Addendum to MRS-BLM Units 1, 2, and 3 Munitions and Explosives of Concern Remedial Action Report Revision 1 Former Fort Ord, California

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Prepared for

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List of Acronyms

AR	Administrative Record
AOI	Area of Interest
Army	United States Department of the Army
BLM	United States Bureau of Land Management
BO	Biological Opinion
Burleson	Burleson Consulting
CBRNE	Chemical, Biological, Radiological, Nuclear and Explosives
CMC	central maritime chaparral
DGM	Digital Geophysical Mapping
EOD	Explosive Ordnance Disposal
KEMRON	KEMRON Environmental Services, Inc.
LUC	Land Use Control
MEC	Munitions and Explosives of Concern
MD	Munitions Debris
MDAS	Material Documented as Safe
MDEH	Material Documented as an Explosive Hazard
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA	Munitions Response Area
MRS	Munitions Response Site
mV	millivolt
QA	Quality Assurance
QC	Quality Control
RA	Remedial Action
RAR	Remedial Action Report
RD	Remedial Design
ROD	Record of Decision
SSWP	Site-Specific Work Plan
SUXOS	Senior Unexploded Ordnance Supervisor
TM	Technical Memorandum
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
UXOQCS	Unexploded Ordnance Quality Control Specialist

1.0 Introduction

A remedial action (RA) was conducted in Munitions Response Site (MRS) - Bureau of Land Management (BLM) Units 1, 2, and 3 as reported in the *Final MRS-BLM Units 1, 2, and 3 Remedial Action Report, Revision 1, Former Fort Ord, California* [Units 1, 2, and 3 RAR; KEMRON Environmental Services, Inc. (KEMRON), 2018b]. The RA included a limited subsurface removal (126 anomalies) in an area of interest (AOI) in Unit 3 to reduce the probability that an unknown filler item would be encountered in the future. 189 anomalies identified outside of the AOI in Unit 3 were not investigated. To further reduce the uncertainty that an unknown filler item could be encountered in the future, those 189 anomalies were intrusively investigated in 2018. This addendum to the Units 1, 2, and 3 RAR (KEMRON, 2018b) provides the results of the additional investigation. Figure 1 shows the location of Unit 3.

1.1 Purpose and Scope

This RAR Addendum describes additional limited subsurface MEC removal conducted in MRS-BLM Unit 3 after completion of surface and limited subsurface MEC removal, and Digital Geophysical Mapping (DGM). Additional anomaly investigation was completed to address 189 near surface anomalies outside of the AOI that had the potential to be MEC items with unknown fillers within Unit 3. The general scope of the RA, as defined in the *Final Track 3 Record of Decision Impact Area Munitions Response Area Track 3 Munitions Response Site Former Fort Ord, California* [Track 3 ROD; United States Department of the Army (Army), 2008] is to manage "the potential risk to future land users from MEC at the Impact Area Munitions Response Area (MRA)." The specific scope of this project - as defined in *Field Work Variance 019 to the Final Site-Specific Work Plan MRS-BLM Burn Units 01-05 Munitions and Explosives of Concern Remedial Action Former Fort Ord, California* (KEMRON, 2018a) - entailed the following:

- limited subsurface MEC removal in Unit 3 to intrusively investigate 189 near surface (maximum one foot depth) anomalies outside the AOI with the potential to be MEC items with unknown fillers, and
- detonation of any MEC items removed following confirmation of filler.

1.2 Approval Documents

The RA within Unit 3 occurred under the following:

- Track 3 ROD (Army, 2008),
- *Final Work Plan, Remedial Design (RD)/Remedial Action (RA), Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal Former Fort Ord, California* (Track 3 RD/RA Work Plan; United States Army Corps of Engineers [USACE], 2009),
- *Final Work Plan MRS-BLM Units 1-5 Munitions and Explosives of Concern Removal Former Fort Ord, California* (Final Units 1-5 SSWP; Shaw Environmental, Inc. [Shaw], 2008), and
- *Field Work Variance 019 to the Final Site-Specific Work Plan MRS-BLM Burn Units 01-05 Munitions and Explosives of Concern Remedial Action Former Fort Ord, California* (KEMRON, 2018a), which is included in Appendix A.

2.0 Site Background

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 south western portion of the Impact Area MRA.

Unit 3 is located in the south western section of the Impact Area MRA and falls within the MRS-BLM. Unit 3 is adjacent to the Impact Area MRA boundary (Blue Line Road) to the west. It is bounded to the north, south and east, respectively, by Watkins Gate Road, Nowhere Road and Austin Road. Roads bounding Unit 3 are shown on Figure 2.

2.2 Remedial Actions Conducted Prior to Additional Work Performed

A RA was conducted in Units 1, 2, and 3 at the former Fort Ord, California from 2010 to 2017. During the MEC surface removal in Unit 3, eight 4 inch Stokes mortar projectiles (4 screening smoke; 3 smoke, hexachloroethane; and 1 smoke, White Phosphorus) and one Livens Projector (screening smoke) were encountered and removed. Although all nine items were subsequently confirmed to contain screening smoke fillers, these items also have the potential to be used for delivery of chemical warfare agent. Since the filler of these items cannot be confirmed visually, they are generally classified as munitions with unknown fillers. Both Department of Defense and USACE guidance specify that only Explosive Ordnance Disposal (EOD) or Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) response personnel can determine the most likely filler of these munitions. In accordance with standard operating procedures, active duty EOD personnel were contacted to determine the filler of these items. The location of each of the items described above resulted in a stoppage of munitions response work until a response was completed by EOD and CBRNE personnel. These multiple work stoppages significantly extended the munitions response in Unit 3. Following completion of surface MEC removal within Unit 3, DGM was performed to document the presence of subsurface anomalies.

Stokes mortar projectiles and Livens Projectors were previously encountered and removed in an adjacent unit (Seaside 1). A subsurface MEC removal to the depth of instrument detection was performed on this adjacent unit. All these Stokes mortar projectiles and Livens Projectors were also determined to contain screening smoke fillers.

Prescribed burns are eventually required in Unit 3 as a mitigation for impacts to the habitat from being cut, and the potential existed for 4 inch Stokes mortar projectiles and Livens Projectors to remain in the shallow subsurface in Unit 3. Any additional such items were likely to contain screening smoke fillers. USACE, Sacramento District, identified as a concern that the potential presence of these unknown filler items in the shallow subsurface could a) result in an item functioning during a prescribed burn, or b) being encountered during BLM reuse activities within Unit 3. Any future encounter would necessitate time-consuming procedures that could impact the planned long-term reuse of the property by BLM. Although the possibility of an item functioning was deemed as unlikely, an AOI with regard to the potential presence of shallow subsurface

unknown filler items was delineated. USACE recommended removal of subsurface anomalies within this AOI that could represent these unknown filler items to a depth of 12 inches.

Based on the expected millivolt (mV) response of a 4.2 inch mortar projectile (an acceptably similar proxy item for a 4 inch Stokes mortar projectile) at a maximum depth of 12 inches (250 mV), subsurface anomalies that could represent 4 inch Stokes mortar projectiles and Livens Projectors were selected in Unit 3. Those within the AOI (126 anomalies) were intrusively investigated. Three items required the procedures described above to confirm their fill and were subsequently determined to be smoke-filled. The subsurface investigation resulted in removal of four MEC (including the three smoke-filled 4 inch Stokes mortar projectiles). This work was performed in January and February 2017. This work, along with surface MEC removal, limited subsurface MEC removal and DGM was documented in the Units 1, 2, and 3 RAR (KEMRON, 2018b).

