

Track 1
Plug-In Approval Memorandum
BLM-Headquarters and MRS-35
Former Fort Ord, California

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United States Department of the Army
Base Realignment and Closure (BRAC)
Former Fort Ord, California

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APPENDIX

A	GLOSSARY OF MUNITIONS RESPONSE PROGRAM TERMS
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ACRONYM LIST

Army	United States Department of the Army
ADL	Arthur D. Little
ASR	Archives Search Report
bgs	below ground surface
BCT	BRAC Cleanup Team
BLM	Bureau of Land Management
BRA	Basewide Range Assessment
BRAC	Base Realignment and Closure
BRR	Bench Rest Rifle Range
cal	caliber
CEMSL	California Environmental Monitoring Systems Laboratory
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CID	Criminal Investigation Division
CMS	CMS Environmental, Inc.
CSM	Conceptual Site Model
ctgs	cartridges
DENR	Directorate of Environmental and Natural Resources
DGM	digital geophysical mapping
DMM	discarded military munition
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
DTSC	California Environmental Protection Agency's Department of Toxic Substances Control
EE/CA	Engineering Evaluation/Cost Analysis
ESD	Explanation of Significant Differences
ESL	Explosive Storage Location
FAAF	Fritzsche Army Airfield
FFA	Federal Facility Agreement
FTS	Field Trial Site
GIS	Geographic Information System
GPS	Global Positioning System
HLA	Harding Lawson Associates (now MACTEC)
HMP	Habitat Management Plan
MACTEC	MACTEC Engineering and Consulting, Inc.
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
mm	millimeter
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
ODDS	Ordnance Detection and Discrimination Study
OE	Ordnance and Explosives
PA/SI	Preliminary Assessment/Site Inspection
PM	Project Manager
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RR	recoilless rifle
Shaw	Shaw Environmental, Inc.

SMART	Strategic Management, Analysis, Requirements, and Technology Team
SUXOS	Senior UXO Supervisor
SSWP	site specific work plan
USA	USA Environmental, Inc.
USACE	U.S. Army Corps of Engineers, Sacramento District
USAEDH	U.S. Army Corps of Engineers, Huntsville Division
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UXB	UXB International, Inc.
UXO	Unexploded Ordnance

1.0 INTRODUCTION

This Track 1 Plug-In Approval Memorandum (Approval Memorandum) was prepared for Munitions Response Site (MRS) 35, and the reconfigured Parcel F1.12, which is the footprint of the current Bureau of Land Management (BLM) headquarters (former Fort Ord Range Control); hereafter referred to as “BLM-Headquarters and MRS-35” located within the former Fort Ord in Monterey County, California (Plate 1-1). The purpose of this Approval Memorandum is to provide information necessary to address BLM-Headquarters and MRS-35 within the Track 1 Plug-In process.

The Munitions Response Remedial Investigation/Feasibility Study (MR RI/FS; formerly ordnance and explosives [OE] RI/FS) program for the former Fort Ord is being implemented to evaluate and address all areas within the base with regards to known and suspected areas containing munitions and explosives of concern (MEC) from past military training activities. The MR RI/FS program is being completed by grouping areas and sites within the former Fort Ord as a series of “tracks” numbered 0 through 3 that are based on MEC-related characteristics to expedite clean-up, reuse and/or transfer of Fort Ord property. The Track 1 portion of the MR RI/FS program addresses sites where military munitions were suspected to have been used, but based on the RI/FS for each site, it falls into one of the following three categories:

- Category 1: There is no evidence to indicate military munitions were used at the site, i.e., suspected training did not occur; or
- Category 2: The site was used for training, but the military munitions items used do not pose an explosive hazard, i.e., training did not involve explosive items; or
- Category 3: The site was used for training with military munitions, but military munitions items that potentially remain as a result of that training do not pose an unacceptable risk based on site-specific evaluations conducted in the Track 1 OE RI/FS. Field investigations identified evidence of past training involving military munitions, but training at these sites involved only the use of practice and/or pyrotechnic items that are not designed to cause injury. In the unlikely event that a live item of the type previously observed at the site is found, it is not expected that the item would function by casual contact (i.e., inadvertent and unintentional contact).

The ROD No Further Action Related to Munitions and Explosives of Concern—Track 1 Sites, No Further Remedial Action with Monitoring for Ecological Risks from Chemical Contamination at Site 3 (MRS-22) dated April, 2005 (Track 1 ROD) addresses twenty-one sites, and also provides a Plug-In process to address future sites that are considered eligible for inclusion into the Track 1 process.

BLM-Headquarters and MRS-35 has been identified as eligible as a Track 1, Category 1 Plug-In site based on the location, physical features, past use, and MEC and munitions debris (MD) found at the site. This site includes portions of MRS-BLM that were previously associated with Track 3 areas being re-categorized from Track 3 to Track 1 based on the evaluation provided in this document.

When the written concurrence from the United States Environmental Protection Agency (USEPA) and acknowledgement from the California Environmental Protection Agency's Department of Toxic Substances Control (DTSC) are received, this memorandum will serve as the decision document stating that no further action regarding munitions response is required for BLM-Headquarters and MRS-35. The following sections provide an overview of Fort Ord; the Track 1 process; and site-specific documentation including history of the area, future use, and rationale for inclusion of BLM-Headquarters and MRS-35 into the Track 1 Plug-In process.

1.1 Fort Ord and MR RI/FS Background

The former Fort Ord is located in northern Monterey County approximately 80 miles south of San Francisco (Plate 1-1). The former United States Department of the Army (Army) base comprises approximately 28,000 acres of land next to Monterey Bay and the cities of Seaside, Sand City, Monterey, and Del Rey Oaks to the south, and Marina to the north. The former Fort Ord is bounded to the east and north by the Salinas Valley. A Southern Pacific Railroad track and Highway 1 pass through the western portion of the former Fort Ord, separating the beach from the rest of the base. Laguna Seca Recreation Area, Toro Park, and Highway 68 border former Fort Ord to the south and southeast.

The U.S. Government bought the present day East Garrison and nearby lands on the east side of Fort Ord in 1917 to use as a maneuver and training ground for field artillery and cavalry troops stationed at the Presidio of Monterey. No permanent improvements were made until the late 1930s, when administrative buildings, barracks, mess halls, tent pads, and a sewage treatment plant were constructed.

In 1940, additional agricultural property was purchased for the development of the Main Garrison. At the same time, the beachfront property was donated to the Army. The Main Garrison was constructed between 1940 and the 1960s, starting in the northwest corner of the base and expanding southward and eastward. During the 1940s and 1950s, a small airfield within the Main Garrison was present in what is now the South Parade Ground. In the early 1960s, Fritzsche Army Airfield (FAAF) was completed. The Main Garrison airfield was then decommissioned and its facilities were redeveloped as a motor pool and other facilities. Significant construction activities at the former Fort Ord have not occurred since that time.

Since it was established in 1917, Fort Ord served primarily as a training and staging facility for infantry troops. Fort Ord was a basic training center from 1947 to 1975; served as a base for 7th Infantry Division after 1975; and was selected for closure in 1991. Fort Ord was officially closed in September 1994 in response to the 1991 Base Realignment and Closure Act (BRAC). No active Army division is stationed at Fort Ord; however, Army personnel operate the areas of Fort Ord still held by the Army. Much of the installation has been or will be disposed to federal, state, local, and private entities through economic development conveyance, public benefit conveyance, negotiated sale, or other means.

Because various Army units used portions of Fort Ord for maneuvers, target ranges, and other training/staging activities, military munitions may be present at the former Fort Ord. In preparation for transfer and reuse of Former Fort Ord property, various military munitions-related investigative and removal/remedial activities have been performed since 1993. Potential chemical contamination at the Former Fort Ord was investigated under the Basewide Remedial Investigation/Feasibility Study (*Harding Lawson Associates, [HLA], 1995*).

A Federal Facility Agreement (FFA) was signed in 1990 by the Army, USEPA, and the DTSC and the Regional Water Quality Control Board. The FFA established schedules for performing remedial investigations and feasibility studies and requires that remedial actions be completed as expeditiously as possible. In 1998, the Army agreed to evaluate military munitions at former Fort Ord in an MR RI/FS consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). In April 2000, an agreement was signed between the Army, USEPA, and the DTSC to evaluate military munitions at the former Fort Ord subject to the provisions of the Fort Ord FFA (Strategic Management, Analysis, Requirements, and Technology Team, *[SMART], 2000*). The MR RI/FS utilizes a “tracking” process which categorizes areas with similar MEC-related characteristics to expedite clean-up, reuse and/or transfer of Fort Ord property. According to this “tracking process,” an area under investigation is assigned one of four tracks, Track 0 through Track 3, which are described as follows:

Track 0: Areas that contain no evidence of MEC and have never been suspected as having been used for military munitions-related activities of any kind. Details of the Track 0 program and areas addressed are provided in the Track 0 ROD (*Army, 2002*), and the Track 0 Explanation of Significant Differences (ESD; *Army, 2005b*).

Track 1: Sites where military munitions were suspected to have been used, but based on the RI/FS for each site, it falls into one of the following three categories:

- Category 1: There is no evidence to indicate military munitions were used at the site, i.e., suspected training did not occur; or
- Category 2: The site was used for training, but the military munitions items used do not pose an explosive hazard, i.e., training did not involve explosive items; or
- Category 3: The site was used for training with military munitions, but military munitions items that potentially remain as a result of that training do not pose an unacceptable risk based on site-specific evaluations conducted in the Track 1 OE RI/FS. Field investigations identified evidence of past training involving military munitions, but training at these sites involved only the use of practice and/or pyrotechnic items that are not designed to cause injury. In the unlikely event that a live item of the type previously observed at the site is found, it is not expected that the item would function by casual contact (i.e., inadvertent and unintentional contact).

No further action related to munitions response is required for designated Track 1 sites.

Details of the Track 1 program and sites addressed are provided in the Track 1 ROD (*Army, 2005a*).

Track 2: Sites where MEC items were present and MEC removal action has been conducted.

Track 3: Areas where MEC items are known or suspected to be present, but MEC investigations have not yet been completed.

The Track 1 Plug-In process, which addresses future Track 1 sites, is described below.

1.2 Track 1 Plug-In Process

This section describes the Track 1 program and summarizes steps to address future sites eligible for Track 1 through the Plug-In process.

As described in the Track 1 ROD, No Further Action decisions for future Track 1 Plug-In sites (e.g., BLM-Headquarters and MRS-35) will be proposed and documented in Approval Memoranda. This memorandum provides the same level of information that was included in the RI Site Reports in the Track 1 OE RI/FS (MACTEC Engineering and Consulting, Inc., [*MACTEC*], 2004), and describes the rationale for Track 1 designation. In accordance with the Track 1 ROD, the Approval Memorandum for BLM-Headquarters and MRS-35 includes the following:

1. A description of the site;

2. A description of the historical use of the site;
3. Rationale for the designation of this site as Track 1; and
4. A map of the site detailing its location and any pertinent available MEC-related information.

There will be a public review process for all Approval Memoranda, and these memoranda will be primary documents under the Fort Ord FFA. Each Track 1 Plug-In Approval Memorandum will be submitted and finalized according to the agency consultation process outlined in Section 7 of the FFA. Following the agency review of draft Approval Memorandum and necessary revisions, the Army will submit the Approval Memorandum for a 30-day public review and comment period. A public notice will be posted in a local newspaper announcing the opportunity to review and comment on the proposed decision(s). Subsequently, the Army will submit to the agencies a summary of public comments and responses to the comments, and any needed revisions to the Approval Memorandum, at which time the Approval Memorandum will be considered a draft final document as defined in the FFA. Within 30 days of this submittal, the agencies will, in writing, either concur with or acknowledge the Army's decision(s), or initiate a dispute per Section 12 of the FFA.

When the written concurrence from USEPA and acknowledgement from DTSC are received, a public notice will be posted in a local newspaper. Planned and completed 'No Further Action Related to MEC site determinations will also be described in Fort Ord environmental cleanup newsletters prepared by the Army for local residents. Notification of these proposed and completed activities will also be distributed to appropriate local agencies. The Proposed Plan and ROD for Track 1 and other tracks, as well as all associated Approval Memoranda, are in the former Fort Ord Administrative Record and the local information repositories.

1.3 Report Organization

This approval memorandum consists of two main parts. The first part, contained in Sections 2.1 through 3.5, includes a presentation and assessment of archival data and the conceptual site model (CSM). Specific elements include a review of site history and development, evaluation of potential ordnance at the site, a summary of previous munitions response investigations and removal actions, and development of a conceptual site model. The above-mentioned information was used to support the second part of this report, which is the Site Evaluation (Section 4.0). The Site Evaluation was conducted in accordance with the procedures described in the Final Plan for Evaluation of Previous Work (*HLA, 2000b*) and may restate some information presented previously. The Site Evaluation discusses the evaluation of the literature review process (Section 4.1), evaluation of sampling process(es) (Section 4.2), and evaluation of the site

walk process (Section 4.3). These discussions are based upon information from standardized literature review and sampling review checklists (Attachment 1). Section 5.0 provides conclusions and recommendations for the site. References are provided in Section 6.0.

2.0 BLM-HEADQUARTERS AND MRS-35 – FORMER FORT ORD RANGE CONTROL

Information supporting the determination of the BLM Headquarters and MRS-35 as a Track 1 Plug-In site is presented in the following sections.

2.1 Site Location and Description

BLM-Headquarters and MRS-35 was formerly used as Camp Huffman from at least the late 1930s through the 1950s, was designated as Range Control in the 1960s through closure, and currently serves as BLM headquarters. The site is centrally located on the northern edge of the Impact Area, south of Eucalyptus Road and just west of Watkins Gate Road. The northeast corner of the site abuts the intersection of Broadway and Eucalyptus roads and the southeast corner crosses Watkins Gate Road (Plate 2-1).

