DRAFT FINAL
FIELD EVALUATION WORK PLAN
MUNITIONS RESPONSE
MRS-BLM UNITS 13, 17, AND 20
FORMER FORT ORD, CALIFORNIA

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FIELD EVALUATION WORK PLAN
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FORMER FORT ORD
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Acronyms and Abbreviations

Army	United States Department of the Army
ASR	Archives Search Report
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
CMC	central maritime chaparral
COC	contaminant of concern
CQCSM	Contractor Quality Control System Manager
CSM	conceptual site model
CTS	California Tiger Salamander
DEM	digital elevation module
DGM	digital geophysical mapping
DMM	discarded military munitions
DoD	Department of Defense
DQO	data quality objective
EFA	Eucalyptus Fire Area
EOD	explosive ordnance disposal
ESCA RP	Environmental Services Cooperative Agreement Remediation Program
GIS	geographic information system
GPS	global positioning system
HE	high explosive
HMP	Habitat Management Plan
HMX	cyclotetramethylene tetranitramine
ISD	insufficient data
KEMRON	KEMRON Environmental Services, Inc.
LAW	light anti-tank weapon
LiDAR	light detection and ranging
LUC	land use control
MACTEC	MACTEC Engineering and Consulting, Inc.
MD	munitions debris
MEC	munitions and explosives of concern

mm	millimeter
MOUT	Military Operations in Urban Terrain
MPPEH	material potentially presenting an explosive hazard
MR	munitions response
MRA	munitions response area
MRS	munitions response site
MSL	mean sea level
OB/OD	open burn/open detonation
OE	ordnance and explosives
PDA	personal digital assistant
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RACR	remedial action completion report
RCRA	Resource Conservation and Recovery Act
RDX	cyclotrimethylenetrinitramine
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RRD	range-related debris
RTK	real time kinematic
Shaw	Shaw Environmental, Inc.
SOP	standard operating procedure
SUXOS	senior unexploded ordnance supervisor
TCRA	time critical removal action
TS	Training Site
USA	USA Environmental, Inc.
USACE	U.S. Army Corps of Engineers
USAEDH	U.S. Army Engineer Division, Huntsville
USFWS	U.S. Fish and Wildlife Service
UXB	UXB International, Inc.
UXO	unexploded ordnance
UXOSO	unexploded ordnance safety officer
VSP	Visual Sample Plan

1.0 Introduction

Munitions Response Site (MRS)-Bureau of Land Management (BLM) Units 13, 17, and 20 (herein referred to as "Units 13/17/20") are located in the Impact Area Munitions Response Area (MRA) at the former Fort Ord, California. The Impact Area MRA consists of the 6,560-acre portion of the 8,000-acre historical Impact Area that is entirely within the natural resources management area described in the *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord, California* (HMP; U.S. Army Corps of Engineers [USACE], 1997) and is currently identified for transfer to the BLM. **Figure 1-1** depicts the regional location of the former Fort Ord and **Figure 1-2** shows Units 13/17/20 within the Impact Area MRA. The Impact Area MRA is covered by dense vegetation and the dominant plant community is Central Maritime Chaparral (CMC). This plant community is host to several State and Federal threatened or endangered species as well as many other rare species.

The Impact Area MRA was evaluated in the Track 3 Impact Area MRA Remedial Investigation/ Feasibility Study (RI/FS) (MACTEC Engineering and Consulting, Inc. [MACTEC], 2007). Based on the RI/FS, the Track 3 remedy was selected and is documented in the *Final Track 3 Record of Decision (ROD), Impact Area Munitions Response Area, Track 3 Munitions Response Site, Former Fort Ord, California* (ROD; U.S. Department of the Army [Army], 2008). The selected remedy includes (1) vegetation clearance via prescribed burning, (2) technology-aided surface munitions and explosives of concern (MEC) removal, (3) subsurface MEC removal in selected areas, (4) digital geophysical survey (DGM), and (5) land use controls (LUCs). The Army has been conducting the remedial action in the Impact Area MRA since 2008 based on the *Final Work Plan, RD/RA, Track 3 Impact Area Munitions Response Area, Former Fort Ord* (USACE, 2009).

Units 13/17/20 were selected for further evaluation prior to conducting the remedial action described above. Their physical characteristics differ greatly from the remainder of the Impact Area MRA in that they contain higher elevations, steeper slopes, more frequent and more prominent rocky outcroppings, and deeper and a greater number of ravines. Significant challenges were identified relative to the Army's ability to plan and execute safe prescribed burns in this area. Furthermore, if prescribed burning is determined not to be feasible, the site conditions present significant challenges to accessibility for safe conduct of vegetation cutting and MEC removal. In addition, due to the location of Units 13/17/20 at the eastern end of the historical Impact Area, limited historical evidence indicating the use of military munitions (other

than small arms) in potentially significant portions of the units, and surface MEC removal having already been conducted in a large portion of Unit 17 (Eucalyptus Fire Area [EFA]), an evaluation will be performed to confirm the portions of the units where remedial activities are warranted and can be implemented safely.

1.1 Purpose

The purpose of this Field Evaluation Work Plan is to present a summary of historical use information for Units 13/17/20 as well as describe the goals, methods, procedures, and personnel that will be used for field evaluation and data gathering activities.

Based on historical information supplemented by the results of the field work, this evaluation will:

- Delineate areas where remedial action activities are required;
    - Within areas where remedial action is required, define areas where site conditions will present significant challenges for the remedial action activities;
- Delineate areas where MEC removal is not warranted due to lack of evidence of munitions use; and
- Provide recommendations for prescribed burning.

Note that if portions of the units are identified as requiring remedial action, but MEC removal cannot be implemented safely, risk management alternatives – such as LUCs – will need to be evaluated (this activity is not part of the scope of this work plan).

2.0 Background

This section presents background information related to Units 13/17/20. This information includes site location, history, site features, and current and future site use.

2.1 Site Location

Units 13/17/20 have a total combined area of 927 acres, not including the fuel breaks, and are located along the eastern boundary of the Impact Area MRA (**Figure 2-1**). The 157-acre Unit 13 is bounded by Steep Road to the north, Impossible Canyon Road to the west, Wildcat Ridge Road to the northeast, and Barloy Canyon Road to the southeast and south. Unit 17 is 562 acres and is bounded by Wildcat Ridge Road to the west, Impossible Canyon Road to the northwest, Eucalyptus Road to the north, and Barloy Canyon Road to the east. The eastern side of Units 13 and Unit 17 make up the eastern edge of the historical Impact Area. The 208-acre Unit 20 is bounded by Impossible Canyon Road to the west, Steep Road to the south, and Wildcat Ridge Road to the east. It should be noted that Wildcat Ridge Road is located on Impossible Ridge.

2.2 Military History

From 1917 to base closure in 1994, military units (e.g., cavalry, field artillery, and infantry) used portions of the former Fort Ord for training (e.g., maneuvers, live-fire) and other purposes. The initial land purchase included the Impact Area MRA; however, no evidence of established range areas within the Impact Area MRA was present on early 1940s aerial photographs. Military munitions identified within the Impact Area MRA are consistent with military munitions available for use prior to 1940.

The Impact Area MRA includes a number of ranges that have various historical uses, designs, and characteristics (**Figure 3-2**). Over the years, various types of munitions were used during training activities within the Impact Area MRA including hand grenades, mortars, rockets, practice mines, artillery projectiles, pyrotechnics, and small arms. Select ranges were used for small arms training activities only, while other ranges were characterized as multi-use. The firing ranges were located along the perimeter of the historical Impact Area such that weapons-firing was generally directed toward the center of the historical Impact Area. The historical Impact Area encompassed an area bounded by Eucalyptus Road to the north, General Jim Moore Boulevard to the west, South Boundary Road to the south, and Barloy Canyon Road to the east.

2.3 Topography

The topography of the Impact Area MRA consists of dune sand deposits that underlie the low rolling hills in the western and central portions. In the eastern portions of the site, where Units 13/17/20 are located, the terrain is more rugged and consists of ridges rising up to 600 feet above the canyon bottoms. It is characterized by relatively well-defined, north-south ridgelines and eastward flowing drainage channels within narrow, moderately to steeply sloping canyons. The topography of Units 13/17/20 consists primarily of steep slopes, canyons, and valleys to rolling hills on the outer edges of the site, with some grasslands and woodlands. Elevations range from approximately 190 feet above mean sea level (MSL) in the north end of Unit 17 to 930 feet above MSL on Wildcat Ridge to the south (**Figure 2-2**).

2.4 Site Conditions

A discussion of the general geologic, soil, and hydrogeologic conditions is presented in Appendix A of the *Final Work Plan, RD/RA, Track 3 Impact Area Munitions Response Area, Former Fort Ord* (USACE, 2009).

2.5 Natural Resources

As part of the Impact Area MRA, Units 13/17/20 are designated in the HMP as habitat reserve. The vegetation is dominated by CMC, oaks, and grasses (**Figure 2-3**). Special-status species that may be encountered within coastal scrub, grasslands, or maritime chaparral are discussed in **Section 10.0**. Measures to reduce impacts to natural resources will be implemented in accordance with the HMP and Programmatic Biological Opinion (U.S. Fish and Wildlife Service [USFWS], 2015). These measures are described in Field Standard Operating Procedure (SOP) 2 of the *Draft Final Quality Assurance Project Plan, Former Fort Ord, California, Volume II, Appendix A, Munitions and Explosives of Concern Remedial Action* (QAPP; KEMRON Environmental Services, Inc. [KEMRON], 2016c) and summarized in **Section 10.0** below.

2.6 Current and Future Site Use

Units 13/17/20 are within the Impact Area MRA, where access is currently restricted to authorized personnel only. An MRS Security Program to mitigate trespassing is currently being implemented by the Army (Army, 2016b). Signs warning of the dangers associated with unexploded ordnance (UXO) are present at regular intervals at the fence line of the Impact Area MRA.

Units 13/17/20 are currently identified for transfer to BLM for future management. Under the HMP, future habitat management activities within habitat reserve areas include habitat

restoration, enhancement (including prescribed burning), and monitoring. BLM has indicated that the future use could also include recreational access on established routes. Nearby BLM land is open to the public for hiking, biking, jogging, and horseback riding.

3.0 Historical Information

This section presents a summary of historical information associated with Units 13/17/20 as presented in previous documents. This information will help facilitate an understanding of the past use of Units 13/17/20, which assists in determining the potential for MEC to be present as well as its possible location. The historical information reviewed includes the following:

- Previous Investigations
- Historical Aerial Photographs and Training Maps (**Appendix A**)
- Annual Monitoring of the Eucalyptus Fire Area (EFA)
- KEMRON Site Walks (Photographs **Appendix B**)

3.1 Previous Investigations Summary

Numerous MEC-related investigations and removal activities have been conducted in the Impact Area MRA. Summaries of the investigations and MEC removal activities that have been performed to date within the areas of Units 13/17/20 are presented below. Areas of previous work are depicted on **Figure 3-1**. **Table 3-1** provides a list of historical ranges and training areas associated with Units 13/17/20 and **Figure 3-2** depicts their location. **Table 3-2** provides a list of MEC previously recovered in Units 13/17/20 as well as the adjacent fuel breaks. **Figure 3-3a** depicts an overview of MEC item locations within Units 13/17/20 and the immediately surrounding areas while **Figure 3-3b** provides more detailed information and the location of each MEC item within Units 13/17/20. Munitions debris (MD) data quality varies in previous reporting. If MD data is available, relevant information will be provided in the subsections.

This evaluation will focus on portions of the units where munitions responses were not previously conducted. Information from areas where MEC removal was previously conducted and documented was reviewed. While these areas are not subject to further evaluation, the information related to the development of the CSM is summarized below. These areas include the Military Operation in Urban Terrain (MOUT) Site Buffer, Range 36A, EFA, HA-33 and HA-34. The MOUT training area is located adjacent to Unit 17, outside the Impact Area MRA, and is being used as a tactical training area for law enforcement agencies. Subsurface MEC removal was completed on a 100-foot buffer surrounding the MOUT site (hereinafter referred to as the MOUT Site Buffer), including a portion within Unit 17. Range 36A in Unit 20 is not included in the field evaluation because it has achieved Resource Conservation and Recovery Act (RCRA) closure. Additional areas that are excluded from the field evaluation because MEC

removals have been conducted include HA-33 (located in Unit 20), HA-34 (located in Unit 17), the Impact Area MRA portion of the EFA (located in Unit 17), as well as the fuel breaks adjacent to the Units. The areas of previous work that are excluded from this field evaluation are displayed on **Figure 3-1**.

Additionally, historical use and previous investigation summaries are provided for MRS-14A, MRS-14D, MRS-28, MRS-30, and MRS-47 that are adjacent to Units 13 and 17 (adjacent to the Impact Area MRA) because they could provide information that is relevant to munitions that could be identified in Units 13/17/20.

3.1.1 Revised Archives Search Report

The Archives Search Report (U.S. Army Engineer Division, Huntsville [USAEDH], 1997) was reviewed for information on sites within, adjacent to, and overlapping Units 13/17/20. These sites are described in detail in subsequent subsections and are included in **Table 3-1** and **Figure 3-2**.

3.1.2 Track 3 Impact Area MRA RI/FS

One purpose of the Track 3 Impact Area MRA RI/FS was to describe the site conditions and nature and extent of MEC based on then available data. Sites identified in the RI/FS that are located within or overlap portions of Units 13/17/20 include MRS-27J, MRS-27O, Combat in Cities, Mock-up Village, Fragmentation Hand Grenade/HE Hand Grenade (Range 36), Rocket Launcher Range, Close Combat Course, Rifle Grenade Range, Impossible Ridge Training Area, Artillery Position, Barloy Canyon Sub-Machine Gun Range, Wildcat Ridge Training Area, Combat Pistol Range (Range 35A), Wildcat Ridge Day/Night Combat Course, MOUT Complex, Range 35 3.5-Inch Rocket Launcher, Machine Gun Assault/Close Combat/Mortar (Range 34), STT (Range 46), EOD Range (Range 36A), Demolitions Range (Range 33), and Wildcat Ridge Day/Night/CDCEC Range/Helicopter Attack (Range 32) (MACTEC, 2007). A summary of these sites is provided in **Table 3-1** and their locations are depicted on **Figure 3-3a**.

The Track 3 Impact Area MRA RI/FS also identified areas overlapping Units 13/17/20 that are suspected to contain specific types of MEC based on previous investigations and historical documentation (MACTEC, 2007) (**Figure 3-3a**). The following areas are considered approximate and may either overestimate or underestimate the area in which MEC may be found:

- Area of "HE/Practice Mortars" along the western borders of Units 13 and 20

- Area of "rifle grenades" along the northwestern border of Unit 17 and northeastern border of Unit 20
- Area of "40mm projectiles" along the western borders of Units 13 and 20 and another area in the center of Unit 17
- A large area of "75mm projectiles" in the northwestern portion of Unit 13, along the western border of Unit 17, and in the southern portion of Unit 20
- Area of "37mm projectiles" along the northwestern border of Unit 20
- Area of "3.5-inch practice rockets" in the northwestern portion of Unit 17 as well as along the central western border of Unit 20

3.1.3 Impact Area Grid Sampling

An initial evaluation to determine the scope of future munitions response in the historical Impact Area was conducted in 1997 and 1998. The Impact Area was identified in the After Action Reports as Site MRS-15. Site MRS-15A is located inside the range fans of the small arms ranges inside the Impact Area. MRS-15A does not overlap with Units 13/17/20 and will not be further discussed (USA, 2000a).

Site MRS-15B encompassed the areas located behind the firing points and between the range fans around the perimeter of the Impact Area and are accessible from South Boundary Road, Barloy Canyon Road, Eucalyptus Road or North-South Road. Note that North-South Road was later renamed General Jim Moore Boulevard (USA, 2000c).

The objective was to remove all MEC items from sample grids to a depth of four feet, with deeper excavations as approved by the USACE OE Safety Specialist. No MEC was identified deeper than the removal depth specified. This sampling action ultimately included a 100% search and investigation of 7 100-foot by 100-foot sample grids within Units 13/17/20 (**Figure 3-1**) (USA, 2000c). A total of 2 UXO items and 3 DMM items were identified in the 7 grids within Units 13/17/20 during these activities (**Table 3-2** and **Figure 3-3b**).

3.1.4 MOUT Site Buffer

A MEC remedial action was completed within the MOUT Site Buffer in 2014 (**Figure 3-1**). The scope of this project entailed manual vegetation clearance and a technology-aided surface and subsurface MEC removal within the MOUT Site Buffer, consisting of approximately 22 acres. Approximately 13.75 of these 22 acres were completed in Unit 17. Surface and subsurface MEC

remediation was completed over the entire project area with the exception of existing paved roads. Four UXO items and 78 DMM items were encountered and removed as part of MEC remediation activities in the Unit 17 portion of the MOUT Site Buffer (ITSI Gilbane, 2014a) (**Table 3-2** and **Figure 3-3b**).

3.1.5 Range 36A

This 200-foot by 400-foot area is located wholly within the boundaries of Unit 20 and was used by the Army from the 1940s through October 1992 to dispose of military ordnance and commercial explosives. Disposal occurred by open burning and open detonation (OB/OD). Range 36A was also used for EOD training.

The Army completed a munitions response to a maximum depth of four feet to address the possibility that MEC may be present at Range 36A (**Figure 3-1**). Excavation continued as long as metallic debris was visible or as directed by the OE Safety Specialist. No MEC items were found and most metallic debris was within six inches of the surface. No MEC was identified during the investigation and 217 pounds of MD identified as scrap was removed. There were two notes in the data sheets describing MD related to 40mm and 81mm projectiles; otherwise, it was simply referred to as scrap. The results of the munitions response (MR) investigation are presented in Volume II of the Final Revision 1 RCRA Closure Certification Report for Range 36A (Shaw, 2007).

3.1.6 Basewide Range Assessment

The Comprehensive Basewide Range Assessment Report documents the status of sites identified for investigation for the presence of potential chemicals of concern (COCs) at known or suspected small arms ranges, multi-use ranges, and military munitions training areas within the former Fort Ord military complex. Site walks were conducted within the boundaries of Units 13/17/20 in 2001 in support of the site reconnaissance for the Basewide Range Assessment (BRA) (**Figure 3-4**). The intent of the site walks was to document features such as targets, firing lines, presence of MEC, etc. that determined whether further investigation of COCs was required. Refer to **Table 3-1** for information on what was identified in relation to Units 13/17/20. The BRA sites were then evaluated to ascertain whether the potential COCs could be present in sufficient amounts to warrant remediation (Shaw, 2012). A summary of the training areas identified in the BRA that are located within, overlap, or are adjacent to portions of Units 13/17/20, including HA-32, HA-33, HA-34, HA-35, HA-35A, HA-36, HA-36A, HA-67, HA-69,

HA-71, HA-72, HA-75, HA-105, HA-108, HA-142, HA-147, HA-158, HA-160, and HA-177, is provided in **Table 3-1**, and their locations are depicted on **Figure 3-2**.

Soil remedial action was completed at HA-33 and HA-34 (HA-72) as discussed in **Section 3.1.7**, HA-32 was recommended for reconnaissance and soil sampling after MEC removal, and all other areas were recommended for no further action under the BRA program.

3.1.7 Site 39 Inland Ranges

The Site 39 Inland Ranges Remedial Action Completion Report (RACR) describes the soil remedial action completed to address the soil contamination component of the 8,000-acre historical Impact Area (ITSI Gilbane, 2014b). MEC removal on the surface and at depth was required to support soil remediation areas located within the Site 39 Inland Ranges where historical use included training with various types of munitions, including hand grenades, mortars, rockets, mines, and artillery. The two areas associated with Units 13/17/20, HA-33 and HA-34, were discussed in the RACR (**Figure 3-1**).

HA-33 is a 0.42-acrea area located in Unit 20, southeast of the intersection of Hawkeye and Impossible Canyon Roads, which was used as a Demolition Range. The focus of the remediation was to excavate soil contaminated with cyclotrimethylenetrinitramine (RDX) and cyclotetramethylene tetranitramine (HMX). It was determined that HA-33 had a low probability of encountering MEC; therefore, pre-remediation MEC removal was not required, and the soil was excavated with the aid of construction support. Approximately 20 cubic yards of soil were excavated with an excavation depth of one foot. No MEC or MD was identified during the soil remediation. Post-soil remediation MEC removal was conducted to a depth of four feet (based on the results of a DGM investigation) to facilitate safe habitat restoration activities. All detected anomalies were investigated or resolved. No MEC items were encountered, and approximately seven pounds of MD was recovered (ITSI Gilbane, 2014b).

HA-34 is a 13.8-acre area within Unit 17 located south of the intersection of Eucalyptus Road and Barloy Canyon Road. Historical documentation indicates that Range 34 was a multi-use range used as a Close Combat Course from the late 1950s through the late 1960s, then later used as a Machine Gun Assault Course and a mortar range. Weapons authorized for use included the M60 machine gun, M14 rifle, M16 rifle, 81mm mortar, and 4.2-inch mortar. The focus of the remediation was to excavate soil contaminated with lead.

HA-34 was identified as having moderate to high probability of encountering MEC and required MEC removal to depth within the footprint of the remediation areas prior to excavation. Four UXO items were identified during pre-remediation MEC removal (**Table 3-2** and **Figure 3-3b**). 6,210 pounds of MD were also recovered. It was necessary to provide construction support during soil remediation activities. Approximately 29,330 cubic yards of soil were excavated with an excavation depth ranging from one foot to five feet. One UXO item was found during the soil remediation (**Table 3-2** and **Figure 3-3b**). MD included rifle smoke grenades, practice hand grenades, machine gun links, practice 40mm projectiles, illumination signals, blasting caps, and hand grenades. Post-soil remediation MEC removal was conducted to a depth of four feet (based on the results of a DGM investigation) to facilitate safe habitat restoration activities. All detected anomalies were investigated or resolved. No MEC items were encountered and approximately 356 pounds of MD was recovered (ITSI Gilbane, 2014b).

3.1.8 Time Critical Removal Action – Eucalyptus Fire Area

In July 2003, an accidental fire started in the MOUT site and burned an area of 644 acres, now referred to as the EFA. The Impact Area MRA portion of the EFA included approximately 367 acres in Unit 17 (**Figure 3-1**). The Impact Area MRA portion of the EFA includes the northeastern corner of the Impact Area MRA and is bounded by Eucalyptus Road to the north, Wildcat Canyon to the west, Barloy Canyon Road to the east, and Wildcat Ridge to the south (Shaw, 2005). The remaining acreage was on adjacent property that was previously transferred to the BLM. The BLM portion of the EFA lies to the east of the northern half of Unit 17 and extends to the northeast.

The fire removed vegetation, which provided access for military munitions activities. A TCRA was conducted subsequent to the fire to remove MEC exposed on the ground surface before vegetative regrowth. Some complete grids or partial grids were inaccessible due to steep terrain or unburned vegetation. Within the Impact Area MRA portion of the EFA, there were 3.5 acres that were inaccessible due to steep terrain and MOUT buildings and 16.6 acres that were unburned; therefore, a total of 347.1 acres had surface MEC removal performed (**Figure 3-1**) (Shaw, 2005).

A visual surface sweep was performed throughout the EFA to locate and remove MEC (and MD over 2 inches in size) found on the ground surface. Sweep teams consisted of crews walking side-by-side and spaced 4 to 8 feet apart, visually searching the ground for military munitions. The removal included surface removal of MEC to include disposal by detonation; surface

removal of MD over two inches; and certification, verification, demilitarization, and disposal of MD.

Quality Control (QC) activities performed during the work completed at the Eucalyptus Fire Area removal included physically walking each grid at least once with coverage of 10 to 20 percent; physically walking some grids twice, due to vegetation, with coverage of 15 to 25 percent; observing field activities to verify compliance with required procedures; reviewing field documentation; and reviewing project data from GIS and verifying data verses field conditions. All but 3 grids passed the initial QC process. The grids that failed QC were swept again and QC was performed a second time. No other QC variances were reported during the project.

In addition to these QC activities, USACE preformed Quality Assurance (QA) activities that included monitoring subcontractor field practices including announced and extemporaneous, unobtrusive observations; reviewing and observing field ground control and GPS procedures; independent examination of data files and anomaly maps; and physically walking of at least 10 percent of each grid at least once. No QA failures were reported for this project.

During the surface sweep, several HE 40mm projectiles were identified. 40mm projectiles are inherently hazardous because they have a point-detonating fuze that can be initiated by physical disturbance. Additionally, they were found in areas of sandy soil where the possibility of live items being buried in the shallow depth below ground surface existed. Procedures were modified in the 22 grids associated with these areas to allow use of metal detectors and subsurface investigation of anomalies to a depth of six inches as a precautionary safety measure in addition to the surface sweep. Surface removal was conducted within the exclusion zone using all-metals detectors followed by subsurface anomalies identified with the detectors being investigated by manual excavation to a depth of approximately six inches (**Figure 3-1**) (Shaw, 2005).

A total of 32 UXO items and 9 DMM items were removed from the Impact Area MRA portion of the EFA (**Table 3-2** and **Figure 3-3b**). 20 UXO items and 2 DMM items were removed from the BLM portion of the EFA (**Figure 3-3a**). Munitions debris consisted primarily of 3.5-inch practice rockets, practice hand grenades, hand grenade fuzes, practice rockets, and signals (Shaw, 2005).

3.1.9 MEC Removal on Fuel Breaks

To prevent the spread of accidental fires and to manage prescribed burns within the Impact Area MRA, fuel breaks were established around portions of the Impact Area MRA perimeter and reestablished in the interior portions of the Impact Area MRA.