2.3 Summary of MEC-Related Activities and Data Collected Prior to the Additional Anomaly Investigation

MEC investigation work completed within Unit 3 prior to the work addressed in this report resulted in the recovery of two Discarded Military Munitions (DMM) items, thirty-seven Unexploded Ordnance (UXO) items, and two insufficient data (ISD) items. Further detail is included in the Units 1, 2 and 3 RAR (KEMRON, 2018b).

2.4 Reason for Additional Anomaly Investigation

Subsurface anomalies that met the 250mV threshold located outside of the AOI in Unit 3 were not initially removed. It was determined that removal of these anomalies would further reduce the uncertainty that an unknown filler item in Unit 3 outside of the AOI could be encountered in the future. Based on the expected mV response of a 4.2 inch mortar projectile (a close proxy item for a 4 inch Stokes mortar projectile) at a maximum depth of 12 inches (250 mV), there were a total of 189 subsurface anomalies recommended for investigation and removal outside the AOI.

3.0 Additional Anomaly Investigation

Target anomalies selected for subsurface removal were reacquired prior to excavation. Each target anomaly, with its unique target ID, was displayed on a grid map over the gridded DGM data to assist the reacquisition team. Target anomaly locations were reacquired using Real-Time Kinematic (RTK) -Global Positioning System (GPS). The location of each target anomaly was verified and refined, if necessary, by using a single-coil person-portable EM61-MK2A to search a 3.5 foot diameter centered on the reported target location, using the target anomaly response value as a guide. A colored non-metallic pin flag marked with the unique target anomaly identification was placed at the anomaly's peak response location. The offset from the original flag location and the peak Channel 2 EM61-MK2A response value was digitally documented and recorded.

If multiple peak responses were located within the reacquisition search radius, the peak with the highest response amplitude was selected as the intrusive investigation location. If no unique peak response was identified, the original flag location was selected as the intrusive investigation location. If no peak response greater than the target selection threshold was located within 3.5 feet of the original flag location, a white pin flag was placed at the original flag location, and the Field Geophysicist was consulted.

Following reacquisition of the 189 subsurface anomalies, 155 anomalies were determined to require excavation, which occurred in October 2018. All anomalies were investigated to a depth of one foot. If a depth of one foot was reached and no item was encountered, excavation was stopped and the excavation was backfilled. Measuring tapes were used to verify depths of excavations. Standard excavation quality control measures were implemented for all excavations. Investigation of these subsurface anomalies resulted in the discovery of two MEC items (4.2 inch M2 series FS smoke filled projectiles). These items required the procedures described above to confirm their fill and were subsequently determined to be smoke-filled. Munitions Assessment Review Board results for these two MEC items are included in Appendix B. Dig results for all excavations are shown in Table 1 and Figure 2.

4.0 Quality Control/Quality Assurance

For the limited subsurface MEC removal in Unit 3 to address the potential for unknown filler items to remain in the shallow subsurface outside of the AOI, a modified DGM Quality Control (QC) / Quality Assurance (QA) process was implemented. This modified process was implemented because the goal of the investigation was the removal of only large anomaly sources that could be associated with 4 inch Stokes mortar projectiles or Livens Projectors. Dig teams were therefore not required to clear targets below 4 mV as they would in a standard DGM-based subsurface removal. The QC geophysicist conducted a standard mV comparison on all dig results to ensure that although residual levels were above 4mV, they were well below the mV level that would indicate the presence of a 4 inch Stokes mortar projectile or Livens Projector (250 mV). Additionally, a percentage of dig locations were field checked by the QC Geophysicist with an EM61.

DGM data were reviewed by the QA Geophysicist to ensure all data met established measurement quality objectives (MQOs) and Category A spacing requirements. Further detail is included in the *MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (KEMRON, 2016). The 189 additional target picks and QC documentation were reviewed by the QA Geophysicist to ensure all anomalies above 250 mV were selected, reacquired, and resolved in accordance with standard operating procedures (SOPs) and FWV 19 (KEMRON, 2018a). This modified process is discussed further in Appendix J to the Units 1, 2 and 3 RAR (KEMRON, 2018b).

5.0 MEC and MD Removal

This section provides summaries of the MEC and Munitions Debris (MD) removed from the work area. Table 1 provides data for the MEC and MD items recovered and removed.

5.1 Remedial Action

Statistical information for the additional anomaly investigation was recorded, tracked, and reported by removal grid, individual item, and date. A summary of the dig results is provided in Table 1.

5.1.1 MEC Removal

MEC was recovered and subjected to detonation during the course of this additional anomaly investigation. As shown in Table 1, a total of two MEC items were found and removed during this action. A summary of the dig results is provided in Table 1.

5.1.2 MD Removal

Recovered MD was characterized by weight on an individual dig basis. A total estimated quantity of 672.5 pounds of MD was removed during the work activities. MD was initially classified as Material Potentially Presenting an Explosive Hazard (MPPEH). Following initial classification, the MPPEH was certified by the Senior Unexploded Ordnance Supervisor (SUXOS), Unexploded Ordnance Quality Control Supervisor (UXOQCS), and USACE Ordnance and Explosives (OE) Safety Specialist as either material documented as safe (MDAS) or material documented as an explosive hazard (MDEH). MDEH was detonated. MDAS was certified free from explosive material and stored in lockable roll-off containers. MDAS was demilitarized as appropriate. MDAS was inspected, certified and will be transported to a recycling facility.

5.1.3 Detonation of Munitions and Explosives of Concern

During the course of this work, two MEC items were destroyed by detonation. All procedures for demolition operations included in the Final Units 1-5 SSWP (Shaw, 2008) and in subsequent updates 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 (MMRP) database.

5.1.4 Disposition of Munitions Debris

The MDAS will be transported to Demil Metals for smelting and eventual recycling. DD Form 1348-1A documentation will accompany the MDAS.

5.2 Conceptual Site Model

The locations of the two MEC items found and removed during the additional anomaly investigation within Unit 3 are shown on Figure 2. Unit 3 includes portions of the range fan of Range 23. Although this range was primarily used for small arms training just prior to the closure

of Fort Ord, there is evidence that this range was probably used for mixed use training during earlier periods. Surface MEC removal and DGM data were evaluated in the *MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California* (Units 1, 2, and 3 TM; KEMRON, 2016). Additional subsurface MEC removal was performed following completion of the TM based upon recommendations in that document. This subsurface MEC removal included work performed in administrative areas, as well as a limited subsurface MEC removal in Unit 3 (a total of 126 subsurface anomalies) in the AOI described above. Both a Livens Projector and Stokes mortars were located during surface MEC removal in a portion of Unit 3, and three 4 inch Stokes mortars were located during the limited subsurface MEC removal. The work addressed in this document resulted in the location of two 4.2 inch mortar projectiles. All the items discussed above were determined to be smoke filled. 4.2 inch mortar projectiles were not previously located during MEC removal activities, but fragments of these items have been noted. The two phases of anomaly investigation resulted in removal (to 12 inches in depth) of subsurface anomalies in Unit 3 that could potentially represent unknown filler items. This removal greatly reduced the uncertainty regarding the potential to encounter these items in the future.

Munitions with sensitive fuzes were not expected in Unit 3. The completion of a technology-aided surface removal of MEC in Unit 3 did not result in the removal of any MEC items considered to have sensitive fuzes. During the munitions response described in the Units 1, 2, and 3 TM (KEMRON, 2016), no evidence was reported, including types of MD, that indicates the presence of munitions associated with sensitive fuzes. The work addressed in this document did not result in any indication of the presence of munitions with sensitive fuzes.