MRS-35 consists of approximately 13 acres as shown on Plate 2-1. In a May 12, 2010 Munitions Response Base Realignment and Closure Cleanup Team (BCT) meeting, the Army proposed expanding and reconfiguring the boundaries of Parcel F1.12 (a development parcel which was transferred to BLM in 1996), in this Track 1 Approval Memorandum. This reconfigured boundary is shown on Plate 2-1 and brings the total area of the Site to 15.7 acres, which includes MRS-35 and the reconfigured Parcel F1.12 within its boundaries. The adjacent habitat reserve parcel F1.13 will be reconfigured accordingly. The reconfigured Parcel F1.12 boundary incorporates a portion of adjacent Track 3 Impact Area Munitions Response Area (MRA). The portion of the parcel now included in this site will be re-categorized from Track 3 to Track 1 based on the evaluation provided in this report and a provision in the Habitat Management Plan (HMP) (*U.S. Army Engineer, Huntsville Division [USAEDH], 1997a*) allows parcel reconfigurations as long as the overall goals and objectives of the HMP are not compromised.

The site is relatively level; ground surface elevation is approximately 400 feet above mean sea level. There is a fenced, developed area in the central portion of the site that contains buildings, cleared parking areas, access roads, and trees. The surrounding undeveloped areas contain trees, chaparral, and grassland. There is also a cleared area in the northeast corner of the site just south of the intersection of Broadway and Eucalyptus roads.

2.2 Site History and Development

This section presents a summary of the site history and development that is based on archival research and review of historical facility maps and aerial photographs. Plates have been prepared that present

pertinent features digitized from historical facility maps and scanned aerial photographs reviewed by MACTEC. It should be noted that minor discrepancies between source maps, combined with the natural degradation of older source maps and photographs, has resulted in misalignment of some map features. In addition, camera angle and lens distortion introduced into older aerial photographs, combined with changes in vegetation and site features over time has also resulted in misalignments of some map features with respect to the aerial photographs.

2.2.1 Pre-1940s Era

The site lies within a land tract purchased from private landowners by the Army in 1917 (*Arthur D. Little, Inc. [ADL], 1994*). Prior to 1917, the area was ranch land owned by David Jacks Corporation. Training maps are not available for the period of 1917 through 1944. The 1938 Camp Ord and Vicinity topographic map was reviewed and Camp Huffman is shown in site location (*Army, 1938*). A target range is shown just south of Camp Huffman.

2.2.2 1940s Era

Review of 1940s documentation and aerial photographs indicates the site was developed as a camp with buildings and fences in the same general location as at present (Plate 2-2). An infiltration course and target range were located south of the site. More specific information is provided below.

2.2.2.1 Aerial Photograph Review

This section presents the review of available aerial photographs. Not all the aerial photographs discussed below are provided as plates. The photographs selected for detailed review below, represent the historical periods described in this section.

1941 Photograph

In the 1941 photograph, Eucalyptus and Watkins Gate roads, and Broadway Avenue are present, but do not appear to be paved (Plate 2-2). There is a developed, rectangular area in the central portion of the site in the same location as the current developed area. Within this area, there appear to be three small structures in the north and three in the northeast, and one small building in the southwest. There are trees in the northern and eastern portions of the developed area. There is a dirt road running east-west through the center of the developed area with a loop at the western end. There appear to be small trees along Broadway Road just to the south of the developed area. There are scattered trees or scrub south of Eucalyptus Road. The rest of the site appears to be grassland (no scrub). There are two dirt roads in the

northern portion of the site that run diagonally northwest to southeast between Eucalyptus and Watkins Gate roads. There are numerous dirt tracks leading south from the developed area. To the south of the site is a cleared area and further to the south, there is a line of approximately twelve square cleared areas on the north side of a low hill.

A small berm appears to be present in the eastern part of the Site. Two possible berms are also present to the southeast of the site. Based on the presence of these potential berms it is possible that the area may have been used as a small arms range; however, it is unlikely that they would have been firing that close to the Camp. In addition, this range is not identified on available training maps.

1949 Photograph

The resolution of the 1949 aerial photograph is poor. From review of the photograph, it appears that there are some structures in the central portion of the site and that the site has been cleared of vegetation. Broadway Avenue appears to be unpaved. There are two additional dirt tracks leading to the central portion of the site from Eucalyptus Road.

2.2.2.2 Facility Map Review

July 1945 topographic map (*United States Geological Survey [USGS], 1945*)

The site vicinity (south of Eucalyptus Road and north of Broadway Road) is identified as Camp Huffman Ranger Station on the July 1945 topographic map. A Target Range is shown as located south of Broadway Road.

Training Facilities, Fort Ord and Vicinity, California, Revised August 1945 (*Army, 1945*)

This map identifies a rectangular area south of Broadway as the Hoffman infiltration course. There is no notation of facilities at the location of BLM-Headquarters and MRS-35.

2.2.3 1950s Era

Review of 1950s era documentation including training maps, aerial photographs, and other Fort Ord maps indicates that during the 1950s, the site continued to be used as the Camp Huffman Ranger Station, larger buildings were constructed in the developed portion of the site, and the northeast corner of the site at the intersection of Watkins Gate Road and Eucalyptus Road had been cleared as well as an area north of the developed portion of the site (Plate 2-3). The area to the south continued to be used as an infiltration course and the area further south was used as a rocket launcher range. In 1956, the training area to the

west was used for 106 millimeter (mm) Recoilless Rifle (RR) Training, but in 1957 and 1958, apparently the area west of the site was used for 60mm mortar training. The following summarizes the results of the 1950s historical map and aerial photograph review:

2.2.3.1 Aerial Photograph Review

1955 Photograph

In the 1955 photograph (Plate 2-3), Watkins Gate and Eucalyptus Roads, and Broadway Avenue appear to be unpaved. Larger structures appear to have been constructed in the developed portion of the site; in the northern (appears to be four structures) and western portions of the site (appears to be two structures). There are also trees in the northern and western portions of the site and along the north side of Broadway Road. The northeast corner of the site is cleared (disturbed) with no visible vegetation. There is also a wedge shaped cleared area west of the developed portion of the site.

1956 Photograph

In the *Aerial Photographic Analysis of Fort Ord Military Reservation, Monterey County, California* by Environmental Monitoring Systems Laboratory (CEMSL, 1992), the site was included in a larger area identified as the Range 39 Area. A vertical tank was identified within the MRS-35 boundary in the northeast corner of the developed area. To the south of BLM-Headquarters and MRS-35, there is a well defined rectangular cleared area that is included in the larger “Range 39 Area”.

2.2.3.2 Facility Map Review

Historical maps from “After 1953” and 1956 (*Army, After 1953, 1956a, and 1956b*) show the area south of Eucalyptus Road (location of MRS-35) as the Camp Huffman Ranger Station. The “After 1953 Map” shows Grant Training area west of the site and the 1956 Maps show a “106 RR” training area to the west. South of the site are an infiltration course and a rocket launcher range showing firing from east to west. Maps from 1957 and 1958 (*Army, 1957 and 1958*) show Mortar Range #3 (60mm) to the west, with firing from north to south. In these facility maps, the infiltration course and rocket launcher range are shown as located south of the site.

2.2.4 1960s Era

Review of 1960s era documentation including training maps, aerial photographs, and other Fort Ord maps indicates that the site was designated as Range Headquarters. The northeast portion of the site has a structural feature that consists of two columns of several linear features. The area to the south was

designated as an infiltration range, and the range further south as a Bench Rest Range. To the west, Range 31 was identified as a 106 RR training area. More specific information is provided below.

2.2.4.1 Aerial Photograph Review

Fort Ord, California, Aerial Mosaic Location of Ranges, May 1965 (*Army, 1965*)

In this annotated enlarged aerial photograph, Range 30 is shown south of the site. In the northwest corner of the site there are two columns of several rows of linear features within a roughly rectangular area that may correspond to some sort of structural framework or possibly bleachers. Because of its close proximity to Camp Huffman it is unlikely that this structure was used for munitions training.

2.2.4.2 Facility Map Review

On a 1969 topographic map, five buildings are shown at the site location. On training and facility maps from 1967 and 1969 (*Army, 1967a, 1967b, and 1969*), Range 30 is shown located south of the site with an infiltration course (Range 40) and Bench Rest Range (Range 39) to the south and RR 106 (Range 31) to the west.

2.2.5 1970s Era

Review of 1970s era documentation including training maps, aerial photographs, and other Fort Ord maps indicates that the site was still identified as Camp Huffman and was designated as Range Headquarters (Plate 2-4). Training areas to the south were used as an infiltration course and Bench Rest Range and to the west for recoilless rifle training. The two columns of linear features are present in a 1974 aerial photograph, possibly a structural framework, or bleachers, but were not observed in a 1978 aerial photograph. There is no designation on Army maps indicating the location or purpose of this observed feature.

2.2.5.1 Aerial Photograph Review

1974 Photograph

Plate 2-4 presents the 1974 aerial photograph. In the northeast corner of the site, there is a roughly square cleared area, disturbed and devoid of vegetation. In the grassy area west of the square cleared area, and north of the developed area, and south of Eucalyptus Road, there are two columns of linear features within a roughly rectangular area that were also identified during review of the 1965 aerial mosaic map. From north to south are: two columns each containing four rows of lighter lines with grassy area

separating them from one row of two columns of darker wider linear features, then four rows of lighter lines with grassy area separating them from one row of two columns of darker wider linear features. It is possible that these may have been bleachers or some other structural framework.

The developed area in the central portion of the site appears similar to the 1950s and 1960's era photographs, with the exception that the trees appear larger.

There is still a cleared rectangular area south of the site that corresponds to the location of the infiltration course.

1978 Photograph

The 1978 photograph has poor resolution. Review of the map shows a cleared square area in northeast quadrant of site and a developed area in central area of site. There is no evidence of the two columns of rows of linear features observed in the northwest quadrant of the site in the 1974 photograph.

2.2.5.2 Facility Map Review

Maps from 1972 and 1975 (*Army, 1972a-d, 1971-1976, 1973, and 1977a*) show the site as the Camp Huffman Ranger Station with six structures within the site boundaries (four in the north and two in the west). Training maps identify the site as Range Headquarters, with Ranges 40 (Infiltration Course) and 39 (Bench Rest Range) to the south and Range 41 (106/90 MM RR [subcaliber] range) to the west. A 1977 map showing Future Development Plans and Training Facility Plans, shows Range 40 as a Criminal Investigation Division (CID) pistol marksmanship course.

2.2.6 1980s to Present

Review of 1980 through 2009 documentation including training maps, aerial photographs, and other Fort Ord maps indicates that the site was used as Range Headquarters and contained buildings and parking areas present at the site today. The site is currently used as BLM Headquarters and was transferred to BLM on October 18, 1996. In 1987, the northwest corner of the site was identified as a helipad. Sites 41 and 39 continued to be used as 106/90MM RR (subcaliber) moving target range and Bench Rest Range, respectively. In 1980, Range 40 was listed as inactive and in 1987 Range 41 was also used for mortar training.

2.2.6.1 Aerial Photograph Review

1986 Photograph

The site appears similar to the present with four buildings in the northern portion of the rectangular cleared areas, two buildings in the eastern portion of the developed portion of the site, and one building in the eastern portion of the rectangular developed area. There are two dirt roads leading from the developed area across the southern portion of the site.

1989 Photograph

The 1989 photograph is similar to the 1986 photograph, except that there is a row of young trees in a line below a cleared area just south of Eucalyptus Road and there are trees along the western edge of the bare square cleared area in the northwest portion of the site.

2009 Aerial Photograph

In the 2009 photograph (Plate 2-5), Broadway Road cuts across the southern portion of the site and then turns north-northeast on the eastern portion of the site. Broadway Road serves as an access point to the developed portion of this site. In the 2009 photograph there are trees bordering Broadway.

A developed area consisting of buildings, cleared parking areas, and trees occupy a rectangular area in the central portion of the site. Most of the trees are in the eastern portion of this area. Several buildings are located in the eastern and northern portions of this area and there is a small building in the southwest corner of this area. The building present in the southwestern part of the site in the 1974 aerial photograph has been removed. This building was present in 1994 when UXB International, Inc. (UXB) completed sampling operation as evident in the shape of the southwestern most grid, which was located adjacent to the building. There are cleared, hardstanded areas that serve as parking west and south of the buildings. There appears to be a loop road in the western portion of the developed area. There is also a fence around the perimeter of this area.

To the north of the developed area are a cleared area and two structures, one square and the other rectangular. There are trees and low scrub in the southeast corner of the site, also trees just south of Eucalyptus Road, trees along the southern and eastern boundary lines and just above a cleared area to the north of the developed portion of the site. The rest of the site is grassland. There is a cleared square area in the northeast corner of the site just south of the intersection of Broadway and Eucalyptus roads.

2.2.6.2 Facility Map Review

A training facility map from 1980 shows the site as the Camp Huffman Ranger Station, Range 40 south of the site is identified as inactive, Range 41 to the west, is designated for 106/90MM training, and Range 39 to the east is identified as Bench Rest Range (*Army, 1980*). Maps from 1984 identify the site as Inland Range Headquarters and Range 41 is identified as 106/90MM RR (subcaliber) moving target range (*Army, 1984a*). A 1987 map shows a helipad south of the intersection of Parker Flats and Eucalyptus Road, Inland Range Headquarters is shown west of the helipad. Range 40 to south is identified as an infiltration course, Range 41 to the west as a 90/M72/106 RR 14.5 Sub-cal moving target /mortar range, and Range 39 to the east as a Bench Rest Range (*Army, 1987*).