As reported in the 2001 Maintenance Report Fuel Breaks Multi-Range Area document (Parsons, 2001), in accordance with the recommendation that the Impact Area be divided into defensible polygons, additional fuel breaks were re-established in 2001. Initially it was determined that fuel breaks would consist of a 15-foot wide central road cleared of MEC on the surface and to a depth of four feet with a 15-foot wide surface MEC removal on either side (45-foot total surface width). In some areas, the width of the road area with subsurface MEC removal to a four-foot depth was 20 feet (50-foot total surface width). MEC removal actions were designed to address MEC to depths of four feet. If a magnetometer detected an anomaly, the anomaly was excavated and removed. The fuel breaks were comprised of contiguous 45- by 100-foot or 50- by 100-foot grids (Parsons, 2001). The information provided below relates to the entire length of the fuel breaks, which may not relate directly to the boundaries of Units 13/17/20.

- Impossible Canyon Road had surface MEC removal performed on 17.58 acres and 4-foot subsurface removal on 4.82 acres (**Figure 3-1**).
    - Seven UXO items were identified (**Table 3-2** and **Figure 3-3b**).
- Surface MEC removal was performed adjacent to the western side of Barloy Canyon Road to create a fuel break on the perimeter of the Impact Area MRA totaling 17.73 acres. No subsurface MEC removal was conducted (**Figure 3-1**).
    - No MEC items were identified.
- Eucalyptus Road had surface MEC removal performed on 8.02 acres. No subsurface MEC removal was conducted (**Figure 3-1**).
    - No MEC items were identified.
- Steep Road had surface MEC removal performed on 2.44 acres and 4-foot subsurface removal on 1.01 acres (**Figure 3-1**).
    - Two UXO items were identified (**Table 3-2** and **Figure 3-3b**).
- Wildcat Ridge Road had surface MEC removal performed on 11.06 acres and 4-foot subsurface removal on 1.79 acres (**Figure 3-1**).

- Two UXO items were identified (**Table 3-2** and **Figure 3-3b**).

Note that there were three phases involved in the establishment of the fuel breaks; however, fuel breaks associated with Units 13/17/20 were not identified in the After Action Reports for the initial fuel break removal conducted in 1998 (USA, 2001b) nor in Phase 3 conducted in 2006 (Parsons, 2006).

Additional MEC removal from fuel breaks adjacent to Units 13/17/20 was completed in 2012. Both MEC surface removal and removal to depth was performed as part of this activity in accordance with the *Final Site-Specific Work Plan Munitions and Explosives of Concern Remedial Action Non-Burn Areas Former Fort Ord, California* (Shaw, 2010).

- Wildcat Ridge Road had surface and 4-foot subsurface MEC removal performed 11 acres (**Figure 3-1**).
  - Eight UXO items were identified (**Table 3-2** and **Figure 3-3b**).
- Steep Road had surface and 4-foot subsurface MEC removal performed on 2.4 acres (**Figure 3-1**).
  - Four UXO items and one discarded military munition (DMM) item were identified (**Table 3-2** and **Figure 3-3b**).

DGM surveys were also conducted on the permanent fuel breaks located within the Impact Area MRA. Permanent fuel breaks have generally had technology-aided surface MEC removal and some subsurface MEC removal along a 45-foot wide path. Permanent fuel breaks associated with Units 13/17/20 in the DGM of the Permanent Fuel Breaks Technical Information Paper (Shaw Environmental, Inc. [Shaw], 2011b), included Steep Road, Wildcat Ridge Road, and the portion of Impossible Canyon Road between Hawkeye Road and Steep Road (**Figure 3-1**). Portions of Wildcat Ridge were not surveyed because they were deemed inaccessible to the DGM equipment as the center road portion consisted of asphalt and/or there were concrete culverts along the outer road buffers (Shaw, 2011b).

The Impossible Canyon Road survey revealed low to moderate anomaly density. Steep Road had a low anomaly density, and Wildcat Ridge Road showed mostly low anomaly density with a couple moderate areas (Shaw, 2011b). It is important to note that anomaly densities do not necessarily relate to the presence or density of subsurface MEC as all metallic objects are recorded including cultural debris such as barbed wire.

3.1.10 Current Removal Efforts

Preparation for the 2016 prescribed burns included vegetation cutting and surface MEC removal of approximately 17 acres within Unit 13, 4 acres within Unit 17, and 10 acres within Unit 20 (KEMRON, 2016b). As of October 17, 2016, 5 material potentially presenting an explosive hazard (MPPEH) items have been identified within Unit 13 and 1 MPPEH item was identified within Unit 20 (**Table 3-2** and **Figure 3-3b**).

Burn preparation work is also being conducted at Unit 25 (KEMRON, 2016b) and MEC removal efforts are being performed in Unit 28 (KEMRON, 2016a) in support of the selected remedy described in the Track 3 ROD. Unit 25 is adjacent to the western border of Units 13 and 20. Unit 28 is adjacent to the western border of Unit 20. Refer to **Figure 3-3a** for the types of munitions items found in these units as of October 17, 2016.

3.1.11 Laguna Seca Parking MRA

The Laguna Seca Parking MRA consists of land that was transferred to the Fort Ord Reuse Authority and includes MRS-14A (Lookout Ridge II, HA-105), MRS-30 (Laguna Seca Turn 11, HA-160), and MRS-47 (Wolf Hill, HA-177) (Environmental Services Cooperative Agreement Remediation Program [ESCA RP] Team, 2012). MRS-14A is located east of and adjacent to Units 13 and 17; MRS-30 is located south of and adjacent to Unit 13, just north of and adjacent to the Laguna Seca Raceway; and MRS-47 is located to the southwest of and adjacent to Unit 13, just north of the Laguna Seca Raceway (**Figure 3-2**). Note that MRS-29 is also included in the Laguna Seca Parking MRA; however, it is located southeast of MRS-14A and is not suspected of having the potential to affect Units 13/17/20.

According to the *Final Group 3 Remedial Investigation/Feasibility Study, Volume 1: Remedial Investigation, Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, Monterey County, California* (ESCA RP Team, 2012), recovered MEC and MD suggested that training occurred in the vicinity of the Laguna Seca Parking MRA starting prior to WWII. The review of the historical training maps and results of sampling and removal operations indicated that the MRS-47 portion of the Laguna Seca Parking MRA was an impact area prior to WWII and into the 1970s. The remainder of the Laguna Seca Parking MRA, including MRS-14A and MRS-30, appeared to have been used for basic maneuvers with occasional impact by various projectiles. MRS-30 was part of the historical Impact Area since at least 1945 (ESCA RP Team, 2012).

Historical aerial photographs and training maps indicated artillery and mortar training beginning in the Laguna Seca Parking MRA in the 1950s along with the establishment of the Lookout Ridge (MRS-14A) and Wolf Hill (MRS-47) training areas. Training maps indicated aviation training in MRS-14A beginning in 1968, with the addition of helipads and an aircraft rappelling training area in the 1980s. A 1972 training map indicated the use of MRS-47 as a demolition area. The 1982 Training Facilities Map showed the western portion of MRS-47 labeled as Platoon Attack Course (ESCA RP Team, 2012). The portion of the Laguna Seca Parking MRA corresponding to MRS-14A was included in MRS-14. MRS-14 was described as containing 7-inch and 8-inch naval projectiles; however, no such projectiles or evidence of such projectiles were identified within the site. MRS-14 was used for subcaliber artillery and mortar practice from approximately 1972 through 1992 (USAEDH, 1997). In addition, the blank small arms ammunition, pyrotechnics, smoke-producing items, and practice and smoke hand grenades recovered throughout the Laguna Seca Parking MRA indicate that the area was used for troop training in basic maneuvers (ESCA RP Team, 2012).

Data resulting from sampling and removal actions within the Laguna Seca Parking MRA indicated that training operations in the vicinity included the use of various projectiles, mortars, rockets, missiles, grenades, and miscellaneous flares, signals, and simulators (ESCA RP Team, 2012).

Surface and subsurface removal actions were conducted in MRS-14A (UXB International, Inc. [UXB], 1995b; USA Environmental, Inc. [USA], 2001a). A total of 29 UXO items were identified during these removal actions, with 3 “insufficient data” (ISD) entries (**Figure 3-3a**).

One (1) UXO item was removed during the removal action conducted on MRS-30 (UXB, 1995a) (**Figure 3-3a**).

Surface and subsurface removal actions were conducted in MRS-47 (UXB, 1995c; USA, 2000b). A total of 76 UXO items were identified during these removal actions, with 2 ISD entries (**Figure 3-3a**).

3.1.12 MRS-14D – Site 14 West

MRS-14D is located east of and adjacent to Unit 17; situated between Barloy Canyon Road and Lookout Ridge Road (**Figure 3-2**). Based on interviews conducted as part of the archives search investigation, MRS-14 was suspected of containing 7- and 8-inch naval projectiles that overshot the Impact Area west of the site; however, no such projectiles or evidence of such a projectile

was identified within the site (USAEDH, 1997). MRS-14D is a subsite of MRS-14. MRS-14D was identified as Range P-5 on 1972 through 1987 ranges and training maps. Range P-5 was used as a 14.5 millimeter (mm) subcaliber and 22mm subcaliber range (Gilbane, 2015).

MEC sampling operations were performed at MRS-14, before it was subdivided into five parts (A through E), and then again specifically in MRS-14D. Information regarding MD, range-related debris (RRD), and small-arms ammunition removed during the MEC sampling operations at MRS-14D was not documented because documentation of those items was not required at the time the operation took place. Based on the results of the sampling operation, the decision was made that a surface and subsurface removal action was required (Gilbane, 2015). A total of 14,825 UXO items and 13,768 DMM items were identified during these removal actions (**Figure 3-3a**).

3.1.13 MRS-27J – Training Site 10

MRS-27J (Training Site [TS]-10) was identified in the BLM Area B and MRS-16 Track 2 RI/FS as a former training site used as a bivouac area. The southern half of the site is located within the Impact Area MRA and the northern half is located within MRS-10A and MRS-10B. MRS-27J was listed as TS-10 on a 1984 training map. Bivouac Area L was identified as being located at the site in 1967. Additionally, MRS-27J was identified as being located partially within the known distance range (Gilbane, 2015).

Removal and sampling activities were conducted for MRS-10A and MRS-10B from 1995 through 2000 (Gilbane, 2015) (**Figure 3-3a**).

3.1.14 MOUT Site MRA

The MOUT Site MRA consists of MRS-28, which is the MOUT training area, and a portion of MRS-27O (TS-15). MRS-27O is a training site that overlaps the northern portion of Unit 17 (ESCA RP Team, 2012).

Recovered MEC and MD items suggested hand grenade training and troop training in MRS-28 began in the 1940s. Hand grenade training in MRS-28 and combat course training along Barloy Canyon Road was shown in maps from as early as 1953. Training facility maps showed features that indicated increased activity in the 1960s and 1970s, including a rocket launcher range, close combat course range, squad tactics range, and night defense fire range. A bivouac training area and grenade training area were also identified. In the 1960s, a firing point for a rocket launcher range was positioned in the center of MRS-28 and directed south. Training maps from the 1980s

indicate the addition of training areas and several range fans, including combat pistol training, a subcaliber firing range, and several other unspecified ranges. (ESCA RP Team, 2012).

The MOUT training area was described in the 1997 Archives Search Report (ASR) as potentially being used as an explosive ordnance disposal (EOD) training area. The MOUT training area contains Impossible City, which was a mock city used for training infantry to operate within an urban center. The MOUT training area also contains Tire House, constructed of sand-filled tires, which was authorized for use of live small arms and high explosive (HE) hand grenades (USAEDH, 1997). "The 1997 ASR also stated that 40mm HE grenades and bazooka projectiles were fired into Wildcat Canyon located south of Impossible City" (ESCAP RP Team, 2012).

Grid sampling investigations including surface and subsurface removal were conducted in MRS-28 to determine the need for performing a MEC removal action. A total of 38 UXO items and 6 DMM items were identified during these activities (**Figure 3-3a**).

A removal action conducted in support of the EFA Time Critical Removal Action (TCRA), discussed in **Section 3.1.8**, encompassed MRS-27O (ESCA RP Team, 2012).

3.2 Aerial Photograph and Historical Map Review

Historical aerial photographs from 1941, 1949, 1978, and 1986 as well as historical maps from 1953, 1956, 1961, 1964, 1965, 1968, 1971, 1984, and 1987 that include Units 13/17/20 areas were reviewed as part of this evaluation. No evidence of established range areas within the Impact Area MRA is present on early 1940's aerial photographs or documented on existing training maps (MACTEC, 2007).

The photographs and maps provide evidence of the location and extent of former ranges and areas of activity. However, ranges or training areas that were observed as part of this evaluation were previously identified in other historical documents as discussed above. Therefore, additional discussion will not be provided here. **Appendix A** presents the aerial photographs and historical training maps reviewed for this evaluation.

3.3 Annual Monitoring

As part of the selected remedy described within the Track 3 ROD, the Army conducts monitoring of safety/security data for areas within Track 3 where a removal of MEC has been completed. This includes the review of reports and observations involving potential MEC; the recording, compilation, and analysis of MEC incident reports; and conducting annual area walks. An assessment of area conditions is developed annually until the area is determined to have reached a stable condition.

An area walk is a component of the monitoring program and is an effort to determine if MEC has become exposed by erosion, flooding, or other weathering effects. Also of interest is the presence of expended or practice projectiles and casings MD that retain their original configuration. The presence of MD may indicate the potential for MEC to be similarly present and require adjustment to access, security, or other operating procedures.

The area walk does not assess the entirety of an area but focuses on locations likely accessible to trespassers and authorized workers. In addition, earthworks (revetments and excavations), previous target and MEC locations, range roads, fuel breaks, banks, and slopes are of interest. **Figure 3-4** illustrates the tracks that were walked during the annual monitoring efforts.

2009 As described in the *Munitions and Explosives of Concern, Area Monitoring Reports, Fort Ord, California, 2009* (Army, 2009), an area walk of the EFA surface removal area and Range 34 was conducted on June 5 and June 8, 2009. The walk was designed to traverse identifiable target locations, vegetation transition zones (grassland to brush and moderate to heavy brush), areas of sparse vegetation, unstable slopes, locations where surface MEC was previously removed, and roadways. Prior to the walk the possible visual surface disposition of 40mm HE projectiles was reviewed due to the previous evidence of their use in the area and the potential danger of those items.

During the area walk, a considerable amount of RRD (target debris) and MD were encountered (small arms casings and projectiles, MD fragments). No MEC was identified during the area walk. Encounters with suspicious munitions items were recorded by photo and global positioning system (GPS) coordinates. The majority of MD observed was identified as small arms, expended subcaliber light anti-tank weapon (LAW) rockets, expended 40mm practice projectiles, and 60mm and 81mm mortar fins. The photos were examined by the project USACE OE Safety Specialist, and the items were determined to be MD.

2010 As described in the *Munitions and Explosives of Concern, Track 3 Area Monitoring Reports, Former Fort Ord, California, 2010* (Army, 2010), an area walk of 1.13 acres (0.42 percent) of the EFA surface removal areas was conducted on March 12, 2010. The walk was designed to traverse identifiable target locations, vegetation transition zones (grassland to brush and moderate to heavy brush), areas of sparse vegetation, unstable slopes, locations where surface MEC was previously removed, and roadways. Prior to the walk, the possible visual surface disposition of 40mm HE projectiles was reviewed due to the previous evidence of their use in the area and the potential danger of those items as UXO.

During the area walk, no MEC or MD was encountered. More than 6 years had passed since the completion of a surface removal action on EFA. In the intervening years, the maritime chaparral habitat had recovered considerably from the associated vegetation removal actions and obscured approximately 80 percent of the ground surface area. The plants in these areas have recovered sufficiently enough to significantly hinder access on foot in the majority of the grids.

2011 As described in the *Final Track 3 Surface Removal Area, Munitions and Explosives of Concern, Monitoring Reports, Former Fort Ord, California, 2011* (Army, 2011), an area walk of 1.6 acres (0.4 percent) of the EFA surface removal areas and Range 34 was conducted on February 16, 2011. The walk was designed to traverse identifiable target locations, vegetation transition zones (grassland to brush and moderate to heavy brush), areas of sparse vegetation, unstable slopes, locations where surface MEC was previously removed, and roadways. Prior to the walk, the possible visual surface disposition of 40mm HE projectiles was reviewed due to the previous evidence of their use in the area and the potential danger of those items as UXO. During the area walk no MEC and no MD was encountered. More than 7 years had passed since the completion of a 100 percent surface removal action on EFA. In the intervening years, the maritime chaparral habitat had recovered considerably from the associated vegetation removal actions and at the time of the 2011 area walk obscured approximately 90 percent of the ground surface area. The plants in these areas had recovered sufficiently enough to significantly hinder access on foot in the majority of the grids.

Due to the absence of observed MEC during 3 years of monitoring and the significant obscuration of the surface by vegetation in the majority of the area, additional surface remediation was not recommended. Additionally, vegetation recovered in the EFA to a point that continued surface monitoring would not be effective and would no longer be conducted.

2012 As described in the *Munitions and Explosives of Concern Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2012* (Army, 2012), an area walk of the visible boundary of approximately 4,183 feet of Range 34 occurred on March 2, 2012. The walk was designed to observe a newly created unstable boundary between the soil excavation and adjacent habitat as well as alluvium deposit locations and where surface MEC was previously removed. While the subsoil exposed by the excavation could be transited on foot with ease, access to the surrounding dense CMC undergrowth was limited to trails and small grasslands. Previous locations or areas with evidence (previous finds or range reference) of MEC were of particular interest. Some MEC-like MD (inert/expended but visually similar to MEC) was collected during the area walk. Due to the potential for surface exposure of white phosphorus rifle grenades as UXO at the boundary of recent excavation, continued monitoring was recommended until habitat restoration

has stabilized the soil excavation boundaries to the degree that MD was not reported exposed by erosion for consecutive years.

2013 As described in the *Munitions and Explosives of Concern Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2013* (Army, 2013), a MEC incident was reported on 9 December 2012 describing the discovery of a UXO white phosphorus rifle grenade in alluvial material during an engineering response to erosion on Range 34.

An area walk examined approximately 300 feet of the visible boundary of Range 34 and the visible portion of the adjacent ground surface in March-April. The walk included observing where MEC was previously removed. Several suspected MEC items observed in grids adjacent to Range 34. Four (4) grids were reported to the UXOSO for investigation of suspect items. All items subsequently collected were determined to be MD. Some MEC-like MD (MD which retains some visual MEC characteristics) was collected by the monitoring team from outside the southern boundary of the Range 34 excavation during the area walk. No MD or MEC was collected or noted within Range 34 during the area walk. No areas of high subsurface anomaly density remain in Range 34.

The unexcavated area adjacent to the boundary of Range 34 continues to yield MEC-like MD with characteristics of rifle grenades. Access to Range 34 should remain limited to authorized personnel. Due to the potential for surface exposure of UXO at the boundary and within subsequent alluvium, continued monitoring was recommended until engineering/habitat restoration has stabilized the soil excavation boundaries and MEC/MEC-like MD is not observed in or adjacent to the area for consecutive years.

2014 As described in the *Munitions and Explosives of Concern Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2014* (Army, 2014), an area walk inspected approximately 300 feet of the visible boundary of Range 34 and the visible portion of the adjacent ground surface March-April. The walk included observing where MEC was previously removed. No MD or MEC was collected or noted within Range 34 during the area walk. The unexcavated area adjacent to the boundary of Range 34 continues to yield MEC-like MD with characteristics of rifle grenades. Access to Range 34 should remain limited to authorized personnel. Due to the potential for surface exposure of UXO at the boundary and within subsequent alluvium, continued monitoring was recommended until engineering/habitat restoration has stabilized the soil excavation boundaries and MEC/MEC-like MD is not observed in or adjacent to the area for consecutive years.

2015 As described in the *Munitions and Explosives of Concern Track 3 Surface Area Monitoring Reports, Former Fort Ord, California, 2015* (Army, 2016a), an area walk observed approximately 300 feet of the visible boundary of Range 34 and the visible portion of the

adjacent ground surface March-April. The walk included observing where MEC was previously removed. One suspected MEC item was reported during the area walk. That item was identified as MD.

The unexcavated area adjacent to the boundary of Range 34 continues to yield MEC-like MD with characteristics of rifle grenades. Access to Range 34 should remain limited to authorized personnel. Due to the potential for surface exposure of UXO at the boundary and within subsequent alluvium, continued monitoring was recommended until engineering/habitat restoration has stabilized the soil excavation boundaries and MEC/MEC-like MD is not observed in or adjacent to the area for consecutive years.

3.4 KEMRON Site Walks

Approximately nine miles of visual survey site walks within Units 13/17/20 were performed between January and November 2015 by the Unexploded Ordnance Safety Officer (UXOSO) (Val Valdez, KEMRON) and the task manager (Larry Carr, Gilbane) to gather qualitative information on the layout of areas within Units 13/17/20 and to better understand the general terrain and accessibility. **Figure 3-5** depicts the transects associated with these site walks and the location of one MEC (DMM) and MD items identified in addition to other range related features. As small arms debris is not of concern to this investigation, the location of these items is not depicted; although these finds are discussed in the text below. The circled numbers on **Figure 3-5** denote the associated photograph number of the photographs included in **Appendix B**.

3.4.1 Unit 13

In the northern half of Unit 13, the terrain was observed to be steep with low to medium dense vegetation during a walk originating from Wildcat Ridge Road and down the southward facing portion of the ridge. Bedrock was exposed in this area. The former Wildcat Ridge Training Area was observed to the southeast and appeared to have two wood buildings (suspected storage sheds for targets) remaining. Shell casings (0.30 caliber and 5.56mm) and clips were observed throughout the area. On the path heading towards the southwest, MD consisting of an unknown fuze (**Photograph 5**) and a M1907 fuze was encountered.

The walk continued into a ravine to the southwest where two structures were encountered. Each structure consisted of a concrete base with steel support pieces and was believed to be supports for former targets or possibly a machine gun rack (**Photograph 6**). The terrain surrounding the ravine was heavily eroded, including a former road washout leading into the area. In the ravine near the concrete structures, an unidentified MD item (most likely a piece of a fragmented

mortar) and 0.30 caliber shell casings and clips were observed. Two empty ammunition boxes were noted. 5.56mm (0.223") casings and links were also found near the concrete structures.

No evidence of training was visible in the west portion of Unit 13 along Impossible Canyon Road. To the east, a higher elevation terrain with medium dense vegetation was present. Evidence of maneuver-type training was visible, including dug out security positions, possible firing points, razor wire, and trenches. Shell casings (0.30 caliber) were found throughout the upper area of this site walk, outside the oak tree area. No MEC was observed.

On the east side of Unit 13, continuing towards the center of the unit, the terrain was rugged with a slight change in elevation and moderate vegetation consisting mostly of manzanita. A former concrete latrine foundation/pit was noted, along with a number of security ("fighting") positions and berms, concertina ("tanglefoot") wire, and small caliber casings (30 caliber and 5.56mm). These features are consistent with maneuver training activities.

3.4.2 Unit 17

In the northern portion of Unit 17, the terrain was flat at Impossible Canyon near the intersection with Eucalyptus and gained elevation towards the southeast. Bedrock was exposed in the higher elevation areas. The former suspected rifle range (or rifle grenade range), security positions, and firing points were noted near the intersection of Eucalyptus Road and Impossible Canyon Road. Above this area, an approximately 100-foot long, 2 to 3-foot deep, wood-reinforced trench was observed along with 3 concrete footings. On the ridge above was a steel plate target, which had damage consistent with armor-piercing munitions. A flattened elevated area/platform built up from rock was noted approximately 800 feet from Impossible Canyon Road. This elevated platform was approximately 400 to 500 feet from the previously described target and was overgrown with vegetation, which obscured it. No MEC was identified and 0.30 caliber shell casings were found along this transect.

Directly south of and adjacent to Range 34 is a portion of the EFA that was not included in the surface sweep during the TCRA due to unburned vegetation. During the site walk in this area, the terrain was observed to be moderately steep. MD consisting of a pyrotechnic rifle grenade, practice rifle grenade, and unknown rifle grenade were located in this area (**Figure 3-5** and **Photographs 1A, 1B, and 1C**).

Wildcat Canyon is located between Impossible Ridge and Wildcat Ridge; east of Wildcat Ridge Road. A site walk was performed through Wildcat Canyon. The terrain in Wildcat Canyon was primarily flat with a gradual increase in elevation heading south. A former Army road, now

overgrown, connects this area with the MOUT site. Small caliber shell casings (0.30 caliber) were found distributed in Wildcat Canyon. In the southern portion of Wildcat Canyon, an intact bandolier was observed containing 5.56mm rounds, as shown in **Photograph 4**. No MEC items were observed during this site walk.

Along Impossible Ridge, off the east side of Wildcat Ridge Road in Unit 17, the terrain was rocky and became steep towards the east. The vegetation was sparse and bedrock was prominent; therefore, the ground surface was mostly exposed. Expended 30mm casings were found off the eastern side of the ridge (approximately 50 to 100 feet). Some casings were grouped relatively close together, but approximately 25 casings were noted farther down the side of the ridge. They were likely transported by erosion. Empty small caliber shell casings (0.30 caliber) were also noted in this area.

Further south along Wildcat Ridge Road, a wood structure/platform feature was observed adjacent to a former road that runs approximately 40 feet to the east and parallel to Wildcat Ridge Road. No MEC or MD was observed during this site walk.

3.4.3 Unit 20

To the west of Wildcat Ridge Road, in the southern portion of Unit 20 and northwest of Range 32/Helicopter Attack training range (**Figure 3-2**), was an area where the ground surface was clearly visible because it was comprised of bedrock and low vegetation. Spent cartridge casings, 40mm, HE, M383 (approximately 30-40 MD items) were found approximately 150 feet west of Wildcat Ridge Road (**Figure 3-5** and **Photographs 3A and 3B).**

In the south-central portion of Unit 20, along the west side of Impossible Ridge (Wildcat Canyon Road), the terrain was relatively flat in the canyon with moderate to heavy vegetation. As the elevation increased, the vegetation density decreased, allowing for increased visibility of the ground surface. Erosional features were present along the flanks of the ridge, with a prominent washed out former road extending east-west from Impossible Canyon to Impossible Ridge. The site revealed only small caliber shell casings and associated clips. No MEC or any other evidence of training activities was observed.

