area of Past Erosion (see figure 1)

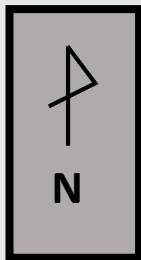


Figure 1: Unit Map and Areas of Previous Erosion



**LEGEND**

- Impact Area Boundary
- - - Unit Boundary
- Areas of Previous Erosion



## *Appendix C*

### *DGM QA Approval and Discussion*



**FORMER FORT ORD, CALIFORNIA  
UNIT 25  
QUALITY ASSURANCE REPORT:  
DIGITAL GEOPHYSICAL OPERATIONS**



**PREPARED BY  
GEOLOGY SECTION  
SACRAMENTO DISTRICT  
U.S. ARMY CORPS OF ENGINEERS**

**PREPARED FOR  
FORT ORD BASE REALIGNMENT AND CLOSURE (BRAC) OFFICE**

**MARCH 2018**

1.0	INTRODUCTION .....	3
1.1	Site details .....	3
2.0	QA ACTIVITES .....	3
2.1	Data Collection Methods.....	3
2.2	Field Oversight.....	4
2.3	Geophysical System Verification.....	4
2.4	Digital Data Review .....	5
2.5	Corrective Action Request .....	6
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## **1.0 INTRODUCTION**

This report covers the Quality Assurance (QA) processes conducted by the U.S. Army Corps of Engineers (USACE) with respect to the collection, processing, and evaluation of digital geophysical data collected by KEMRON Environmental Services, Inc (KEMRON). The field work was performed in Unit 25. Work was performed under WERS contract No. W912DY-10-D-0027, Site-Specific Work Plan, MRS-BLM Units 25 and 31. The field protocols, database management, and QA reviews were based on a combination of methods previously used in other units and described in the UFP-QAPP Volume II Appendix A, along with additional procedures necessary for ensuring compliance with the WERS MMRP contract and the standard operating procedures performed by KEMRON's subcontractors GILBANE and NAEVA. USACE QA verified that KEMRON had an adequate Quality Control (QC) program in place and that data collected in Unit 25 were in accordance with project Data Quality Objectives (DQOs) and Measurement Quality Objectives (MQOs), as established in the UFP-QAPP (KEMRON, 2016). Unit 25 did not include any areas recommended for subsurface removal and were collected in their entirety to meet Category B data.

### **1.1 Site details**

Unit 25 is on the southeastern edge of the Impact Area Munitions Response Area that is planned to be transferred to BLM, as depicted in Figure 1. The area is bounded in the south by the Impact Area's southern boundary and by fuel breaks on the remaining sides. Unit 25 encompasses a total of approximately 95 acres. Due to steep terrain in the eastern portion of Unit 25 approximately 86 acres was accessible to surface clearance and approximately 75 acres was accessible to DGM operations.

Clean-up operations pertinent to DGM activities were initiated with a vegetation clearance followed by an instrument aided surface removal. Unit 25 DGM was collected using the Category B data protocols, as no subsurface removal is planned for this unit. During vegetation clearance and surface clearance, a total of 324 MEC items were removed.

According to the Installation-Wide Multispecies Habitat Management Plan (HMP) for Fort Ord (USACE 1997), the site will be transferred to BLM to be used as an undeveloped habitat reserve. The Impact Area is mostly covered by maritime chaparral and grassland habitats. The terrain in the Impact Area is dominated by rolling hills with elevations ranging from 720-900 ft. above sea level (ASL). These hills are composed of sand associated with Pleistocene aged sand dunes that may be as thick as 250 ft. The eastern edge of Unit 25 contains a number of steep cliffs and gullies that were inaccessible to the DGM survey team, shown in Figure 2.

## **2.0 QA ACTIVITIES**

### **2.1 Data Collection Methods**

Production geophysical data were collected using Geonics EM-61MKII electromagnetic sensors in a multi-coil configuration (towed array) throughout most of the site. The EM-

61MKII is a time-domain electromagnetic sensor that generates an electromagnetic pulse, inducing eddy currents within the subsurface. During the off period of the EM pulse, the eddy current decay produces secondary electromagnetic fields within both ferrous and non-ferrous metallic objects. These secondary electromagnetic fields are received and recorded over four averaged time gates per data collection interval (10Hz).

Data were collected either as individual grids or in grid blocks of variable size consisting of multiple grids. All data collected met the Category B line spacing requirements, with 98% not to exceed a lane spacing of 3 ft. As stated in the MEC Procedures Supplement, the purpose and objective for the Category B DGM surveys is to obtain high quality DGM data in order to characterize the site for overall anomaly distribution and density. Obstacles and issues with terrain precluded 100% coverage and approximately 20 acres of Unit 25 were determined by UXO Safety to be inaccessible to DGM survey due to extreme terrain. All data gaps were appropriately documented in the obstacle files submitted with DGM packages. Figure 2 of this QA report depicts the full DGM dataset for Unit 25.

## **2.2 Field Oversight**

Field oversight was performed intermittently throughout the project by both the USACE Project Geophysicist and the OESS. Appropriate field procedures were reviewed and found to be in compliance. Under the new WERS Contract No. W912DY-10-D-0027, NAEVA is now subcontracted to collect the geophysical data. As there were no Category A areas, no USACE QA DGM data were collected.

## **2.3 Geophysical System Verification**

Under the WERS contract, USACE and KEMRON fully incorporated the physics based Geophysical System Verification (GSV) approach as described in the July 2009 ESTCP report and supported by EM 200-1-15. GSV includes two methods for providing QA/QC: blind seeding and the instrument verification strip (IVS). IVS data results were recorded on daily QC submittals attached as PDF files to the grid blocks.. Data were reviewed by the QA Geophysicist to ensure all MQOs were achieved. The QA data review process is described in section 2.4 and a summary of MQOs for towed array DGM operations is given in Table 1. Further details regarding MQOs are provided in the UFP-QAPP (KEMRON, 2016).

Production data required the GSV blind seeds placed throughout Unit 25, as documented in the UFP-QAPP. By placing blind seeds at an average rate of one per day, the instrument functionality can be tested on a daily basis. Any failures to detect a blind seed could be indicative of an issue with data collection. All blind seeds were small industry standard objects buried at six inches below ground surface. The blind seeds were placed by the QC Geophysicist. All blind QC seeds were detected and both the responses and positioning were within the requirements of the MQOs and SOPs. Table 2 summarizes the QC seed results for Unit 25.