2.2.7 Future Land Use

Future reuse of this area will be as development (BLM headquarters) with the remaining areas habitat reserve. The *Final Phase I Engineering Evaluation/Cost Analysis (EE/CA) (USAEDH, 1997c)* indicated that the site may be subject to additional development in the future and the 1997 HMP identifies the parcel as a development parcel (*USAEDH, 1997a*). According to the BLM Habitat Conservation Plan, the types of development that could occur on BLM lands include construction of visitor centers, visitor contact stations, roads, trails, administrative support buildings or warehouses. This information was provided as an attachment to BLM comments on the Draft Track 3 Impact Area Munitions Response Remedial Investigation/Feasibility Study (*BLM, 2006*).

2.3 Potential Military Munitions Based on Historical Use of the Area

This section identifies the types of military munitions that may have been used in this area. Historical records indicate that the site vicinity was used as a camp or for range control operations. Based on this past use, no munitions would have been used at the site. However, during site investigations and removal actions, several MEC and MD items, including an expended 3.5 inch M29A2 practice rocket (MD), an M18 Series smoke hand grenade (MEC), MK II and M30 practice hand grenades (MD), an M125 Series ground illumination signal (MEC), a grenade fuze (unknown model), and an M228 practice hand grenade fuze (MD) were found both at the ground surface and buried at depths ranging from four to 24 inches below ground surface (bgs). These are listed in Table 2-1. Descriptions of these munitions are provided in Attachment 2.

2.4 History of Munitions Response Investigations and Removal Actions

The following presents a summary of Fort Ord munitions response-related reports and investigations concerning the site. Plates 2-5 and 2-6 display details of investigation activities and locations of discovered MEC and MD items during past investigations.

Final Report for Ordnance and Explosive Removal Action, Fort Ord, California, Fort Ord Range Control (UXB, 1994b)

Between August 22 and September 7, 1994, UXB conducted a sampling action at the site. The sampling procedure was described in UXB's work plan (UXB, 1994a) and consisted of site perimeter surveys to establish the boundary of the work area, surveying and marking 100 by 100 foot square grids within the site boundaries, brush clearing, surface and subsurface MEC (formerly OE) investigation and removal, and quality assurance/quality control (QA/QC) checks. At MRS-35, 52 grids of varying sizes were established by UXB, based on the site size (eight acres at the time of sampling) and configuration. Ten percent of the grids (seven grids) were investigated, with excavations extending to depths of four feet.

Once grids were established, the seven grids were divided into five-foot wide search lanes. The search lanes were visually inspected while simultaneously searching for subsurface anomalies with a magnetometer. UXB used Schonstedt Models GA 52C and GA-72CV magnetometers to investigate the site. Each magnetic anomaly identified with the magnetometer was marked with a pin flag and hand excavated by an unexploded ordnance (UXO) Specialist to a depth of four feet bgs to identify or confirm the presence of MD or MEC. If munitions or other metal debris were not encountered within four feet, the onsite USAEDH Safety Specialist determined whether deeper excavation was required.

MEC or MD items were identified recorded and assessed to determine condition and potential hazard. Non munitions trash was placed in trash dumpsters. Munitions-related material was disposed through Defense Reutilization and Marketing Office (DRMO).

A total of 510 munitions-related items were uncovered which consisted of 508 small arms items and two MEC items. The small arms items consisted of five expended 45 caliber (cal) ball cartridges (ctgs), eight 5.56mm ball ctgs, 480 7.62mm ball ctgs, and 15 22 cal ball ctgs. The MEC items consisted of one M125 series ground illumination signal, and one grenade fuze (model unknown). Both of the MEC items were found at the ground surface. As indicated below, these items (MEC and small arms ammunition) were found in three of the seven grids.

Grid1-A	
Signal, illumination, ground M125 series (MEC)	1 item
Grid 1-AA	
7.62mm ball cartridge	470 items
Grid 1-AB	
Fuze, grenade (Model not specified) (MEC)	1 item
22 cal. ball cartridge	15 items
5.56 cal. ball cartridge	8 items
7.62mm ball cartridge	10 items
45 cal. Ball cartridge	5 items

QC checks were performed on each grid after munitions investigation and removal operations were completed. A minimum of 10 percent of each investigated grid area was checked to verify that the grid had been surveyed and munitions related items removed. If munitions related items (other than small arms) were found during the QC sweep, the grid would need to be resurveyed. The work plan stated that after the QC check the site would undergo a QA check by the USAEDH safety specialist. The report indicated that sampling was stopped by the USAEDH representative on September 7, 1994.

Revised Archives Search Report, Former Fort Ord, California (ASR), (USAEDH, 1997b)

The purpose of the archives search was to identify sites, gather and review historical information to determine the types of munitions used at Fort Ord, identify possible disposal areas, identify unknown training areas and recommend follow-up actions. The archives search included a Preliminary Assessment/Site Investigation (PA/SI) consisting of interviews with individuals familiar with the sites, visits to previously established sites, reconnaissance of newly identified training areas, and the review of data collected during sampling or removal actions.

The site was not included in the initial 1993 ASR (USAEDH, 1993) or in the ASR Supplement, but was identified in the 1997 Revised ASR (USAEDH, 1997b) as having formerly been used as Camp Huffman and, at the time of the report, serving as a BLM facility, the site boundaries were shown on Plate B-1 of the Revised ASR. The Revised ASR summarized results of the UXB sampling action and recommended removal action at the site.

Engineering Evaluation/Cost Analysis- Phase I, Former Fort Ord, Monterey County, California, Final (USAEDH, 1997c)

This document provided a brief description of previous and current land use and results of the UXB removal action. Surface removal was recommended because the munitions-related materials found at the

site during the UXB sampling action were not expected to be present in the subsurface (they were non-penetrating).

Literature Review Report, Ordnance and Explosives, Remedial Investigation/Feasibility Study, Former Fort Ord, California (HLA, 2000a)

In this document, the site was identified as having had a complete surface removal and that the site will undergo additional evaluation in the MR RI/FS. At the time of the Literature Review Report, no subsurface MEC items had been identified at the site.

Final OE Surface Removal After Action Report, Inland Range Contract, Former Fort Ord California, Site OE-35 (USA Environmental, Inc [USA], 2000)

Work was performed by CMS Environmental, Inc (CMS) which was purchased and became part of USA prior to preparation of the final after action report. Initial work consisted of a site visit which was conducted between June 5 and 9, 1995. In 1995, CMS established the site boundaries based on information provided by the installation (based on an eight acre site). In January 1998, CMS resurveyed the site using a global positioning system (GPS); at direction of the Directorate of Environmental and Natural Resources (DENR), the entire 13.02 acre BRAC parcel was surveyed for munitions surface removal.

A surface removal was performed over the entire site on February 11, 1998 by one removal team, consisting of one UXO Team Leader and six UXO Specialists. The surface removal was conducted by visual inspection of the ground surface. Schonstedt GA-52Cx magnetometers were used in areas where vegetation hampered vision; no vegetation removal was performed prior to the removal work. CMS performed operational checks and QC inspections as specified in their work plan (CMS, 1995). One expended 3.5 inch M29A2 practice rocket was found during the removal southeast of the BLM headquarters building. The site underwent QC check on June 16, 1998 consisting of a magnetometer inspection (using a Schonstedt Model GA-52Cx magnetometer) of at least 10 percent of each search grid. The work was accepted by the U.S. Army Corps of Engineers, Sacramento District (USACE) QA on June 18, 1998. No deficiency reports were submitted.

Conclusions presented in the after action report indicated that surface MEC removal activities “do not indicate remaining UXO on the surface of the site.” The report did state that “it is possible that ordnance scrap (MD) items may remain below the surface in Site OE-35.” The document also stated that the results of this surface OE (MEC) removal action do not indicate that further OE (munitions response) is needed to support reuse of the property.”

Final 4' OE Removal After Action Report, Former Fort Ord, California, Site OE-15 (Roads and Trails) (USA, 2001)

A removal action was completed on eight (8) range access roads and 32 dirt roads and trails within the Impact Area between March 1997 and March 1998. This includes a route connecting Watkins Gate Road to the middle of MRS-35 that was cleared to a four-foot depth (Plate 2-5). Vegetation removal activities were accomplished by manual means by CMS UXO sweep teams using chain saws and rotary trimmers. The areas were investigated using Schonstedt GA-52Cx flux gate magnetometers, with all detections intrusively investigated to a depth of at least four feet. USA performed operational checks and QC inspections as specified in their work plan (*CMS, 1997*). All grids passed the initial QA inspection and were accepted by the Corps of Engineers. No MEC was found during this work.

Final Reestablishment of Impact Area Fuel Breaks Phases 1, 2, and 3 After Action Report, Former Fort Ord, Monterey, California, Military Munitions Response Program (*Parsons, 2006*)

The Reestablishment of the Impact Area fuel breaks consisted of fuel break identification, land survey and grid installation, environmental survey and protection, vegetation mowing and cutting, MEC and MD removal, MEC detonation, and QC and QA of MEC removal work. The work was performed as part of re-establishment of pre-existing roads and fuel breaks in accordance with the long term fire management plan for Former Fort Ord. The MEC removal consisted of four-foot subsurface removal of MEC along a 15 to 20-foot wide road within each fuel break and surface MEC removal along a 15-foot wide corridor along both sides of the road. A small portion of this work was conducted within the BLM Headquarters and MRS-35 boundary as shown on Plate 2-5. In Phase 3, additional removal to depth was performed over the entire width of the major fuelbreaks. This includes the portion of Watkins Gate Road that overlaps the proposed Track 1 footprint.

MEC removal grids were approximately 100 foot long and extended across the width of the fuel break/road. Subsurface removals were performed within the fuel break using a Schonstedt GA-52Cx magnetometer. All detected anomalies were excavated until reaching the source or a depth of four feet bgs. If the area was excavated to four feet bgs without finding metal debris, the clearance team consulted with the USACE representative concerning the need to excavate deeper.

Surface removal of MEC was performed by team members walking abreast and online, and visually inspecting the ground surface for MEC and MD. When removal teams encountered MEC items, they documented the location, quantity, and provided a description of the item on a grid operation record.

MEC items were taken to collection points if they could be safely moved. MEC items that were determined not safe to move were marked to be blown in place. MEC were detonated using engineering controls to suppress noise and limit the distance of fragments. MD were sorted and transported to the scrap collection area at the Explosive Storage Location (ESL) on Barloy Canyon Road. After the MD were sorted by type of material and certified as inert, the MD was transferred to a processing mill to be recycled.

QC inspections were performed by using a Schonstedt GA-52Cx to scan at least 10 percent of every subsurface removal grid. No items were detected during the 10 percent QC inspection. After subsurface removal grids passed QC inspection, the USACE UXO Safety Specialist conducted a QA inspection using a magnetometer over at least 10 percent of every subsurface removal grid. QA inspections identified no items.

Broadway Avenue which cuts across the lower portion of the site was designated for MEC removal as part of re-establishment of fuel breaks at Former Fort Ord under Phase 2. MD items were found in July 2001 during subsurface excavation of a grid that overlapped with the southeast boundary of the site. These items are listed on Table 2-1 and included M30 and MK II practice hand grenades, and M228 hand practice grenade fuzes. These items were found at depths ranging from four to 24 inches bgs. No MEC items were found within the proposed Track 1 area during this work.

Comprehensive Basewide Range Assessment (BRA) Report (MACTEC/Shaw Environmental, Inc., [Shaw], 2006)

A literature review and limited reconnaissance of the site (designated in the BRA as HA-167) was conducted as part of the Comprehensive Basewide Range Assessment for Former Fort Ord. The reconnaissance was performed in July 1999. No evidence of a range was identified on the site.

Subsurface MEC Remediation Buffer Area, Habitat-Development Border, Track 3 Munitions Response Area (MRA) (Shaw, 2010a and 2010b)

BLM-Headquarters and MRS-35 is surrounded by the Track 3 Impact Area MRA. The Track 3 ROD includes subsurface MEC remediation within a buffer area along the habitat-development border. Subsurface MEC remediation along the northern and western boundaries of the site was performed in March 2009. One discarded military munition (DMM) item, a MK II practice hand grenade was found within the site boundary (Shaw, 2010a) (Table 2-1). Subsurface removal along the western and northern boundaries was completed under the *Final Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Units 18 and 22, Former Fort Ord, California, Revision 0* (Shaw, 2010a). Subsurface removal in the small triangle on the eastern part of the site was conducted as part of the and the *Final*

Site-Specific Work Plan, Munitions and Explosives of Concern Remedial Action, Non-Burn Areas, Former Fort Ord, California, Revision 0 (Shaw, 2010b). No MEC or DMM was found during the Non-Burn Area removal.

2.5 Adjacent Remedial Actions and Previous Investigation

This section presents a brief discussion of the remedial actions that have been completed as part of the Track 3 Impact Area MRA remediation adjacent to BLM-Headquarters and MRS-35 and describes MEC identified during previous investigations conducted adjacent to BLM Headquarters and MRS-35.

Burn Units 18 and 22 Remedial Action

A surface removal was completed within adjacent burn units 18 and 22 in 2009 followed by a subsurface removal to depth in the 100-foot buffer on the western side of BLM Headquarters and MRS-35. During the remedial action a M83 series 60mm mortar projectile was found within 200 feet of the site boundary. This item was identified as DMM. No other MEC items were found within 200 feet of the site boundary during the remedial action.

Non Burn Area Remedial Action

A subsurface remedial action was recently conducted as part of the Non-Burn Areas remediation along the eastern side of BLM Headquarters and MRS-35. Several MD items were found.

Previous Investigations

Four MEC items, a M10 Series grenade fuze, a M69 practice hand grenade, a C4 demo block and an M6 electric blasting cap were found within 200 feet of the current site boundary during previous investigations that occurred in 1993 and 2001.

The items that were found adjacent to the site do not indicate that BLM Headquarter and MRS-35 was used for training that would have involved use of military munitions.