6.0 Environmental Protection

6.1 Description of Impacts and Mitigation Measures

Unit 3 is within the Natural Resource Management Area designated for transfer to BLM as undeveloped habitat reserve. Habitat reserve areas support plant and animal species protected under the Endangered Species Act and require implementation of mitigation measures identified in the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (HMP; USACE, 1997) and the *Programmatic Biological Opinion for Cleanup*

and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California [United States Fish and Wildlife Service (USFWS), 2017] to minimize potential adverse impacts to listed species. The Unit 3 remedial action area consists primarily of central maritime chaparral (CMC) vegetation and contains numerous protected species listed in the HMP (USACE, 1997).

Remedial action activities conducted within Unit 3 for the work described in this RAR addendum included subsurface MEC removal and debris removal. Mitigation and environmental protection measures to reduce impacts to protected species during MEC remedial actions are described in the HMP (USACE, 1997) and the *Programmatic Biological Opinion for Cleanup and Property Transfer Actions Conducted at the Former Fort Ord, Monterey County, California* (USFWS, 2017). Prior to the remedial action, a Site Habitat Checklist outlining specific avoidance and minimization measures was prepared by the Project Biologist and reviewed with all personnel involved in remedial action activities. Additionally, an Employee Education Program was conducted for all supervisors and field personnel by the Project Biologist 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 unintentional impacts to HMP species. Avoidance and minimization measures implemented during the project are summarized below:

- Minimize Disturbance Associated with MEC Removal: Disturbances were limited to those required for MEC removal. As required by the HMP (USACE, 1997), 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. Additionally, access roads, staging areas, and other appurtenant facilities were sited to avoid impacts to HMP plant and wildlife species.

- Avoid Disturbance of HMP Annual Plant Populations: Populations of sand gilia, Monterey spineflower, Seaside bird's-beak, and Yadon's piperia were identified within openings in the CMC in Unit 3 (Burleson Consulting [Burleson], 2016). While MEC removal activities

were necessary within the HMP annuals plant population areas, no equipment or personnel were permitted within these areas from approximately March (approximate time of germination) through June (approximate time of seed-set) for Monterey spineflower and sand gilia, and through approximately September for Seaside bird's-beak and Yadon's piperia.

- Minimize Impacts to Black Legless Lizard: Supervisors and field personnel were trained during the Employee Education Program to identify black legless lizards and were informed of the potential for this species to occur within the project site and the established protocol if any individuals were encountered. However, 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 California Tiger Salamanders and California Red-legged frogs, and were informed of the potential for these species to occur within the project site and the established protocol if any individuals were encountered. However, no California Tiger Salamanders or California Red-legged frogs were observed during the course of this work.

- Invasive Weed Control: In order to reduce the spread of invasive weeds, existing roads were used to the greatest extent feasible. Equipment, vehicles, and gear were required to be cleaned daily or before moving out of the area within areas identified to be highly invaded with pampas grass (*Jubata cortideria*).

- Erosion Control: To reduce erosion concerns normal vehicle access was restricted to existing roads and established access routes. KEMRON monitored the work site for potential erosion problems and a final inspection was conducted by the Project Biologist.

6.2 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 *1997 Annual Habitat Monitoring Report Former Fort Ord Monterey, California* (Harding Lawson Associates, 1997) and the *2012 Biological Monitoring Report for Units 2, 3, 6, 10; Units 11, 12, 4, and 23; and Units 14 and 19, Former Fort Ord* (Tetra Tech, Inc., 2013). Follow-up monitoring was conducted by Burleson in 2015 and 2017. Results of these surveys are presented in the *2015 Annual Monitoring Report for BLM Area B, Subareas A, B, B-3 East, B-3 West, and C, and Units 05, 13, and 20; Units 01 West, 02 West, and 03 West; Units 02 East and 03 East; Units 15, 21, 32, and 34; and 2015 Annual Wetland Vegetation and Wildlife Monitoring Report, Former Fort Ord* (Burleson, 2016) and 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* (Burleson, 2018). Monitoring within Unit 3 will continue according to the *2017 Programmatic BO* (USFWS, 2017) to document the recovery of HMP species and habitat.

7.0 Protectiveness Assessment

The protectiveness of the remedial action was evaluated against the requirements of the Track 3 ROD (Army, 2008). The work performed in Unit 3 was consistent with the Final Units 1-5 SSWP (Shaw, 2008) and the Track 3 RD/RA Work Plan (USACE, 2009), and no conditions contrary to these documents were encountered at the site.

The work described in this RAR addendum to address the potential for unknown filler items to remain in the shallow subsurface outside of the AOI is complete. As discussed further in the Units 1, 2, and 3 RAR (KEMRON, 2018b), the following actions will occur until all remedial actions within the Track 3 Impact Area MRA are complete:

- Unauthorized public access to or within the Impact Area MRA will continue to be prohibited,

- MEC 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 RA within the Impact Area MRA, the Army will evaluate the work completed against planned reuse activities and the suitability of the Land Use Controls (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.

8.0 References

Burleson Consulting (Burleson), 2016. *2015 Annual Monitoring Report for BLM Area B, Subareas A, B, B-3 East, B-3 West, and C, and Units 05, 13, and 20; Units 01 West, 02 West, and 03 West; Units 02 East and 03 East; Units 15, 21, 32, and 34; and 2015 Annual Wetland Vegetation and Wildlife Monitoring Report, Former Fort Ord*. [Administrative Record (AR)# BW-2795]

Burleson, 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*. (AR# BW-2845)

Harding Lawson Associates, 1997. *1997 Annual Habitat Monitoring Report Former Fort Ord Monterey, California*. (AR# OE-0211)

KEMRON Environmental Services, Inc. (KEMRON), 2016. *MRS-BLM Units 1, 2, and 3, MEC Remedial Action Technical Memorandum, Former Fort Ord, California*. (AR# OE-0875)

KEMRON, 2018a. *Field Work Variance 019 to the Final Site-Specific Work Plan MRS-BLM Burn Units 01-05 Munitions and Explosives of Concern Remedial Action Former Fort Ord, California*. (AR# OE-0626R)

KEMRON, 2018b. *MRS-BLM Units 1, 2, and 3 Munitions and Explosives of Concern Remedial Action Report Revision 1 Former Fort Ord, California*. (AR# OE-0920C)

Shaw Environmental, Inc., 2008. *Final Work Plan MRS-BLM Units 1-5 Munitions and Explosives of Concern Removal Former Fort Ord, California*. (AR# OE-0626L)

Tetra Tech, Inc., 2013. *2012 Biological Monitoring Report for Units 2, 3, 6, 10; Units 11, 12, 4, and 23; and Units 14 and 19, Former Fort Ord*. (AR# BW-2645)