## 2.4 Digital Data Review

A review of digital geophysics data by the USACE was performed to monitor the effectiveness of data processing and consistency of data delivery. Issues that were reviewed in these data included:

- 1) Missing survey lines within a grid (interline gaps)
- 2) Point-to-point data gaps along survey lines
- 3) Bowing out of survey lines beyond 50% of survey line spacing, unless otherwise collected
- 4) Unreasonable data “spikes”
- 5) Data incongruity across survey grids (Data levels in one grid are not reasonably compatible with data levels in neighboring grids)
- 6) Inadequate data density along survey traverse
- 7) Lack of accurate, precise locations; survey line orientation
- 8) Inadequate/incomplete site survey coverage
- 9) Missing, incomplete, or noncompliant instrument standardization checks
- 10) Completeness of file header information and supporting documentation
- 11) Consistent IVS and GSV results supporting the data quality objectives

To accomplish this, all raw and processed data files were checked by the USACE to ensure that KEMRON followed an appropriate and informative naming convention reflecting the grids surveyed as outlined in the EM 200-1-15. The USACE checked that KEMRON managed the field and processed data in a professional manner, including organization, daily maintenance, and complete documentation. This focused on a review of header files on the pre-processed data (data that has been merged into a single file and synchronized with the GPS data) and processed data to verify that dates were consistent, systems and system sampling parameters were identified, project name and contractor was listed, and all column headers were included and defined. KEMRON also delivered supporting summary sheets that further documented field parameters and processing. All of the summary sheets were reviewed for completeness, verification of calibration data, and consistency to the electronic data file headers.

In order to make the above process more efficient, a grid tracking spreadsheet located in the Unit 25 folder on the FTP site was updated weekly and allowed for the QC Geophysicist and USACE QA Geophysicist to document their verification of each deliverable. Minor issues such as corrupt or incomplete zip files were addressed within the table, major issues were addressed as corrective action requests. The final excel file will be maintained within the Final Data Submittal QC folder on the Fort Ord server.

The procedure for reprocessing and projecting the pseudo-color maps of the DGM Category B data included starting with a 100% review of the data in Geosoft Oasis Montaj to include re-leveling and re-gridding. These digital data were imported into Geosoft for the generation of pseudo-color maps that were then exported as a georeferenced geotif.

Overall, the general QA digital data review consisted at a minimum of:

- 1) Creating a processed database
- 2) Importing XYZ data
- 3) Calculation of sum channel
- 4) Generating a grid (0.25 cell size and blanking distance of 2 ft.) of sum channel
- 5) Plotting the sum channel
- 6) Plotting a symbol cover for the track lines (view coverage)
- 7) Exporting the plots to geotifs
- 8) Importing the geotifs into a GIS

## **2.5 Corrective Action Request**

No corrective action requests were issued for data collected in Unit 25; however one item is of note. IVS Test Items IVS 29, IVS 30, and IVS 31 did not meet the established MQOs for the Item Response and Positional tests on 07/20, 08/01, and 08/14-08/21. The issue was due to a database problem: anomalies picked from the IVS survey were being compared to the wrong IVS Test Items, resulting in the failed MPCs. The QC Geophysicist corrected the IVS item locations in the affected databases and the corrected data was re-submitted. The corrected data was reviewed by the QA geophysicist to confirm daily IVS test data passed established MQOs (Figure 3). As noted, the issue was only due to a database problem and not indicative of a data quality issue. No CAR was issued.

## **3.0 CONCLUSIONS**

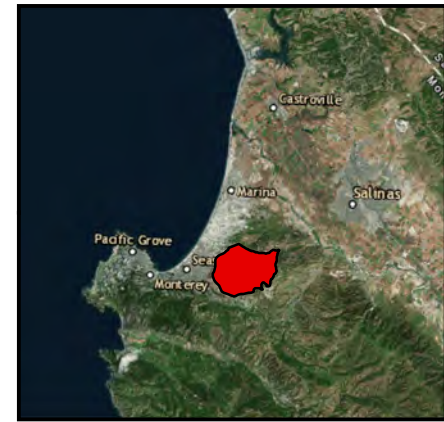
QA activities by the Government verified KEMRON had an adequate QC program in place and that data collected within Unit 25 are sufficient and in accordance with the project DQOs and MQOs.

#### **4.0 REFERENCES**

KEMRON, 2016. *Final, Quality Assurance Project Plan, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action*. December. (OE-0884A)