3.0 CONCEPTUAL SITE MODEL

CSMs are generally developed during the preliminary site characterization phase of work to provide a basis for the sampling design and identification of potential release (functioning of the MEC item; e.g., detonation) and exposure routes. CSMs usually incorporate 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).

The CSM for BLM-Headquarters AND MRS-35 is based on currently available site-specific and general information including the revised ASR (*USAEDH, 1997b*), review of aerial photographs, training maps, sampling results, field observations, and technical manuals. The CSM was developed to help evaluate the adequacy of the investigation completed to date and to identify potential release and exposure pathways.

3.1 Training and Site Use Practices

Training and site use practices are discussed below to provide information on the potential types and distribution of military munitions that may have been used at the site, and the potential areas of concern remaining at the site, if any.

BLM-Headquarters and MRS-35

Range Control: MRS-35 operated as Range Control Headquarters. Military personnel would have checked in with range control prior to going onto training sites and ranges. Range Control personnel managed and monitored the training sites at Fort Ord which consisted of tracking training and patrolling the ranges to ascertain that there were no unauthorized persons on training ranges. The perimeter of the site was fenced to prevent the public from inadvertently entering the Impact Area.

Range 30/40 (South of BLM- Headquarters AND MRS-35): The ranges immediately to the south of BLM-Headquarters and MRS-35 (Ranges 39/40) were used as an infiltration course and CID pistol marksmanship course. Because of the close proximity of range to BLM-Headquarters and MRS-35, the following provides a description of training practices that were performed at Range 30/40 to provide an understanding of munitions potentially used at this adjacent site.

Infiltration Course: An infiltration course operated immediately south of the site between 1945 and 1971. According to Mr. Lee Stickler, former Range Control Officer, the infiltration courses were set up with machine guns equipped with a height restrictor so that they would always shoot over the heads of trainees. The course(s) were 100 to 150 yards long. The soldiers would come up over a wall and crawl

until they got to the “no fire” area. There were charges set up in pits within the infiltration course. According to Mr. Stickler, these charges were not of the type that would produce fragmentation, but would generate a report and smoke. Demolition experts from Range Control would clear the area after each use (*Stickler, 2003*).

CID pistol marksmanship course: Training maps from the late 1970s indicate that the area to the south was used as a CID pistol marksmanship course and Bench Rest Rifle Range (BRR Range) (Range 39) and was operated by the Rod and Gun Club from at least 1973 through 1980. It is described as having five (*Army, 1992*) or 10 (*Army, 1973*) firing points and was authorized for shotguns, rifles and pistols. The range was set-up for variable distance targets up to 300 meters. This type of range usually consists of a firing line, several rows of targets generally 50 to 100 meters apart, and may or may not contain a backstop or berm. The direction of fire was to the south.

3.2 Site Features

The site is relatively level, contains buildings, parking areas, roads, open grassy areas, cleared areas, and some trees and low scrub. There are no indications that the area was used for munitions training.

3.3 Potential Sources and Location of MEC

Because the site was used as a camp or for range control operations, no munitions storage or training would have occurred at the site. MD and MEC items found on the ground surface during removal actions would likely have been from munitions that may have been unintentionally or intentionally discarded while military personnel were checking in at the site, but would not have been used within the site boundaries. The buried MD items (practice hand grenades) found at the southeast boundary of the site during MEC removal associated with re-establishment of the fuel break along Broadway Road, were likely disposed by the Army at the site perimeter.

3.4 Potential Exposure Routes

Potential exposures to MEC, although unlikely, could result from encountering subsurface MEC including practice rockets or practice hand grenades, if more are present in the subsurface. Subsurface MEC would potentially be encountered by digging, drilling, or disturbance of soil during normal activities such as use of vehicles during wet and muddy conditions. Exposure to MEC on the surface, although unlikely because a surface removal has been completed, could occur if erosion or soil disturbance exposes subsurface MEC, or if a surface item was missed during the surface removal.

For each of the munitions-related items found at the site, the following discussions provide information on: (1) how the item was designed to function, (2) the likelihood the item would function if found onsite and handled, and (3) the type of injury the item could cause if it functions. Additional details on these items are presented in Attachment 2.

Grenade, Hand, Practice, MKII – The MKII practice hand grenade used the M205 or the M10A3 fuze on earlier models, and was designated to train personnel to arm and throw hand grenades. It was identical to the MK II fragmentation grenade, except for a filling hole in the base and a cork stopper to close the hole after the black powder strips had been inserted. The black powder strips provided noise and smoke without fragments upon functioning. It was functioned when a soldier removed the safety pin from the safety lever and threw the grenade allowing the safety lever to fly free, releasing the spring-loaded striker to strike the primer. The primer ignited the delay element in the fuze, which burned for a period of 4.0 and 5.0 seconds before igniting the black powder strips forcing the cork out of the hole in the base and causing spotting charge (*Navy, 1947*). These could be caused to function by incidental contact by movement, i.e., stepping on, picking up, or kicking the grenade. The safety lever is made of thin metal and if exposed to the elements for long periods of time, will deteriorate to eventually allow the safety pin to break free. This will allow the functioning sequence mentioned above to take place. If caused to function, the type of injury that could be sustained would be burns from the black powder spotting charge. The functioning fuze is not designed to have sufficient force to fragment the grenade itself.

Summary: It is possible that a person could cause a practice grenade to function and be burned by the black powder filler if one were found at the site; the practice grenade itself would not fragment. However, the grenade would have to contain a live fuze, and these components would have been exposed to moisture degradation and weathering for many years, which could decrease their effectiveness.

Grenade, Hand, Practice, M30 – The M30 practice hand grenade is used for training in care, handling and throwing of fragmentation grenades M26A1 and M26. The M26A1 and M26 hand grenade is used to supplement small arms fire against the enemy in close combat (*Army, 1994*). The body is not loaded with high explosive filler but may have a small, separate black powder charge. Hand grenade fuzes M205A1 and M205A2 are pyrotechnic delay-igniting fuzes. Removal of the safety pin permits release of the safety lever. When the safety lever is released it is forced away from the grenade body by a striker acting under the force of the striker spring. If the grenade were to be activated, the igniter would initiate the black powder charge. A loud report, like that of a firecracker, and a puff of white smoke would follow. These could be caused to function by incidental contact by movement, (i.e., stepping on, picking up, or kicking the grenade). If caused to function, the type of injury that could be sustained would be burns from the

black powder, or possibly, exposure to explosive metal fragments from the detonator housed within the grenade, the grenade itself would not fragment.

Summary: It is possible that a person could cause the hand grenade to function if one were found at the site and be burned or exposed to metal fragments from the exploding detonator housed within the grenade, the practice grenade itself would not fragment. However, the grenade would have to contain a live fuze and functioning detonator, and these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Rocket, Practice, 3.5-inch, Model M29A2 – The M29 series 3.5-inch rockets are fired from a Bazooka-type launcher at ground targets. The rocket was designed to be effective against the armor plate of tanks and armored vehicles. The M29 series practice rounds were inert warheads and loaded to conform to the characteristics of a live round (*Hogg, 2001*). The complete round consists of a rocket head, a fuze, and a rocket motor which contains the propellant and igniter. A tail assembly is rigidly attached to the rear of the motor. The fuze body, threaded at both ends, serves also as a coupling for the rocket head and motor.

The same model rocket motor is common to all complete rounds. The motor assembly is threaded externally at the forward end to engage the fuse. The rocket motor propelling charge consists of 12 nonperforated cylindrical extruded grains of M7 solvent propellant. Each grain is five inches long, approximately 3/8 inch in diameter and weighs 0.03 pound. The propellant grains are positioned lengthwise, three in each of four compartments. The rocket warhead was typically filled with plaster of paris. If caused to function, the type of injury that could be sustained would be burns from the propellant charge. Based on the historical use of this area, it is not anticipated that additional 3.5-inch practice rockets would be present at the site; therefore it is unlikely that a person would come in contact with a 3.5-inch rocket within the site boundaries.

Summary: It is unlikely a live round would be encountered onsite or that a person would be able to cause a practice 3.5-inch rocket to function through casual contact. The rockets did not contain an explosive charge, but did contain a propellant and igniter which could cause burns if encountered and functioned. The rocket would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

Grenade, Hand, Smoke, M18 – The M18 is a colored smoke hand grenade used for ground-to-air or ground-to-ground signaling. The grenades may be filled with any one of four smoke colors: red, green, yellow, or violet. Each grenade will emit smoke for 50 to 90 seconds. The grenade body is of thin sheet metal and is filled with smoke composition and topped with a starter mixture. The hand grenade fuze

M201A1 is a pyrotechnic delay igniting fuze. The body contains a primer, first-fire mixture, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever, and safety pin with pull ring. The grenade weighs 19 ounces and contains 11.5 ounces of smoke composition. It was functioned when a soldier removed the safety pin from the safety lever and threw the grenade allowing the safety lever to fly free, releasing the spring-loaded striker to strike the primer. The percussion primer ignited the first fire mixture. The fuze delay element, which burns for 0.7 to two seconds, ignition mixture, and grenade starter mixture and filler, are ignited by the preceding component. The pressure sensitive tape is blown off the emission holes from which the colored smoke emits (*Army, 1977c*). Assuming an M18 smoke grenade was discovered in an unfired condition and caused to function, the type of injuries that could be sustained would be burns from the burning smoke composition. Due to the heat generated, it is unlikely that a person who found a grenade and caused it to function would hold onto it after ignition. Given that these items have been exposed to the elements for many years, moisture can penetrate and degrade the pressure sensitive tape, the smoke composition, and the condition of the sheet metal case of the grenade.

Summary: It is possible that a person could cause the smoke grenade to function if one were found at the site and be burned, but it would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

Signals, Illumination, Ground, Clusters: Green Star, M125A1; Red Star, M158; White Star, M159.

These signals were designed for daytime and nighttime signaling. Star cluster signals consist of 5-star illuminant assemblies and a rocket motor propulsion assembly combined in a hand-held aluminum launching tube. The base of the launching tube contains a primer and an initiating charge. As shipped, the firing pin cap is assembled to the forward end and must be reversed for firing. Stabilizing fins on the tail assembly of the rocket are folded parallel to the axis of the signal. A bolt, which also transfers the initiating charge flash to the propellant, extends into the center of the solid propellant, which fills the propulsion assembly. The illuminant assembly is mounted on top of the propulsion assembly with a delay assembly and an expelling charge between. It was functioned by striking the primer with the firing pin, which ignites the initiating charge to ignite the rocket propellant. As the rocket emerges from the tube, the fins unfold for flight stability. Before rocket motor burnout, at 200 feet, the black powder expelling charge is ignited performing a two-fold purpose of expelling and igniting the 5-star illuminant assemblies. Burn time is six to 10 seconds with burnout occurring at 250 to 300 feet above the ground (*Army, 1977b*). It is unlikely that incidental contact could cause a signal to function as the cap must be removed, placed over the base, and struck sharply. If caused to function, the type of injury that could be sustained would be burns from the initiating charge and possibly the rocket motor.

Summary: It is unlikely that a person could cause a signal to function through casual contact if one were found at the site and be burned, because it: (1) would require precise placement of components and a hard blow to function, and (2) would have been exposed to moisture, degradation, and weathering for 25 or more years, which could decrease the effectiveness of the components that cause it to function.

3.5 Potential Exposure Pathways

Based on review of the existing data, including previous removal actions and understanding of historical site use, it is not likely that that military munitions items related to training are present on the ground surface and that they could be encountered by the public or BLM personnel. Based on this analysis, the surface exposure pathways for human receptors are not considered complete because evidence suggests that the items were likely not the result of onsite training activities and because a surface removal was conducted. It is possible, although unlikely, that a person digging at the site could encounter items in the subsurface in the area of Broadway Road where MD was encountered within the road; however, if a person encountered an item, it is unlikely that a person could cause the item to function for the reasons stated in Section 3.4.

4.0 SITE EVALUATION

The available data (e.g., archival and reconnaissance data) regarding BLM-Headquarters and MRS-35 were reviewed and evaluated according to procedures described in the *Final Plan for Evaluation of Previous Work (HLA, 2000b)*. The evaluation process is documented through the completion of a series of checklists. Copies of the checklists are provided as Attachment 1. This section presents a summary of the results of the checklist evaluation. It is divided into two sections, an assessment of the literature review and an assessment of the sampling performed at the site.

4.1 Literature Review

4.1.1 Type of Training and Military Munitions Expected

Based on a review of Fort Ord facilities and training maps and aerial photographs, BLM-Headquarters and MRS-35 has been used as a camp and as range headquarters (range control) since at least 1941. Based on this past use, no munitions are expected to have been used at the site.

4.1.2 Subsequent Use of the Area

The site is currently used as BLM headquarters.

4.1.3 Establishment of Site Boundaries

Historical aerial photographs, topographic maps, and Army facility maps show that the central portion of the site has been developed from 1941 until the present and contained buildings, roads, and parking areas. Aerial photographs show that the northwest corner of the site was occupied in the 1960s and 1970s by an unknown structure (possibly bleachers or temporary building support) and the northeast corner has been cleared since the 1950s and was used in the 1980s as a helicopter pad. The site boundaries include the developed areas and the cleared area and structure observed in the 1960s and 1970s aerial photographs as well as undeveloped property surrounding these features and include areas that have not historically been used for munitions training. The original MRS-35 site boundary was developed based on the Former Range Control site use and the HMP. The reconfigured boundary was provided by BLM to reflect the intended footprint of the BLM Headquarters parcel. The proposed Track 1 site boundary discussed in this approval memorandum includes the footprint of the BLM Headquarters parcel and the original MRS-35 boundary within that footprint.