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

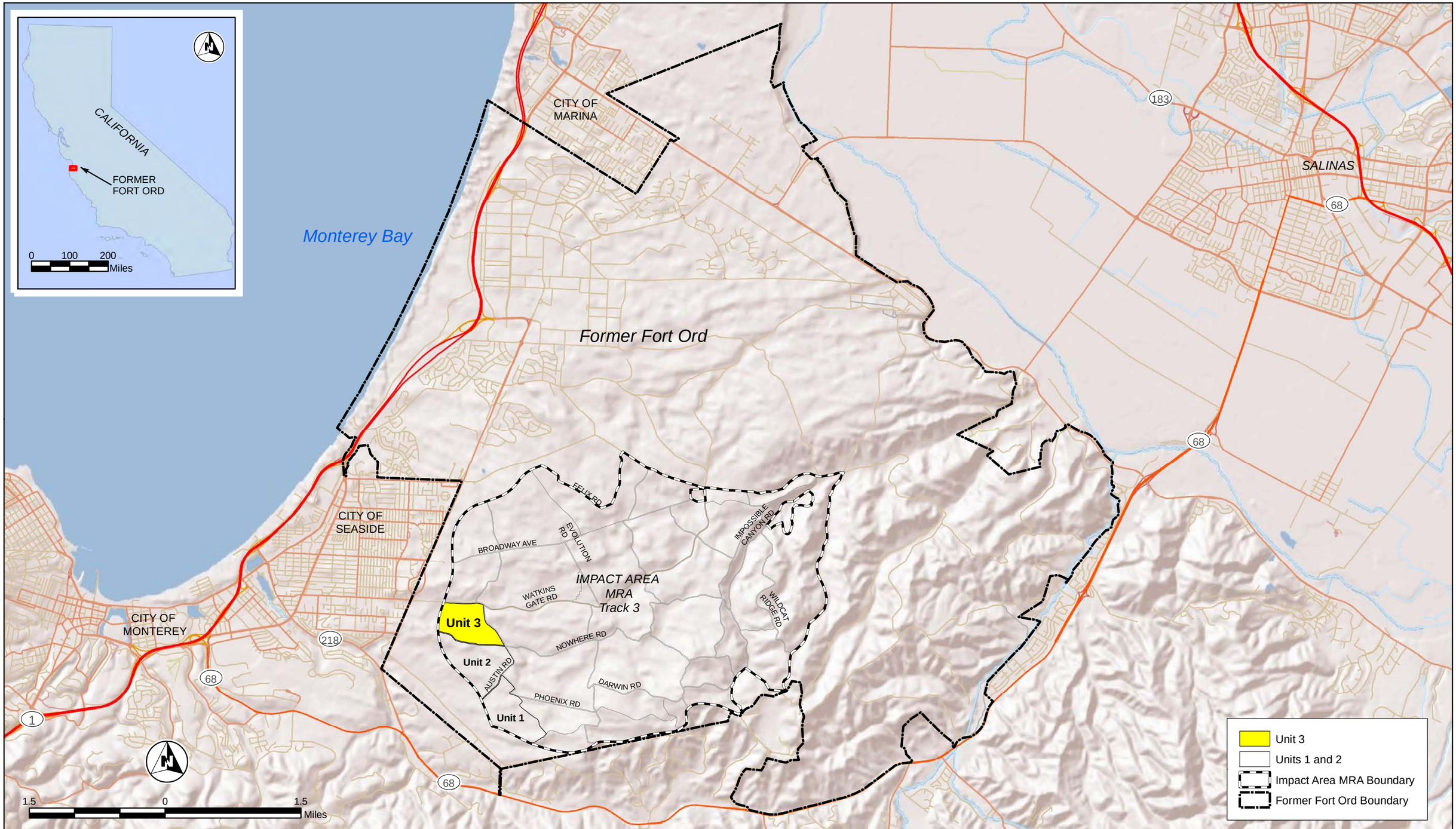
USACE, 2009. *Final Work Plan, Remedial Design (RD)/Remedial Action (RA), Track 3 Impact Area Munitions Response Area (MRA) Munitions and Explosives of Concern (MEC) Removal Former Fort Ord, California*. (AR# OE-0660K)

The United States Department of the 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)

United States 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. *2017 Programmatic Biological Opinion.* (AR# BW-2747A)

Figures



Unit 3 Remedial Action Report Addendum
Munitions and Explosives of Concern (MEC) Removal
ImpactArea MRA
Former Fort Ord, California

Figure 1

Regional Location Map

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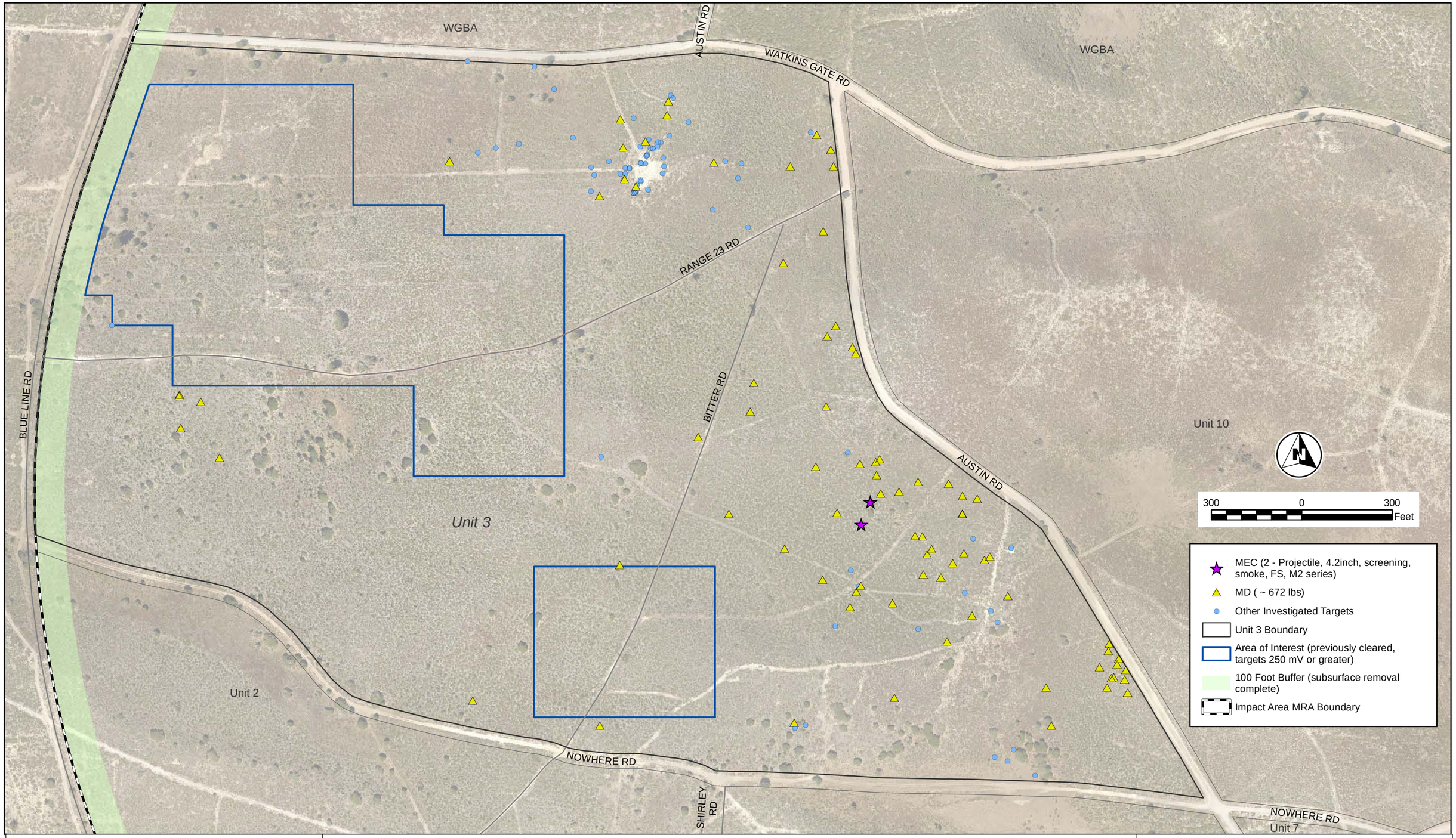