## 5.0 FIGURES





**Legend**

- Impact Area
- Fuel Breaks
- Unit\_25

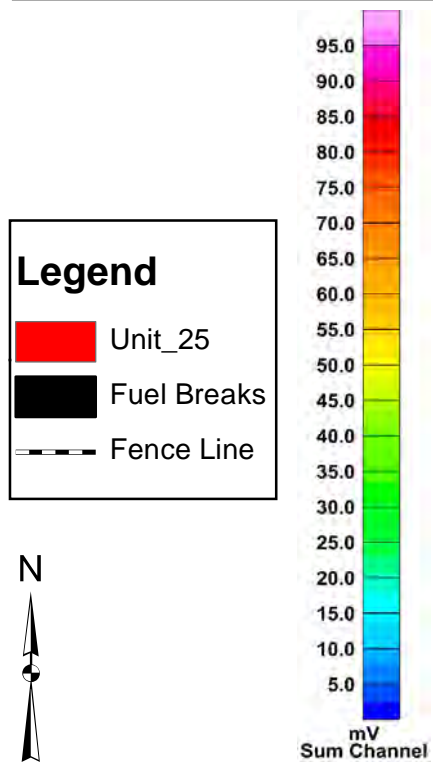
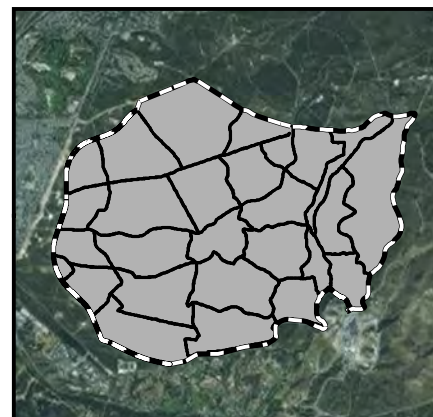
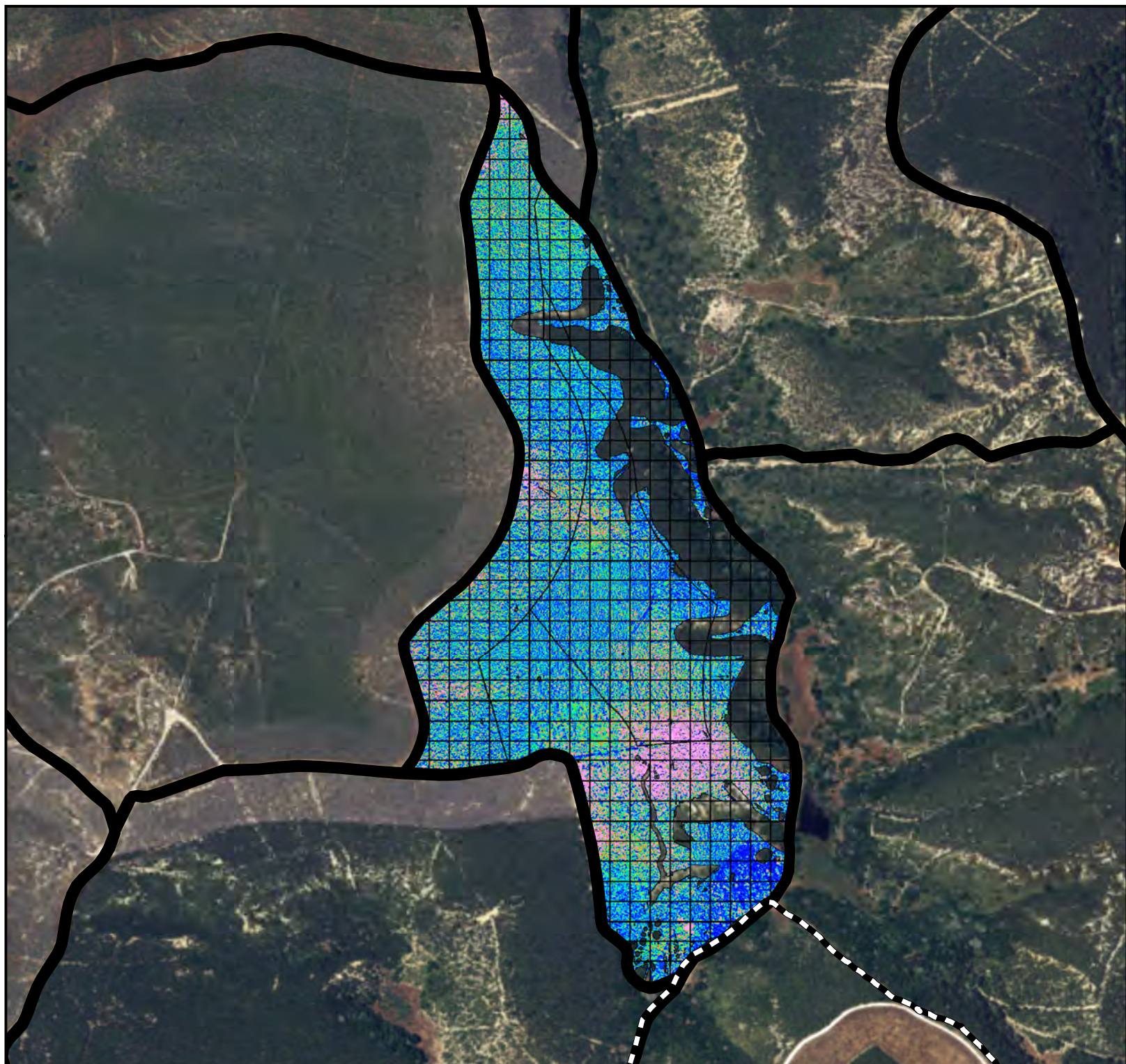


 U.S. Army Corps of Engineers  
Sacramento District

**Figure 1**

Unit 25  
Former Fort Ord, CA





 U.S. Army Corps of Engineers  
Sacramento District

**Figure 2**  
Unit 25 DGM data  
Former Fort Ord, CA



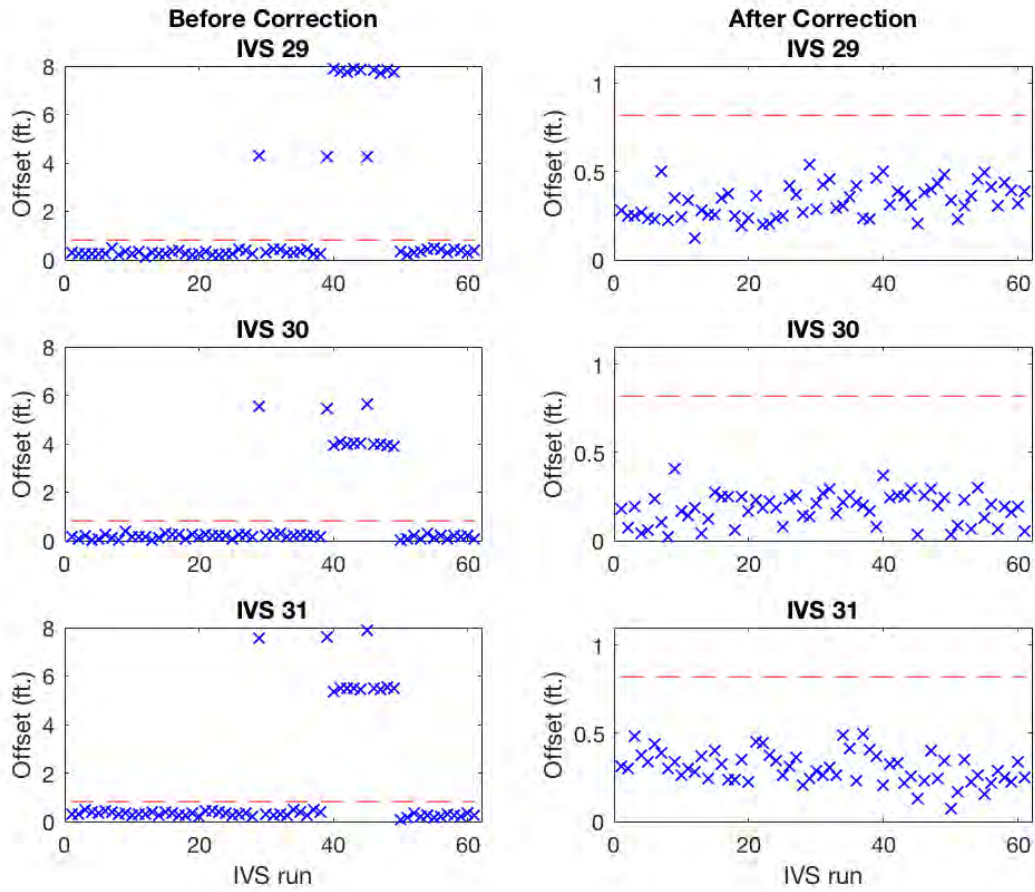


Figure 3. Blue 'x' shows calculated offset between picked DGM target and IVS item location, before and after database correction. Red dashed line shows maximum acceptable offset established in MPC.