Just west of Wildcat Ridge Road, in the central portion of Unit 20 on the western side of Impossible Ridge, a cartridge, 40mm, high explosive, M383 was identified amongst empty 40mm M383 casings (**Figure 3-5** and **Photograph 2**). The item is being dealt with in accordance with procedures outlined in the UXO SOP 5 in the QAPP (KEMRON, 2016). The distribution of

empty cartridges was similar to that of the spent 40mm M383 casings found to the south, as described previously.

3.5 Evaluation of Historical Use Information

Previous investigations, historical aerial and training map review, the annual monitoring of the EFA and Range 34, and the KEMRON site walks reveal that Units 13/17/20 have been used since before 1940 for a variety of training purposes including maneuvers, bivouacking, attack helicopter training, live fire exercises, day/night combat simulation, EOD training, demolitions, and small arms training. These training activities involved the use of live fire ammunition and there is potential to encounter MEC associated with artillery, mortars, rockets, hand grenades, pyrotechnics, and rifle grenades in portions of these units.

Additionally, past use history and MEC items identified during previous removal actions at the MRSs adjacent to Units 13/17/20 indicate use that has the potential to affect the munitions that could be identified within Units 13/17/20. These adjacent sites will be taken into consideration for the planning of the field investigations.

Based on the grid sampling; the surface removal, successful QA/QC activities, and annual monitoring that recommended no additional surface remediation at the EFA TCRA; Range 33, Range 34, and Range 36A removals; the MOUT Site Buffer removal; and the current burn preparation effort, approximately 405 of 927 acres have had surface MEC removal and 30 acres have had subsurface MEC removal. These areas are recommended for no further remedial action activities. Note that approximately 20 acres of the unburned areas in the EFA will be included in the field evaluation.

3.6 Data Gaps

Upon evaluation of the historical information and the previous MEC investigations that have occurred within Units 13/17/20, data gaps remain. The data gaps are as follows.

- As 405 of the combined 927 acres have had surface MEC removals, areas within the remaining 522 acres of Units 13/17/20 that require remedial action activities needs to be delineated (**Figure 3-1**).
- Site conditions in the remaining 522 acres of Units 13/17/20 that will limit or prevent the full implementation of the Track 3 remedy (as discussed in **Section 5**, the field evaluation will include recording vegetation type and density; estimated degree of slope; evidence or

presence of wildlife; or land disturbance that will present significant challenges for the remedial action activities).

- Areas where MEC removal is not warranted due to lack of evidence of munitions use.
- If prescribed burning can be conducted safely. An independent expert, the Fort Ord Burn Boss, will be provided with the additional information from the field evaluation discussed in **Section 5** and will be consulted on the feasibility of prescribed burning.

4.0 Conceptual Site Model Development

This section presents the CSM for Units 13/17/20 based on current understanding of historical site use and types of training that may have occurred. The CSM has been developed in accordance with EM 200-1-12 (USACE, 2012). As subsequent data is acquired, the CSM will be refined and updated as needed to provide the basis for site management decisions.

The CSM provides a basis for the site evaluation design and identification of potential release and exposure routes. The CSM incorporates information regarding the physical features and limits of the area of concern (the site), nature and source of the contamination (in this case, MEC), and exposure routes (potential scenarios that may result in contact with MEC).

4.1 Facility Profile

- Site location is discussed in **Section 2.1**.
- Units 13/17/20 are located 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. A MRS Security Program to mitigate trespassing incidents is currently being implemented by the Army (Army, 2016b). Existing access deterrents, such as warning signs posted approximately every 300 feet along the Impact Area MRA perimeter fencing, 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 and complete needed repairs in a timely manner. The fences are to be maintained long-term as part of the remedy (Army, 2016b).
- Some structures and range features are present within Units 13/17/20.

4.2 Physical Profile

- As stated in **Section 2.3**, topography of Units 13/17/20 consists primarily of steep slopes and canyons with rolling hills on the outer edges. As depicted on **Figure 2-2**, there are two north-south running ridge lines within Units 13/17/20 with two canyons located in between.
- Vegetation within these canyons is densely populated with CMC being the most extensive natural community. Other plant communities include coast live oak woodland

(coastal and inland); central coastal scrub; grassland; developed/landscaped/ruderal and disturbed dunes; and wetlands (including vernal pools and freshwater marsh (**Figure 2-3**).

- Geology, soil, and hydrogeology are discussed in **Section 2.4**.
- Mediterranean-type climate with dry, warm summers and moderate winters.

4.3 Release Profile

- Munitions Types
  - Units 13/17/20 have been used since before 1940 for a variety of training purposes including maneuvers, bivouacking, attack helicopter training, live fire exercises, day/night combat simulation, EOD training, demolitions, and small arms training. These training activities involved the use of live fire ammunition including artillery, mortars, rockets, hand grenades, pyrotechnics, and rifle grenades.
  - Refer to **Table 3-2** for the quantities, locations, and types of munitions items identified in and adjacent to Units 13/17/20.
- Release Mechanisms
  - Release mechanisms include potential discarding by personnel (resulting in DMM) or weapons firing (resulting UXO or MD).
- MEC Density
  - MEC density is expected to be low to moderate; any presence is expected to be heterogeneously distributed.
- Transport Mechanisms/Migration Routes:
  - There is a potential for MEC to be present on the surface as well as in the subsurface as a result of wind and water erosion.
  - There is also the potential for MEC that is in the subsurface to be exposed as a result of wind and water erosion.

4.4 Land Use and Exposure Profile

- Units 13/17/20 are identified for transfer to BLM for future management.

- Under the HMP, future habitat management activities within habitat reserve areas include habitat restoration, enhancement (including prescribed burning), and monitoring. MEC items could be encountered by the receptor types defined in the Track 3 Impact Area MRA RI/FS (MACTEC, 2007): prescribed burn workers, habitat monitors, habitat maintenance/restoration workers, construction workers, visitors, and trespassers. Surface pathways for MEC for these receptors are considered potentially complete.
- Because site work could include intrusive activities, a subsurface pathway for MEC is considered potentially complete for receptors involved in ground-disturbing or intrusive activities (e.g. habitat maintenance/restoration workers and construction workers).
- BLM has indicated that future use could also include recreational access limited to established routes where surface and subsurface MEC removal has been conducted, such as roads within fuel breaks. Therefore, surface and subsurface pathways for MEC for recreational users are considered incomplete.

4.5 Ecological and Cultural Resources Profile

- There are no known cultural resources present within Units 13/17/20.
- Ecological resources are discussed in **Section 10.0**.
  - Of consideration for the field evaluation is that the majority of Units 13/17/20 is dominated by CMC (**Figure 2-3**), which is identified as a protected plant community in the HMP (USACE, 1997).
  - The habitats within the Units 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. California tiger salamanders (CTS, *Ambystoma californiense*) could be encountered in areas near vernal ponds or in upland habitat.

5.0 Field Evaluation Plan

The field evaluation will be conducted in two separate phases. Phase I will include conducting visual survey of the open and accessible (with regard to vegetation and slope) areas within each unit based on light detection and ranging (LiDAR) imagery and of specific areas of potential interest identified from historical aerial photography. Phase II will use the results of Phase I, historical research, and the Visual Sample Plan (VSP) UXO module to determine the location and amount of additional coverage needed to sufficiently investigate the remainder of the units.

5.1 Data Quality Objectives

Data Quality Objectives (DQOs) are qualitative and quantitative statements that outline the decision-making process and specify the data required to support corrective actions. DQOs specify the level of uncertainty that will be accepted in results derived from data. The DQO process used for developing data quality criteria and performance specifications for decision making is consistent with the *Guidance on Systematic Planning Using the Data Quality Objectives Process*, United States Environmental Protection Agency QA/G-4 (USEPA, 2006). The DQO process consists of the seven steps below.

5.1.1 Step 1: State the Problem

The selected remedy includes (1) vegetation clearance via prescribed burning, (2) technology-aided MEC surface removal, (3) subsurface MEC removal in selected areas, (4) digital geophysical survey, and (5) LUCs (Army, 2008). Units 13/17/20 were selected for further evaluation before applying the remedy described above. Their physical characteristics differ greatly from the remainder of the Impact Area MRA in that they contain higher elevations, steeper slopes, more frequent and more prominent rocky outcroppings, and deeper and a greater number of ravines. Significant challenges were identified relative to the Army's ability to plan and execute safe prescribed burns in this area. Furthermore, if prescribed burning is determined not to be feasible, the site conditions present significant challenges to accessibility for safe conduct of vegetation cutting and MEC removal. In addition, due to the location of Units 13/17/20 at the eastern end of the historical Impact Area, limited historical evidence indicating the use of military munitions (other than small arms) in potentially significant portions of the units, and surface MEC removal having already been conducted in a large portion of Unit 17 (EFA), an evaluation will be performed to confirm the portions of the units where remedial activities are warranted and can be implemented safely.

5.1.2 Step 2: Identify the Goals of the Study

This evaluation will delineate areas where remedial action activities are required (within areas where remedial action is required, define areas where site conditions will present significant challenges for the remedial action activities); delineate areas where MEC removal is not warranted due lack of evidence of munitions use; and provide recommendations for prescribed burning.

5.1.3 Step 3: Identify Information Inputs

Inputs that will be considered during the course of this evaluation include historical documents and training maps, previous investigations, analysis of LiDAR data, and data and observations from the field evaluation as described below. Whether prescribed burning within Units 13/17/20 is practicable and can be conducted safely will be dependent upon the professional judgment of a subject matter expert (Fort Ord Burn Boss).

5.1.4 Step 4: Define the Boundaries of the Study

As discussed in **Section 3**, no additional work was recommended in the EFA or areas with previous investigations (**Figure 3-1**). Therefore, the activities conducted in support of this field evaluation to determine the nature and extent of MEC will comprise the remaining 522 acres of Units 13/17/20.

5.1.5 Step 5: Develop the Analytic Approach

If evaluation of Units 13/17/20 indicates MEC removal is required, then the site conditions that present significant challenges for the remedial action activities will be assessed.

If reduction of the footprint of the MEC removal area is indicated, the VSP-designed transect survey will provide statistically-valid and defensible support for that decision.

5.1.6 Step 6: Specify Performance or Acceptance Criteria

If all of the inputs to the analytic approach were performed to the standard of QC procedures as specified in **Section 7**, then the error is within tolerable limits.

5.1.7 Step 7: Develop the Plan for Obtaining Data

The field evaluation will be conducted in two separate phases to provide effective coverage of each unit and collect sufficient data to begin the process of defining nature and extent of MEC. The following sections define the data collection procedures and **Section 7** provides the QC plan.

5.2 LiDAR

An aerial LiDAR survey was conducted in 2012 to model the ground surface and terrain features within the former Fort Ord. The digital elevation model (DEM) derived from the LiDAR data has been used to evaluate and analyze the complex terrain and dense vegetation present in Units 13/17/20 and to identify open and accessible areas to be investigated in Phase I of the field evaluation. Historical aerial photographs have also been analyzed in conjunction with the DEM to identify site features such as berms, trenches, and security positions or pits that are potentially indicative of previous training activities.

A detailed slope/terrain map has been generated from the DEM (**Figure 2-2**) and will be used to assist in the identification of areas where MR operations cannot be safely performed due to excessive slope or rugged terrain. The final determination of areas that cannot be safely evaluated will be made in the field during field evaluation activities.

A LiDAR survey that will utilize advanced optics and data processing algorithms is planned for the former Fort Ord. The resulting high-resolution DEM will provide the project team with enhanced ability to identify terrain and range-related features currently hidden under thick vegetation, including armored vehicles and tanks used as range targets, pop-up target boxes, firing points, and impact craters. If this high-resolution DEM is available prior to the Units 13/17/20 field evaluation, the planned visual reconnaissance paths may be altered to better represent site conditions and features. The vegetation canopy/terrain model will also be used to measure vegetation height and thickness for fuel load calculations, which will benefit evaluation of potential future prescribed burn operations.

5.3 Field Evaluation Methods

Phase I of the two-phase field evaluation in Units 13/17/20 will include a visual reconnaissance survey of areas where existing site knowledge is limited and historical aerial photography and range maps indicate features potentially related to previous munitions use. The results of the Phase I evaluation will be utilized, in conjunction with historical research and the VSP UXO module, to determine the quantity, spacing, and location of additional transect-based investigation paths needed to confidently evaluate the remainder of the units, which will be conducted in Phase II.

5.3.1 Phase One: Meandering Visual Reconnaissance

Phase I of the field evaluation will include visual reconnaissance and GPS mapping along meandering paths in the open and accessible areas within Units 13/17/20 that were not part of the

EFA TCRA or included in previous investigations discussed in **Section 3**. Areas where previous work has been conducted are depicted on **Figure 3-1**. The visual reconnaissance survey paths will be recorded using GPS and added to the project geographic information system (GIS).

Visual reconnaissance paths have been planned for Phase I of the field evaluation to fill gaps in the existing knowledge of the units and assist in the design of the comprehensive evaluation of each unit that will be conducted in Phase II. The meandering Phase I reconnaissance paths have been planned to traverse potential areas of interest where little historical information exists. Areas of interest to be observed (such as known range locations, key site and range features, and locations of potential or known previous munitions activity) have been identified from historical aerial photographs and range maps. Terrain information from the DEM has been included in the design of the planned reconnaissance paths to select paths that are accessible to the reconnaissance team. The planned reconnaissance paths for Phase I of the field evaluation are presented on **Figure 5-1**. The final investigated reconnaissance paths may vary from the planned paths due to actual terrain, vegetation, or safety conditions observed in the field.

Phase I reconnaissance surveys will be conducted by a two-person field team, consisting of a UXO Technician III and an environmental scientist, biologist, geologist, or geophysicist trained to identify terrain disturbances and physical evidence of ordnance activity. The UXO Technician will act as the team leader and UXO escort, employing strict anomaly avoidance procedures, including avoiding or staying clear of visible surface hazards and subsurface anomalies. The UXO Technician will be responsible for safety functions and recognition and location of MPPEH during the visual reconnaissance. The UXO Technician will use hand-held metal detection instruments, including Schonstedt magnetometers and Whites DFX 300 hand-held metal detectors, to detect potential MPPEH items during field activities.

The reconnaissance team will traverse the field evaluation areas based on the planned meandering paths (**Figure 5-1**) to identify evidence of ordnance activity and the locations and extent of former ranges or other areas of ordnance use. The team will document observed visual evidence of previous ordnance activity – such as MPPEH, MEC, MD, RRD, and range features – and other physical evidence and features on a personal digital assistant (PDA) and record the locations with GPS. A new data entry (includes location and description) will be made in the PDA to record the paths walked during the visual reconnaissance; vegetation type and density; estimated degree of slope; terrain features such as roads, drainages, hillsides, and other recognizable topographic or cultural features; evidence or presence of wildlife; buildings or other structures; evidence of excavation, fill, subsidence, or land disturbance; MPPEH, MEC, or MD; significant concentrations of small arms materials; and RRD or range features such as firing

points, berms, targets, or impact craters. The reconnaissance team will take digital photographs of munitions-related material identified in the field and of the site conditions.

In the event an MPPEH item is identified, the reconnaissance team will document the discovery, take a digital photograph of the item, record its location using the PDA and GPS instrument, mark the location with flagging tape, and notify the Senior Unexploded Ordnance Supervisor (SUXOS). The SUXOS will verify the identity of the item, including its fuze type and condition, and determine its fate in accordance with UXO SOP 5 and UXO SOP 6 in the QAPP (KEMRON, 2016b). Removal of identified items will be conducted separate from the Phase I visual reconnaissance activity.

The investigated visual reconnaissance paths and findings along each path will be evaluated in conjunction with the results of earlier activities and presented in a technical memorandum after the completion of Phase I of the field evaluation. The Phase I technical memorandum will identify portions of Units 13/17/20 where the nature and extent of MEC and the vegetation and terrain have been adequately defined, if applicable, and areas where further evaluation in Phase II is recommended before remediation decisions can be confidently made. The Phase I technical memorandum will also provide specific details of the field evaluation plan for Phase II to supplement the focused field evaluation description in **Section 5.3.2**.

5.3.2 Phase Two: Focused Field Evaluation

Phase II of the field evaluation will include a focused evaluation survey based on the compilation of the results of the Phase I visual reconnaissance, previous investigations, site walks, and information provided in historical documents. The Phase II focused evaluation survey will consist of surface MEC removal and documentation of visible indications of munitions activity along regularly-spaced transects designed with a spacing interval to provide statistical confidence that areas of munitions activity have been identified. The Phase II evaluation survey will be designed using the VSP UXO module to determine the quantity, spacing, and location of investigation transects needed to confidently evaluate Units 13/17/20, perform statistical and data quality assessment, and to support statistically-defensible decisions regarding further remediation needs (Matzke et al, 2010).

The targets of interest discovery tools within VSP are based on the Bayesian statistical model which includes prior probability distributions to account for uncertain quantities in the observed data. This approach allows the incorporation of physical site features and assumptions of how past munitions training activities were conducted in order to more efficiently and confidently conduct the evaluation. When site assumptions are appropriate, the VSP UXO modules provide a

statistically-defensible methodology to validate the effectiveness of munitions response activities.

For example, helicopter-based artillery training is generally conducted by hovering behind the cover of a ridge line, elevating above the ridge to fire at the target area, and then dropping back into cover below the safety of the ridgeline. These firing points are characterized by high concentrations of expended cartridges on the ground surface with intermingled live munitions that were expelled without being fired. Because of this scenario, firing point locations are usually located in areas just behind prominent ridgelines. VSP can incorporate physical site features and terrain information to bias the investigation toward likely firing points. Similarly, target and impact areas tend to be located around visually-prominent terrain features such as hills or other distinct visual targets. The impact areas are characterized by much higher concentrations of surface metal. VSP utilizes the assumptions of target area size and anomaly density above background levels to design a transect-based investigation approach to traverse and detect both firing points and target areas to a designated confidence level (for example, 95% confidence that any existing target areas will be detected).

To ensure a high probability that the VSP-designed transects will both traverse and detect target and firing areas, appropriate inputs must be used, including the anticipated size of the suspected target and firing areas, the background anomaly density in non-munitions use areas, and the anticipated average anomaly density above the background in munitions use areas. These inputs will be determined after analysis of the Phase I reconnaissance and historical information results. The VSP statistical analysis will determine the transect spacing required to meet the desired confidence level of traversing and detecting munitions use areas within the field evaluation area.

The transect spacing determined by VSP will be used in conjunction with the existing Units 13/17/20 DEM in the Fort Ord GIS to design focused evaluation transect paths that follow terrain features and maintain the desired transect spacing. The actual transects evaluated may vary slightly from the designed transects to avoid areas of dense vegetation or terrain features not accounted for in the DEM. The transect paths will be recorded with GPS, and areas with deviations greater than 10 feet from the designed transect paths will be evaluated for compliance with the statistical design. Additional evaluation of transect segments will be added, if necessary, to fill in gaps and maintain the targeted field evaluation confidence level.

Limited vegetation removal will be conducted along the investigation transects to allow safe passage of focused field evaluation personnel and sufficient view of the ground surface to

complete the evaluation. Vegetation removal will be conducted utilizing handheld cutting tools, with approval from USACE and USFWS, and anomaly avoidance monitoring.

The focused field evaluation along the transects will be conducted by UXO Technicians equipped with handheld metal detectors to aid in detecting surface metal within remaining ground cover vegetation. Locations of identified MEC and MPPEH items will be measured with GPS and the details of each discovery will be recorded. Recovered MEC, MPPEH, and MD items will be disposed of in accordance with the procedures in UXO SOP 5 and UXO SOP 6 of the QAPP (KEMRON, 2016b).

After the VSP-designed transects have been investigated, the geostatistical density mapping tools within VSP will be utilized to analyze the spatial variation of surface anomalies along the investigated transects and to estimate and model the density of anomalies in the investigation area, allowing us to more confidently delineate areas in need of further remediation. If reduction of the footprint of the MEC removal area is indicated, the VSP-designed transect survey will provide statistically-valid and defensible support for that decision.

The complex terrain in Units 13/17/20 indicates areas of intense weathering, including regions of erosion and deposition, potentially leading to the movement and relocation of surface and subsurface debris and munitions items. To evaluate the relationship between items observed on the ground surface and items present in the subsurface and to determine if weathering activity has resulted in subsurface conditions that differ from those observed on the surface, DGM will be performed in selected areas along the Phase II transects. DGM will be conducted with a person-portable Geonics EM61-MK2 system along transect segments with evidence of natural erosional deposition and areas that indicate stable weathering conditions. Analysis of the DGM data will be conducted to determine if subsurface anomaly density matches surface metallic density in areas with evidence of different weathering conditions. Areas that are potentially suitable for the DGM analysis of weather impacts will be identified during the Phase I reconnaissance, but the final DGM areas will not be selected until the locations of the Phase II focused evaluation transects have been determined.

5.4 Data Management

GPS and PDA data will be reviewed and archived daily to ensure field evaluation objectives are being met. A field map showing the locations of all MEC, MD and related points of interest will be compiled from the GPS data as the field work progresses. Digital photographs will also be downloaded, correlated with the field map, and archived daily.

Data recorded during the field evaluation will be reviewed by the Contractor Quality Control System Manager (CQCSM) or Unexploded Ordnance Quality Control Specialist (UXOQCS) before being entered into the military munitions response program database.

5.5 Deliverables

During the course of this field evaluation, it is anticipated that the following deliverables will be provided.

- Phase I Technical Memorandum – The Phase I Technical Memorandum will present a discussion of the activities and results of the Phase I evaluation and, in conjunction with the analysis of historical information and previous investigation activities, will detail the work plan for the Phase II focused field evaluation.
- Field Evaluation Report – The Field Evaluation Report will summarize activities conducted in support of the Units 13/17/20 Field Evaluation, present a discussion of the results of both phases of the field effort, and provide conclusions and recommendations for future remediation activities.

6.0 Reporting and Disposition of MEC

As noted in **Section 5**, Phase I of the evaluation will be conducted utilizing anomaly avoidance procedures. UXO personnel will document the location in the event an MPPEH item is discovered. Any suspect MEC items will be reported for ultimate demolition. MEC-related activities will be performed in accordance with the UXO SOP 6 of the QAPP (KEMRON, 2016c).

As described in **Section 5**, Phase II of the evaluation will include MEC and MPPEH management in accordance with UXO SOP 5 and demolition of MEC in accordance with UXO SOP 6 of the QAPP (KEMRON, 2016c).

7.0 Quality Control Plan

An initial preparatory meeting will be conducted prior to the commencement of fieldwork. The preparatory meeting will review plans, ensure personnel are available, and confirm gear/equipment to complete the fieldwork is in proper condition. After the preparatory meeting, an initial inspection will take place to audit fieldwork to verify that all aspects of the plan are being followed. Follow-up inspections will be conducted periodically or when a change of personnel occurs. Follow-up inspections will confirm the continued implementation of the plan throughout the field evaluation, and a final inspection will occur at the completion of the activity. The CQCSM or UXOQCS will independently verify that the QC inspections are being effectively implemented. The Quality Control Plan is detailed in Section 4, Data SOP 1, Data SOP 2, Field SOP 1, Field SOP 2, GEO SOP 8, and UXO SOP 10 of the QAPP (KEMRON, 2016c).

8.0 Explosives Management Plan

UXO SOP 7 of the QAPP (KEMRON, 2016c) details the Explosives Management Plan for MPPEH encounters.

9.0 Explosives Siting Plan

Explosives siting information for Units 13/17/20 is included in an Explosives Safety Submission that has been approved by the Department of Defense (DoD) Explosives Safety Board.

10.0 Environmental Protection Plan

This section describes the procedures to be employed to protect natural resources during the field evaluation activities in Units 13/17/20. It includes a description of the natural resources present, and a list of mitigation measures appropriate to the type of work activity and the habitat types, that will be implemented to reduce impacts to these resources whenever possible. Field SOP 2 of the QAPP also describes general project procedures to be implemented for environmental protection (KEMRON, 2016c).

Units 13/17/20 are within the Natural Resource Management Area which is designated for transfer to BLM as undeveloped habitat reserve. The HMP describes special land restrictions and habitat management requirements within habitat reserve areas (USACE, 1997). 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. Chapter 3 of the HMP describes mitigation measures that must be implemented during MPPEH investigation and remediation. In addition, the Programmatic Biological Opinion contains terms and conditions and reasonable and prudent measures that need to be implemented during MPPEH activities to minimize and reduce impacts to listed species (USFWS, 2015).

10.1 Description of Site and Natural Resources

CMC is a dominant habitat type at Fort Ord and is identified as a protected plant community in the HMP (USACE, 1997). This habitat supports approximately 50 to 85% of the total distribution of several rare, threatened, and endangered plants occurring at Fort Ord, which are designated as protected under the HMP. HMP-listed shrub species present include Hooker's manzanita (*Arctostaphylos h. hookeri*), sandmat manzanita (*Arctostaphylos pumila*), Monterey manzanita (*Arctostaphylos montereyensis*), Monterey Ceanothus (*Ceanothus cuneatus rigidus*), and Eastwood's golden bush (*Ericameria fasciculata*). Other habitats present include areas of coast live oak woodland, meadow habitat, and wetlands.

The habitats within the sites 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. CTS (*Ambystoma californiense*) could be encountered in areas near vernal ponds or in upland habitat.

HMP annual plant species that may be encountered are the sand gilia (*Gilia tenuiflora arenaria*), Monterey spineflower (*Chorizanthe p. pungens*), and Seaside bird's beak (*Cordylanthus rigidus littoralis*).