Unit 3 Remedial Action Report Addendum
Munitions and Explosives of Concern (MEC) Removal
ImpactArea MRA
Former Fort Ord, California

Figure 2

Unit 3 Phase 2 Dig Results

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Tables

Table 1
Unit 3 Phase 2 Stokes Mortar and Livens Projector Investigation Dig Results

Date	Item Type	Quantity	MEC/MD Description	Other Description	Unit	Depth (inches)
10/1/2018	MD		Assorted MD Components;fuze, grenade;signal, illum	Scrap Metal;Trash Pit	Unit 3	12
10/1/2018	RRD		None	Aluminum Scrap Metal;Metal Pipe;Nail(s);Scrap Metal;Trash Pit;Wire	Unit 3	12
10/1/2018	RRD		None	Aluminum Scrap Metal;Scrap Metal;Trash Pit	Unit 3	12
10/1/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6
10/1/2018	OD		None	Aluminum Scrap Metal;Construction Debris;Metal Pipe;Metal Plate;Nail(s);Trash Pit;Wire	Unit 3	12
10/1/2018	OD		None	Metal Pipe	Unit 3	12
10/1/2018	OD		None	Metal Pipe	Unit 3	6
10/1/2018	OD		None	Scrap Metal;Wire	Unit 3	4
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	1
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	6
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	4
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	6
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	6
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	4
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	8
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	6
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	8
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	12
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	12
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	6
10/1/2018	MD	1	projectile, 75mm	None	Unit 3	12
10/2/2018	OD		None	Metal Plate	Unit 3	8
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	8
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/2/2018	Unknown*		None	None	Unit 3	12
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/2/2018	OD		None	Nail(s)	Unit 3	4
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/2/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	1
10/2/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	8
10/2/2018	OD		None	Construction Debris	Unit 3	1
10/2/2018	RRD		None	Scrap Metal	Unit 3	12
10/2/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	12
10/2/2018	OD		None	Cable;Scrap Metal	Unit 3	4
10/2/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	3
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	10
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	7
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	10
10/2/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	3
10/2/2018	OD		None	Nail(s)	Unit 3	8
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/2/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	9
10/2/2018	OD		None	Rebar	Unit 3	1
10/3/2018	OD		None	Rebar	Unit 3	1
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	3
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/3/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	7

Table 1
Unit 3 Phase 2 Stokes Mortar and Livens Projector Investigation Dig Results

Date	Item Type	Quantity	MEC/MD Description	Other Description	Unit	Depth (inches)
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	6
10/3/2018	UXO	1	projectile, 4.2inch, screening, smoke, FS, M2 series	None	Unit 3	4
10/3/2018	MD	1	projectile, 4.2 in	None	Unit 3	10
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/3/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	4
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	10
10/3/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	9
10/4/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	6
10/4/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	8
10/4/2018	UXO	1	projectile, 4.2inch, screening, smoke, FS, M2 series	None	Unit 3	6
10/4/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/4/2018	RRD		None	Scrap Metal	Unit 3	12
10/4/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	6
10/4/2018	MD		Assorted MD Components	None	Unit 3	12
10/4/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	9
10/4/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	12
10/4/2018	MD		Assorted MD Components;projector, livens	None	Unit 3	12
10/4/2018	MD		Assorted MD Components;projector, livens	None	Unit 3	12
10/4/2018	MD		Assorted MD Components;projector, livens	None	Unit 3	12
10/4/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	4
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6
10/9/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	4
10/9/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	6
10/9/2018	RRD		None	Sign Post	Unit 3	8
10/9/2018	RRD		None	Scrap Metal	Unit 3	5
10/9/2018	RRD		None	Scrap Metal	Unit 3	3
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	4
10/9/2018	RRD		None	Scrap Metal	Unit 3	1
10/9/2018	RRD		None	Scrap Metal	Unit 3	1
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	2
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	3
10/9/2018	RRD		None	Scrap Metal	Unit 3	5
10/9/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	5
10/10/2018	FP		None	None	Unit 3	12
10/10/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	8
10/10/2018	OD		None	Aluminum Scrap Metal	Unit 3	6
10/10/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/10/2018	SameAnom		None	None	Unit 3	2
10/10/2018	MD		fuze, grenade;projectile, 4.2 in	None	Unit 3	4
10/10/2018	OD		None	Scrap Metal	Unit 3	6
10/10/2018	OD		None	Scrap Metal;Trash Pit	Unit 3	4
10/10/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	4
10/10/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/10/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	2
10/11/2018	RRD		None	Scrap Metal	Unit 3	0
10/11/2018	OD		None	Survey Marker	Unit 3	3
10/11/2018	OD		None	Survey Marker	Unit 3	7

Table 1
Unit 3 Phase 2 Stokes Mortar and Livens Projector Investigation Dig Results

Date	Item Type	Quantity	MEC/MD Description	Other Description	Unit	Depth (inches)
10/11/2018	MD		Assorted MD Components;projectile, 40mm	Scrap Metal	Unit 3	5
10/11/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/11/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/11/2018	SameAnom		None	None	Unit 3	0
10/11/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/11/2018	MD		Assorted MD Components;projectile, 40mm	None	Unit 3	0
10/11/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/11/2018	OD		None	Reinforced Concrete;Scrap Metal	Unit 3	12
10/11/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/11/2018	SameAnom		None	None	Unit 3	0
10/11/2018	OD		None	Scrap Metal	Unit 3	8
10/15/2018	OD		None	Scrap Metal	Unit 3	12
10/15/2018	OD		None	Rebar	Unit 3	12
10/15/2018	OD		None	Rebar	Unit 3	6
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	RRD		None	Scrap Metal	Unit 3	4
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	SameAnom		None	Same as 46B	Unit 3	0
10/15/2018	OD		None	Scrap Metal	Unit 3	3
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/15/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/16/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	4
10/16/2018	OD		None	Scrap Metal	Unit 3	8
10/16/2018	RRD		None	Scrap Metal	Unit 3	2
10/16/2018	MD	1	signal, illumination	None	Unit 3	0
10/16/2018	RRD		None	Scrap Metal	Unit 3	2
10/16/2018	RRD		None	Scrap Metal	Unit 3	4
10/16/2018	RRD		None	Scrap Metal	Unit 3	0
10/16/2018	RRD		None	Scrap Metal	Unit 3	0
10/16/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/16/2018	OD		None	Rebar	Unit 3	12
10/16/2018	OD		None	Scrap Metal	Unit 3	10
10/16/2018	OD		None	Rebar;Reinforced Concrete	Unit 3	12
10/17/2018	MD		Assorted MD Components;mortar, 4 in Stokes	None	Unit 3	4
10/17/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	0
10/17/2018	MD		Assorted MD Components;mortar, 4 in Stokes	None	Unit 3	0
10/17/2018	Unknown*		None	None	Unit 3	12
10/17/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	8
10/17/2018	MD		Assorted MD Components;mortar, 4 in Stokes	None	Unit 3	10
10/17/2018	MD		Assorted MD Components;mortar, 4 in Stokes	None	Unit 3	12
10/17/2018	MD		Assorted MD Components;mortar, 4 in Stokes	None	Unit 3	12
10/17/2018	MD		Assorted MD Components;projectile, 4.2 in	None	Unit 3	10
10/17/2018	Unknown*		None	None	Unit 3	12
10/17/2018	RRD		None	Aluminum Scrap Metal	Unit 3	3
10/17/2018	OD		None	Aluminum Scrap Metal	Unit 3	12
10/17/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6

Table 1
Unit 3 Phase 2 Stokes Mortar and Livens Projector Investigation Dig Results

Date	Item Type	Quantity	MEC/MD Description	Other Description	Unit	Depth (inches)
10/17/2018	RRD		None	Aluminum Scrap Metal	Unit 3	2
10/17/2018	Unknown*		None	None	Unit 3	12
10/17/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	12
10/17/2018	MD		Assorted MD Components;projectile, 4.2 in;projectile, 75mm	None	Unit 3	10
10/17/2018	MD		Assorted MD Components;projectile, 75mm	None	Unit 3	6

* - Item types noted as unknown were investigated to a depth of 12 inches with no metallic anomaly encountered.