## 6.0 TABLES

Data Type	DQI	QC Sample and/or Activity to Assess Measurement Performance	MQO	Frequency	Consequence of Failure (a)
Cable Shake Test	Sensitivity	Instrument Response Tests at the IVS	Cable shake test: 98% of response values will not exceed +/- 2 mV when system cables are moved (for all EM61MK2 channels)	Once Daily (AM)	Do not proceed with DGM field activities until failure is resolved and cable shake test has passed.
Personnel Test	Sensitivity	Instrument Response Tests at the IVS	Personnel test (PP): 98% of response values (due to proximity of data collection personnel) will not exceed +/- 2 mV (for all EM61MK2 channels).	Once Daily (AM)	Do not proceed with DGM field activities until failure is resolved and personnel test has passed.
Tow Vehicle Test	Sensitivity	Instrument Response Tests at the IVS	Tow vehicle test (towed array): 98% of response values (due to elevated tow vehicle RPM) will not exceed +/- 2 mV (for all EM61MK2 channels).	Once Daily (AM)	Do not proceed with DGM field activities until failure is resolved and tow vehicle test has passed.
Static repeatability (instrument functionality) (b)	Accuracy/Precision	Instrument Response Tests at the IVS	<p>98% of the daily static background response values (no test object) will not exceed +/- 2 mV of expected baseline response (for all EM61MK2 channels). (d)</p> <p>98% of the response values to the standard spike test item (a small ISO fixed at an orientation and distance from the sensor to provide an approximately 100 mV response on channel 2 of the EM61MK2) will not exceed +/- 10% of the expected baseline response (for all EM61MK2 channels). (d)</p>	Twice Daily (AM/PM)	<p>If failure occurs during the AM static test, do not proceed with DGM field activities until failure is resolved and AM static test(s) have passed.</p> <p>If failure occurs during PM static test, the day's data fails unless BSI is mapped that day with repeatable anomaly characteristics (see dynamic detection repeatability (GSV blind seeding)).</p>

Along track sampling	Completeness	DGM Data Set or Grid	98% <= 0.65 ft. (20 cm)	By grid or dataset (c)	Submittal fails.
Coverage	Completeness	DGM using GPS Positioning: DGM Data Set or Grid	<p>Category A (towed array): A lane spacing of 2 ft is to be used for the towed array. 95% (or greater) of the lane spacing is to be at the project design lane spacing of 2 ft. 100% of the lane spacing is to be at 3 ft. No unexplained data gaps.</p> <p>Category B (towed array): A lane spacing of 2 ft is to be used for the towed array. 95% (or greater) of the lane spacing is to be at the project design lane spacing of 2 ft. 98% (or greater) of the lane spacing is to be at 3 ft.</p>	By grid or dataset (c)	Data gaps must be filled in before submittal is accepted.
Dynamic detection repeatability (IVS)	Accuracy/Precision	Instrument Response Tests at the IVS	<p>98% of the dynamic background response values during the daily IVS survey will not exceed +/- 3 mV of expected baseline response (for all EM61MK2 channels). (d)</p> <p>Instrument response to each IVS item will be within +/- 25% or +/- 2 mV( whichever is greater) of the expected baseline response (for all EM61MK2 channels). The baseline response for each IVS item will be the average of the instrument responses to that item measured during the first week of IVS surveys. (d)</p>	Twice Daily (AM/PM)	<p>If failure occurs during the AM IVS test, do not proceed with DGM field activities until failure is resolved and AM dynamic IVS test(s) have passed.</p> <p>If failure occurs during PM IVS test, the day's data fails unless BSI is mapped that day with repeatable anomaly characteristics (see Dynamic Detection Repeatability (GSV blind seeding)).</p>
Dynamic detection repeatability (GSV blind seeding)	Sensitivity/Accuracy/Precision/Completeness	DGM Data Set or Grid	All BSIs must be located. Peak response >75% of maximum expected BSI response. (d)	1 per day per team (# per acre to be based on production rate)	Submittal fails.



Dynamic positioning repeatability (IVS)	Accuracy/Precision	Instrument Response Tests at the IVS	Position offset of IVS targets < 25 cm.	Twice Daily (AM/PM)	<p>If failure occurs during the AM IVS test, do not proceed with DGM field activities until failure is resolved and AM dynamic IVS test(s) have passed.</p> <p>If failure occurs during PM IVS test, the day's data fails unless BSI is mapped that day with repeatable anomaly characteristics (see Dynamic Positioning Repeatability (GSV blind seeding)).</p>
Dynamic positioning repeatability (GSV blind seeding)	Sensitivity/Accuracy/Precision/Completeness	DGM Data Set or Grid	<p>90% positioning offset is <math>\leq 25 \text{ cm} + 1/2 \text{ line/sensor spacing}</math> and 100% is <math>\leq 35 \text{ cm} + 1/2 \text{ line/sensor spacing}</math> for digital positioning systems.</p> <p>For Towed Array DGM using 2 ft line spacing (Category A and Category B) and RTK-GPS:  90% <math>\leq 22 \text{ inches}</math>  100% <math>\leq 26 \text{ inches}</math></p>	1 per team per day (# per acre to be based on production rate - same as dynamic detection repeatability (GSV blind seeding)).	Submittal fails.
Velocity	Completeness	DGM Data Set or Grid	95% of all geophysical measurements with the EM61MK2 will be collected at a speed not to exceed 4 miles per hour (1.8 meters per second)	By grid or dataset (c)	Submittal fails.
Target Selection	Completeness	DGM Data Set or Grid	All dig list targets are selected according to project design as detailed in the SSWP	By grid or dataset (c)	Submittal fails.
Geodetic equipment functionality	Accuracy/Precision	GPS Function check at IVS	GPS position checks will not exceed +/- 3 inches (7.6 cm) from the established baseline position.	Once Daily (AM)	Do not proceed with DGM field activities until failure is resolved and positional check has passed.

Geodetic accuracy	Accuracy/Precision	GPS Function Check of Positional monuments used for RTK-GPS base station(s)	Project control points that are used more than once must be repeatable to within 5 cm (e).	For points used more than once, occupation will be repeated (f) for each point used, either monthly (for frequently used points) or before re-use (if used infrequently) (g).	Reset points not located at original locations or resurvey point.
Verify Field Work Methods	Accuracy/Precision	QC Geophysicist will monitor field team work methods.	Verify work methods are being performed in accordance with MEC QAPP, SOPs, and SSWP.	Daily	Stop work. Generate an RCA, CAR, and CAP (as necessary). Implement corrective actions.
DGM Data Reprocessing	Sensitivity/Accuracy/Precision/Completeness	10% of DGM Data Set or Grid	DGM data will be reprocessed by the QC Geophysicist in accordance with GEO SOP 8 (Geophysical QC).	Daily	Stop work. Generate an RCA, CAR, and CAP (as necessary). Implement corrective actions.