4.1.4 Summary of Literature Review Analysis

Based on the literature review, the area was used as a camp or as range headquarters since at least 1941. Comparison of a 1954 training map to the 1997 ASR boundary and the proposed boundary shows that the site includes Range Control headquarters and surrounding areas that were not part of munitions training areas. Any munitions present at the site would not have been used within the site boundaries but either discarded by personnel checking in at Range Control or disposed in the subsurface.

4.2 Sampling Review

This section describes the items that were found at the site and how these items support historical information concerning past use of the site. Site boundaries are assessed in terms of the items found. There is also a discussion regarding sampling equipment, methods, and quality control measures used during prior munitions response sampling programs.

4.2.1 Sampling Results (Items Found)

As summarized in Section 2.4, investigation and removal actions at BLM-Headquarters and MRS-35 were performed in 1994, 1998, 2001, and 2009 by UXB, USA, Parsons, and Shaw (*UXB, 1994b; USA, 2000 and 2001; Parsons, 2006; and Shaw, 2010a and 2010b*), which included surface removal over the entire site and subsurface clearance in grids in the western and southwestern portions of the site. During these investigations and removal actions, several MEC and MD items, including a M18 Series smoke hand grenade (MD), MK II and M30 practice hand grenades (one DMM and rest MD), a M125 Series ground illumination signal (MEC), a grenade fuze (unknown model) (MEC), M228 practice hand grenade fuzes (MD), and an expended 3.5 inch M29A2 practice rocket (MD) were found both at the ground surface and buried at depths ranging from four to 24 inches bgs (Table 2-1). Regarding the expended practice rocket USA did not provide coordinates, but there are grid records showing its location within the site. During the 1994 UXB investigation, 508 small arms items were found at the site.

No munitions are expected to have been used at the site. However, the small arms ammunition items found are consistent with use of the infiltration range and CID marksmanship course to the south. The practice hand and smoke grenades and fuzes found at depths of four to 24 inches bgs were possibly present within material used during construction or maintenance of Broadway Road. The other items found at the ground surface, including the expended 3.5 inch M29A2 practice rocket, practice hand grenades, and ground illumination signal, were likely unintentionally dropped or intentionally discarded, potentially by military personnel checking in with Range Control. Additional information concerning the types of munitions debris found is provided in Attachment 2.

4.2.2 Site Boundaries Review

Site investigation and MEC removal operations were conducted by UXB and USA within the site boundaries. The removal performed by Parsons along Broadway Road overlapped into the site boundaries. Most of the subsurface clearance has been performed in the western portion of the site and none in the eastern and northern areas. Field investigations conducted at the site and review of historical documents do not indicate that the site boundaries require any changes.

4.3 Equipment Review

Schonstedt Magnetometer

The Schonstedt Models GA-52/C or GA-72/Cv magnetometers were used by UXB prior to October 1994 and Schonstedt Model GA-52CX was used by UXB after October 1994 and by USA and Parsons during surface munitions clearance and removal work in 1998 and 2001. The Schonstedt instruments are passive dual flux-gate magnetometers that are highly sensitive magnetic locators that detect ferrous (iron) metal objects; however, they cannot detect non-ferrous metal objects (e.g., lead, brass, copper, and aluminum). Magnetometers make passive measurements of the earth's natural magnetic field; ferrous metal objects and rocks are detected because they produce localized distortions (anomalies) in the magnetic field. The Schonstedt magnetometers actually detect slight differences in the magnetic field (the "gradient") by means of two sensors mounted a fixed distance apart within the instruments' staff. Because the magnetic response falls off (changes) greatly even over a short distance, a gradient magnetometer like the Schonstedt GA-52/Cx is especially sensitive to smaller, near-surface ferro-metal objects (*Breiner, 1973*).

The performance of the Schonstedt GA-52/C, GA-52Cx, and GA-72/Cv magnetometers was evaluated as part of the Ordnance Detection and Discrimination Study (ODDS; *Parsons, 2002*). Studies were performed as part of ODDS to evaluate:

- Signatures of inert military munitions items suspended in air at varying orientations and distances from the geophysical sensor (static tests).
- The ability of various geophysical instruments to detect and discriminate between different military munitions items buried at various depths (seeded tests).
- Geophysical instrument performance at actual munitions response sites (field trial site testing).

The Schonstedt tools were not evaluated during the static tests; therefore, only the seeded test results and the field trial tests are discussed herein. It is recognized that the ODDS study areas may not represent the

same field conditions as BLM-Headquarters and MRS-35; therefore, differences in field conditions, if applicable, should be considered when using information from the ODDS.

For the purposes of evaluating the geophysical instruments used at this site, it is assumed that munitions potentially discarded or disposed at BLM-Headquarters and MRS-35 would be located at the surface or potentially buried below ground surface. As part of the ODDS, non-penetrating items (signal flares and hand grenades [ODDS Type I]) were evaluated as were penetrating items (2.36-inch and 3.5-inch rockets, rifle grenades, and 14.5mm projectiles [ODDS Type II]). Therefore, the Type I and II seeded test results were used for comparison purposes in evaluating the performance of the geophysical equipment used at this site in identifying surface and buried munitions items.

During the seeded tests, the Schonstedt Model GA-52/C located between 56 (search radius of 1.6 foot and maximum lane width of five feet) and 59 (search radius of 3.3 feet and maximum lane width of five feet) percent of the Type I items buried at depths ranging from just below the ground surface to one foot bgs and the Schonstedt Model GA-72/Cv located between 63 (search radius of 1.6 foot and lane width of five feet) and 78 (search radius of 3.3 feet and lane width of five feet) percent of the Type I items. The detection rate for Type I items for the Schonstedt Model GA-52/Cx ranged between 67 and 78 percent of Type I items. The detection rate for Type II items for the Schonstedt Model GA-52/C ranged from 44 (search radius of 1.6 foot and lane width of five feet) to 49 (search radius of 3.3 feet and lane width of five feet) percent and the detection rate for Type II items for the Schonstedt Model GA-72/Cv ranged from 41 (search radius of 1.6 foot and lane width of five feet) to 51 (search radius of 3.3 feet and lane width of five feet) percent. The detection rate for Type II items for the Schonstedt Model GA-52/Cx ranged from 64 to 85 percent using the Schonstedt Model GA-52/Cx

The detection rate percentages presented in the ODDS varied according to the search radius, which ranged from 1.6 to 3.3 feet and the search lane width which was three to five feet wide. A maximum five-foot wide search lane was used during the munitions response sampling programs at the site. Results for the three-foot wide search lanes were not included in the detection percentages presented above because three-foot search lanes were not used during the site investigations. A standard search radius for investigation anomalies was not specified in work plans or reports, therefore, the detection range for the different search radii are presented above.

The seeded test detection rates are considered conservative because one foot was added to the item's calculated penetration depth to allow for soil deposition over time. Because the field conditions at the seeded test site and orientation of the subsurface item may not be comparable to the BLM-Headquarters

and MRS-35 conditions, the results should only be used as an indication that the equipment is capable of detecting the same types of items at depths that are the same as used in the seeded tests.

Results of the ODDS Field Trial Sites (FTS) were also reviewed for potential use in evaluating instrument performance at the site. Detection rates were calculated for four of the six test sites; the remaining sites did not have enough MEC or MEC-like MD detected to allow calculation of site statistics. The calculated detection rates for the combined sites ranged from 52 to 96 percent for the Schonstedt Model GA-52/C, 64 to 98 percent for the Schonstedt Model GA-72/Cv, and from 97 to 100 percent for the Schonstedt GA-52/Cx, depending on the search radius used for the calculation. As previously discussed, results for the three-foot wide search lanes were not included in the detection percentages presented above because three-foot search lanes were not used during the site investigations. The lower detection rates were for a 1.6-foot search radius and the higher detection rates were for a 3.3-foot search radius. It should be noted that the ODDS field trial sites were selected to represent areas with high MEC or munitions debris density. In comparison, Track 1 sites, such as BLM-Headquarters and MRS-35, are expected to have very low densities of munitions debris, if any. Therefore, the field trial results may not be applicable to this site.

Although not directly comparable to BLM-Headquarters and MRS-35, the results of the ODDS indicate that the Schonstedt Models GA-52/C and -72/Cv and 52/Cx are capable of detecting ferrous surface and subsurface MEC if present in the surface or shallow subsurface at the site.

Digital Geophysical Equipment

Digital geophysical surveys using an EM61 MK 2 were performed as part of the MRS-BLM, burn units 18 and 22 remedial action conducted adjacent to the site and partly within the site boundaries on the western side. The EM61 is capable of detecting both buried ferrous and non-ferrous metals, while being less sensitive to cultural features such as fences, buildings, and power lines. Data was collected using either a towed array or using a single manual unit in areas that were inaccessible to the towed array system. The performance EM61 MK 2 was evaluated against Measurement Quality Objectives identified in the Draft MRS-BLM Units 18 and 22, Munitions and Explosives of Concern, Remedial Action Report (*Shaw, 2010b*).

4.4 Sampling Methods Discussion

During the investigation and clearance work the site boundaries and grids were surveyed and marked to provide control on the areas investigated. In addition, field logs were prepared to note depth, location,

and description of the MD or MEC items found. The subsurface clearance performed by UXB in 1994 was conducted within grids that fell within the site boundaries and the subsurface clearance as part of the 2001 fuel break reestablishment was conducted by Parsons within a grid that partially overlapped into the site boundaries. Surface clearance performed by USA was performed over the entire site.

In 1994, UXB performed subsurface investigation in 10 percent of the grids (seven grids). Once grids were established, the grid was divided into five-foot wide search lanes. The search lanes were visually inspected while simultaneously searching for subsurface anomalies with a magnetometer. Each magnetic anomaly identified with the magnetometer was marked with a pin flag and hand excavated by UXO Specialist to a depth of four feet to identify or confirm the presence of MD or MEC. If munitions or other metal debris were not encountered within four feet, the onsite USAEDH Safety Specialist determined whether deeper excavation was required.

USA performed surface clearance/removal in 1997 and 1998 that that consisted of visual inspection of the entire site and along roads within the area surrounding the site that that consisted of visual inspection of the entire site; Schonstedt GA-52Cx magnetometers were used to aid in the clearance in areas where vegetation hampered vision and along roads.

Parsons performed subsurface clearance in 2001 within removal grids that were approximately 100 foot long and extended across the width of the fuel break/road. Subsurface removals were performed within the fuel break using a Schonstedt GA-52Cx magnetometer. All detected anomalies were excavated until reaching the source or a depth of four feet. If the anomaly site was excavated to four feet bgs without finding metal debris, the clearance team consulted with the USACE representative concerning the need to further excavate.

Surface removal of MEC was performed by team members walking abreast and online, and visually inspecting the ground surface for MEC and MD. When removal teams encountered MEC items, they documented the location, quantity, and provided a description of the item on a grid operation record.

Small arms cartridges, one expended 3.5 inch M29A2 practice rocket, one ground illumination signal, two grenade fuzes (one MEC and one MD) and 17 practice hand grenades (one MEC and 16 MD), and one smoke grenade (MEC) were found in the western and southwestern portions of the site. Schonstedt tools are not capable of detecting brass small arms cartridges; therefore, it is likely that the cartridges were visually identified by field personnel.

Shaw performed surface removal and digital geophysical survey with anomaly excavation to depth as part of the MRS BLM Units 18 and 22 remedial action. The digital geophysical data was collected and processed for anomaly selection using the procedures outlined in the MEC Procedures Supplement included in the Units 18 and 22 site specific work plan (SSWP, *Shaw, 2008*). Following selection of anomalies, the targets were relocated and flagged in the field. The identified anomalies were then excavated and an EM61 M2 unit was used to assess the area of a three foot radius around the excavation. One MEC item, identified as a DMM, a MK II practice hand grenade was identified within the site BLM Headquarters and MRS-35 boundary.

4.5 Quality Assurance/Quality Control

The QA/QC procedures used during sampling are described below.

4.5.1 Field Sampling QA/QC

1994 Ordnance and Explosive Sampling Action: The report that documented UXB's sampling investigation indicated that QC checks were performed on each investigated grid after munitions sampling operations were completed. A minimum of 10 percent of each investigated grid was checked to verify that the grid had been surveyed and munitions related items removed. If munitions related items (other than small arms) were found during the QC sweep, the grid would need to be resurveyed. The work plan stated that after the QC check the site would undergo a QA check by the USAEDH safety specialist.

1998 Surface Removal: The After Action Report indicated that USA performed operational checks and QC inspections as specified in their work plan. The work plan specified that QC consisted of daily and periodic QC audits as described below.

Daily QC Audits. According to the Work Plan, instruments and equipment requiring maintenance and/or calibration were checked prior to the start of each workday. Batteries were replaced as needed and the instruments were checked against a known source. The QC Specialist was responsible for ensuring that personnel accomplished all operational checks and that the appropriate log entries were made. The QC Specialist performed random, unscheduled checks of the various sites to ensure that personnel followed procedures in the Work Plan and submitted a report of findings to the USA Senior UXO Supervisor (SUXOS).

Periodic QC Audits. The QC Specialist conducted a quality audit of completed sites within a reasonable time after the completion of the work. These audits were performed by USA's QC Specialist and

consisted of a magnetometer inspection (using a Schonstedt Model GA-52Cx magnetometer) of at least 10 percent of each search grid. The QC Specialist inspected each operating grid using a zigzag pattern that covered at least 10 percent of the entire grid and submitted a written report of their findings to the project manager (PM). The Pass/Fail criteria for these audits was zero munitions items. If the QC Specialist did not pass the grid, the PM scheduled the area for re-working. In addition to the physical inspection of the site, the QC Specialist conducted an audit of logs to ensure the proper entries were made. The PM and SUXOS analyzed all grid QC failures to determine required corrective action. According to QC and QA logs, no munitions items were found during the 10 percent QA/QC.