Appendix A

Field Work Variance 019

FIELD WORK VARIANCE

Project Name/Number	Fort Ord	**WP**	17
Applicable Document	Final, Site-Specific Work Plan, MRS-BLM Units 1-5 Munitions and Explosives of Concern Remedial Action, Former Fort Ord, California (Shaw, 2008) (OE-0626L)	**Date**	September 5, 2018

Background: A remedial action has been conducted in MRS-BLM Units 1, 2, and 3 at the former Fort Ord, CA. During the munitions and explosives of concern (MEC) surface removal in Unit 3, eight 4-inch Stokes mortar projectiles (4 screening smoke; 3 smoke, hexachloroethane; and 1 smoke, WP) and one Livens Projector (screening smoke) were encountered and removed. Although all nine items were subsequently confirmed to contain smoke fillers, these items also have the potential to be used for delivery of chemical warfare agent. Since the filler of these items cannot be confirmed visually, they are generally classified as munitions with unknown fillers. Both Department of Defense and U.S. Army Corps of Engineers (USACE) guidance specify that only Explosive Ordnance Disposal (EOD) or Chemical, Biological, Radiological, Nuclear and Explosives (CBRNE) response personnel can determine the most likely filler of these munitions. In accordance with standard operating procedures, active duty EOD personnel were contacted to determine the filler of these items. The location of each of the items described above resulted in a stoppage of munitions response work until a response was completed by EOD and CBRNE personnel. These multiple work stoppages significantly extended the munitions response in Unit 3.

Following completion of surface MEC removal within Unit 3, digital geophysical mapping (DGM) was performed to document the presence of subsurface anomalies.

Stokes mortar projectiles and Livens Projectors were previously encountered and removed in an adjacent unit (Seaside 1). A subsurface MEC removal to the depth of instrument detection was performed on this adjacent unit. All these Stokes mortar projectiles and Livens Projectors were also determined to contain screening smoke.

Prescribed burns are eventually required in Units 1, 2, and 3 as a mitigation for impacts to the habitat from being cut, and the potential exists for 4-inch Stokes mortar projectiles and Livens Projectors to remain in the shallow subsurface in Unit 3. Any additional such items are likely to contain screening smoke fill. USACE, Sacramento District, identified as a concern that the potential presence of these unknown filler items in the shallow subsurface could result in an item functioning during a prescribed burn, or an item being encountered during BLM reuse activities within Unit 3. Any future encounter would necessitate time-consuming procedures that could impact the planned long-term reuse of the property by BLM. Although the possibility of an item functioning was deemed as unlikely, an Area of Interest (AOI) with regard to the potential presence of shallow subsurface unknown filler items was delineated (Figure 1). USACE recommended removal of subsurface anomalies that could represent these unknown filler items to a depth of 12 inches. Based on the expected millivolt (mV) response of a 4.2-inch mortar projectile (a close proxy item for a 4-inch Stokes mortar projectile) at a maximum depth of 12 inches (250 mV), subsurface anomalies that could represent 4-inch Stokes mortar projectiles and Livens Projectors were selected in Unit 3. Those within the AOI (126 anomalies) were intrusively investigated. Three items required the procedures described above to confirm their fill, and were subsequently determined to be smoke-filled. This work was performed in January and February 2017.

Problem Description: Subsurface anomalies that met the 250mV threshold located outside of the AOI shown in Figure 1 were not removed. Removal of these anomalies will address the uncertainty that an unknown filler item in this area could be encountered in the future. Based on the expected mV response of a 4.2-inch mortar projectile (a close proxy item for a 4-inch Stokes mortar projectile) at a maximum depth of 12 inches (250 mV), there are a total of 189 subsurface anomalies recommended for investigation and removal outside the AOI. These subsurface anomaly locations are shown on Figure 2.

Recommended solution:

Conduct a limited subsurface removal that addresses the 189 anomalies shown on Figure 2. Follow field procedures outlined in FWV-005 (OE-0882) developed to address subsurface anomalies in the AOI shown on Figure 1. These procedures are included here for ease of reference.

Field Procedures

DGM Anomaly Reacquisition: Target anomalies selected for subsurface removal will be reacquired prior to excavation. Each target anomaly, with its unique target ID, will be displayed on a grid map over the gridded DGM data to assist the reacquisition team. Target anomaly locations will be reacquired using RTK-GPS or RTS, as applicable. The location of each target anomaly will be verified and refined, if necessary, by using a single-coil person-portable EM61-MK2A to search a 3.5-foot diameter centered on the reported target location, using the target anomaly response value as a guide. A colored non-metallic pin flag marked with the unique target anomaly identification will be placed at the anomaly's peak response location. The offset from the original flag location and the peak Channel 2 EM61-MK2A response value will be digitally documented and recorded.
If multiple peak responses are located within the reacquisition search radius, the peak with the highest response amplitude will be selected as the intrusive investigation location. If no unique peak response is identified, the original flag location will be selected as the intrusive investigation location. If no peak response greater than the target selection threshold is located within 3.5 feet of the original flag location, a white pin flag will be placed at the original flag location, and the Field Geophysicist will be consulted.

Notice to EOD Prior to Commencement of Intrusive Activities: Prior to the commencement of intrusive activities, Vandenberg (or other active duty) EOD unit will be notified by the USACE Ordnance and Explosives Safety Specialist (OESS).

Intrusive Investigation: All reacquired anomalies will be investigated to a depth of one foot. If a depth of one foot is reached and no item is encountered, excavation will be stopped and the excavation will be backfilled. If an intrusively investigated item is determined to be either a 4-inch stokes mortar projectile or Livens Projector, the location of the item will be recorded with an RTK-GPS or RTS. The item will be covered with plastic sheeting, plywood and sand bag(s), and the existing hole will be backfilled. All items determined to be either a 4-inch stokes mortar projectile or Livens Projector will be handled in this manner. Following completion of all anomaly excavations, active duty EOD personnel, if not already on site, will be contacted to determine the filler of these items during one site visit.

Other material potentially presenting an explosive hazard (MPPEH) items encountered during intrusive activities will be handled in accordance with standard procedures.

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 Final Work Plan.