Table 1. DGM MQO table for the towed array system.

- (a) All failures require an RCA.
- (b) Duration of data collection is 1 minute for background, 1 minute for spike and 1 minute for second background measurement. All static repeatability is to be compared to original readings to ensure instrument is consistent throughout the project.
- (c) The terms grid and dataset refer to logical groupings of data or data collection event. Logical groupings of data are contiguous areas mapped by the same instrument and in the same relative timeframe. These can be grids, acres, or some other unit of area. A data collection event is similar to logical groupings of data but refers to data collected over a contiguous timeframe, such as morning, afternoon, battery life, or some other measure of contiguous time.
- (d) For static background, the expected baseline mV response is to be based on an average of all the static background readings collected during the first four days (or first week). For static spike the expected baseline peak mV response is to be based on an average of all the static spike readings collected during the first four days (or first week). For the IVS background, the expected baseline mV response is to be based on an average of all the IVS background readings for the first four days (or first week). For the IVS spike, the expected baseline mV response is to be based on an average of all the IVS spike readings for the first four days (or first week). For GSV BSI items the baseline mV response will be determined by recording an additional survey line that is offset ½ of the planned survey line spacing (1 ft) from the center of the seeded IVS line. This offset line will be recorded twice daily (am/pm) during the first four days (or first week) of DGM operation with the PP system(s) and the baseline mV response to be used for BSIs (for PP and towed array systems) will then be calculated by averaging all of the peak readings for each ISO at this 1 ft offset. Note that separate baselines will be generated and used for the PP and towed-array system static and IVS tests.
- (e) GPS base station coordinates that are currently being used are provided by USACE/BRAC.
- (f) Repeat occupation means demonstrate the control points being used can be recovered and reoccupied and that they have not moved more than the requirement specification. This can be accomplished using the same methodology used to initially tie the local network to a HARN, CORS, OPUS, or other recognized network, or it can be accomplished by other means that achieve this requirement.

- (g) An example of frequently used control points would be points used as RTK DGPS base stations. Infrequently used points could be those used during GPS operations where the control point was used during mapping and then again at some later time for reacquisition and QC statistical sampling. Infrequently used points also could include grid corners; they are used for line and fiducial positioning and then reused for reacquisition or QC statistical sampling.

Seed_ID	Grid	Reported Response	Response Passes?	Total Offset (in)	Positioning Passes?
25001G	A3J5F6	401.87	Yes	8.066631092	Yes
25003G	A3J5D4	229.48	Yes	9.465742548	Yes
25002G	A3J5E5	212.93	Yes	7.209632065	Yes
25012G	B3A5B8	339.00	Yes	5.39122981	Yes
25008G	B3B5B8	367.93	Yes	12.08490396	Yes
25007G	B3B5E8	253.14	Yes	3.750613002	Yes
25011G	B3A5D9	229.28	Yes	10.56831559	Yes
25009G	B3A5I9	322.11	Yes	14.7613516	Yes
25010G	B3A5G0	188.75	Yes	5.779481555	Yes
25004G	B3C5D7	201.42	Yes	12.1041416	Yes
25005G	B3C5A8	316.40	Yes	13.69699917	Yes
25006G	B3B5H7	367.69	Yes	19.91976326	Yes
25014G	A3J6C2	387.26	Yes	7.436370073	Yes
25013G	A3J6E1	499.11	Yes	6.908801342	Yes
25015G	A3J6B3	269.04	Yes	9.851875757	Yes
25020G	B3B5H0	309.07	Yes	7.308719178	Yes
25018G	B3B5J0	397.18	Yes	9.226158463	Yes
25019G	B3B6I1	284.09	Yes	10.21916787	Yes
25016G	A3J6A4	347.21	Yes	14.78189596	Yes
25021G	A3J5I9	252.12	Yes	10.28383197	Yes
25022G	A3J6J1	471.66	Yes	10.30573666	Yes
25025G	A3J6H7	637.16	Yes	5.557567809	Yes
25017G	A3I6J5	505.25	Yes	2.060823137	Yes
25023G	B3A6B3	625.06	Yes	12.76457661	Yes
25029G	A3I6I6	381.85	Yes	3.502725794	Yes
25027G	A3I6J8	365.32	Yes	9.841646202	Yes

Table 2. Blind QC seed response and positioning results.

*Appendix D*  
*Responses to Comments*



## RESPONSES TO COMMENTS

Document: MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC)  
Remedial Action Technical Memorandum, January 2018

Commenting Organization: United States Environmental Protection Agency (EPA)

Name: Judy C. Huang

Date of Comments: January 25, 2018

### **General Comment 1:**

The MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC) Remedial Action Technical Memorandum (hereinafter referred to as the "MRS-BLM Unit 25 MEC RA TM"), states in Section 6.0, Recommendations for Additional Subsurface MEC Remediation, and in Section 7.0, Conclusions/Summary of Recommendations, that "No additional subsurface MEC removal is recommended for Unit 25." No basis for this determination is provided in either section. Also, no qualifications are provided restricting this recommendation to existing or currently identified future uses for the area. Please expand the noted sections as necessary to correct these omissions.

### **Response to General Comment 1:**

The following text has been added to the referenced statement in Section 6.0: "This recommendation is based on the joint inspection described above between the Army and BLM and the future planned land reuse. Additionally, the Army is currently conducting a field study designed to provide more information about how risks from MEC items with sensitive fuzes that potentially remain in the subsurface of areas/grids could be addressed in the future. A recommendation on this issue will be deferred until after the completion of the field study."

### **Specific Comment 1:**

**Section 1, Introduction, Page 1:** This section does not state the type of remedial action (e.g., surface removal, subsurface removal to depth of detection, subsurface removal to a specific depth) that was conducted in MRS-BLM Unit 25. Please revise the cited section to include a description of the type of remedial action that was conducted at the noted location.

### **Response to Specific Comment 1:**

Section 1 text has been revised as follows: "This Technical Memorandum (TM) describes the munitions and explosives of concern (MEC) remedial action (RA) [surface MEC remediation and





## RESPONSES TO COMMENTS

DGM survey] that was performed by KEMRON Environmental Services (KEMRON) with Gilbane as a subcontractor within Munitions Response Site (MRS) - Bureau of Land Management (BLM) Unit 25 (Figure 1).”