2001 MEC Removal as part of Reestablishment of Impact Area Fuel Breaks:

QC associated with this MEC removal program included the following:

- A QC inspection using a Schonstedt GA52Cx magnetometer to detect anomalies on at least 10 percent of every subsurface removal grid. No items were detected during the QC 10 percent inspection.
- After field work was completed, the database and the Geographic Information Systems (GIS) data were checked for detail, quality, and format.

Any grid that failed QC inspection received a nonconformance report and was subject to corrective action (another removal action), after which it received another QC inspection. The process would end when the grid passed QC inspection.

After grids passed QC inspections, the USACE UXO Safety Specialist conducted QA inspections using a Schonstedt GA52Cx magnetometer on at least 10 percent of every subsurface removal grid to detect any anomalies. The QA inspections detected no items.

2009-2010 MRS-BLM Units 18 and 22 MEC Remedial Action:

QC associated with the MRS-BLM Units 18 and 22 remedial action included visual observation of teams conducting surface removal. During subsurface removal, the UXO Quality Control Specialist visually observed teams in the field and conducted additional spot checks. In addition 50 blind seeds were placed prior to conducting technology-aided surface remediation. All but two of the seeds were recovered. One of the seeds not recovered was found to be covered by loose dirt and the other was recovered, but not correctly reported at the time it was recovered.

The digital geophysical survey QC included the following:

- Reviewing and approving the qualifications of the geophysical staff;
- Planning and insuring the acceptable performance and completion of all geophysical QC activities;
- Reviewing the geophysical QC and digital geophysical mapping DGM data, target lists, and dig results as documented in the SSWP (*Shaw, 2008*);
- Identifying quality problems and verifying that appropriate corrective actions were implemented;
- Ensuring that QC records were generated and retained as prescribed in the SSWP; and
- In addition to the QC described above, 17 blind seeds were emplaced within Units 18 and 22 prior to the start of the DGM field operations. Of the 17 blind seeds three seeds were buried deeper than the estimated detection depth for the EM61 to test the detection depth and were not elected as targets, two were selected as targets but not dug, three were located inside the Fuel Break Area that was not dug, and one seed was recovered during surveys where anomalies were identified and dug in real time. The other eight seeds were identified as targets and dug. All but one of the recovered seeds was located within two feet of their known location.

4.5.2 Data Management QA/QC

Parsons performed a 100 percent QC review of the data collected prior to 2006 that is associated with the site. This evaluation included a review of field grid records (if available) and the database created by the munitions response contractor. The USACE followed the QC review with a 10 percent QA of the Parsons' data review. The requirements of the QA review are described in the SOP provided in the Final Track 1 OE RI/FS Report (*MACTEC, 2004*). The purpose of the data review was to complete a 100 percent check of all available grid records to identify discrepancies between the reports documenting field activities and the grid records. Discrepancies were then researched and corrections made, if appropriate, prior to loading the data into the project database. MEC and MD removed by UXB were assigned location coordinates that correspond to the center of the grid in which the item was found as part of the QC review.

Quality control review of data collected after 2006 as part of the MRS-BLM Units 18 and 22 remedial action included review of each entry to confirm MEC and MD nomenclature, completion of targets/grids within a given grid, and the ultimate disposition of MEC items (*Shaw, 2010a*).

4.5.3 Data Quality Conclusions

For BLM-Headquarters and MRS-35, the following conclusions can be made regarding the quality of the data:

Data collected by UXB, CMS, and Parsons, and Shaw were collected in grids that were located wholly or partially within the area identified as BLM-Headquarters and MRS-35.

Schonstedt magnetometers were used for sampling and removal actions conducted prior to 2006 and are effective at identifying surface and shallow subsurface MEC or MD items, but based on the depth of burial of some of the practice grenades found at the site, would not be capable of finding items intentionally buried at the site.

The EM61 MK 2 used during the Units 18 and 22 remedial action was also effective at identifying surface and shallow subsurface MEC and MD items based on the results of the QA/QC conducted during the remedial action. Coordinate data were collected for MEC and MD items found except for the expended practice rocket, but there are grid records showing its location within the site. Information concerning depth of found items was not collected by UXB and MEC items are located at the center of the grid in which they were found.

The data collected suggest that the munitions found at depth at the site were intentionally disposed, but the few items found at the ground surface represent items that were intentionally or unintentionally discarded.

5.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents conclusions and recommendations for BLM-Headquarters and MRS-35 that are based on review of historical information and sampling data.

5.1 Conclusions

5.1.1 Site Use and Development

Based on the literature review and site sampling results, the site appears to have been used as a camp and served as Range Headquarters. The MD and MEC items found at the site would not have been used at the site but were likely unintentionally or intentionally discarded or disposed on the surface and in the subsurface, possibly during road construction or maintenance activities. The site is currently used as BLM headquarters.

Most of the MD and MEC items discovered at the site were found below the ground surface. Most were discovered on the southwestern edge of the site associated with subsurface removal actions on Broadway Road. The following MEC or MD items, if present at the site, are likely only to be present at depth and, if encountered, are considered to pose an acceptable risk for the following reasons:

M30 and MK II Practice, Hand Grenades: It is possible that a person could cause a practice grenade to function if one were found at the site and be burned by the black powder filler; the practice grenade itself would not fragment. However, the grenade would have to contain a live fuze, and these components would have been exposed to moisture degradation and weathering for many years, which could decrease their effectiveness.

M18 Smoke Hand Grenade: It is possible that a person could cause the smoke grenade to function if one were found at the site and be burned, but it would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

M125 Series Ground Illumination Signal: It is highly unlikely a human receptor would be able to function a M125 Series illumination signal through casual contact. This is supported by the following reasons: (1) it would require precise placement of components and a hard blow to function, and (2) the signal would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function. The M125 series illumination signal contains no explosives. It only poses a burn hazard if functioned.

Rocket, Practice, 3.5-inch, Model M29A2: It is unlikely that additional 3.5-inch practice rockets are present at the site. The one practice rocket that was found was recovered on the surface adjacent to the BLM Headquarters are. There is no evidence that this area was ever used for 3.5-inch practice rocket training and it is suspected that this item may have been placed at the site. If a 3.5-inch practice rocket were to function, the type of injury that could be sustained would be burns from the propellant charge.

5.1.2 Sampling Adequacy and Data Quality

The following provides conclusions regarding data adequacy and quality:

- Schonstedt GA-52/C, GA-52Cx, and GA-72/Cv were used by during investigations and removal actions. These instruments were evaluated as part of the ODDS and these instruments are capable of detecting ferrous MEC items expected at this site.
- MEC and MD items found at the site (practice grenades, smoke grenades, grenade fuzes, ground illumination signal, and a practice rocket) were not expected to be present at the site based on historical uses. The munitions items found in the subsurface were likely related to unintentional disposal during road construction or maintenance and the few items found at the ground surface may have been unintentionally dropped or intentionally discarded.
- The area identified on Army training map as Camp Huffman and Range Control Headquarters is included within the boundary of BLM-Headquarters and MRS-35 and was subject to surface MEC removal over the entire site as well as subsurface removal over 10 percent the site.
- The sampling data do not indicate that practice munitions were used at the site. Items located on site were likely associated with construction or maintenance of Broadway Road, or were discarded on the ground surface.
- Because the entire site underwent surface MEC removal and 10 percent underwent subsurface MEC removal, the quantity and quality of available information is sufficient to make an informed decision regarding the site. Because the military munitions items found during removal actions at the site are considered to pose an acceptable risk (see Section 3.4), additional MEC sampling at the site would not add significantly to the understanding of the site or change the conclusions of this report.

5.2 Recommendations

Based on review of existing information, MEC is not expected to be found at BLM-Headquarters and MRS-35, and No Further Action Related to MEC is recommended for this site. BLM-Headquarters and MRS-35 meets the Track 1, Category 1 criteria because historical research and field investigations indicate that the site was not used for munitions training. Munitions-related items found at the site appear to have been unintentionally disposed in the subsurface, possibly during road construction or repair, and discarded at the ground surface. MEC are not expected to be present on the ground surface of the site as the entire site underwent surface MEC removal. In the unlikely event that a MEC item is found of the type previously observed at BLM-Headquarters and MRS-35, it is not expected that it could be caused to function through casual contact (i.e., inadvertent and unintentional contact). The munitions items found at BLM-Headquarters and MRS-35 have been exposed to moisture, degradation, and weathering for many years which could decrease the effectiveness of the components that cause it to function.

The USACE has performed three munitions removal actions at BLM-Headquarters and MRS-35 and plans to perform additional investigations/removal actions in the buffer zone south of the site. The buffers on the other sides of the site have been completed. The Army, with regulatory oversight from the USEPA and DTSC, conducted systematic investigations of the site and based on these investigations and the items found, it appears that the site was not used for munitions training and that the items found at the site were discarded on the ground surface, or unintentionally buried during road construction.

The site may be developed in the future which may include intrusive work. No actionable risk was identified through the remedial investigation process. However, in the interest of safety, reasonable and prudent precautions should be taken when conducting intrusive operations at this site. As a basewide effort to promote safety and because of Fort Ord's history as a military base, the Army provides "ordnance recognition and safety training" to anyone who requests that training. Construction personnel involved in intrusive operations at the former Fort Ord may attend the Army's "ordnance recognition and safety training" to increase their awareness of and ability to identify MEC items. Section 1.3.1 (Description of the Remedy) of the Track 1 ROD (*Army, 2005a*) describes the scope of the safety training. Trained construction personnel will contact an appropriate local law enforcement agency if a potential MEC item is encountered. The local law enforcement agency will arrange a response by the Army.

For BLM-Headquarters and MRS-35, the Army recommends that construction personnel involved in intrusive operations at this site attend the Army's "ordnance recognition and safety training." To accomplish that objective, the Army will request notice from the future landowner of planned intrusive

activities, and in turn will provide ordnance recognition and safety training to construction personnel prior to the start of intrusive work. The Army will provide ordnance recognition and safety refresher training as appropriate. BLM-Headquarters and MRS-35 should be added to the list of Track 1 sites with management controls shown in the MRS Security Program (*Army, 2010*). This document presents the elements of the “ordnance recognition and safety training, notification procedures, and Army and local law enforcement responsibilities. In accordance with the Track 1 ROD (*Army, 2005a*), the Army will assess whether the education program should continue. If information indicates that no MEC items have been found in the course of development or redevelopment of the site, it is expected that the education program may, with the concurrence of the regulatory agencies, be discontinued, subject to reinstatement if a MEC item is encountered in the future.

Because ordnance recognition and safety training is recommended for the BLM-Headquarters and MRS-35, at the time of the next five-year review, the Army, in accordance with the Track 1 ROD (*Army, 2005a*), will assess whether the education program should continue. In the future, should any military munitions-related item be found at BLM-Headquarters and MRS-35, the Army will take an appropriate immediate action (i.e., removing the found item, recording the incident), and within 90 days of the discovery, submit a plan for appropriate follow-on action to USEPA and DTSC for consultation, pursuant to Section 7.7(b) of the Fort Ord FFA.

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TABLE

Table 2.1
MEC and MD Found
Site Assessment Approach Technical Memorandum

Site	Grid	MM Item Description	Risk Code	Depth (in)	Easting (ft)	Northing (ft)	MM Type	Quantity	MM Scrap (lbs.)	Burial Pit	Fragment	Date
MRS-15	Broadway Road East 1041	Fuze, grenade, hand, practice, M228		4	5748413.616	2120422.26	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		12	5748414.296	2120453.816	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		24	5748411.074	2120459.652	MD	1		N	0	8/8/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, M30		6	5748425.644	2120456.404	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		7	5748422.226	2120457.771	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		4	5748428.037	2120460.506	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		6	5748432.822	2120463.24	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		9	5748427.011	2120452.644	MD	2		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, M30		11	5748430.429	2120460.164	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Fuze, grenade, hand, practice, M228		4	5748424.96	2120459.138	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		6	5748428.72	2120465.975	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		5	5748436.582	2120461.531	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		6	578432.822	2120463.24	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		7	574846.245	2120462.557	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		10	5748466.663	2120467.001	MD	1		N	0	7/23/01
MRS-35	MRS-35_01 AB	Fuze, grenade (model unknown)	1	0	5748348.895	2120660.809	ISD	1		N	0	9/6/94
MRS-35	MRS-35_01 A	Signal, illumination, ground, M125	2	0	5748363.892	2120731.864	MEC	1		N	0	8/25/94
Units 18/22		Grenade, hand, practice, MK II	1		5748284.36	2120929.8	MEC-DMM	1		N	0	3/13/09
MRS-35	LB3-MI04-SJ01	Grenade, hand, smoke, M18 series	1	0	5748582.98	2120951.03	ISD	1		N	0	7/28/97
		Rocket, 3.5inch, practice, M29 series					MD	1		N	0	2/11/98
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		6	5748423.935	2120462.215	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		9	5748426.327	2120459.822	MD	1		N	0	7/23/01
MRS-15	Broadway Road East 1041	Grenade, hand, practice, MK II		4	5748460.169	2120471.102	MD	1		N	0	7/23/01

Abbreviations:

in = inches
ft = foot
lbs = pounds
N = No

MM = Military munitions
MRS = Munitions Response Sites
MD = Munitions Debris
MEC = Munitions and Explosives of Concern

ISD = Insufficient data available to determine MM Type

Checked NAM

Approved BPF

Notes:

November 2008 version of the MR data base used.

Fragment Field: One (1) in the fragment field signifies the item was a fragment. Zero (0) in the fragment field signifies the item was not a fragment.

The risk code provides a risk hazard value of 0 to 3.