10.2 Protection of Natural Resources

Measures to reduce impacts to natural resources will be implemented in accordance with the HMP and the Programmatic Biological Opinion provided by the USFWS to address Army clean-up activities (USFWS, 2015). These measures are described in Field SOP 2 of the QAPP (KEMRON, 2016c) and include:

- Employee environmental training,
- Preparation of habitat checklists,
- Avoiding and reducing impacts to HMP plants and habitats,
- Avoiding impacts to CTS and black legless lizards,
- Replacement of topsoil when feasible,
- Implementation of best management practices to reduce the spread of invasive weeds,
- Restricted vehicle access, and
- Monitoring of erosion and invasive weeds during and after remedial activities.

11.0 References

Cited references include the Fort Ord Administrative Record number in brackets where applicable.

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Figures

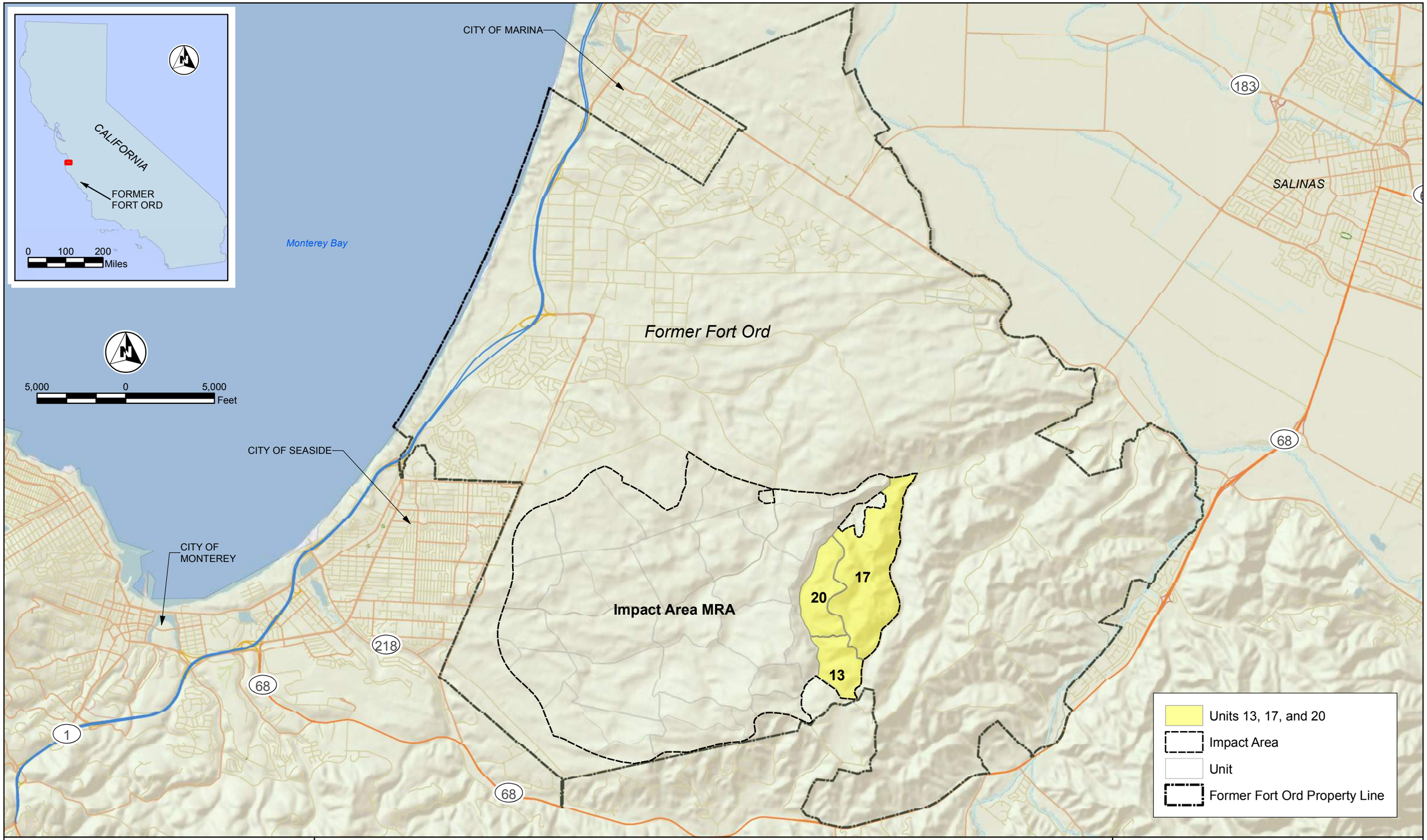
Tables

Appendix A
Historical Aerial Photographs and Training Maps

Appendix B
KEMRON Site Walk Photographs

Appendix C
Response to Comments

Figures



Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 1-1

Regional Location Map
Units 13, 17, and 20

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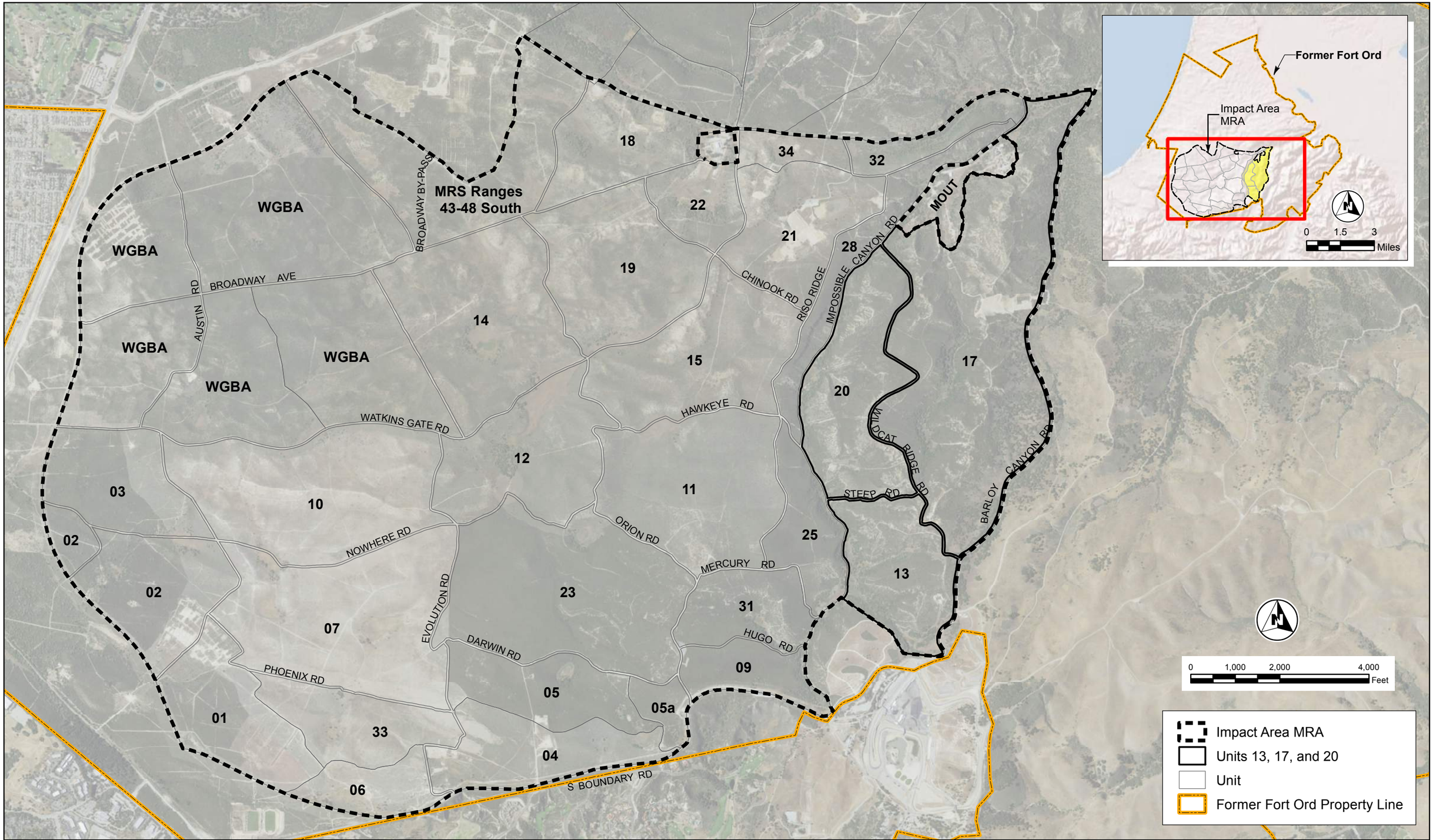

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 1-2

Impact Area MRA

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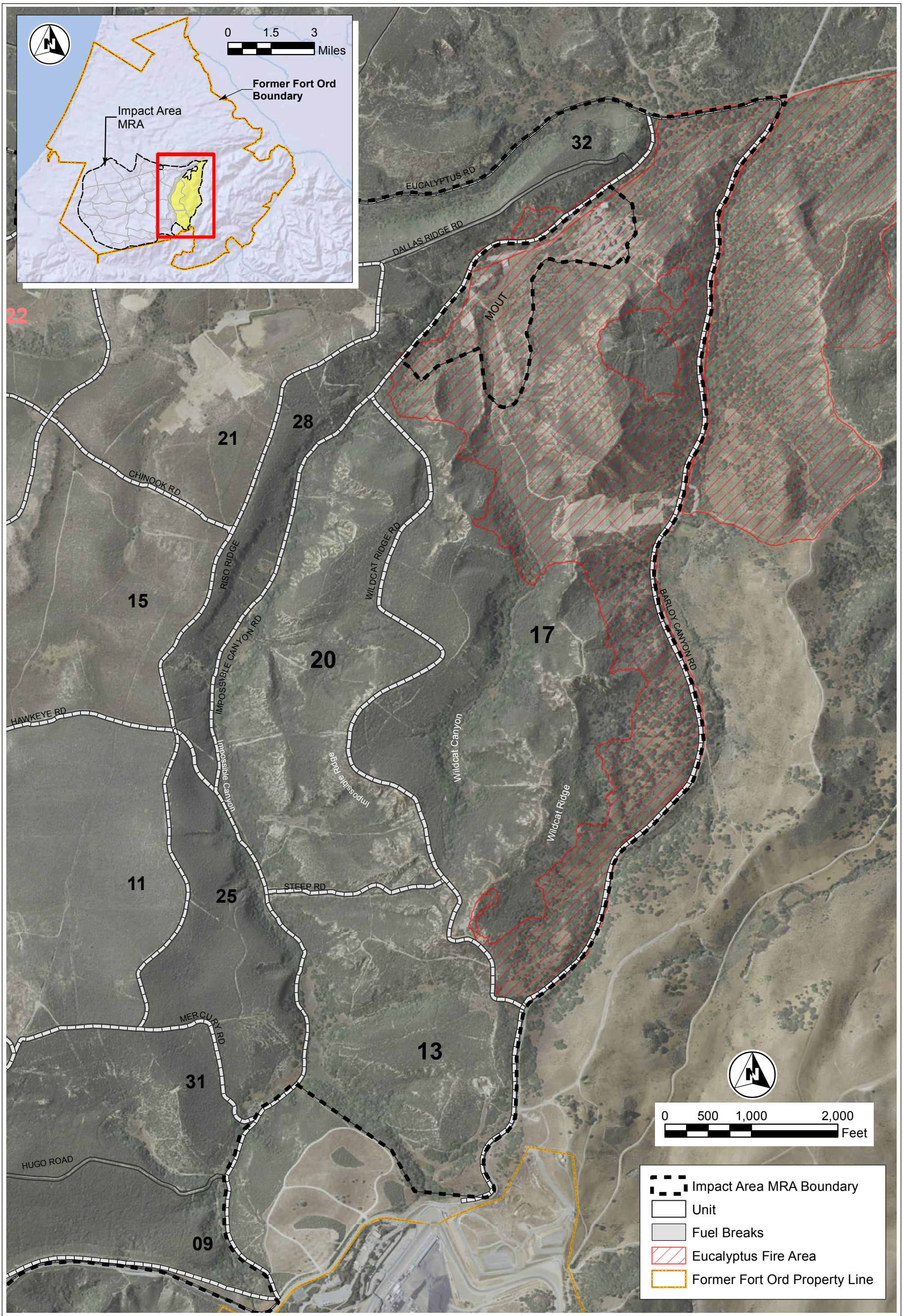

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Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 2-1

Units 13, 17, and 20
Site Overview

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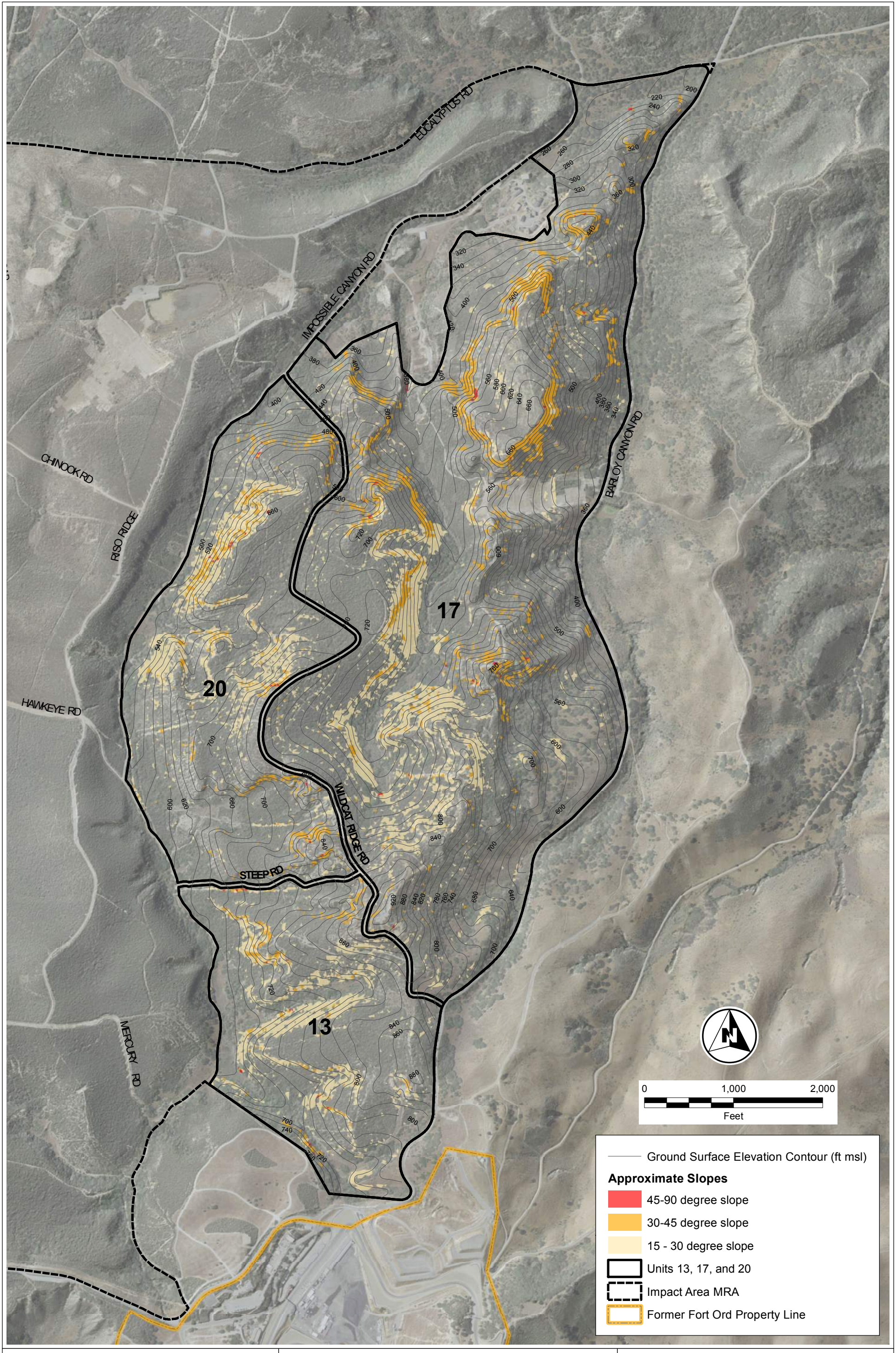

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 2-2

Terrain Overview

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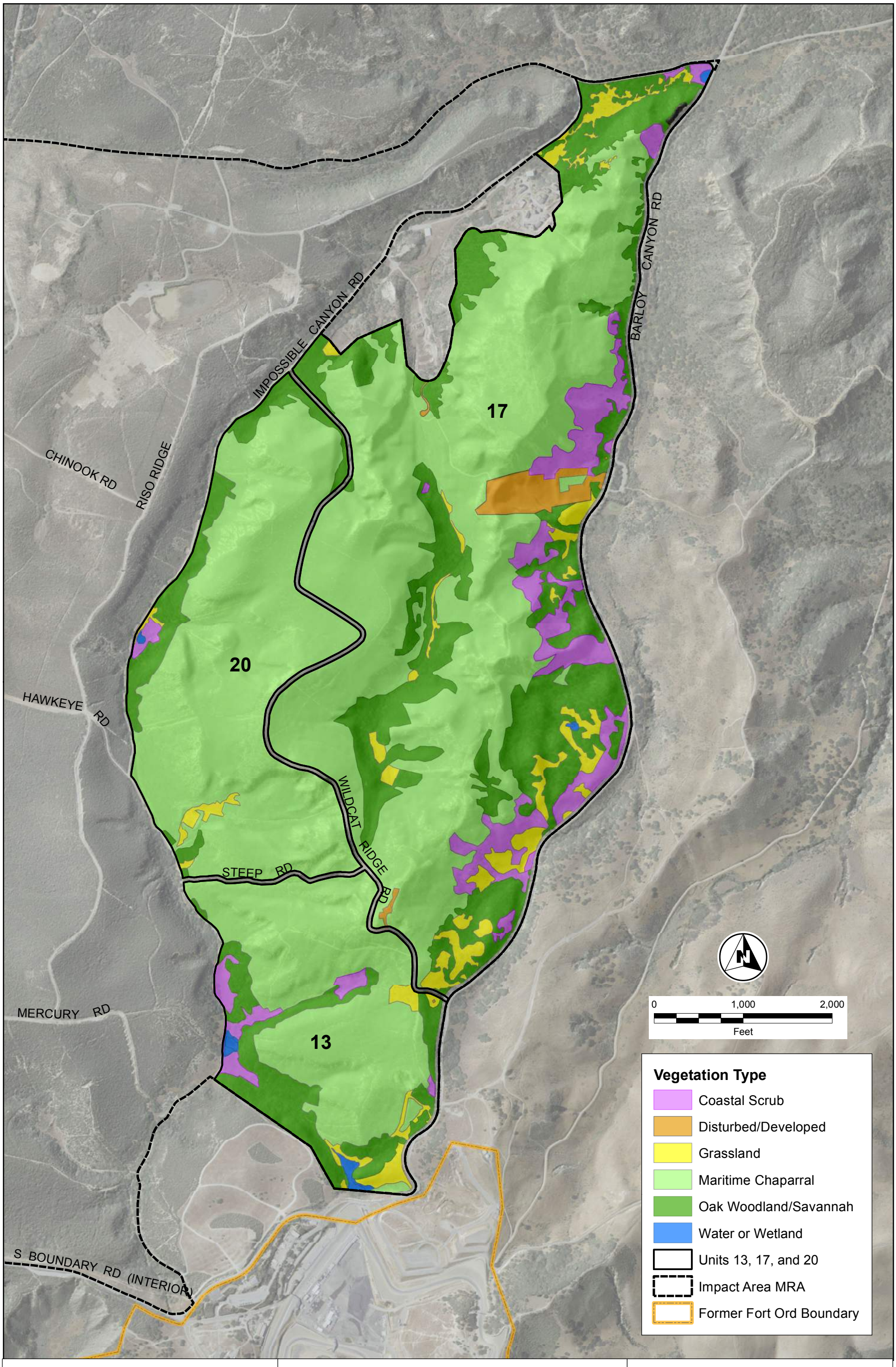

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 2-3

Vegetation

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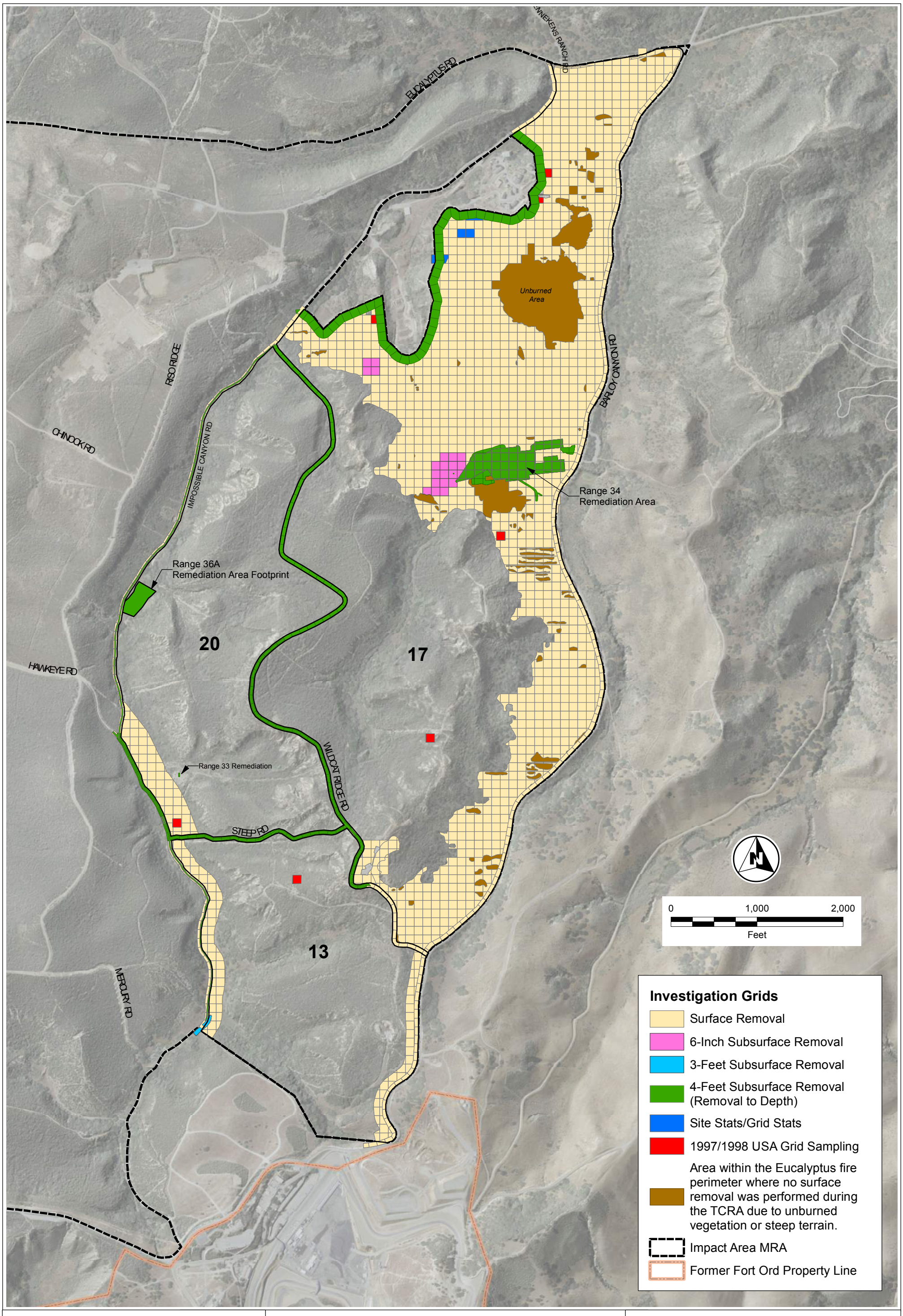

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 3-1

Previous Work
within Units 13, 17, and 20

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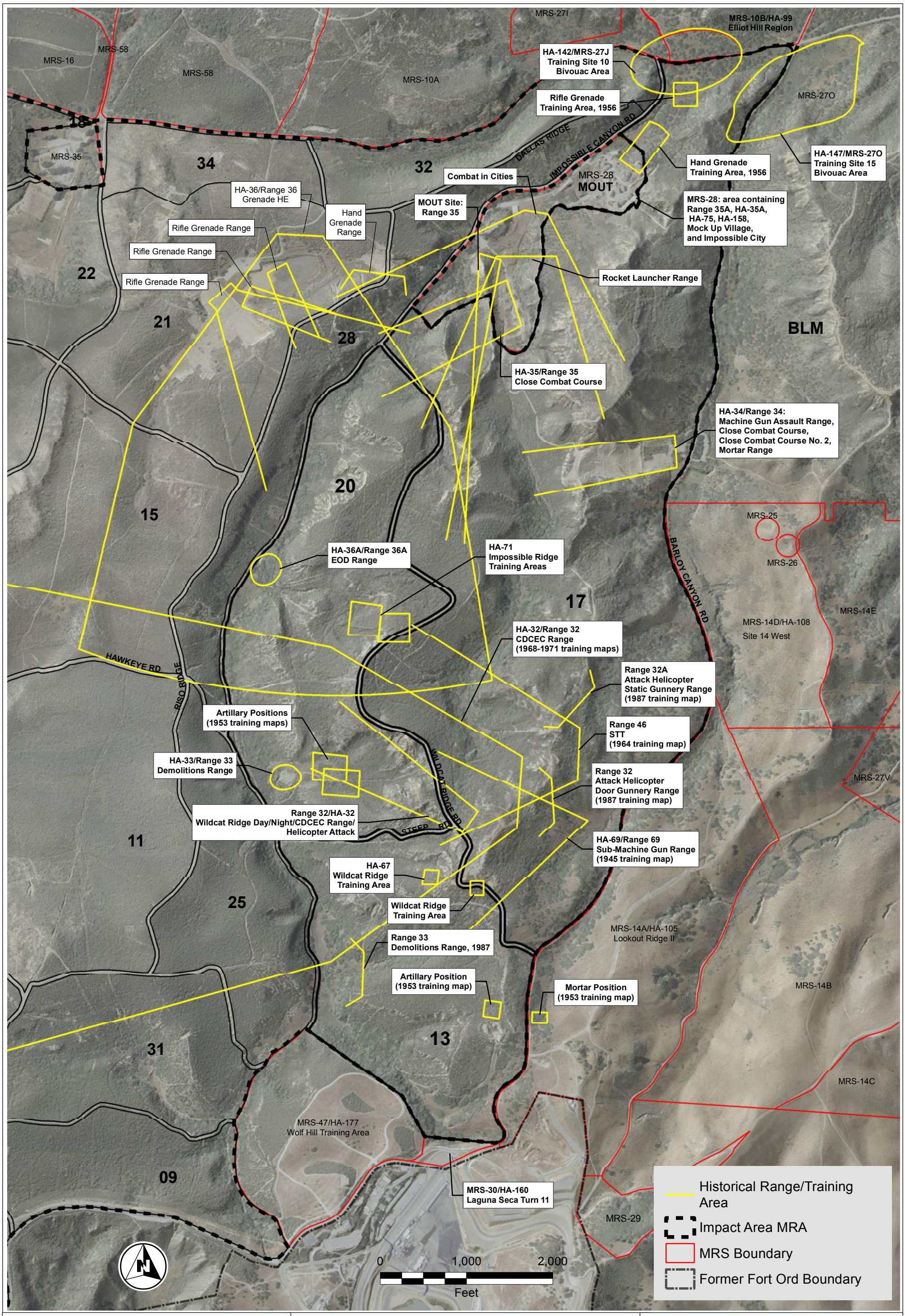