Subsurface removal areas were not identified in Unit 25 during the development of the Site-Specific Work Plan.

### **Specific Comment 2:**

**Table 1, MEC Items Encountered and Removed Prior to Remedial Action Operations, Unnumbered Page:** The nomenclature of the majority of the munitions listed in the table are missing the letter “s” found as the last letter in the formal nomenclature thereof. This is due to the current formatting of the “Description” column of the table. Please reformat the noted column of the table to allow the entire nomenclature of all listed munitions to be displayed.

### **Response to Specific Comment 2:**

Changes to table formatting have been made to all affected tables.

### **Specific Comment 3:**

**Table 2, MEC Items Encountered and Removed During Operations Covered in TM, Page 3 of 7:** The nomenclature of the munition listed on the ninth line of this page of the table should read “Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series.” However, as the table is currently formatted, the portion of the nomenclature that reads “8 series” is not visible. Please reformat the noted table or the munition nomenclature to allow the entire nomenclature to be displayed.

### **Response to Specific Comment 3:**

Changes to table formatting have been made to all affected tables.

### **Specific Comment 4:**

**Table 2, MEC Items Encountered and Removed During Operations Covered in TM, Page 7 of 7:** The table does not contain the total of the items contained therein. Please revise the noted table to include the total of the MEC items encountered and removed.

### **Response to Specific Comment 4:**

A total has been added to the bottom of Table 2.

## RESPONSES TO COMMENTS

### **Specific Comment 5:**

**Table 3, Cumulative Results, Page 1 of 1:** The table title does not specify whether the results noted include those of previous actions on the site (Table 1) or are limited to the results of the remedial action covered by this Technical Memorandum (TM). Please revise the title of Table 3 to read “Cumulative Results of the Remedial Action Operations Addressed in this TM,” or provide a similar title that indicates that the results are only associated with the noted remedial action.

### **Response to Specific Comment 5:**

Title to Table 3 has been changed to Cumulative Results of the Remedial Action. This table does not include items from Table 1.

### **Specific Comment 6:**

**Table 4, MEC Recovery Information, Page 1 of 1:** The table title does not specify whether the results noted include those of previous actions on the site (Table 1) or are limited to the results of the remedial action covered by this TM. Also, the table contains a column labeled as “Unit 28.” This should read “Unit 25” instead. Please revise the title of Table 4 to read “Remedial Action MEC Recovery Information,” or provide a similar title that indicates that the results are only associated with the noted remedial action. Also, correct the noted mislabeling of the column in the table.

### **Response to Specific Comment 6:**

Title to Table 4 has been changed to MEC Recovered by Type during Remedial Action. This table does not include items from Table 1. Unit identification has been changed to Unit 25.



## RESPONSES TO COMMENTS

Document: MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC)  
Remedial Action Technical Memorandum, January 2018

Commenting Organization: Department of Toxic Substances Control (DTSC)

Name: Vlado Arsov

Date of Comments: February 15, 2018

### **Specific Comment 1:**

**Section 1.0, Middle of the paragraph:** “Unit 25 vegetation clearance was initially intended to be performed by prescribed burning.”

Consider starting a new paragraph since this is a description of the vegetation clearance activities. Please include a short description of DGM survey since you described vegetation clearance earlier.

### **Response to Specific Comment 1:**

A new paragraph was started for the description of the vegetation clearance activities. Digital geophysical mapping (DGM) survey is described in Section 2.3.

### **Specific Comment 2:**

**Section 2.3, First paragraph:** “Appendix C includes the USACE DGM QA approval and Discussion for Unit 25.”

Please include a short discussion about objectives described in the QAPP and referenced in the Appendix C.

### **Response to Specific Comment 2:**

The text of Section 2.2 has been revised as follows: “Quality control/quality assurance (QC/QA) processes were implemented in accordance with the Final SSWP (KEMRON, 2016a) and the Final Quality Assurance Project Plan, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action, Former Fort Ord, California (MEC QAPP) (KEMRON, 2016b).”

The text of Section 2.3 has been revised as follows: “Measurement quality objectives were met and QC/QA processes were implemented in accordance with the Final SSWP (KEMRON,

## RESPONSES TO COMMENTS

2016a) and the MEC QAPP (KEMRON, 2016b). Measurement performance criteria were evaluated according to the standards specified in the QAPP and the Final SSWP. Specific criteria that were evaluated included GPS accuracy, static background and response tests, dynamic background and response tests (IVS), velocity, minimum along track sampling and across track coverage, accurate detection of Blind Seeds with respect to both response and positioning, surveillance of field methods, and reprocessing of field data. Each of these criteria were evaluated separately with results recorded in the project database and subsequently reviewed by the QC Geophysicist. Appendix C includes the USACE DGM QA Approval and Discussion for Unit 25.”

### **Specific Comment 3:**

**Section 6.0, Second paragraph:** “Factors that will be considered when determining whether additional actions are necessary include...”

This Section 6.0 is about recommendations. Could you explain are you still working on considerations and they are not completed at this moment? Will you make recommendations in the new Section 6.0 once you are done with considerations?

### **Response to Specific Comment 3:**

Recommendations for Unit 25 are not expected to change at the next stage of the TM. The text noted is a synopsis from the Track 3 ROD and is intended to describe factors that were considered in order to make recommendations.

### **Specific Comment 4:**

**Section 6.0, Fourth paragraph:** “The Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface removal could be addressed in the future.”

Similar to comment #3. Will Section 6.0 be changed once the field study designed to provide more information is conducted?

### **Response to Specific Comment 4:**

Recommendations for Unit 25 are not expected to change after the completion of the field study. If subsurface MEC removal is planned following completion of the field study, a separate work plan will be developed to conduct this work in Unit 25 and other units.

## RESPONSES TO COMMENTS

### **Specific Comment 5:**

**Section 6.0, First bullet:** “Areas where MEC with sensitive fuzes were located will be monitored with enhanced procedures during annual surface area monitoring.”

Please describe these "procedures"? Could you give examples of such procedures?

### **Response to Specific Comment 5:**

Enhanced monitoring procedures involve observing more than 10 percent of the visible surface area within 100 feet of the location of UXO with sensitive fuzes that were previously removed. The procedure is described in reports of annual surface monitoring (the most recent report is for 2017, Administrative Record number: OE-0847H).

### **Specific Comment 6:**

**Section 6.0, Sixth and Seventh paragraph:** “A joint Army-BLM inspection summary is provided in Appendix B. This summary describes areas such as erosion features that appear to have naturally stabilized, and currently do not require subsurface MEC removal...No additional subsurface MEC removal is recommended for Unit 25.”