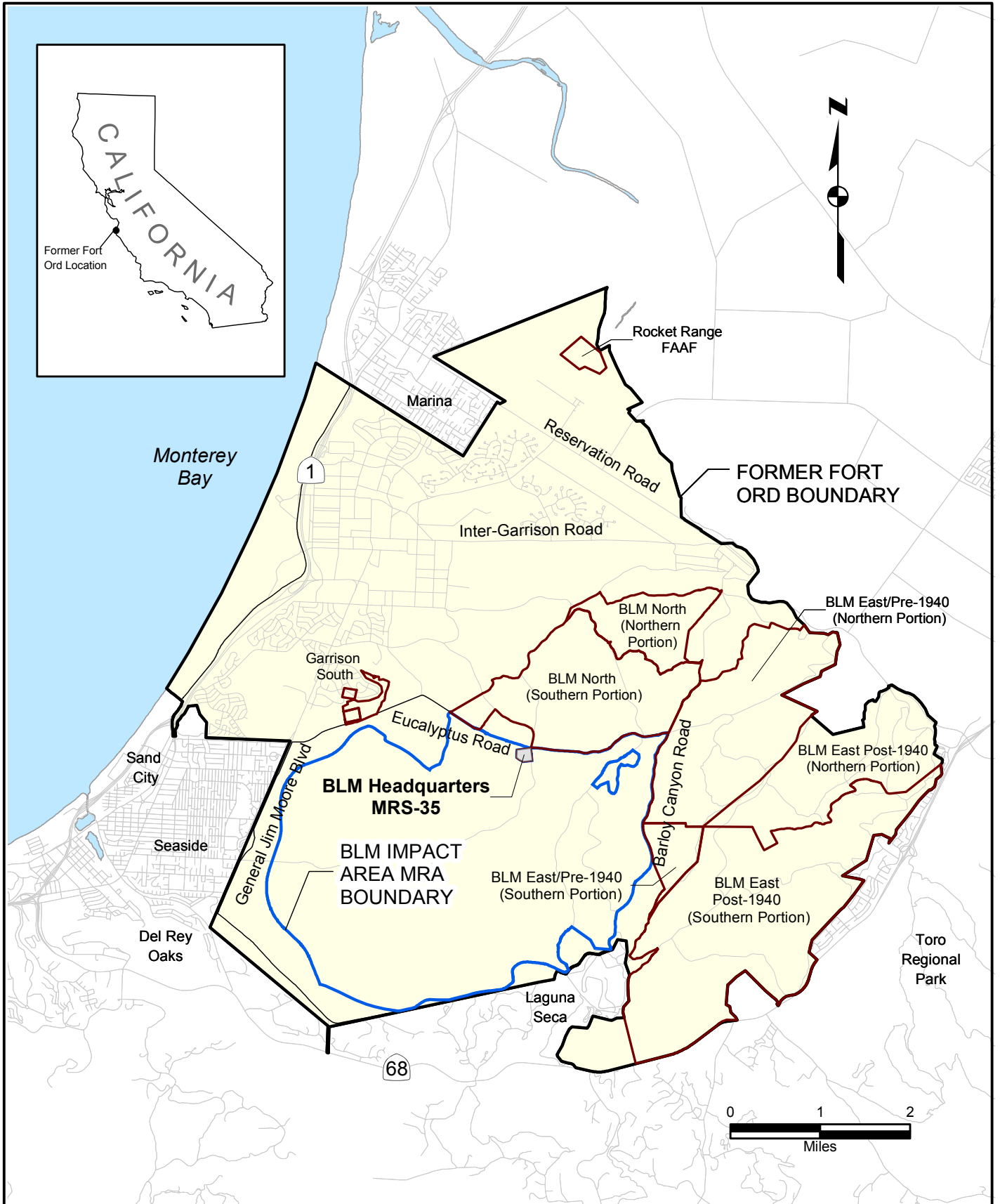
- 0 = inert
- 1 = could cause minor injury
- 2 = could cause major injury
- 3 = could kill an individual if functioned by an individual's activities

* in the MM Item Description field indicates there is no equivalent Master Pick List nomenclature for the item; therefore, the nomenclature from the original grid sheet was used.

** Not found in the MR database. Found during initial RAC site investigation during November 1995.

*** Found during Basewide Range Assessment site reconnaissance. Not listed in MR database.

PLATES



Former Fort Ord Location Map
 Track 1 Plug-in Approval Memorandum
 BLM Headquarters and MRS-35
 Former Fort Ord, California

PLATE

1-1

DRAWN
TJH

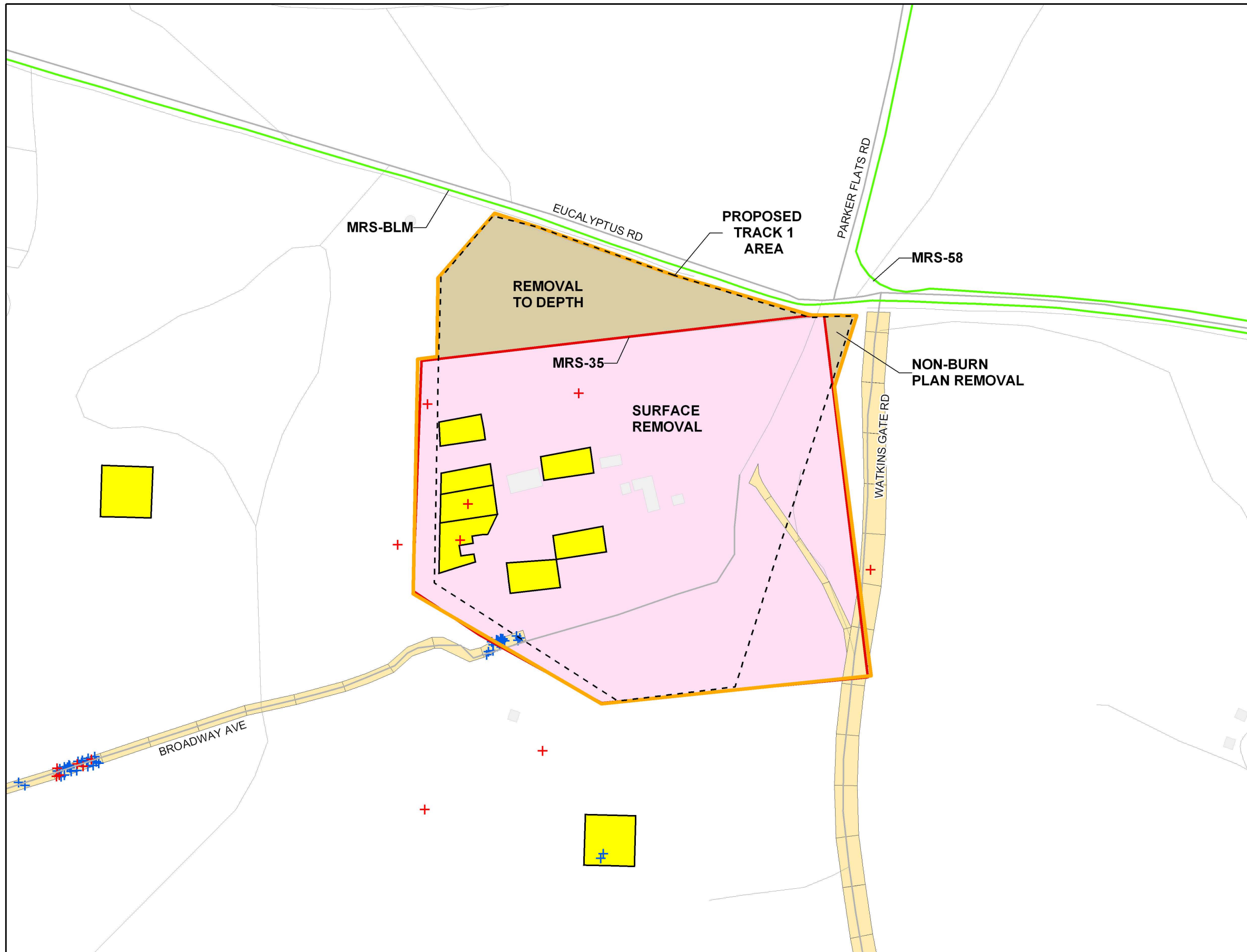
JOB NUMBER
4084086512 16a.1

CHECKED
MJH

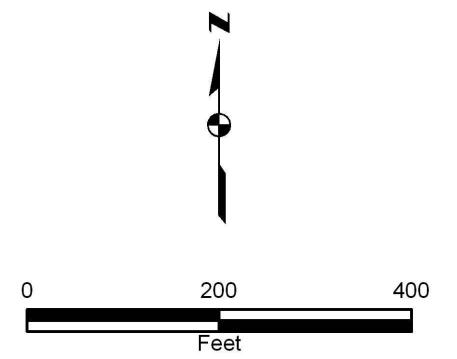
CHECKED DATE
7/2010

APPROVED
BPF

APPROVED DATE
1/2011



- EXPLANATION**
- Proposed Track 1 Area
 - Historic MRS-35 Boundary
 - Other MRS Site Boundaries
 - Fence Line/Reconfigured Parcel F1.12
 - + Munitions and Explosives of Concern
 - + Munitions Debris
 - Removal to Depth
 - Surface Removal
- Grid Removal Status**
- 100% Sampling
 - Removal (4-foot)



DRAWN: TJH	PROJECT NO: 4084086512 16.1a
ENGINEER:	SCALE: AS SHOWN
CHECKED: MJH	APPROVED: BPF
DATE: 7/2010	DATE: 7/2010



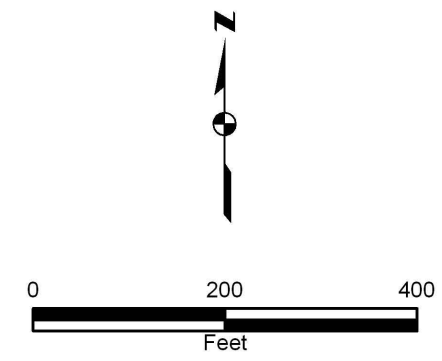
Track 1 Plug-in Approval Memorandum
BLM Headquarters and MRS-35
Former Fort Ord, California

Site Plan

PLATE
2-1



- EXPLANATION**
- Proposed Track 1 Area
 - Fence Line/Reconfigured Parcel F1.12
 - Historic MRS-35 Boundary
 - Other MRS Site Boundaries



DRAWN: TJH	PROJECT NO: 4084086512 16.1a
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CHECKED: MJH	APPROVED: BPF
DATE: 7/2010	DATE: 7/2010

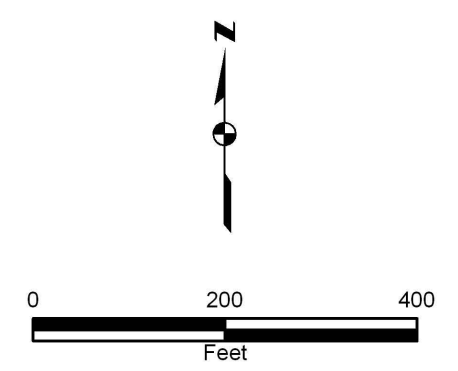


Track 1 Plug-in Approval Memorandum
BLM Headquarters and MRS-35
Former Fort Ord, California

1941 Aerial Photograph and
Training Facilities, Circa 1945



- EXPLANATION**
- Proposed Track 1 Area
 - Fence Line/Reconfigured Parcel F1.12
 - Historic MRS-35 Boundary
 - Other MRS Site Boundaries



DRAWN: TJH	PROJECT NO: 4084086512 16.1a
ENGINEER:	SCALE: AS SHOWN
CHECKED: MJH	APPROVED: BPF
DATE: 7/2010	DATE: 7/2010



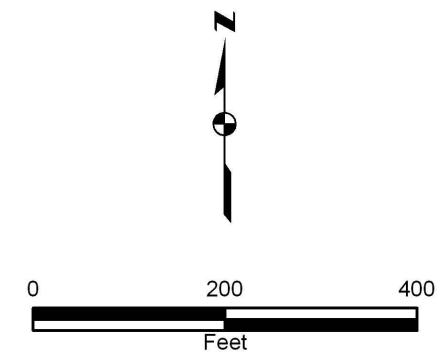
Track 1 Plug-in Approval Memorandum
BLM Headquarters and MRS-35
Former Fort Ord, California

1955 Aerial Photograph and
Training Facilities, Circa 1957

January 27, 2011 12:13:52 PM
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- EXPLANATION**
- Proposed Track 1 Area
 - Fence Line/Reconfigured Parcel F1.12
 - Historic MRS-35 Boundary
 - Other MRS Site Boundaries