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 3-2

Historical Sites and Training Areas

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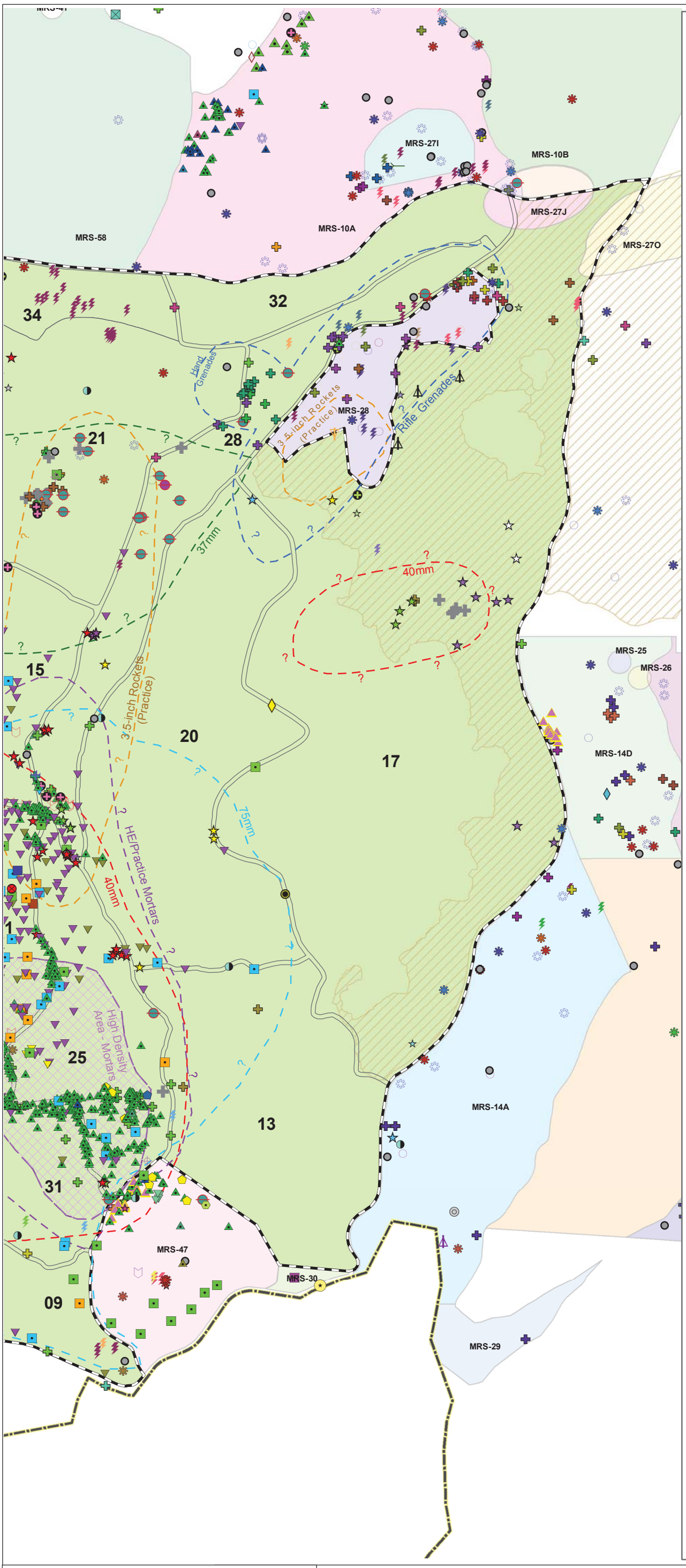

MEC

- 81mm, ILLUMINATION, MORTAR ROUND (Model Unknown)*
- Ash, Pyrotechnic
- Blocks, demo, C4
- CTG,IGNITOR, FLAME THROWER (Model Unknown)*
- Cap, blasting, electric, M6
- Cartridge case, 106mm, M93B1
- Cartridge, 20mm, TP, M99
- Cartridge, 20mm, high explosive incendiary, M210
- Cartridge, 37mm, high explosive (model unknown)
- Cartridge, 40mm, high explosive, M383
- Cartridge, 40mm, practice, M382
- Cartridge, 40mm, practice, M781
- Cartridge, grenade, auxiliary, M7
- Cartridge, ignition, M2 series
- Cord, detonating
- Explosive, bulk, high explosive
- Firing device, pressure, M1A1
- Flare, aircraft, parachute, M9A1
- Flare, surface, trip, M49 series
- Fuze, bomb, nose, M103
- Fuze, chemical, mine, antitank, M600
- Fuze, grenade, hand, M10 series
- Fuze, grenade, hand, M204 series
- Fuze, grenade, hand, M206 series
- Fuze, grenade, hand, M213
- Fuze, grenade, hand, M215
- Fuze, grenade, hand, practice, M205 series
- Fuze, grenade, hand, practice, M228
- Fuze, grenade, igniting, M201
- Fuze, mine, combination, M10 series
- Fuze, rocket, base detonating, M404
- Grenade, Rifle, M19
- Grenade, hand, Illumination, MK I
- Grenade, hand, fragmentation, M26 Series
- Grenade, hand, fragmentation, M67
- Grenade, hand, fragmentation, MK II
- Grenade, hand, practice, M21
- Grenade, hand, practice, M62
- Grenade, hand, practice, M69
- Grenade, hand, practice, MK II
- Grenade, hand, riot, CN1, ABC-M25A1
- Grenade, hand, riot, CS, M7A3
- Grenade, hand, riot, CS-1, ABC-M25A2
- Grenade, hand, smoke, HC, AN-M8
- Grenade, hand, smoke, M18 series
- Grenade, hand, smoke, M48
- Grenade, hand, smoke, white phosphorous, M15
- Grenade, rifle, antitank, M9 series
- Grenade, rifle, high explosive antitank, M28
- Grenade, rifle, high explosive antitank, M31
- Grenade, rifle, smoke, M22 series
- Grenade, rifle, smoke, M23 series
- Grenade, rifle, smoke, white phosphorous, M19A1
- Ignition Cylinder, Flamethrower, M1
- Mine, antipersonnel, practice, M8 series
- Ordnance Components
- PROJECTILE, 37mm (Model Unknown)*
- Pot, 2.5lb, smoke, HC, screening, M1
- Primer, igniter tube, M57
- Projectile, 155mm, high explosive, MK 1
- Projectile, 155mm, shrapnel, MK 1
- Projectile, 20mm, high explosive incendiary, M56A3
- Projectile, 37mm, armor piercing tracer, M51 series
- Projectile, 37mm, high explosive, M63
- Projectile, 37mm, high explosive, MK II
- Projectile, 37mm, low explosive, MK I
- Projectile, 37mm, low explosive, MK II
- Projectile, 4.2inch, mortar, high explosive, M3 series
- Projectile, 4.2inch, mortar, smoke, white phosphorous, M328 series
- Projectile, 40mm, cluster, white star, M585
- Projectile, 40mm, high explosive tracer, M677
- Projectile, 40mm, high explosive, M381
- Projectile, 40mm, high explosive, M383
- Projectile, 40mm, high explosive, M406
- Projectile, 40mm, parachute, M583 series
- Projectile, 40mm, parachute, star, M662
- Projectile, 40mm, practice, M385
- Projectile, 40mm, practice, M407A1
- Projectile, 40mm, practice, M918
- Projectile, 40mm, smoke, M713 series
- Projectile, 50mm, Mortar, Type89, Japanese NI
- Projectile, 57mm, high explosive antitank, M307
- Projectile, 57mm, high explosive, M306 series
- Projectile, 60mm, mortar, high explosive, M49 series
- Projectile, 60mm, mortar, illumination, M83 series
- Projectile, 60mm, mortar, practice, M50 series
- Projectile, 75mm, Shrapnel, MK I
- Projectile, 75mm, high explosive (model unknown)
- Projectile, 75mm, high explosive, M48
- Projectile, 75mm, high explosive, MK I
- Projectile, 81mm, mortar (model unknown)
- Projectile, 81mm, mortar, high explosive, M362
- Projectile, 81mm, mortar, high explosive, M43 series
- Projectile, 81mm, mortar, illumination, M301 series
- Projectile, 81mm, mortar, practice, M43 series
- Projectile, 81mm, mortar, training, M68
- Projectile, 8inch, high explosive, MKIA1
- Projectile, 90mm, high explosive tracer, M71
- Projectile, 90mm, high explosive, M71, Series
- Propellant, 60mm, wafers, mortar
- Pyrotechnic mixture, illumination
- Rocket motor simulator (model unknown)
- Rocket motors, M222/M223 (DRAGON)
- Rocket, 2.36inch, high explosive antitank, M6
- Rocket, 2.36inch, practice, M7
- Rocket, 3.5inch, high explosive antitank, M28 series
- Rocket, 3.5inch, practice, M29 series
- Rocket, 35mm, subcaliber, practice, M73
- Rocket, 4.5inch, barrage, high explosive, MK III
- Signal, ground, rifle, parachute, M17 series
- Signal, illumination, AN-M43 series
- Signal, illumination, ground, M125 series
- Signal, illumination, ground, M126 series
- Signal, illumination, ground, M131
- Signal, illumination, ground, parachute, M19 series
- Signal, smoke, ground, M62 series
- Simulator, blast, stinger, civilian, M15
- Simulator, explosive boobytrap, flash, M117
- Simulator, explosive boobytrap, whistling, M119
- Simulator, flash artillery, M110
- Simulator, grenade, hand, M116A1
- Simulator, launching, antitank guided missile and rocket, M22
- Simulator, projectile, airburst, M74 series
- Simulator, projectile, ground burst, M115A2
- Squib, rocket, simulator
- projectile, 3inch, stokes mortar, prac, MK I

MEC Source:
MMRP Database, 2/2/2017

- Eucalyptus Fire Area
- Impact Area MRA
- Former Fort Ord Property Line

General MEC Area (Approximate)

- 3.5-inch Rockets (Practice)
- Projectile, 37mm
- Projectile, 40mm
- Projectile 75mm
- HE/Practice Mortars
- Rifle/Hand Grenades
- Mortar/High Density Area

Notes:
General MEC areas are approximated, and were originally presented in the Impact Area MRA Track 3 Remedial Investigation (MACTEC, 2007)

N

0 1,200 2,400
Feet

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 3-3a

MEC Overview

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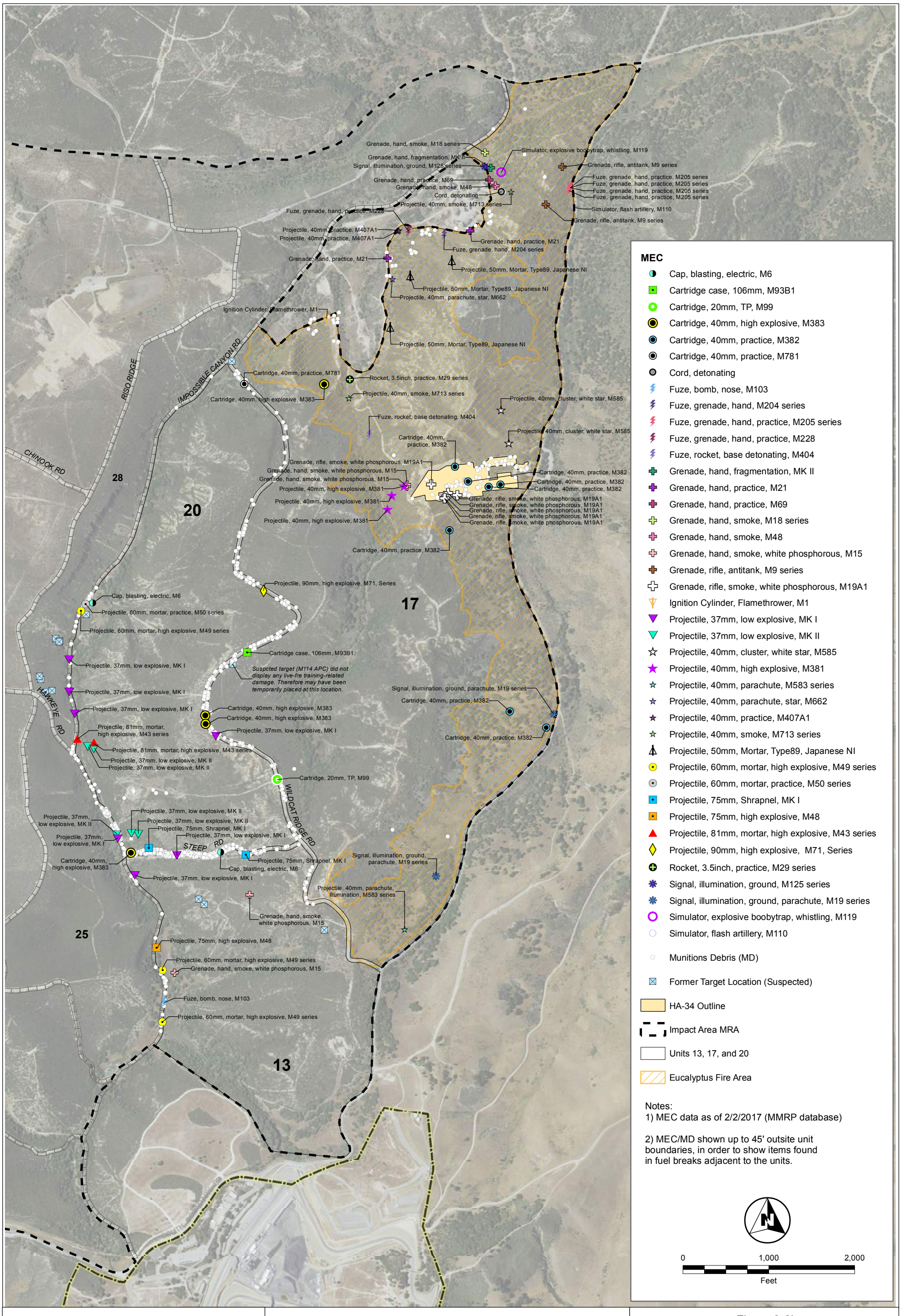

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 3-3b

MEC Encountered
within Units 13, 17, and 20

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EUCALYPTUS RD

TONGUE RIDGE

CHINOOK RD

IMPOSSIBLE CANYON RD

17

20

13

WILDCAT RIDGE RD

STEEP RD

BARLOY CANYON RD

N

0 500 1,000 2,000

Feet

Annual Monitoring Site Walk - BRAC

- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- Reconnaissance Site Walk (BRA) - 2001, MACTEC
- HA 34 Outline
- Impact Area MRA
- Units 13, 17, and 20
- Eucalyptus Fire Area (within the Impact Area MRA)
- Former Fort Ord Boundary

KEMRON ENVIRONMENTAL SERVICES Gilbane

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 3-4

Previous Site Walks

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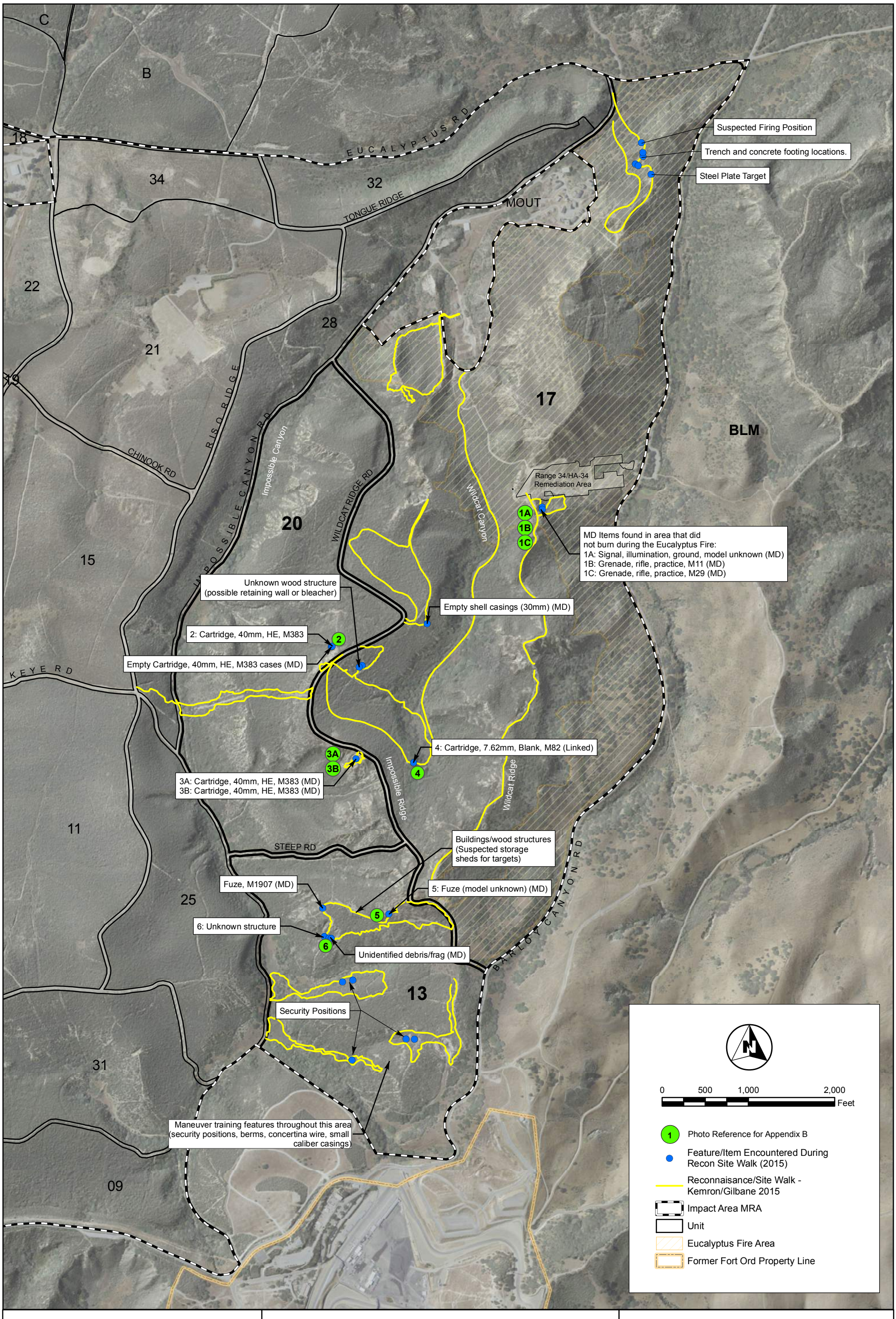

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 3-5

KEMRON-Gilbane Reconnaissance
Site Walks and Items Encountered

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Planned Visual Reconnaissance Paths

Previous Site Walks (see Figure 3-4 and Figure 3-5)

Areas of Previous Work (see Figure 3-1)

Units 13, 17, and 20

Impact Area MRA

Former Fort Ord Boundary

20

17

13

WILDCAT RIDGE RD

STEEP RD

N

0 500 1,000 2,000

Feet

Field Evaluation Work Plan
Munitions Response
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure 5-1

Planned Visual Reconnaissance Paths

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Tables

Table 3-1
Historical Sites Associated with Units 13, 17, and 20

Name	Unit	Military History/Training Activities	Munitions Used/Potentially Used
Artillery Position	13	Identified on 1953 training map.	Projectile (105mm, 155mm, 8-inch)
Rifle Grenade Range	20	The firing point for this range fan is outside of Units 13, 17, and 20, but the direction of fire is toward and overlaps with Unit 20. It is shown on training maps from 1956 through 1958.	Grenade (Rifle-fired)
Rocket Launcher Range	17, 20	Identified on training maps from circa 1953 through 1958.	Rockets (3.5-inch)
Elliot Hill Region (MRS-10B, HA-99)	Adjacent to 17	Used as a training area throughout the history of Fort Ord.	Projectile (60mm mortars), cartridge (40mm rifle), small arms ammunition, flares
Lookout Ridge II (MRS-14A, HA-105)	Adjacent to 13, 17	MRS-14A is a subsite of MRS-14.The entirety of MRS-14 was suspected of being an impact location for 7- and 8-inch naval gun projectiles which overshot the intended target area; however, no such projectiles or evidence of such a projectile was identified within the site. MRS-14 was used for sub-caliber artillery and mortar practice from approximatey 1972 through 1992. MRS-14A was used for basic maneuvers with occasional impact by various projectiles. Artillery and mortar training began in the 1950s. Aviation training began in 1968, with the addition of helipads and an aircraft rapelling training area in the 1980s.	Small arms ammunition, grenade (rifle, smoke), projectile (81mm mortar), trip flares, signals, simulators
Site 14 West (MRS-14D, HA-108)	Adjacent to 17	MRS-14D is a subsite of MRS-14.The entirety of MRS-14 was suspected of being an impact location for 7- and 8-inch naval gun projectiles which overshot the intended target area; however, no such projectiles or evidence of such a projectile was identified within the site. MRS-14 was used for sub-caliber artillery and mortar practice from approximatey 1972 through 1992. MRS-14D was identified as Range P-5 on 1972 through 1987 ranges and training maps. Two hilltop firing points are located within MRS-14D with a direction of fire parallel to Unit 17.	Small arms ammunition (.30 caliber, 5.56mm, 7.62mm), sub-caliber (14.5mm, 22mm), projectile (3-inch stokes mortar), grenade (smoke), flares
Multi-Range Area, Impact Area (MRS-15B)	13, 17, 20	Site MRS-15B encompasses the areas located behind the firing points and between the range fans around the perimeter of the Impact Area MRA and are accessible from South Boundary Road, Barloy Canyon Road, Eucalyptus Road or North-South Road (General Jim Boulevard).	Not applicable
Training Site 10 (MRS-27J, HA-142)	17	This bivouac area is identified as a former training site. MRS-27J was listed as Training Site 10 on a 1984 training map. Bivouac Area L was identified as being located at the site in 1967. Additionally, MRS-27J was identified as being located partially within the known distance range.	Signals, flares, simulators, grenades (hand)

Table 3-1
Historical Sites Associated with Units 13, 17, and 20

Name	Unit	Military History/Training Activities	Munitions Used/Potentially Used
Training Site 15 (MRS-27O, HA-147)	17	This bivouac area is identified as a former training site. The historical use of MRS-27O and the unfenced area east of Barloy Canyon Road included bivouac and troop maneuver	Signals, flares, simulators
Laguna Seca Turn 11 (MRS-30 - formerly OE-30, HA-160)	Adjacent to 13	Used for basic maneuvers with occasional impact by various projectiles. MRS-30 was part of the Multi Range Area (historical Impact Area) since at least 1945.	Signals, flares, simulators, projectile (75mm)
Wolf Hill (MRS-47, HA-177)	Adjacent to 13	MRS-47 was an impact area prior to WWII and into the 1970s. Artillery and mortar training began in the 1950s. A 1972 training maps indicated the use of MRS-47 as a demolition area. The 1982 Training Facilities Map showed the western portion of MRS-47 labeled as Platoon Attack Course.	Signals, projectile (20mm, 37mm, 75mm, 81mm, 3-inch stokes mortar, 4.2-inch mortar), rocket (2.36-inch), grenade (hand)
Wildcat Ridge Day/Night Combat Course, CDCEC Range, Attack Helicopter and UH-1 Door Gunnery, Live Fire Exercise, Day/Night Combat (Range 32, Range 32A, HA-32)	13, 17, 20	Appears to have been used for training exercises from as early as the 1940s to the late 1980s. Use ranged from a sub-machine gun training area in the 1940s to unspecified training in the 1950s, as inactive through most of the 1970s, and as a helicopter attack range in the 1980s.	Small arms ammunition (5.56mm, 7.62mm, M60), sub-caliber (20mm), cartridge (40mm practice), possible pyrotechnics for illumination
Demolitions Range (Range 33, HA-33)	20	It was used as a demolition range.	“25lb max.” no electrical blasting caps
Machine Gun Assault Range, Close Combat Course, Close Combat Course No. 2, Mortar Range (Range 34, HA-34, HA-72)	17	Used as a Close Combat Course from the late 1950s through the late 1960s. By 1973, Fort Ord Training Ranges SOPs indicate that it was used as a Machine Gun Assault Course. By 1980, the range was used as a mortar range to support Range 31. SOPs indicate that the range was inactive by June 1991.	Small arms ammunition (5.56m, 7.62mm) projectile (60, 81mm, and 4.2-inch mortars), cartridge (40mm practice)