Clarification ☐ Minor Change ☐ Major Change ☒

Affects Budget Yes ☒ No ☐
Affects Schedule Yes ☒ No ☐

Signature Erin K. Caruso Date _____
Task Manager

Signature Bradley Olson Digitally signed by Bradley Olson Date: 2018.09.06 13:04:08 -07'00' Date _____
SUXOS

Signature Steve Crane Date 9/5/18
Project Manager

Signature cclyde@gilbaneco.com Digitally signed by cclyde@gilbaneco.com DN: cn=cclyde@gilbaneco.com Date: 2018.09.06 11:59:40 -07'00' Date _____

CQCSM

Signature Bruce McClain Digitally signed by Bruce McClain Date: 2018.09.06 13:54:29 -07'00' Date _____

UXOQCS

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Deputy Project Manager

USACE Approval: If Major Change:

Signature BRITT.JAMES.CLIFTON.1056168920 Digitally signed by BRITT.JAMES.CLIFTON.1056168920 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=BRITT.JAMES.CLIFTON.1056168920 Date: 2018.09.13 11:51:40 -07'00' Date _____

OE Safety Specialist

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USACE Project Geophysicist

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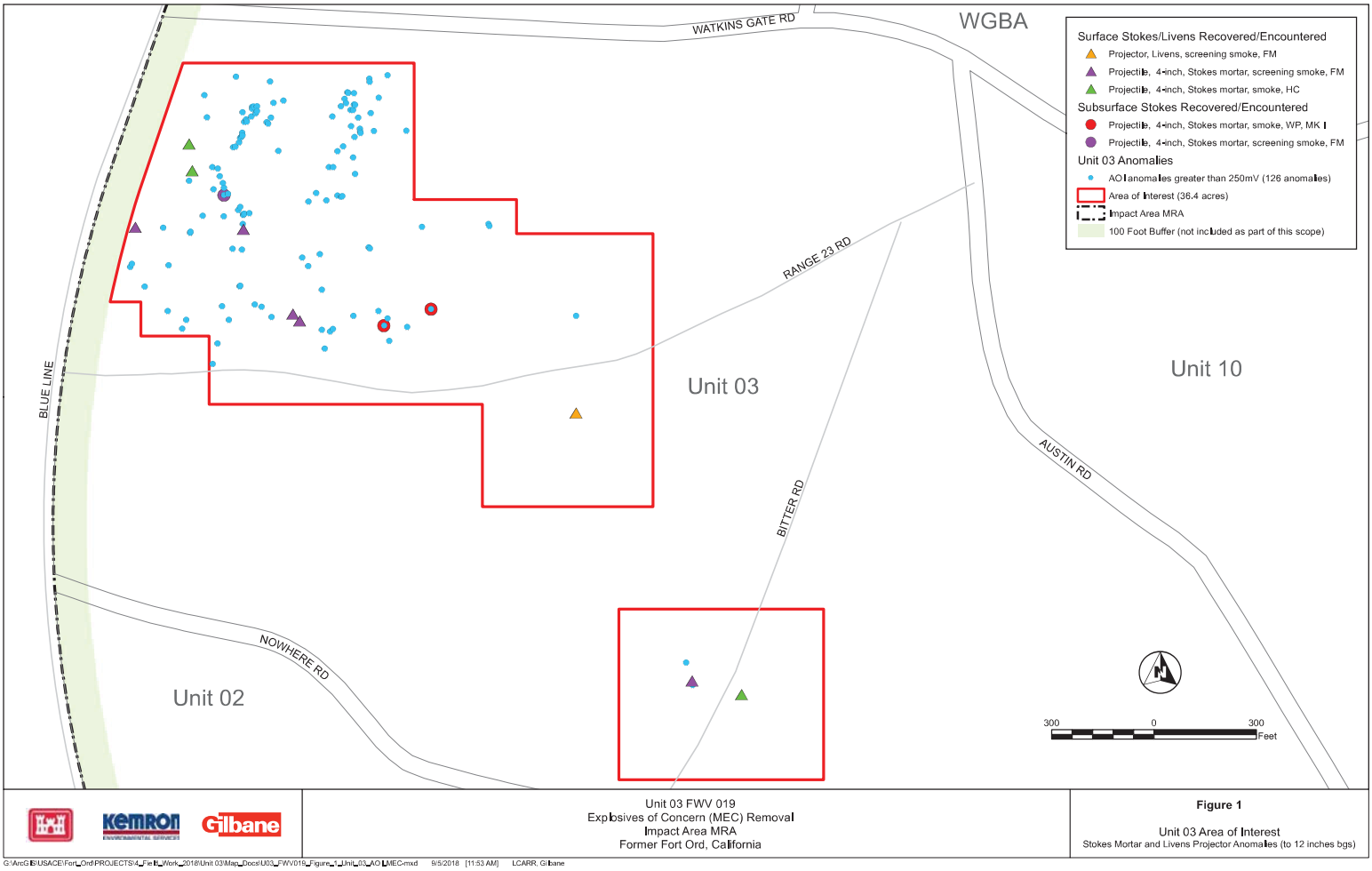
USACE COR or TM

R. Curtis Payton, II

Technical/Project Manager

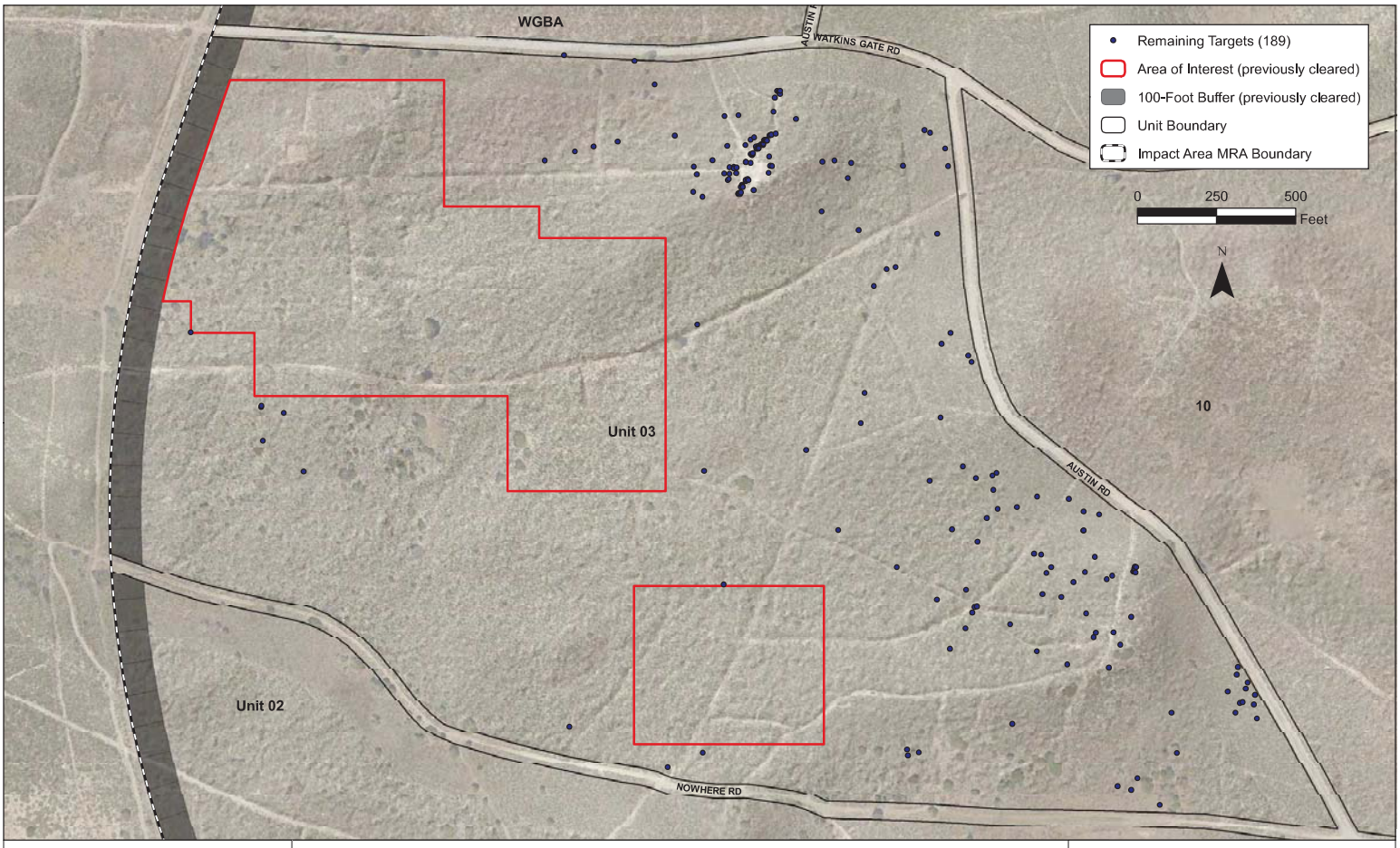


Unit 03 FWV 019
Explosives of Concern (MEC) Removal
Impact Area MRA
Former Fort Ord, California