Could you expand on findings included in the Appendix B and how they are related to any future MEC removals in this area since you do not recommend any action?

Include a description of how it was determined that this area is naturally stabilized.

### **Response to Specific Comment 6:**

As described in the joint inspection summary, the Army and BLM conducted a joint inspection of the unit after technology-aided surface removal and DGM were completed, to determine if any areas may require subsurface removal action, or future construction support, based on BLM's planned use (e.g., erosion control measures.)

The determination was made during the inspection based on the amount of vegetation regrowth in the affected area, which had stopped or greatly reduced current erosion problems. In addition the concern that conducting subsurface removal to address erosion could enlarge the area affected in the short term.

## RESPONSES TO COMMENTS

### Specific Comment 7:

**Table 1:** Formatting. Make sure text can fit in the cell and all tables use same borders.

### Response to Specific Comment 7:

Changes to cell size and table formatting has been made to all tables.

### Specific Comment 8:

**Table 2:** Formatting. Make sure text can fit in the cell and all tables use same borders. You may consider grouping same MEC items that were discovered on the same day to make this table smaller.

### Response to Specific Comment 8:

Changes to cell size and table formatting has been made to all tables.

### Specific Comment 9:

#### Table 3:

##### “Cumulative Results

Analog subsurface removal acreage	0
<b>Digital</b> Subsurface removal acreage	0
DGM survey acreage	75”

Could you modify the title and clarify what significance is of Table 3?

Could you confirm that DGM surface removal was completed, but no Subsurface removal as required by ROD? Was Digital Subsurface removal technology same as DGM or is it different?  
Formatting. Make sure all tables use same borders.

### Response to Specific Comment 9:

Title to Table 3 has been changed to Cumulative Results of the Remedial Action. Table 3 is intended to provide a cumulative summary of remedial action data collected. Surface MEC removal was performed prior to DGM data collection (DGM survey). Subsurface removal areas were not identified in Unit 25 during the development of the SSWP, therefore, no DGM-based subsurface MEC removal (or analog-based subsurface MEC removal) was performed in Unit 25. Changes to table formatting has been made to all tables.



## RESPONSES TO COMMENTS

### **Specific Comment 10:**

#### **Table 4:**

“MEC Recovery Information  
Unit 28”

Please clarify the title. Is this a total Recovered MEC items per type? Is this total obtained from all items in Tables 1 and 2? The significance of each table should be described in the narrative of the report.

Formatting. Make sure all tables use same borders. Typo, Unit 25.

#### **Response to Specific Comment 10:**

Title to Table 4 has been changed to MEC Recovered by Type during Remedial Action. This table does not include items from Table 1. Unit identification has been changed to Unit 25. Changes to table formatting has been made to all tables.

### **Specific Comment 11:**

**Table 5:** Could you confirm that DGM surface removal was completed, but no Subsurface removal per ROD requirements?

Formatting. Make sure all tables use same borders.

#### **Response to Specific Comment 11:**

Surface MEC removal was performed prior to DGM data collection (DGM survey). No DGM-based subsurface MEC removal (or analog-based subsurface MEC removal) was performed in Unit 25.

### **Specific Comment 12:**

**Appendix C, Section 1.0, First paragraph:** “USACE QA verified that KEMRON had an adequate Quality Control (QC) program in place and that data collected in Unit 25 were in accordance with project Data Quality Objectives (DQOs) and measurement Quality Objectives (MQOs), as established in the UFP-QAPP.”

Could you reference UFP QAPP in the main text and give a short description of what were the MQOs?

## RESPONSES TO COMMENTS

### **Response to Specific Comment 12:**

A reference to the QAPP and a brief text describing the quality objectives for the DGM operations were added to Section 2.3 of the QA report.

### **Specific Comment 13:**

**Appendix C, Section 3.0, First paragraph:** “QA activities by the Government verified KEMRON had an adequate QC program in place and that data collected within Unit 25 are sufficient and in accordance with the project DQOs and MQOs.”

Please describe the DQOs and MQOs and explain how they were met? Please include a short paragraph about these in the main text?

### **Response to Specific Comment 13:**

Project DQOs and MQOs are described in the QAPP. A reference to the QAPP and a brief text describing the quality objectives for the DGM operations were added to Section 2.3 of the QA report.

### **Specific Comment 14:**

#### **Figure 1 and 2 (Appendix C):**

“Unit 25  
Former Fort Ord, CA”

Please include titles for both figures.

### **Response to Specific Comment 14:**

Titles were added to the two figures in the QA report.

*Appendix G*  
*Responses to Comments*



## RESPONSES TO COMMENTS

Document: Draft MRS BLM Unit 25 Munitions and Explosives of Concern (MEC) Remedial Action Report, Former Fort Ord, California, November 2018

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

Name: Maeve Clancy

Date of Comments: December 7, 2018

### General Comment 1:

The Draft MRS-BLM 25 Munitions and Explosives of Concern (MEC) Remedial Action Report, Former Fort Ord, Monterey County, California, dated November 2018 (hereinafter referred to as the D BLM Unit 25 MEC RAR), contains some issues concerning munitions with sensitive fuzes that were found on the site surface. These include:

- Section 8.2, Conceptual Site Model, states that, “During the remedial action, seven munition items with sensitive fuzes (all M383 high explosive 40mm projectiles) were encountered and removed. MEC items with sensitive fuzes are shown in Figure 7. All MEC items with sensitive fuzes removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road.” A review of the cited figure indicates that eight MEC items with sensitive fuzes have been recovered in the area and one of these (a projectile, 40mm, high explosive, M381) was recovered at the southern end of the site. While a review of Appendix F, MRS-BLM Unit 25 MEC Remedial Action Technical Memorandum, does note that eight sensitively fuzed munitions were recovered in the area, it also states that all eight were recovered during the removal action, which is apparently not the case. The M381 projectile found in the south portion of the site was recovered prior to the removal action per Table 3, MEC Items Encountered and Removed Prior to Remedial Action Operations. In addition, Table 4, MEC Items Found During Surface Removal, records eight of the M383 projectiles as having been found during the removal action.
- Section 8.2, Conceptual Site Model, notes that, “The two boxed areas shown on Figure 7 are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface.” While these boxed areas are associated with seven M383 projectiles, the area surrounding the M381 projectile found in the southern portion of the site does not have a boxed area of concern associated with it. No discussion is provided as to why the M381 projectile does not have an associated area of concern shown on the figure.

## RESPONSES TO COMMENTS

- A review of the narrative portion of Section 8.2 that describes the boxed areas of concern does not discuss the basis for the size of these areas, nor does it indicate why the areas do not extend an appropriate distance outside of the Unit 25 area.