Table 3-1
Historical Sites Associated with Units 13, 17, and 20

Name	Unit	Military History/Training Activities	Munitions Used/Potentially Used
MOUT Site/Complex, Mock Up Village, Combat in Cities, Impossible City, Rocket Range, Combat Pistol Range (MRS-28 - formerly OE-28, Range 35, Range 35A, HA-35, HA-35A, HA-75, HA-158)	Adjacent to 13, 17, 20	This area is identified as a Mock Village Training Area on the 1945 training map. In the 1950s, the area is labeled as Combat in Cities. It is also identified as a Combat Pistol Range that was active beginning at least as early as 1975. Listed in the 1973 SOP as a "Quick Kill" range. SOPs from 1980 through 1992 indicate that the range consisted of six firing lanes. Includes Impossible City, a mock city, which is a facility used for military operations in urbanized terrain training. A "Rocket Launcher" range is described in the MOUT area and identified on training maps from 1953 through 1958. Combat in Cities depicted on a 1953 training map. The range is still in use for police training.	Small arms ammunition (5.56mm, .38 and .45 Caliber, 12 Guage riot gun), grenade (fragmentation hand), cartridge (40mm practice), flares, pyrotechnics, rocket (2.36-inch were used throughout World War II and were replaced by the 3.5-inch rockets at the end of the war)
Fragmentation Hand Grenade/HE Hand Grenade (Range 36, HA-36)	17, 20	Identified on training maps from circa 1953 through 1958.	Grenades (hand)
EOD Range (Range 36A, HA-36A)	20	Range 36A was used by the Army from the 1940s through October 1992 to dispose of military ordnance and commercial explosives. Disposal occurred by OB/OD. It was also used for EOD training.	C4 and TNT - 25-pound maximum charge
STT (Range 46)	17	Used from the early 1960s, possibly as early as 1958, for night firing, pistol firing, and other small arms firing. Range control records indicate it was used for military police training for much of its history.	Small arms ammunition (5.56mm, 7.62mm, 9mm, .38 caliber, .45 caliber)
Wildcat Ridge Training Area (HA-67)	13	Shown on the circa 1953 training map and on the 1958 training and facilities map. The type of training completed in the 1950s is not documented.This training area is not identified on later training maps.	Unknown
Barloy Canyon Sub Machine Gun Range (HA-69)	17	This small arms range was used as a submachine gun range. This range was only shown on the Revised 1945 Training Map.	Small arms ammunition
Impossible Ridge Training Area (HA-71)	20	Used for training in 1950s and early 1960s. The type of training that was done at the site is not documented.	Small arms ammunition

Table 3-2
MEC Encountered within Units 13, 17, and 20 and Adjacent Fuel Breaks

Model	Unit	Grid ID	Date	Type	Quantity	Depth (inches)	Easting	Northing
Grenade, hand, smoke, white phosphorous, M15	13	MRS-15B_G 42	1/26/1998	UXO	1	0	5750795.841	2115745.989
Projectile, 40mm, parachute, star, M662	17	LB3-MH09-SF08	9/1/1998	UXO	1	1	5752284.977	2112843.204
Cord, detonating	17	LB4-MI01-SF01	9/2/1998	DMM	3	0	5752594.156	2115172.639
Projectile, 60mm, mortar, practice, M50 series	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I087	3/29/2001	UXO	1	12	5752943.106	2113691.198
Projectile, 60mm, mortar, high explosive, M49 series	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I086	4/2/2001	UXO	1	0	5753491.293	2118290.547
Projectile, 37mm, low explosive, MK I	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I080	4/4/2001	UXO	1	3	5752111.211	2114335.801
Projectile, 37mm, low explosive, MK I	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I074	4/5/2001	UXO	1	2	5752107.855	2114435.25
Projectile, 37mm, low explosive, MK I	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I076	4/5/2001	UXO	1	16	5751241	2112837.5
Projectile, 60mm, mortar, high explosive, M49 series	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I034	4/12/2001	UXO	1	0	5756077.808	2114293.086
Fuze, bomb, nose, M103	Fuel Break	IMPOSSIBLE CANYON ROAD INTERIOR I036	4/16/2001	UXO	1	0	5755650.948	2114484.759
Cartridge case, 106mm, M93B1	Fuel Break	WILDCAT RIDGE E052	6/13/2001	UXO	1	0	5755544.339	2117125.322
Cartridge, 40mm, practice, M781	Fuel Break	WILDCAT RIDGE E094	6/13/2001	UXO	1	0	5755406.064	2117099.519
Cap, blasting, electric, M6	Fuel Break	STEEP ROAD I012	6/21/2001	UXO	1	0	5755165.108	2117157.19
Projectile, 75mm, Shrapnel, MK I	Fuel Break	STEEP ROAD I015	6/21/2001	UXO	1	0	5755013.047	2117331.562
Projectile, 40mm, parachute, M583 series	17	LA3-MJ09-SJ10	11/4/2003	UXO	1	0	5754949.311	2116592.377
Signal, illumination, ground, parachute, M19 series	17	LB3-MA10-SF03	11/4/2003	UXO	1	0	5752560.603	2118294.643
Fuze, grenade, hand, practice, M205 series	17	LB4-MI01-SF09	11/5/2003	UXO	1	1	5755555	2120530
Fuze, grenade, hand, practice, M205 series	17	LB4-MI01-SF09	11/5/2003	UXO	1	24	5751630.63	2111094.968
Fuze, grenade, hand, practice, M205 series	17	LB4-MI01-SF09	11/5/2003	DMM	3	0	5754889.25	2120032.437
Fuze, grenade, hand, practice, M205 series	17	LB4-MI01-SF09	11/5/2003	UXO	12	0	5756355.782	2120579.423
Grenade, rifle, antitank, M9 series	17	LB4-MI01-SI08	11/5/2003	UXO	1	0	5756359.549	2120578.822
Simulator, flash artillery, M110	17	LB4-MI01-SD09	11/5/2003	UXO	1	0	5756360.102	2120583.119
Cartridge, 40mm, practice, M382	17	LB4-MC01-SC06	11/6/2003	DMM	1	0	5756340.985	2120544.012
Cartridge, 40mm, practice, M382	17	LB4-MC01-SE02	11/6/2003	DMM	1	6	5754473.865	2120076.136
Grenade, rifle, antitank, M9 series	17	LB4-MI01-SD06	11/6/2003	UXO	1	0	5754018.075	2117702.87
Signal, illumination, ground, parachute, M19 series	17	LB4-MC01-SE07	11/6/2003	UXO	1	2	5755429.241	2120812.734
Cartridge, 40mm, practice, M382	17	LB4-MF01-SB01	11/11/2003	DMM	1	0	5754351.794	2120167.912
Projectile, 40mm, cluster, white star, M585	17	LB4-MF01-SG02	11/11/2003	UXO	1	0	5755189.48	2120074.641
Projectile, 40mm, cluster, white star, M585	17	LB4-MF01-SJ01	11/11/2003	UXO	1	0	5755414.058	2120667.639
Cartridge, 40mm, practice, M382	17	LB3-MF10-SA10	11/12/2003	DMM	1	0	5755362.63	2120989.16
Cartridge, 40mm, practice, M382	17	LB3-MF10-SB07	11/12/2003	DMM	1	0	5755485.02	2120603.663
Cartridge, 40mm, practice, M382	17	LB3-MF10-SD06	11/13/2003	DMM	1	6	5752621.963	2112345.067
Fuze, rocket, base detonating, M404	17	LB3-MF09-SH06	11/13/2003	UXO	1	0	5754456.005	2117123.709
Cartridge, 40mm, practice, M382	17	LB3-ME10-SF05	11/14/2003	DMM	1	0	5754453.149	2117100.069
Projectile, 40mm, high explosive, M381	17	LB3-ME09-SJ08	11/14/2003	UXO	1	0	5756262.996	2120821.116
Projectile, 40mm, smoke, M713 series	17	LB3-MG09-SB03	11/14/2003	UXO	1	0	5756069.806	2120383.697
Grenade, hand, smoke, M18 series	17	LB3-MI10-SJ09	11/17/2003	UXO	1	12	5754934.37	2117020.33
Signal, illumination, ground, M125 series	17	LB3-MI10-SI09	11/17/2003	UXO	1	12	5755039.667	2116996.517
Simulator, explosive boobytrap, whistling, M119	17	LB4-MI01-SH01	11/17/2003	UXO	1	6	5754891.945	2116961.173

Table 3-2
MEC Encountered within Units 13, 17, and 20 and Adjacent Fuel Breaks

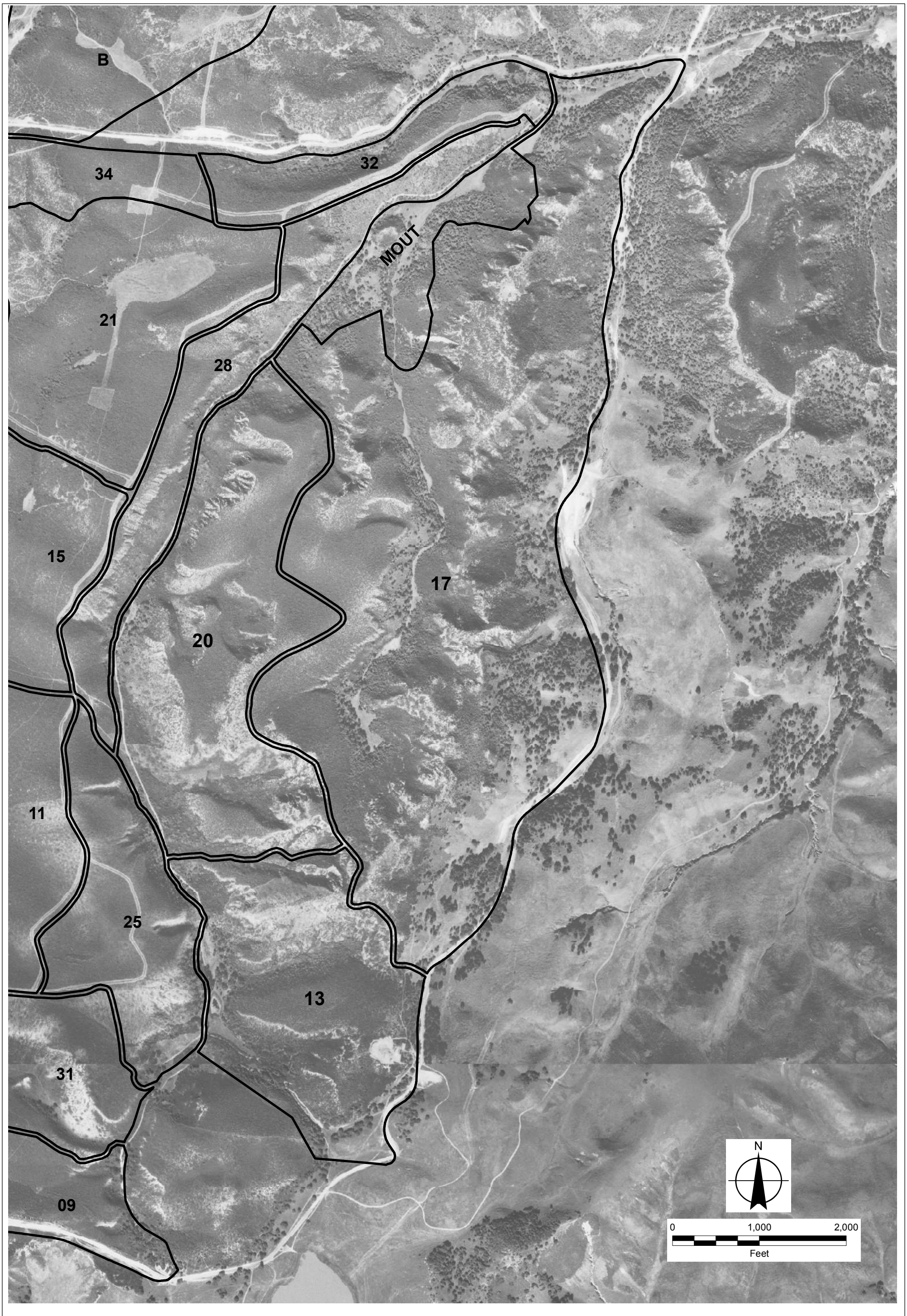
Model	Unit	Grid ID	Date	Type	Quantity	Depth (inches)	Easting	Northing
Grenade, hand, practice, M69	17	LB3-MI10-SG10	11/18/2003	UXO	1	6	5754895.038	2116960.531
Grenade, hand, smoke, M48	17	LB3-MI10-SG10	11/18/2003	UXO	1	6	5754910	2116980
Grenade, hand, practice, M21	17	LB3-MH09-SH08	11/19/2003	UXO	1	12	5754737.199	2117121.996
Projectile, 40mm, practice, M407A1	17	LB3-MI09-SA09	11/19/2003	UXO	1	24	5753519.608	2119055.535
Projectile, 40mm, practice, M407A1	17	LB3-MI09-SA09	11/19/2003	UXO	1	3	5750523.356	2115084.88
Projectile, 40mm, smoke, M713 series	17	LB4-MI01-SF02	11/19/2003	UXO	1	2	5750524.399	2114710.834
Projectile, 50mm, Mortar, Type89, Japanese NI	17	LB3-MH10-SH05	11/19/2003	UXO	1	1	5750587.631	2114455.691
Projectile, 50mm, Mortar, Type89, Japanese NI	17	LB3-MH09-SF10	11/20/2003	UXO	1	18	5751087.307	2113001.771
Fuze, grenade, hand, M204 series	17	LB3-MI10-SA04	12/8/2003	UXO	1	8	5752230.975	2114195.045
Grenade, hand, practice, M21	17	LB3-MI10-SA07	12/8/2003	UXO	1	16	5751775.5	2112809
Rocket, 3.5inch, practice, M29 series	17	LB3-MG09-SD03	12/10/2003	UXO	1	0	5753788.665	2118345.077
Grenade, hand, smoke, white phosphorous, M15	17	LB3-MF09-SB10	3/11/2004	UXO	1	12	5751073.946	2113044.049
Projectile, 40mm, high explosive, M381	17	LB3-MF09-SB10	3/11/2004	UXO	1	0	5755550.876	2117993.687
Projectile, 40mm, high explosive, M381	17	LB3-ME09-SI08	3/15/2004	UXO	1	0	5755640.161	2117606.756
Grenade, hand, smoke, white phosphorous, M15	17	LB3-MF09-SB10	3/16/2004	UXO	1	0	5754278.353	2116996.986
Cartridge, 40mm, high explosive, M383	Fuel Break	LB3-MG08-SC10	3/17/2004	DMM	1	0	5754418.957	2117103.713
Cap, blasting, electric, M6	20	LB3-MD06-SH03	7/27/2005	DMM	6	0	5754231.582	2116836.454
Grenade, rifle, smoke, white phosphorous, M19A1	17	B3E0J6	4/6/2011	UXO	1	0	5754426.121	2111948.838
Grenade, rifle, smoke, white phosphorous, M19A1	17	B3F0B3	8/2/2011	UXO	1	1	5754285	2119515
Grenade, rifle, smoke, white phosphorous, M19A1	17	B3E0J4	9/26/2011	UXO	1	0	5754345.97	2120075.291
Grenade, rifle, smoke, white phosphorous, M19A1	17	B3E0J4	9/28/2011	UXO	1	0	5754358.961	2120084.606
Grenade, rifle, smoke, white phosphorous, M19A1	17	B3E0J5	10/19/2011	UXO	1	0	5753778.304	2118131.485
Projectile, 37mm, low explosive, MK I	Fuel Break	ST007-QC	3/12/2012	UXO	1	0	5755665.231	2120532.99
Projectile, 37mm, low explosive, MK I	Fuel Break	IC058	3/13/2012	UXO	1	0	5754976.825	2119726.777
Projectile, 37mm, low explosive, MK II	Fuel Break	IC058	3/13/2012	UXO	1	0	5754491.647	2119547.668
Cartridge, 40mm, high explosive, M383	17	ST001-QC	3/14/2012	DMM	1	1	5754258.415	2118946.944
Cartridge, 20mm, TP, M99	Fuel Break	WR030	3/22/2012	UXO	1	4	5751607.163	2110868.518
Projectile, 37mm, low explosive, MK I	Fuel Break	WR039	3/22/2012	UXO	1	6	5750658.555	2115654.618
Projectile, 90mm, high explosive, M71, Series	Fuel Break	WR064	3/27/2012	UXO	1	3	5750713.703	2115732.973
Cartridge, 40mm, high explosive, M383	Fuel Break	WR041	5/21/2012	UXO	2	3	5752580.632	2112813.83
Cartridge, 40mm, high explosive, M383	Fuel Break	WR042	5/22/2012	UXO	1	0	5750617	2114165
Grenade, rifle, smoke, white phosphorous, M19A1	17	LB3-MF10-SA05	12/9/2012	UXO	1	12	5752784.836	2115888.743
Ignition Cylinder, Flamethrower, M1	17	MOUT50	2/20/2013	DMM	78	0	5755358.5	2120827.367
Projectile, 50mm, Mortar, Type89, Japanese NI	17	MOUT34	2/25/2013	UXO	1	0	5754794.136	2112568.45
Fuze, grenade, hand, practice, M228	17	MOUT21	3/4/2013	UXO	1	0	5755553.36	2120759.023
Grenade, hand, fragmentation, MK II	17	MOUT04	3/19/2013	UXO	2	0	5756390.763	2120351.787
Projectile, 81mm, mortar, high explosive, M43 series	20	B3C6D2	1/23/2015	UXO	1	0	5751590	2117830
Projectile, 37mm, low explosive, MK I	13	B3A6F8	8/29/2016	UXO	1	0	5751718	2112212
Grenade, hand, smoke, white phosphorous, M15	13	A3J7E3	9/7/2016	UXO	1	0	5751610	2111470
Projectile, 60mm, mortar, high explosive, M49 series	13	A3J7E2	9/8/2016	UXO	1	0	5751540	2111730
Projectile, 75mm, high explosive, M48	13	A3J7H1	9/13/2016	UXO	1	0	5751450	2112890
Projectile, 75mm, Shrapnel, MK I	20	B3A6I0	10/3/2016	UXO	1	0	5751325	2113050
Projectile, 37mm, low explosive, MK II	20	B3B6A8	10/5/2016	UXO	1	0	5751245	2113065
Projectile, 37mm, low explosive, MK II	20	B3B6A9	10/5/2016	UXO	1	0	5751020	2113240

Table 3-2
MEC Encountered within Units 13, 17, and 20 and Adjacent Fuel Breaks

Model	Unit	Grid ID	Date	Type	Quantity	Depth (inches)	Easting	Northing
Projectile, 37mm, low explosive, MK II	20	B3C6A3	11/17/2016	UXO	1	0	5750740	2114070
Projectile, 37mm, low explosive, MK II	20	B3C6A4	11/28/2016	UXO	1	0	5750810	2114045
Projectile, 81mm, mortar, high explosive, M43 series	20	B3C6B4	11/28/2016	UXO	1	0	5750810	2114125

Note: Information is per the MMRP database

Appendix A
Historical Aerial Photographs and Training Maps

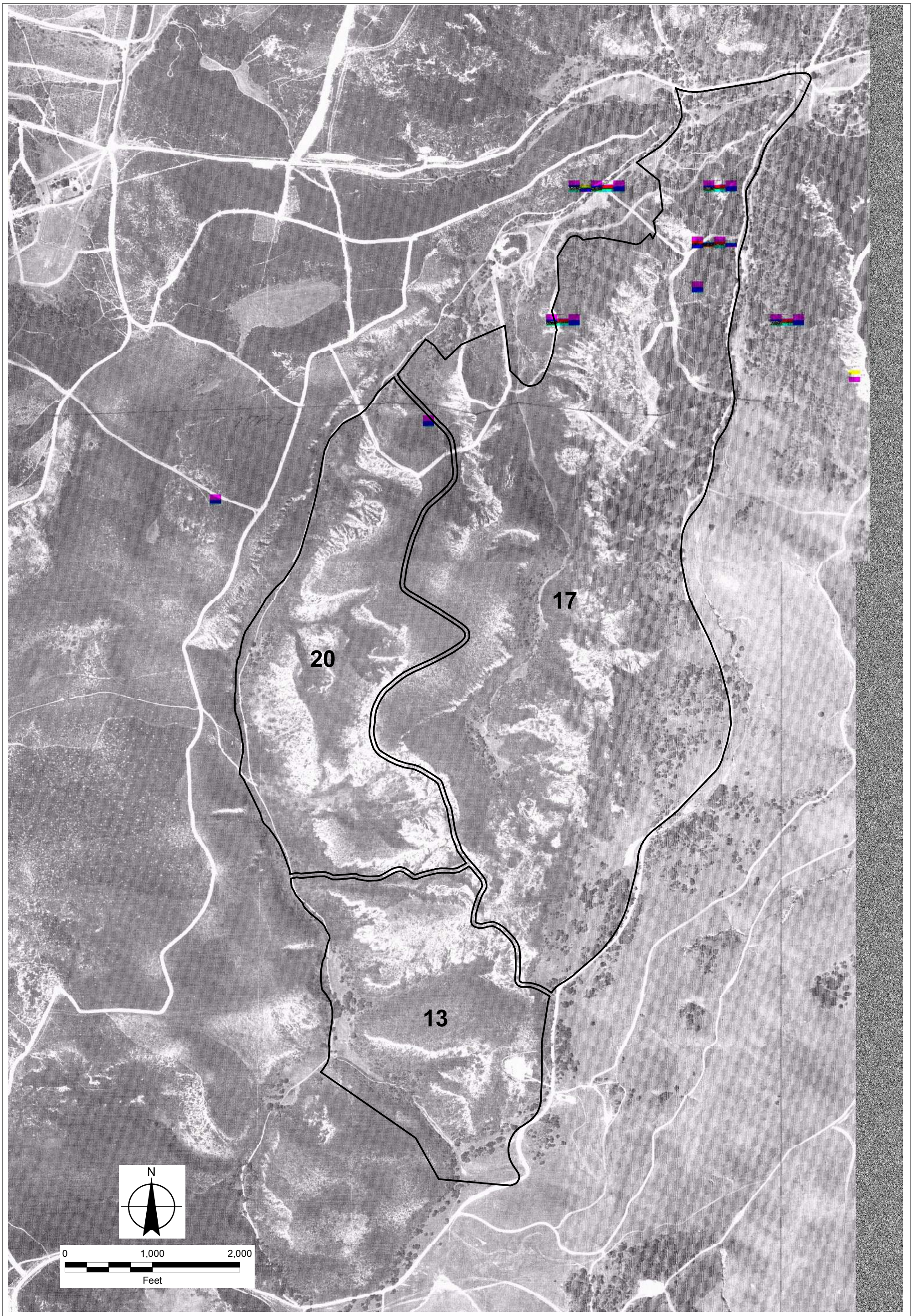


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

FIGURE A-1

1941 AERIAL PHOTO

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A1_1941_photo.mxd 1/12/2017 [14:11 PM] LCARR, Gilbane



Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-2

1949 Aerial Photo

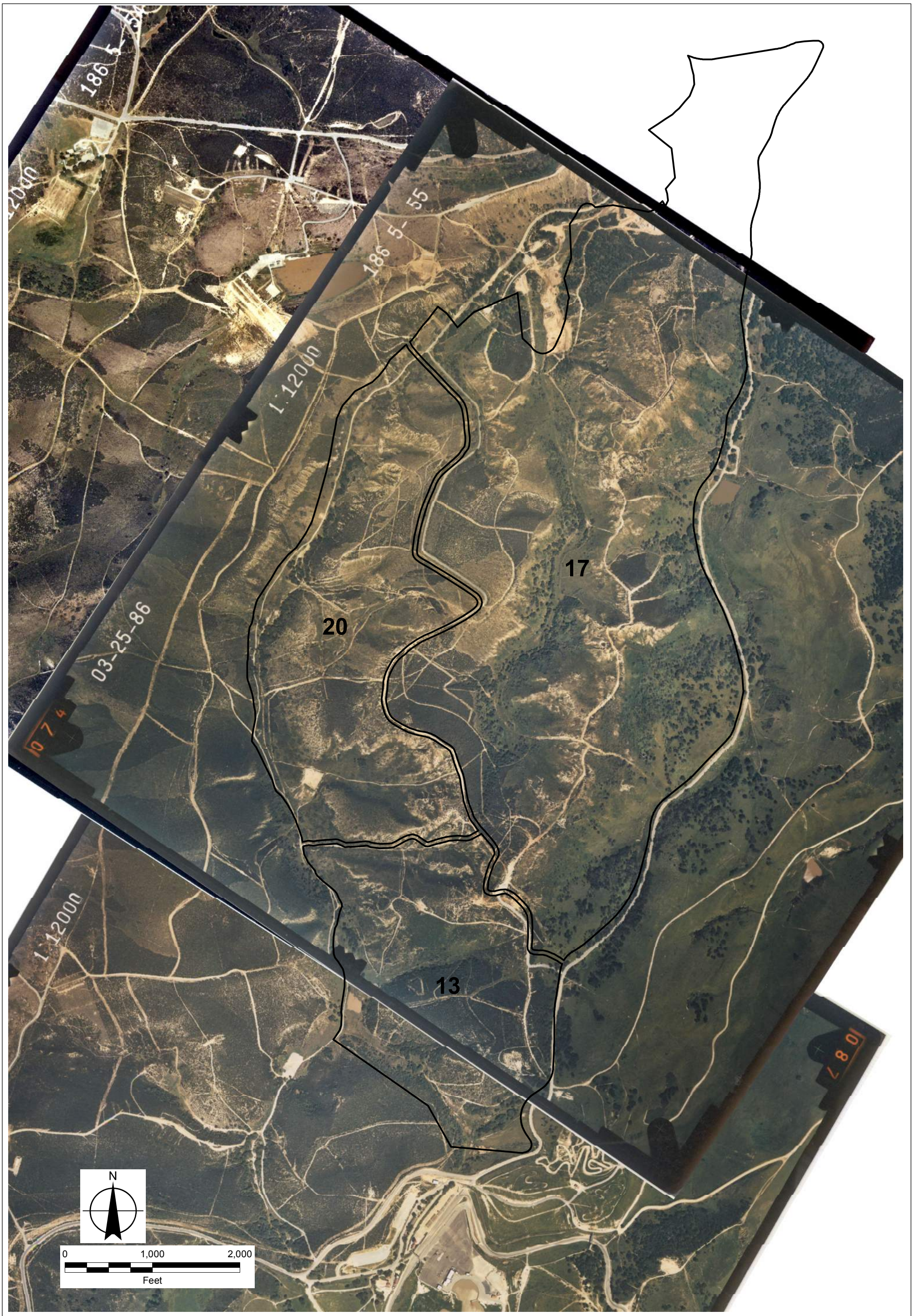
G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A2_1949_photo.mxd 3/30/2016 [22:51 PM] LCARR, Gilbane

Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-3

1978 Aerial Photo

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A3_1978_photo.mxd 3/30/2016 [22:54 PM] LCARR, Gilbane

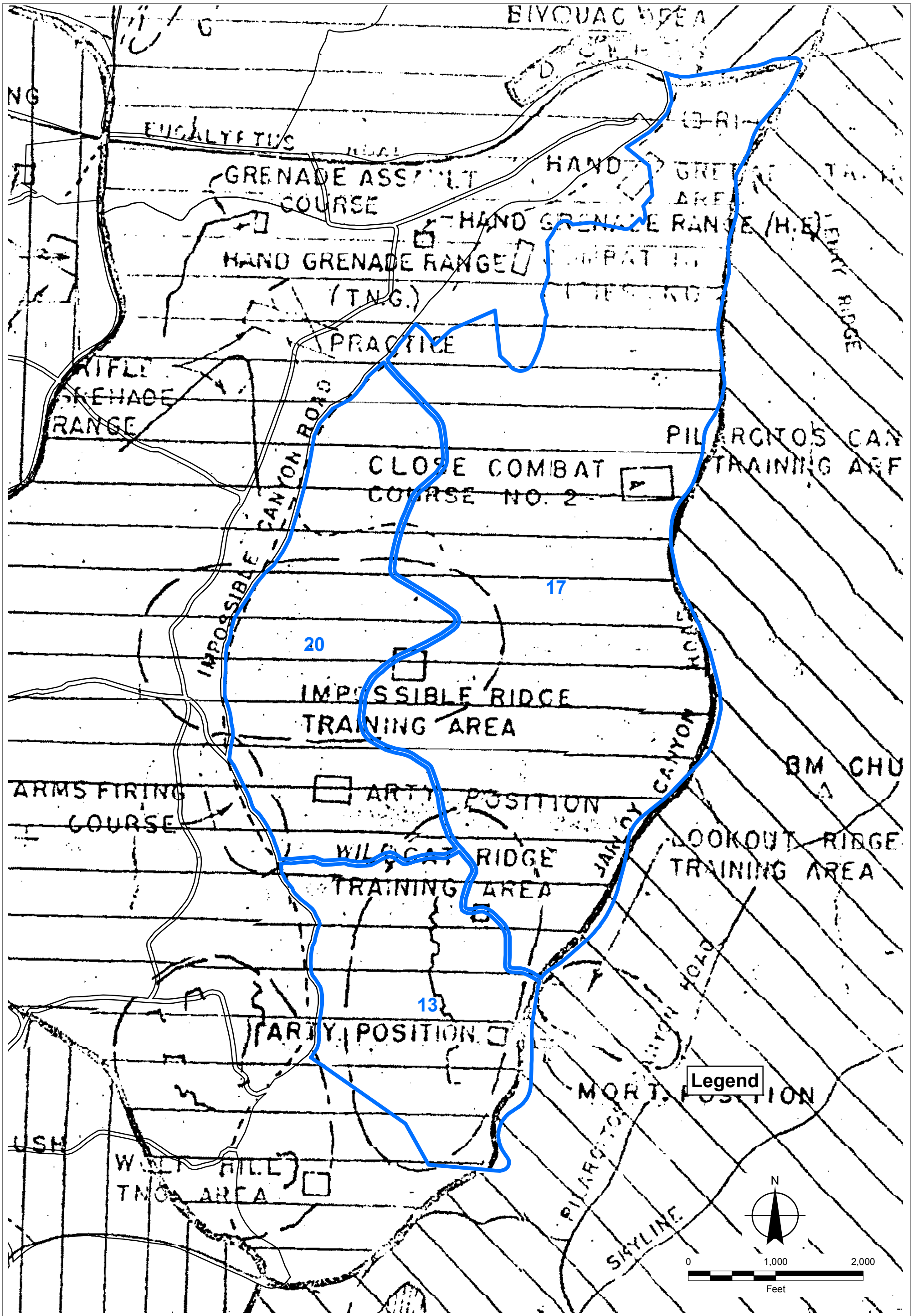


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-4

1986 Aerial Photo

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A4_1986_photo.mxd 3/30/2016 [22:30 PM] LCARR, ITSI

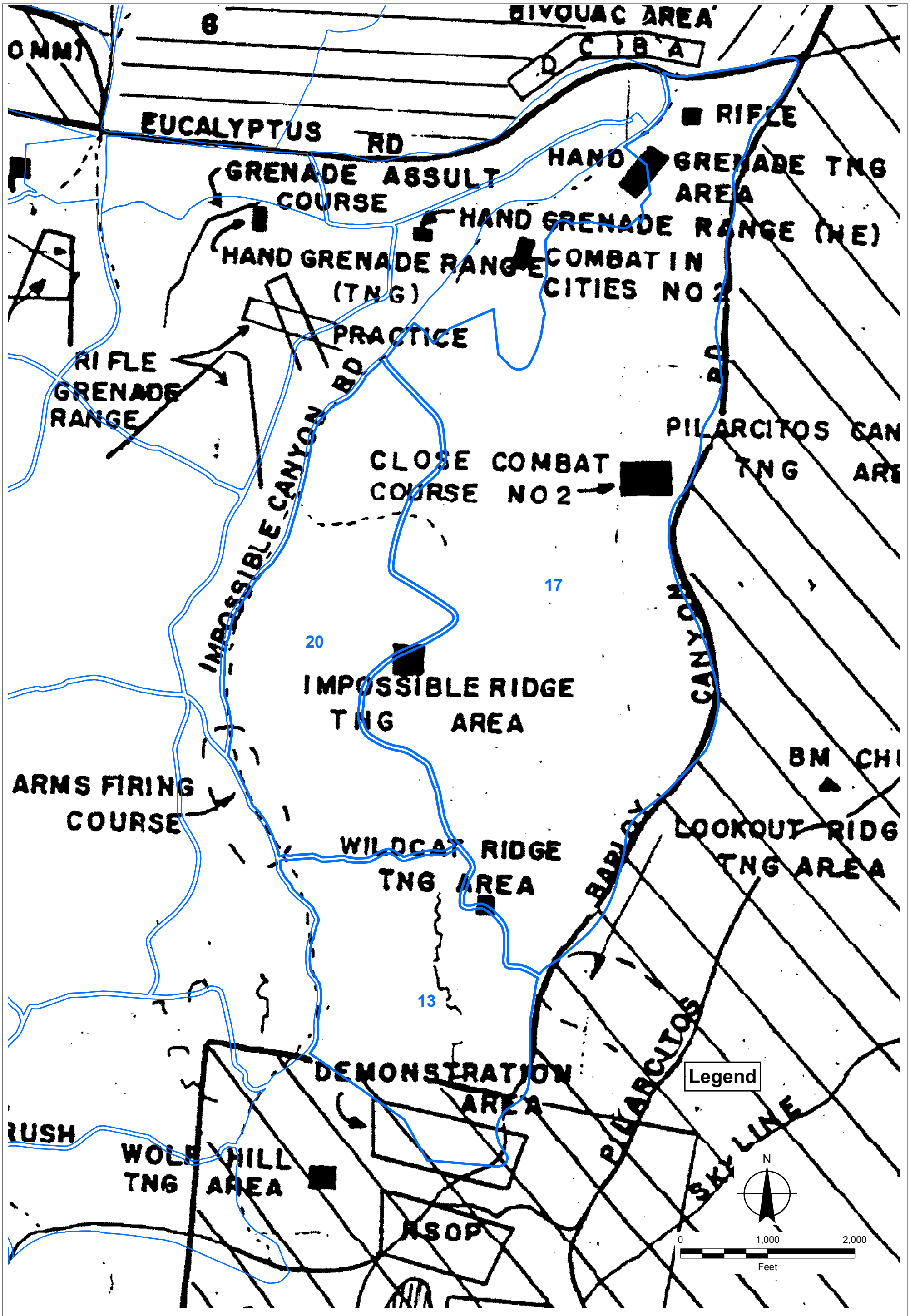


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-5

1953 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A5_1953_Training_Map.mxd 3/31/2016 [11:41 AM] LCARR, Gilbane



Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-6

1956 Training Map

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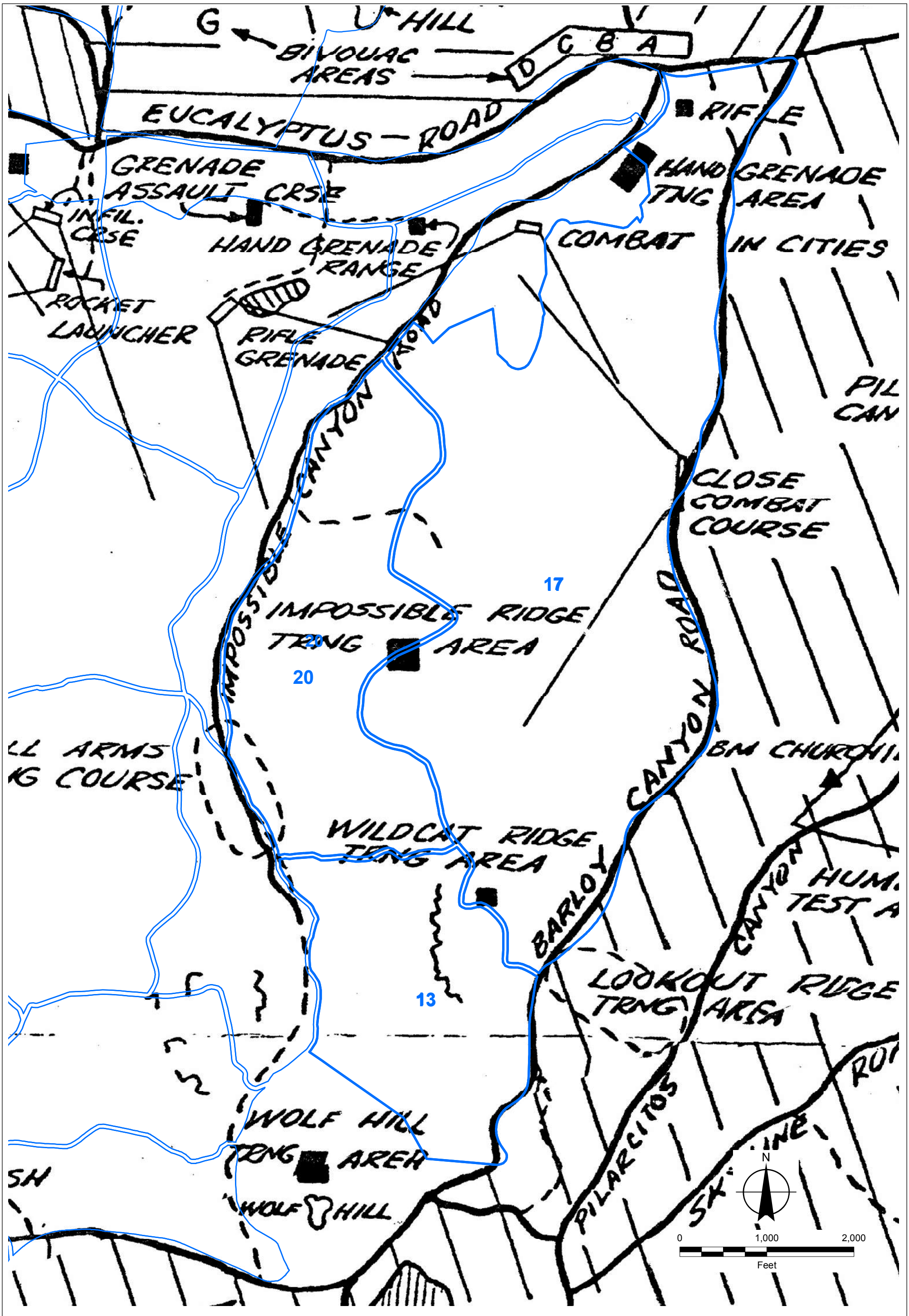
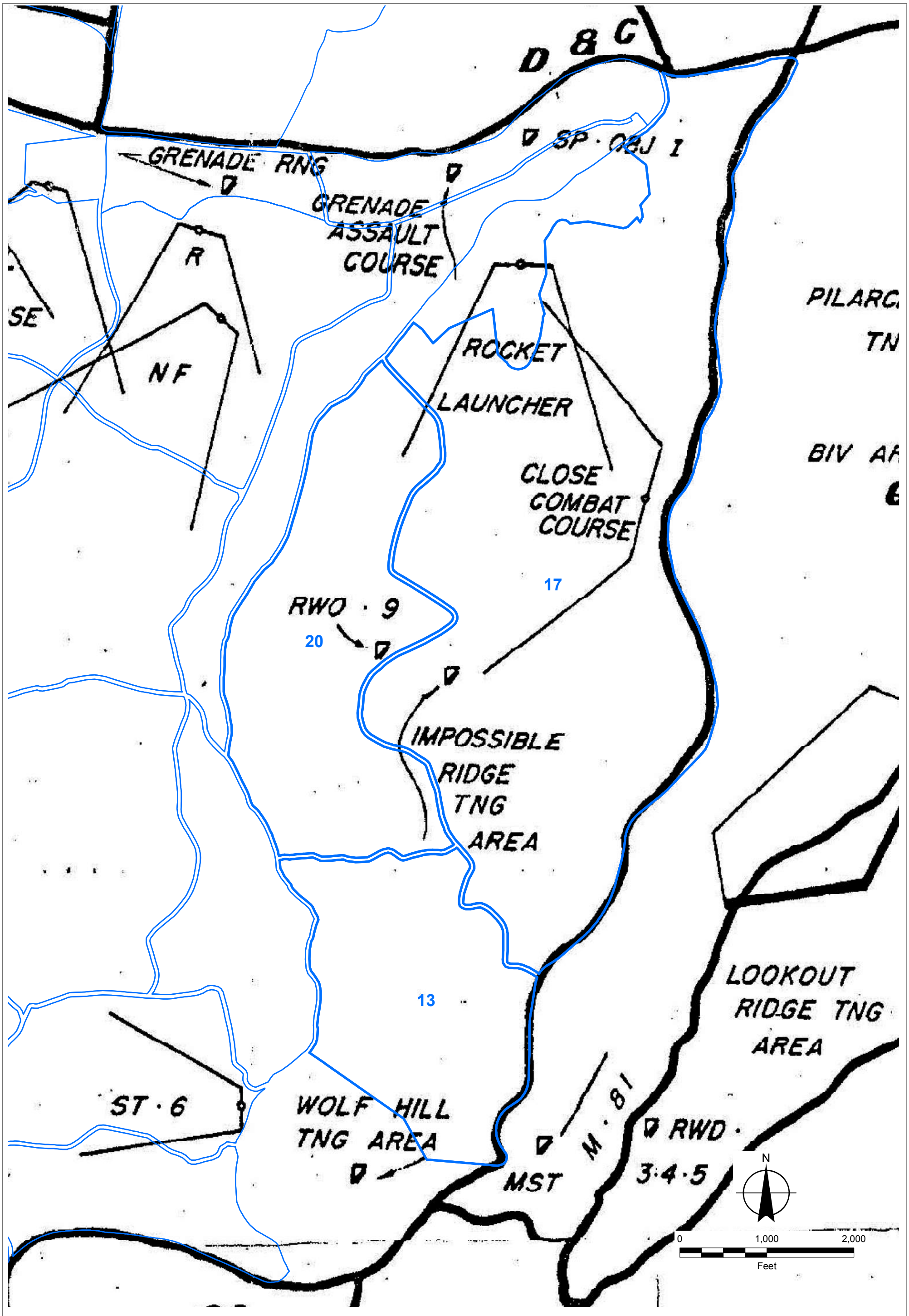


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-7

1957 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A7_1957_Training_Map.mxd 3/31/2016 [11:43 AM] LCARR, Gilbane



Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-8

1961 Training Map

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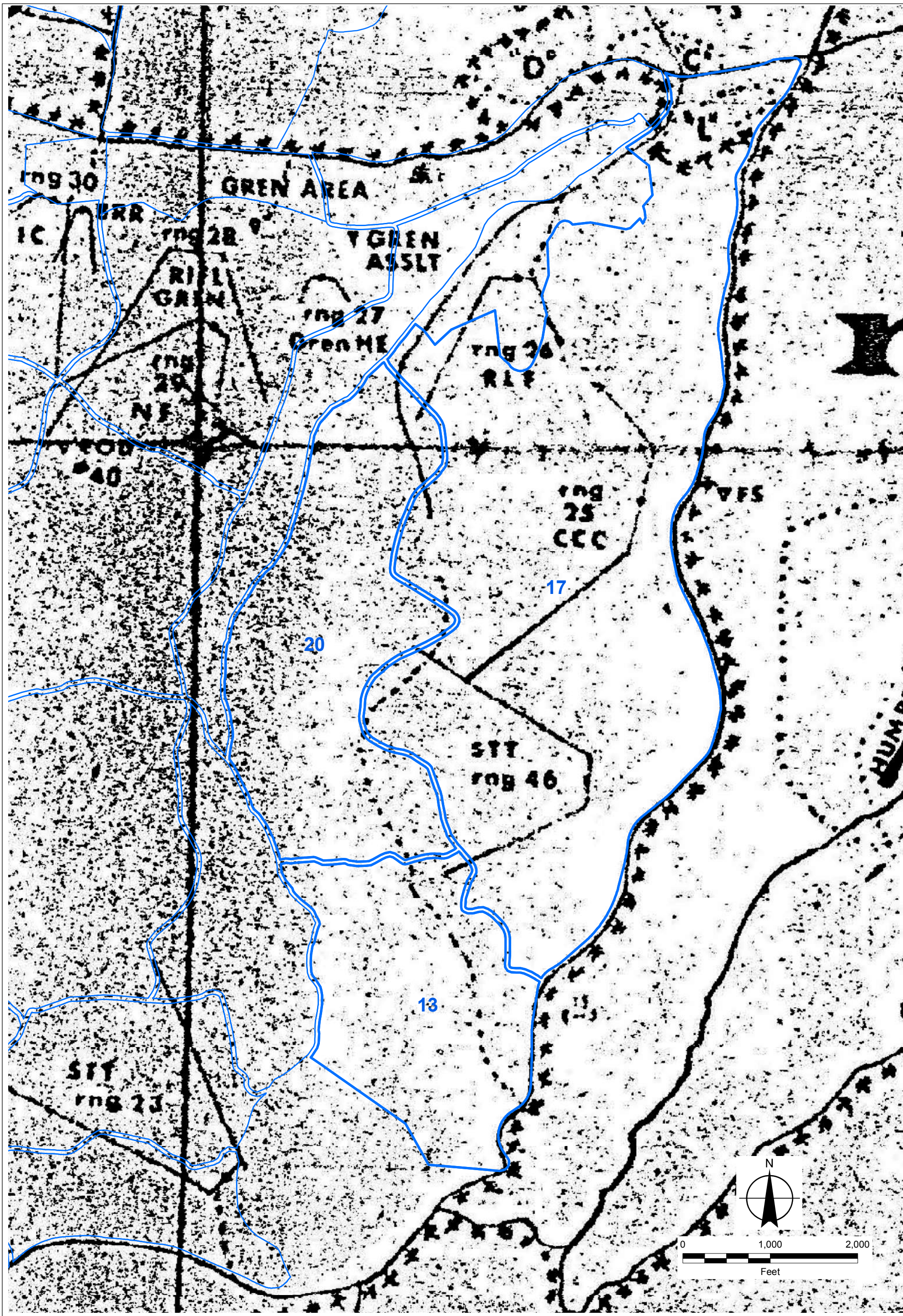
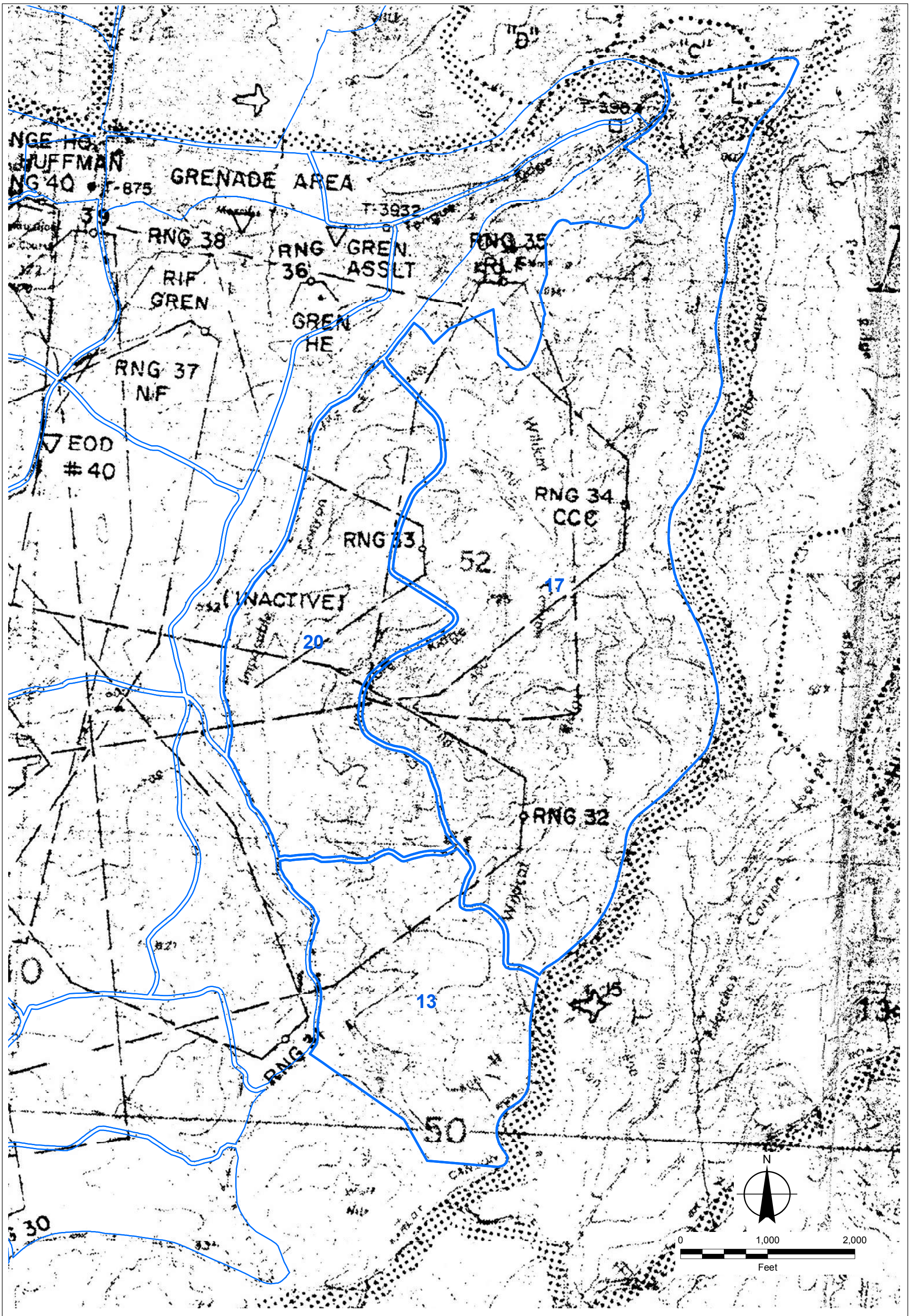


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-9

1964 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A9_1964_training.mxd 3/31/2016 [11:47 AM] LCARR, Gilbane