Figure 1

Unit 03 Area of Interest
Stokes Mortar and Livens Projector Anomalies (to 12 inches bgs)

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\4_Field_Work_2018\Unit 03\Map_Docs\U03_FWV019_Figure_1_Unit_03_AOI_MEC.mxd 9/5/2018 [11:53 AM] LCARR, Gilbane



Unit 3
Former Fort Ord, California

Figure 2
250 mV Targets
Outside the AOI

Document Path: C:\Users\shession\Documents\GIS_Files\PROJECTS\ImpactArea\Unit3\U3_250mV_Targets_20180710.mxd

Distribution List: FWV 019, Final Site-Specific Work Plan MRS-BLM Units 1-5 Munitions and Explosives of Concern Remedial Action Former Fort Ord, California

CD/Email	Paper	Name	Organization	Address	City, State	Zip
1		Mr. Duane Balch	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. James Britt	Department of the Army USACE	4463 Gigling Road	Seaside, CA	93955
1		Mr. Curtis Payton	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		Ms. Betsy Hibbits	Chenega Corporation	4463 Gigling Road	Seaside, CA	93955
1		Mr. Tom Ghigliotto	Chenega Corporation	4463 Gigling Road	Seaside, CA	93955
1	1	Mr. Eric Morgan	Bureau of Land Management, Fort Ord National Monument	940 2nd Avenue	Marina, CA	93933
1		Mr. Robert Young	Tech Law, Inc.	235 Montgomery Street, Suite 717	San Francisco, CA	94104
1		Mr. Tom Hall	Tech Law, Inc.	7 Shore Point Road	North Little Rock, AR	72116
1	1	Mr. Vlado Arsov	California Department of Toxic Substances Control (DTSC)	8800 California Center Drive	Sacramento, CA	95826
1	1	Ms. Maeve Clancy	U.S. Environmental Protection Agency, Region IX	75 Hawthorne Street, Mail SFD-8-3	San Francisco, CA	94105
	1	Mr. David Frisbey	Monterey Bay Air Resources District	24580 Silver Cloud Court	Monterey, CA	93940
1		Mr. Dartanion Mims	California Air Resources Board	1001 I Street	Sacramento, CA	95814
	1	Mr. Mike Weaver	Fort Ord Community Advisory Group (FOCAG)	52 Corral De Tierra Road	Salinas, CA	93908
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		Ms. LeVonne Stone	Fort Ord Environmental Justice Network (FOEJN)	P.O. Box 361	Marina, CA	93933
2	2	Admin Record	Fort Ord BRAC	4463 Gigling Road	Seaside, CA	93955

Approved: PAYTON.R.CURTIS.II.1231979707

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Date: 2018.09.27 15:38:06 -07'00'

R. Curtis Payton, II, PG
Project Manager
U.S. Army Corps of Engineers

Appendix B

Munitions Assessment Review Board Results

DEPARTMENT OF THE ARMY
U.S. ARMY CHEMICAL MATERIALS ACTIVITY
8435 HOADLEY ROAD
ABERDEEN PROVING GROUND, MD 21010-5424

AMSCM-D

JAN 24 2019

MEMORANDUM FOR Department of the Army, Fort Ord Base Realignment and Closure (BRAC) Office (Mr. William Collins), P.O. Box 5008, Monterey, CA 93944-5008

SUBJECT: Materiel Assessment Review Board (MARB) Recommendations for Fort Ord (ORD), CA, Items ORD-18-018 thru ORD-18-021

1. The MARB met on 14 December 2018 to evaluate non-intrusive assessment data collected on four items recovered at ORD. The MARB co-chairs were Mr. Robert Maddox, U.S. Army 20th Chemical, Biological, Radiological, Nuclear and High Yield Explosives (CBRNE) Command and Mr. Russell Fendick, U.S. Army Chemical Materials Activity (CMA) Recovered Chemical Materiel Directorate (RCMD). The U.S. Army CBRNE Analytical Remediation Activity assessed the items with x-ray and the portable isotopic neutron spectroscopy (PINS) chemical assay system.

2. Item ORD-18-018, a 4.2 inch mortar, was determined to contain a 95% liquid fill, fuze remnants and energetic materials. Strong chlorine and titanium peaks were observed. The PINS fill assessment is FM smoke and the item was subsequently recommended for local disposition (LD) by the MARB.

3. Item ORD-18-019, a 4.2 inch mortar, was determined to contain a 95% liquid fill, fuze remnants and energetic materials. Strong chlorine and titanium peaks were observed. The PINS fill assessment is FM smoke and the item was subsequently recommended for LD by the MARB.

4. Item ORD-18-020, a 4.2 inch mortar, was determined to be empty, fuzed and did not contain energetic materials. Weak chlorine and sulfur peaks were observed. The PINS fill assessment is FS smoke residue and it was subsequently recommended for LD by the MARB.

5. Item ORD-18-021, a 4.2 inch mortar, was determined to contain a 95% liquid fill, fuze remnants and energetic materials. Moderate chlorine and strong sulfur peaks were observed. The PINS fill assessment is FS smoke and it was subsequently recommended for LD by the MARB.

6. The MARB conference notes are enclosed and the MARB Materiel Assessment Data Sheets (MADS) are in Attachment C of the enclosure. Item-specific data, including x-ray analysis, explosive configuration and fill are provided in the MADS. Please carefully review the MADS prior to disposal.

AMSCM-D JAN 24 2019
SUBJECT: Materiel Assessment Review Board (MARB) Recommendations for Fort Ord (ORD), CA, Items ORD-18-018 thru ORD-18-021

7. For more information and to report destruction of the items please call [redacted] U.S. Army 20th CBRNE Command [redacted]

Encl

KELSO C. HORNE III
COL, CM
Director

CF: (w/encl)
Dr. Edward Seabury, Idaho National Laboratory, P.O. Box 1625, Idaho Falls, ID 83415-2212
Commander, U.S. Army Research, Development and Engineering Command (AMSRD-OPH/Mr. Smart), 8193 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5424
Commander, U.S. Army CBRNE 20th Command, (AFCB-DCO/COL Muchow), 9088 21st Street, Aberdeen Proving Ground, MD 21010-5424
Director, U.S. Army Edgewood Chemical Biological Center (AMSRD-ECB-CB-C/ Mr. Blades), 8193 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5424
Director, U.S. Army Chemical Materials Activity (AMSCM-RM/Mr. Lyle), 8435 Hoadley Road, Aberdeen Proving Ground, MD 21010-5424
Director, U.S. Army Chemical Materials Activity (AMSCM-TR/Mr. Hertzog), 8435 Hoadley Road, Aberdeen Proving Ground, MD 21010-5424
Director, U.S. Army Chemical Materials Activity (AMSCM-MOM/Mr. Webb), 8435 Hoadley Road, Aberdeen Proving Ground, MD 21010-5424