Please review the portions of the D BLM Unit 25 MEC RAR and its appendices that discuss the issue of the munitions with sensitive fuzes that were recovered on Unit 25 and correct the following as noted:

- Determine the correct number and types of sensitive fuzed munitions found on the site and identify those found prior to and during the removal action addressed in the D BLM Unit 25 MEC RAR. Revise those portions of the document and its appendices as needed to consistently present the subject information.
- Provide a discussion of the reason that no area of concern box was prescribed for the M381 projectile recovered on the southern portion of the site.
- Revise Section 8.2, Conceptual Site Model, to include a discussion of the basis for the size of the areas of concern associated with the sensitively fuzed munitions recovered on Unit 25.
- Provide the reasoning behind confining the associated areas of concern to Unit 25 and not extending them an appropriate distance into the areas adjacent to Unit 25.

### **Response to General Comment 1:**

The total number of munitions with sensitive fuzes removed from Unit 25 is nine, eight of which were removed during the action addressed in this document. A spatial query used to develop Figures 5 and 7 did not capture the ninth item near the boundary of the unit. The ninth M383 40mm projectile has been added to [Figures 5 and 7](#).

The two boxes identified as areas of concern were drawn at the time the Unit 25 Technical Memorandum was developed. The boxed areas consist of the grid(s) in which sensitive fuze-type items were located and an additional two grids (200 feet) in all directions from those locations. The areas were extended only to the unit boundary. The area near the intersection of Riso Ridge and Hawkeye Road (northern portion of the unit) coincides with a relatively higher density of subsurface metal. Digital geophysical mapping (DGM) data collection in the vicinity of the intersection of Steep Road and Hawkeye Road (eastern portion of the unit) was limited due to steep terrain. These areas were identified as areas of concern with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. An area of concern box was not drawn for the M381 projectile recovered in the southern portion of the unit since there was only one item in that vicinity.

## RESPONSES TO COMMENTS

Text in Section 8.2 and Section 11.0 will be revised as follows: “During the remedial action, ~~seven~~ eight munition items with sensitive fuzes (all M383 high explosive 40mm projectiles) were encountered and removed. MEC items with sensitive fuzes are shown in Figure 7. All MEC items with sensitive fuzes except one removed in Unit 25 were located in the northern third of the unit, near the intersections of Steep Road and Hawkeye Road, and Riso Ridge and Hawkeye Road. The single MEC item with a sensitive fuze not encountered and removed near these intersections occurred in the extreme southern end of Unit 25. The two boxed areas shown on [Figure 7](#) are identified as areas of concern in Unit 25 with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. The area near the intersection of Riso Ridge and Hawkeye Road coincides with a relatively higher density of subsurface metal as shown on [Figure 4](#). DGM data collection in the vicinity of the intersection of Steep Road and Hawkeye Road was limited due to steep terrain. The boxed areas consist of the grid(s) in which the items were located and an additional two grids (200 feet) in all directions from those locations. The areas were extended only to the unit boundary.”

The areas of concern boxes were drawn as an initial step towards an evaluation with regard to the potential for MEC items with sensitive fuzes to remain in the shallow subsurface. As discussed in Section 11.0, the Army is currently conducting a field study designed to provide more information about how areas/grids where MEC of the type containing sensitive fuzes were recovered during surface MEC removal could be addressed in the future, and a recommendation on this issue is deferred until after the completion of the study. Completing an evaluation of areas where there are high density anomalies associated with impact areas where military munitions with sensitive fuzes were fired, is identified as one of the remaining actions for the Impact Area Munitions Response Area in *Final Remedial Design/Remedial Action Work Plan Update, Track 3 Impact Area Munitions Response Area, MEC Removal, Former Fort Ord, California* (Administrative Record number: OE-0929B). All pertinent data will be reviewed as part of the evaluation.





## RESPONSES TO COMMENTS

Document: Draft MRS-BLM Unit 25 Munitions and Explosives of Concern (MEC) Remedial Action Report, Former Fort Ord, California, November 2018

Commenting Organization: Fort Ord Community Advisory Group (FOCAG)

Name: Mike Weaver

Date of Comments: December 7, 2018

### Comment 1:

“The FOCAG has had the opportunity to review this Draft document. On page #1 we read KEMRON’s following paragraph:

‘Unit 25 vegetation clearance was initially intended to be performed by prescribed burning. Following a determination by the Fort Ord Prescribed Burn Team that the unit was unsafe to burn due to terrain concerns, Unit 25 was converted to a vegetation cut unit as detailed in Appendix A. In this document, the ‘project’ area does not include the permanent fuel breaks surrounding the unit.’”

“The FOCAG wonders, how many meetings did we sit through, being told that the Army’s prescribed burning is necessary and the only way to successfully help clear an area due to the dangers of ordnance?”

“The FOCAG recalls asking, If the Army contractors can clear a 100-ft. fuel break area surrounding a prescribed burn area, why can’t the entire thing be mechanically mowed/cleared? We never got a good answer to that one.”

“The FOCAG recalls asking about Open Air Detonation of munitions exploding and going off in the heat of a fire.....  
These FOCAG concerns were marginalized and minimized.”

“However, we now learn that a Prescribed Burn Unit CAN be converted to what is being called a “vegetation cut unit”. It CAN and WAS converted.”

“The FOCAG thanks you. You’ve spared the surrounding residential areas from a day’s worth (or more) of thick choking smoke. You’ve also spared the surrounding residential areas from a potential firestorm, like what went through the towns of Paradise and Malibu in California, just this last month.”

## RESPONSES TO COMMENTS

“Thank you for making Unit 25 a lot safer, with a vegetation cut unit!”

“Let the official record reflect that a “vegetation cut unit” can replace a “prescribed burn unit”. We now have proof.”

“Please keep up the good work.”

### **Response to Comment 1:**

Prescribed burning was selected as the primary method of vegetation clearance in habitat reserve containing central maritime chaparral to provide access for conducting MEC remediation. Where prescribed burning is determined infeasible based on site specific conditions, MEC remediation will be supported by manual and/or mechanical cutting. Unit 25 was initially designated for prescribed burning in 2016. During vegetation cutting within primary containment lines, steep and difficult terrain was encountered in portions of the containment area. Due to safety concerns vegetation cutting was not conducted in the areas of difficult terrain. It was not possible to provide sufficient exclusion distance for the prescribed burn personnel to control the burn from the perimeter of the unit. After coordinating with the regulatory agencies and U.S. Fish and Wildlife Service, the vegetation in the unit was cut to conduct MEC remediation.