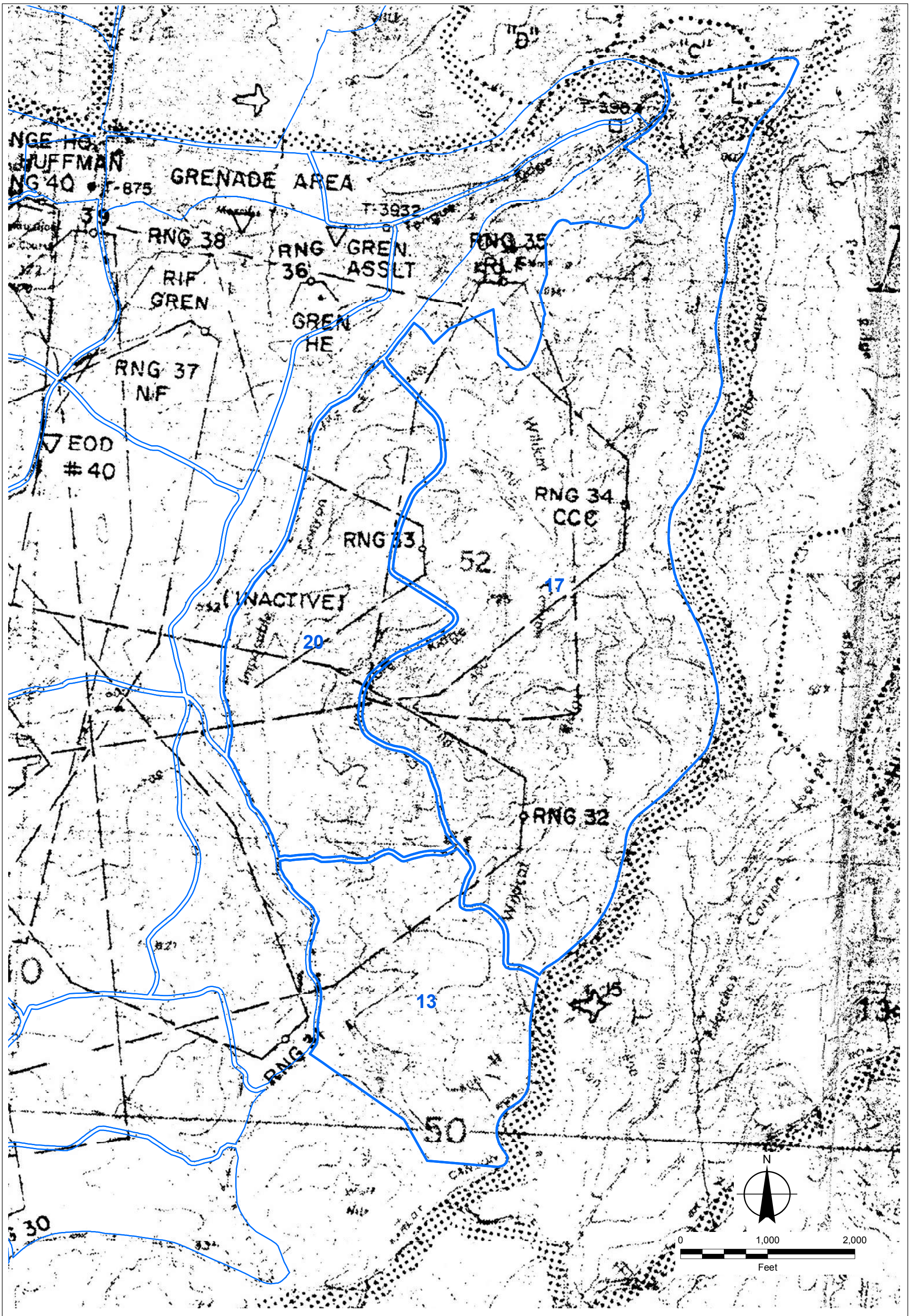


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-10

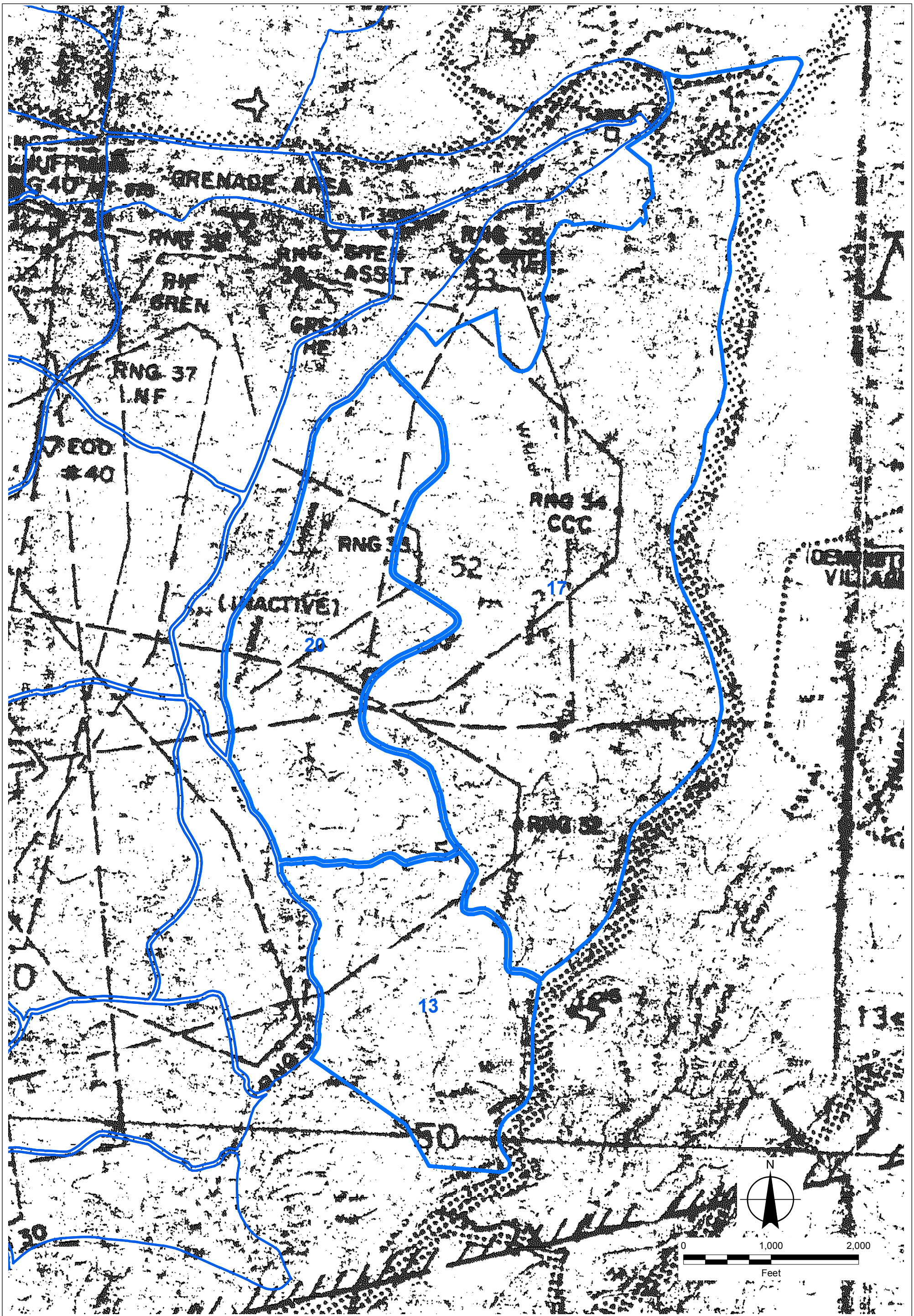
1965 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A10_1965_training.mxd 3/31/2016 [11:47 AM] LCARR, Gilbane



KEMRON ENVIRONMENTAL SERVICES / Gilbane	**Field Evaluation Work Plan** **Munitions and Explosives of Concern Remedial Action** **MRS-BLM Units 13, 17, and 20** Former Fort Ord, Monterey County, California	**Figure A-11** 1968 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A11_1968_training.mxd 3/31/2016 [11:48 AM] LCARR, Gilbane

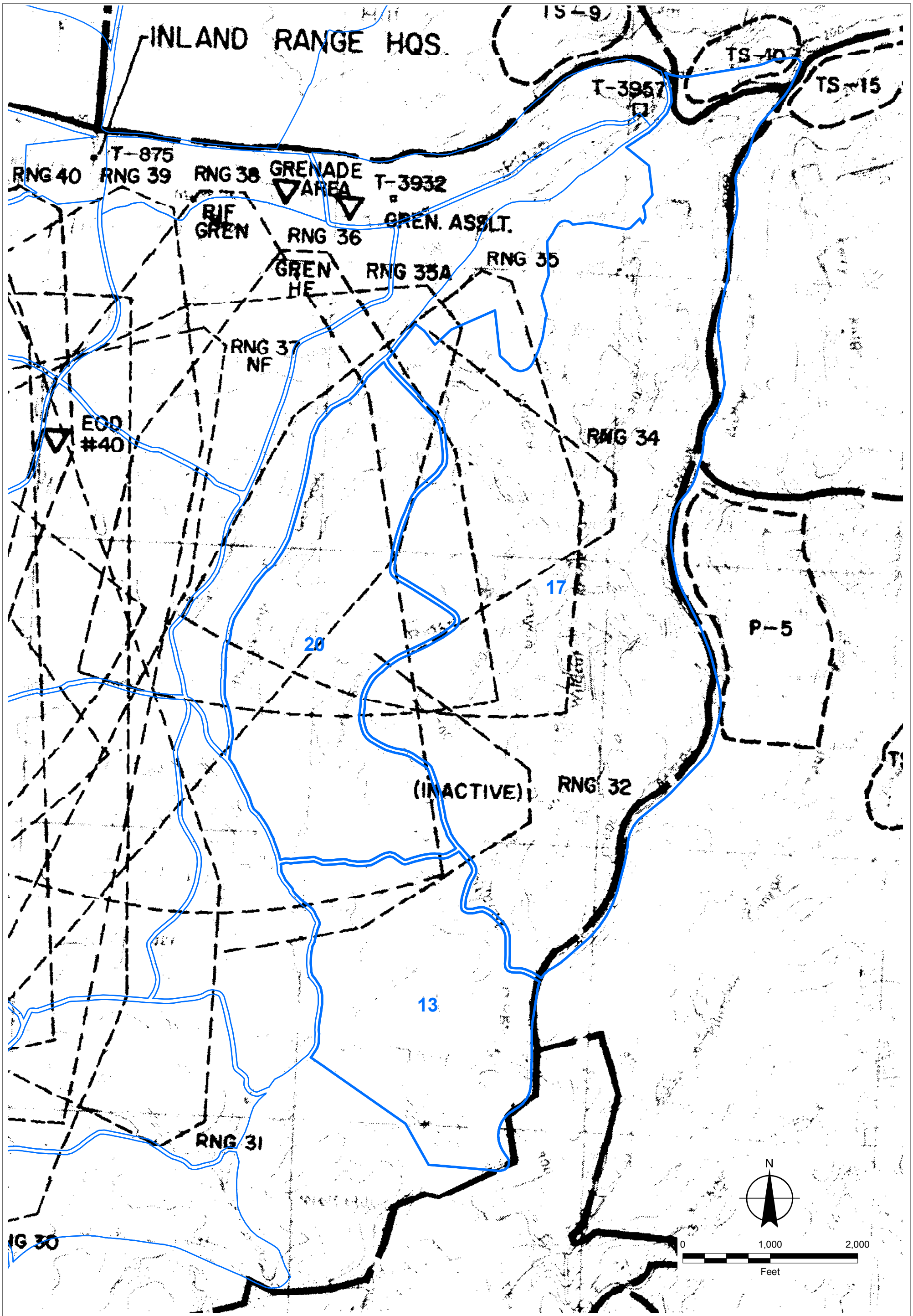


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-12

1971 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A12_1971_training.mxd 3/31/2016 [11:48 AM] LCARR, Gilbane

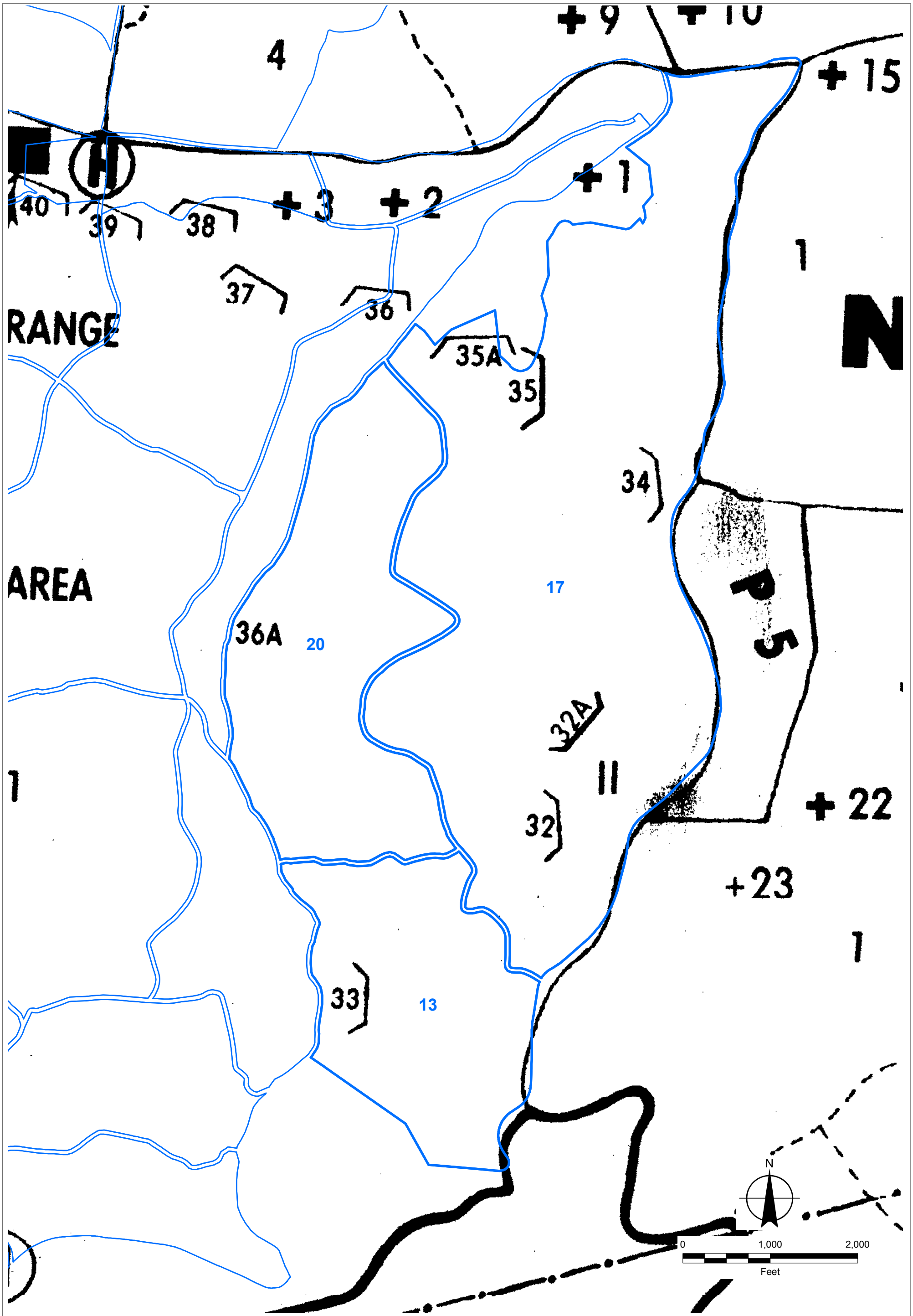


Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-13

1984 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A13_1984_training.mxd 3/31/2016 [11:50 AM] LCARR, Gilbane



Field Evaluation Work Plan
Munitions and Explosives of Concern Remedial Action
MRS-BLM Units 13, 17, and 20
Former Fort Ord, Monterey County, California

Figure A-14

1987 Training Map

G:\ArcGIS\USACE\Fort_Ord\PROJECTS\Units_13_17_20\FEWP\Map_Docs\Appendix_B\A14_1987_training.mxd 3/31/2016 [11:37 AM] LCARR, Gilbane

Appendix B
KEMRON Site Walk Photographs

Appendix B

Site Photos 2015

(See Figure 3-5 for location reference)

Photo 1A: Signal, illumination, ground, model unknown (MD). Located south/adjacent to Range 34 remediation area.

Photo 1B: Grenade, rifle, practice, M11 (MD). Located south/adjacent to Range 34 remediation area.

Photo 1C: Grenade, Rifle, practice, M29 (MD). Located south/adjacent to Range 34 remediation area.

Photo 2: Cartridge**,** 40mm, HE, M383. Located on Impossible Ridge.

Photo 3A: MD from Cartridge**,** 40mm, HE, M383. Located on Impossible Ridge.

Photo 3B: MD from Cartridge**,** 40mm, HE, M383. Located on Impossible Ridge.

Photo 4: Cartridge, 7.62mm, Blank, M82 (Linked). Located in Wildcat Canyon.

Photo 5: Fuze (model unknown). Located in Unit 13

Photo 6: Unknown structure, Unit 13 (1 of 2 at this location)

Photo 7: Woodland Area, Unit 13 (oaks)

Appendix C
Responses to Comments

RESPONSES TO COMMENTS

Document:	Draft, Field Evaluation Work Plan, Munitions Response, MRS-BLM Units 13, 17, and 20, Former Fort Ord, California
Commenting Organization:	United States Environmental Protection Agency (EPA)
Name:	Maeve Clancy
Date of Comments:	December 28, 2016

General Comment 1:

The Draft Field Evaluation Work Plan, Munitions Response, MRS-BLM Units 13, 17, and 20, Former Fort Ord, California dated November 2016, (hereinafter referred to as the Draft FEWP), uses the term "40mm grenades" when referring to the munitions fired by the M79, the M203 series grenade launchers, as well as a number of other related weapons. However, a review of TM 43-0001-28 (Technical Manual, Army Ammunition Data Sheets, Artillery Ammunition, Guns, Howitzers, Mortars, Recoilless Rifles, Grenade Launchers, and Artillery Fuzes) and FM 23-31 (40mm Grenade Launchers M203 and M79) indicates that the term used to refer to the complete round is "40mm cartridge" or "40mm round," and the portion of the munition that is expelled from the muzzle of the weapon when fired is a "40mm projectile." Neither publication refers to the cartridge or the projectile as a "40mm grenade." Please revise the Draft FEWP to replace the term "40mm grenade" with the correct terms as noted above.

Response to General Comment 1:

The term “40mm grenade” will be replaced as requested throughout the document.

General Comment 2:

The slang term "bazooka" is used in the Draft FEWP instead of the correct title of the noted weapon, which is "Launcher, Rocket, Antitank, 2.36-inch, M9." The ammunition is generally referred to as "Rocket, 2.36-inch, (type [e.g., high explosive antitank, white phosphorous smoke]), (model number)." Please make this correction as needed.

Response to General Comment 2:

The slang term “bazookas” was used in the Draft FEWP because it was a directly taken from the *Final Group 3 Remedial Investigation/Feasibility Study, Volume 1: Remedial Investigation, Del Rey Oaks/Monterey, Laguna Seca Parking, and Military Operations in Urban Terrain Site Munitions Response Areas, Former Fort Ord, Monterey County, California.* July. The text in

Section 3.1.14 has been updated as follows: "'The 1997 ASR also stated that 40mm HE grenades and bazooka projectiles were fired into Wildcat Canyon located south of Impossible City." (ESCA RP Team, 2012).

General Comment 3:

There are a number of statements concerning subsurface munitions and explosives of concern (MEC) removals to a specific depth. No statement is provided as to how the unresolved anomalies that were below that depth were addressed/recorded, or whether permission was requested from the appropriate authority to continue the excavation until the anomaly was resolved. Please review all instances where a specific removal depth is specified and revise the discussion to provide the noted information.

Response to General Comment 3:

The historical information summarized from referenced documents will be revised to include additional subsurface removal details as appropriate.

Specific Comment 1:

Acronyms and Abbreviations, Page v: The acronym "VSP" is incorrectly defined as "Visual Sampling Plan" in this section. The correct definition is "Visual Sample Plan." Please revise the definition as noted in this section and at any other uses in the Draft FEWP.

Response to Specific Comment 1:

The definition will be corrected to Visual Sample Plan throughout the document.

Specific Comment 2:

Section 2.2, Military History, Page 2-1, Lines 73-75: The text states that, "Over the years, various types of munitions were used during training activities within the Impact Area MRA including hand grenades, mortars, rockets, practice mines, artillery projectiles, and small arms." While this is correct, a review of Table 3-2, MEC Encountered within Units 13/17/20 and Adjacent Fuel Breaks; and Figure 3-3a, MEC Overview, reveals a significant number of pyrotechnic munitions were also employed on these sites. Please revise the cited sentence to include "pyrotechnics."

Response to Specific Comment 2:

The text will be revised as follows: “Over the years, various types of munitions were used during training activities within the Impact Area MRA including hand grenades, mortars, rockets, practice mines, artillery projectiles, pyrotechnics, and small arms.”

Specific Comment 3:

Appendix A, Historical Aerial Photographs and Training Maps, Figure A-1, 1941 Aerial Photograph: This photograph does not include the unit numbers as do all other figures in Appendix A. Please revise Figure A-1 to include the unit numbers.

Response to Specific Comment 3:

Figure A-1 will be revised to include the labeled units.

Specific Comment 4:

Appendix B, KEMRON Site Walk Photographs, Photo 1A, Rocket Grenade: The item pictured is not a "Rocket Grenade, (pyrotechnic)." The correct identification of the item, pictured is: "Signal, Illumination, Ground; (Type [if known]), (Model Number [if known). The item does not have a rocket motor, but is propelled by a rifle grenade cartridge fired by the projecting rifle. Please correct the nomenclature of the noted item.

Response to Specific Comment 4:

The nomenclature of the item will be corrected to: “signal, illumination, ground, model unknown (MD).”

Specific Comment 5:

Appendix B, KEMRON Site Walk Photographs, Photo 1b, Rocket Grenade: The item pictured is not a "Rocket Grenade (practice)." The correct identification of the item pictured is not easily determined, but it is not a "Rocket Grenade," as no such item exists/existed in the listing of type classified munitions that were in use during the operational period of Fort Ord. Please correct the nomenclature of the noted item.

Response to Specific Comment 5:

The nomenclature of the item will be corrected to: “grenade, rifle, practice, M11 (MD).”

Specific Comment 6:

Appendix B, KEMRON Site Walk Photographs, Photo 1c, Rocket Grenade: The item pictured is not a "Rocket Grenade (model unknown)." The correct identification of the item pictured is not easily determined, but it is not a "Rocket Grenade," as no such item exists/existed in the listing of type classified munitions that were in use during the operational period of Fort Ord. Please correct the nomenclature of the noted item.

Response to Specific Comment 6:

The nomenclature of the item will be corrected to: “grenade, rifle, practice, M29 (MD).”

Specific Comment 7:

Appendix B, KEMRON Site Walk Photographs, Photo 4, Bandolier, 5.56mm rounds: The item pictured is not a "Bandolier, 5.56mm rounds." The correct identification of the item pictured is likely a linked belt of 5.56mm rounds for use in the former Squad Automatic Weapon (SAW) that has been reclassified as the M249 light machine gun (LMG). Please correct the nomenclature of the noted item.

Response to Specific Comment 7:

The nomenclature of the item will be corrected to: “Cartridge, 7.62mm, Blank, M82 (linked).”

Minor Comment 1:

Section 3.1.8, Time Critical Removal Action-Eucalyptus Fire Area, Page 3-6, Lines 296-297: This section contains a sentence that reads, "Sweep teams consisted of crews walking side-by-side and space 4 to 8 feet apart, visually searching the ground for military munitions." The word "space" should be changed to read "spaced." Please make this correction.

Response to Minor Comment 1:

“Space” will be replaced with “spaced” as requested.

RESPONSES TO COMMENTS

Document:	Draft, Field Evaluation Work Plan, Munitions Response, MRS-BLM Units 13, 17, and 20, Former Fort Ord, California
Commenting Organization:	Department of Toxic Substances Control (DTSC)
Name:	Vlado Arsov
Date of Comments:	February 13, 2017

Comment 1:

The draft Field Evaluation Work Plan (dFEWP) primary purpose is to delineate areas where remedial action activities are required, delineate areas where munitions and explosives of concern (MEC) removal is not warranted due to lack of evidence of munitions use, and provide recommendation for prescribed burning.

General Comment:

The Department of Toxic Substances Control (DTSC) has no comment regarding the technical procedures of the dFEWP; however, the purpose of the field evaluation regarding required remedial action activities and delineation of where MEC removal is warranted can only be evaluated after implementation of the selected remedy for the Track 3 Record of Decision Impact Area MRA (ROD). The first phase of the selected remedy is vegetation clearance via prescribed burning through which this work plan is applicable. The dFEWP appears to minimize the full scope of the Remedy and subsequent Remedial Design/ Remedial Action (RD/RD) with this field evaluation. DTSC does not concur that this field evaluation will fully comply with the ROD. The dFEWP appears to start basic characterization of these areas with Site Investigation (SI) or Remedial Investigation (RI). The Track,3 Impact Area MRA has already had a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) complete characterization and the recommended action has been selected in the Feasibility Study and documented in the ROD. The DTSC will not make a determination as to the adequacy of implementation of the ROD selected remedy, until after a Site Specific Work Plan (SSWP) is provided and remedial actions are completed. The SSWP is a primary document of the Federal Facility Agreement. The inability to fully implement the selected remedy must be documented in an Explanation of Significant Difference or ROD Amendment.

Response to Comment 1:

As indicated in the title of the document and as described to DTSC during the Munitions Response (MR) Base Realignment and Closure (BRAC) Cleanup Team (BCT) meetings in 2016 as well as additional conversations, this document is not intended as a remedial action implementation work plan. It is for an evaluation of Units 13, 17, and 20 to gather information that would lead to developing a work plan that would describe the implementation of the selected remedy in the units. As stated in Section 1.0 of the document and as previously explained to DTSC, Units 13, 17, and 20 were selected for further evaluation prior to conducting the remedial action. Significant challenges were identified relative to the Army's ability to plan and execute safe prescribed burns in this area. Furthermore, if prescribed burning is determined not to be feasible, the site conditions present significant challenges to accessibility for safe conduct of vegetation cutting and surface removal. Because of these known challenges, additional evaluation of the units is warranted to appropriately address those challenges and to incorporate the knowledge into a remedial action work plan that can be implemented safely.

The field evaluation work plan does identify the potential that, due to the location of the units at the eastern end of the historical Impact Area and limited historical evidence indicating the use of military munitions other than small arms, and previously conducted work, portions of the units could potentially be identified as not warranting surface removal and associated disturbance to the habitat. The field evaluation work plan is not intended to seek agency determination as to the adequacy of implementation of the selected remedy.

As the field evaluation proceeds, the Army anticipates providing status updates to and conducing discussions with the MR BCT.