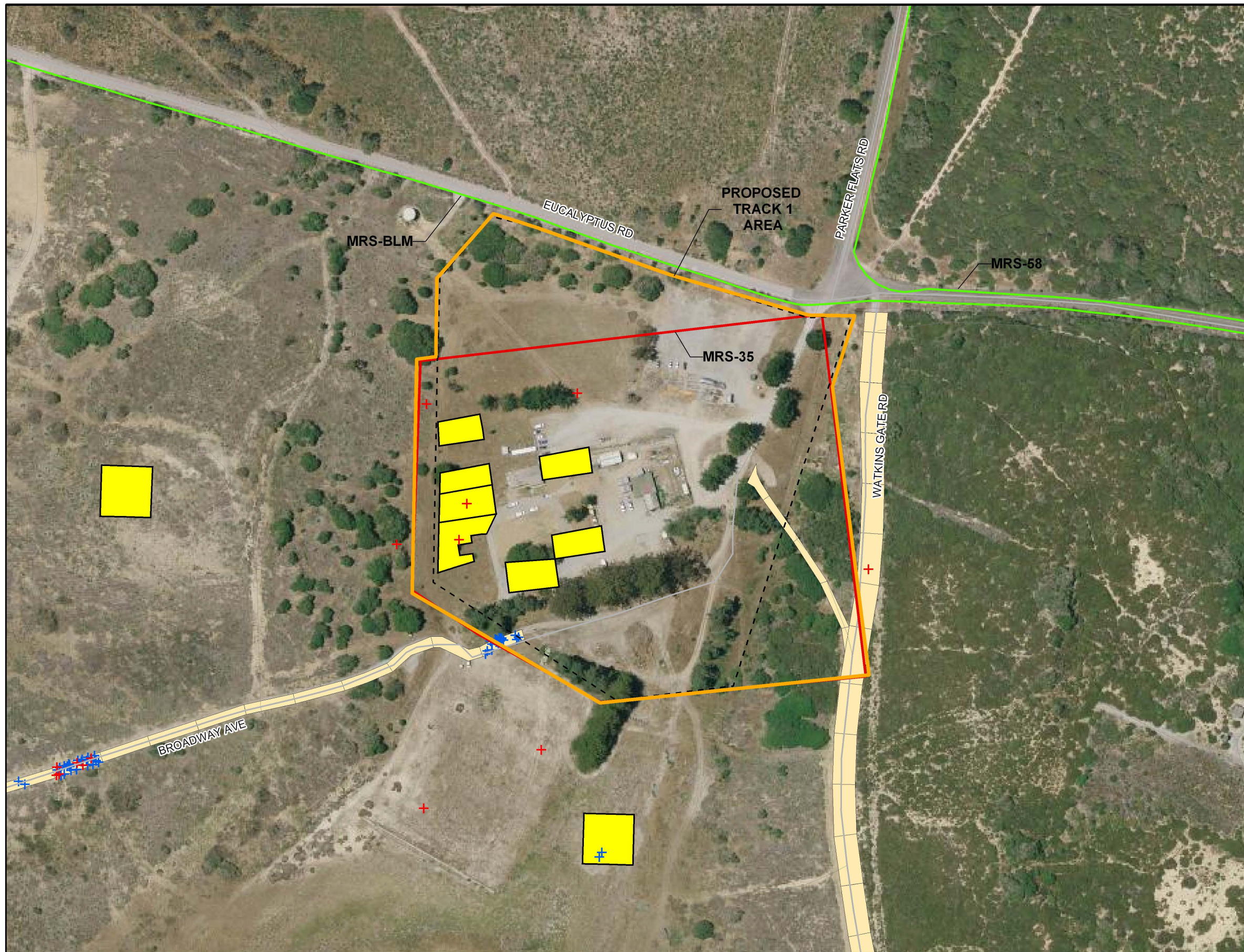
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DATE: 7/2010	DATE: 7/2010



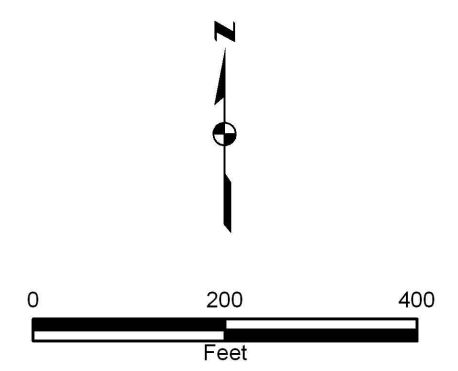
Track 1 Plug-in Approval Memorandum
BLM Headquarters and MRS-35
Former Fort Ord, California

1974 Aerial Photograph and
Training Facilities, Circa 1972

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- EXPLANATION**
- Proposed Track 1 Area
 - Fence Line/Reconfigured Parcel F1.12
 - Historic MRS-35 Boundary
 - Other MRS Site Boundaries
 - + Munitions and Explosives of Concern
 - + Munitions Debris
- Grid Removal Status**
- 100% Sampling
 - Removal (4-foot)



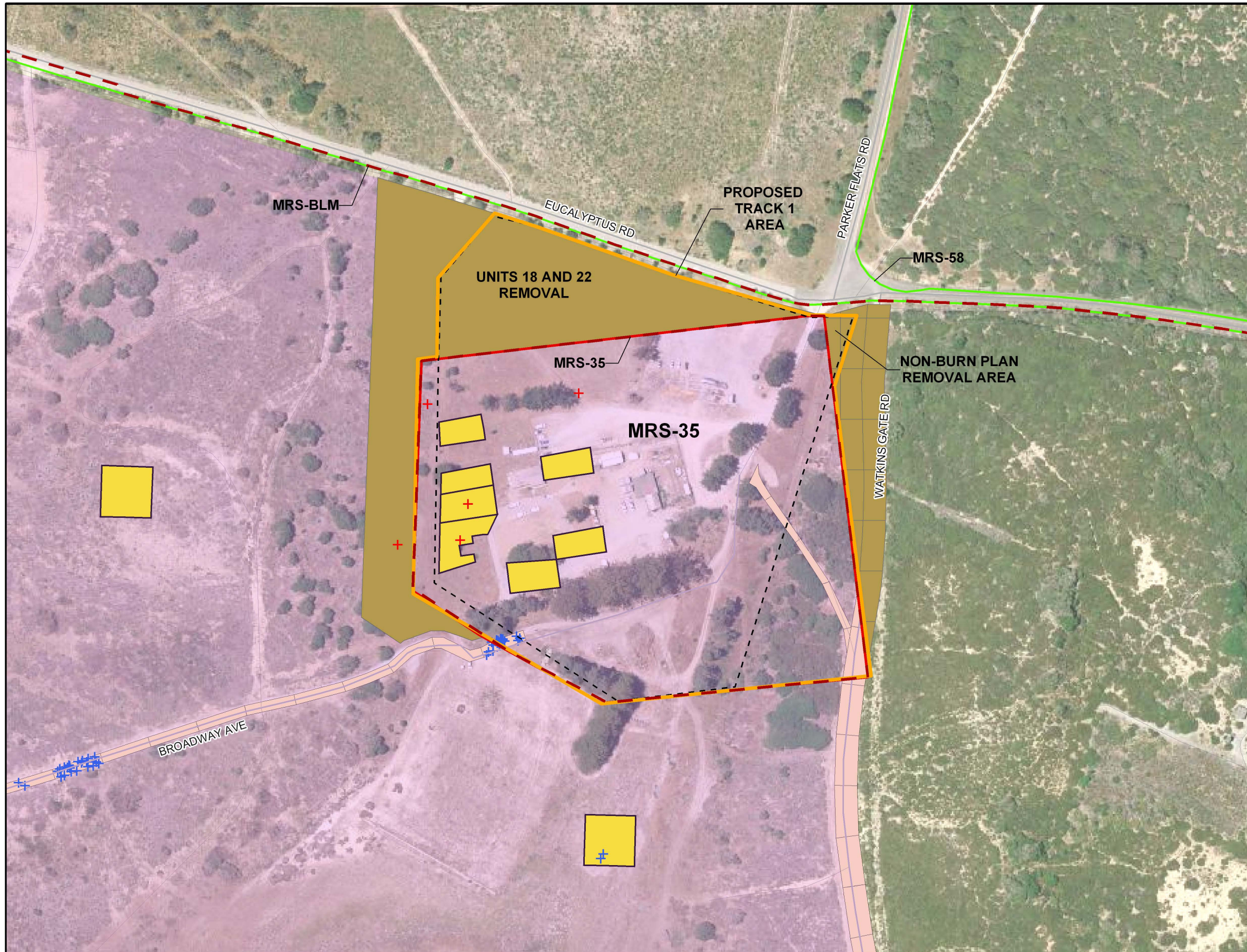
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CHECKED: MJH	APPROVED: BPF
DATE: 7/2010	DATE: 7/2010



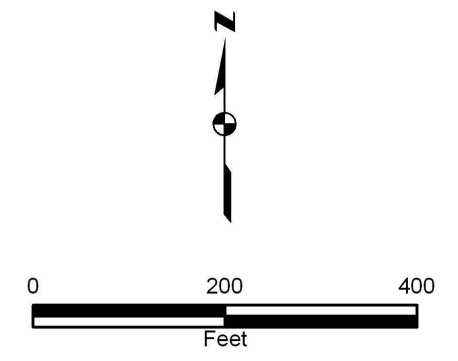
Track 1 Plug-in Approval Memorandum
BLM Headquarters and MRS-35
Former Fort Ord, California

2009 Aerial Photograph,
MEC and MD Items, and
Sample Grids

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- EXPLANATION**
- Proposed Track 1 Area
 - Fence Line/Reconfigured Parcel F1.12
 - Historic MRS-35 Boundary
 - MRS Site Boundary
 - BLM Impact Area MRA
 - + Munitions and Explosives of Concern
 - + Munitions Debris
 - Surface Clearance
 - 100-foot Buffer Clearance to Depth
- Grid Removal Status**
- 100% Sampling
 - Removal (4-foot)



Note: Investigations inside BLM Impact Area MRA are presented on this plate.

DRAWN: TJH	PROJECT NO: 4084086512 16.1a
ENGINEER:	SCALE: AS SHOWN
CHECKED: MJH	APPROVED: BPF
DATE: 7/2010	DATE: 7/2010



Track 1 Plug-in Approval Memorandum
BLM Headquarters and MRS-35
Former Fort Ord, California

Investigation Status

PLATE
2-6

ATTACHMENT 1

Evaluation of Previous Work Checklists

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

TYPE OF TRAINING AND MILITARY
 MUNITIONS EXPECTED

Yes No Inconclusive

1. Is there evidence that the site was used as an impact area (i.e., fired military munitions such as mortars, projectiles, rifle grenades and other launched military munitions)?

	No	
--	----	--

Sources reviewed and comments

There is no evidence to indicate that the site was used as an impact area. Training maps indicate that the site has been used as Camp Huffman and as Range Headquarters (Range Control), since at least 1941. An expended 3.5-inch M29A2 practice rocket (MD) was found on the ground surface. It is believed that this rocket was unintentionally dropped or discarded onsite.

References:
 USAEDH, 1997

2. Is there evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?

	No	
--	----	--

Sources reviewed and comments

No evidence indicating training involving HE or LE items occurred onsite. The subsurface practice hand grenade (MD) and smoke grenade (MEC) and fuzes (MD) found on the southern boundary of the site are most likely associated with road construction or maintenance using soil from the impact area or disposal of munitions-related items used at other ranges.

References:
 USAEDH, 1997 (ASR); UXB, 1994b; USA, 2000, Parsons, 2006; and Shaw, 2010.

3. Is there evidence that training involved use of pyrotechnic and/or smoke producing items (e.g., simulators, flares, smoke grenades) but not explosives?

	No	
--	----	--

Sources reviewed and comments

One smoke grenade (MEC) was found on the surface onsite. This was most likely dropped or potentially discarded at the site..

References:
 UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
4. Was sampling and/or reconnaissance performed within the appropriate area?	Yes		

Sources reviewed and comments

Surface clearance activities took place across the entire site along with subsurface clearance in grids in the western and southwestern portions of the site.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

5. Does sampling indicate MEC and/or munitions debris are present at the site?			x
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Sources reviewed and comments

A M18 Series smoke hand grenade (MEC), MK II and M30 practice hand grenades (MD), a M125 Series ground illumination signal (MEC), grenade fuzes (MD), and an expended 3.5-inch M29A2 practice rocket (MD) were found at the site. MEC surface clearance and removal activities resulted in a high degree of certainty that munitions related material on the ground surface had been identified and removed, but that there was potential for other material to be buried in and around the site.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

6. Were the type(s) of items found consistent with the type of training identified for the site?		No	
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Sources reviewed and comments

The buried practice hand grenades were not consistent with the use of the site for Range Control and appear to have been intentionally disposed onsite. It is believed that the ground illumination signal (MEC) and 3.5-inch practice rocket (MD) were unintentionally dropped or intentionally discarded onsite.

References:

UXB, 1994b; USA, 2000, Parsons, 2006; and Shaw, 2010

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
7. Were the type(s) of items found consistent with the era(s) in which training was identified?	Yes		

Sources reviewed and comments

Items found were consistent with the time period during which the ranges south, east, and west of the site were used for training (infiltration course, bench rest range, recoilless rifle range, mortar range, and rocket launcher range).

References:

USAEDH, 1997; UXB, 1994b; USA, 2000, Parsons, 2006; Shaw, 2010; Army, 1945 "After 1953"; 1956a; 1956b; 1957; 1958; 1965; 1967a; 1967b; 1969; 1972a; 1972b; 1972c; 1972d; 1971-1976; 1977; 1980; 1984a; 1984b; 1984c; 1987.

8. Was HE fragmentation found?		No	
---------------------------------------	--	----	--

Sources reviewed and comments

No HE fragmentation was found. A smoke grenade (MEC), practice hand grenades and fuzes (MD), a ground illumination signal (MEC) and an expended 3.5-inch practice rocket (MD) were found onsite.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

9. Was HE found?		No	
-------------------------	--	----	--

Sources reviewed and comments

No HE was found. A smoke grenade (MEC), practice hand grenades and fuzes (MD), a ground illumination signal (MEC), and an expended 3.5-inch practice rocket (MD) were found onsite.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

10. Were LE found?		No	
---------------------------	--	----	--

Sources reviewed and comments

No LE was found. Only a smoke grenade (MEC), practice hand grenades and fuzes (MD), a ground illumination signal (MEC) and an expended 3.5-inch practice rocket (MD) were found onsite.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

11. Were pyrotechnics found?

Yes	No	Inconclusive
Yes		

Sources reviewed and comments

A M125 series ground illumination signal (MEC) was found onsite as well as fuzes that are pyrotechnic delay-igniting fuzes.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

12. Were smoke producing items found?

Yes		
-----	--	--

Sources reviewed and comments

One M18 Series smoke hand grenade (MEC) was found buried onsite.

References:

USA, 2000.

13. Were explosive items found (e.g. rocket motors with explosive components, fuzes with explosive components)?

Yes		
-----	--	--

Sources reviewed and comments

Expended hand grenade fuzes (MD) were found buried onsite; they have are pyrotechnic delay-igniting fuzes, but are not high explosive.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

14. Do items found in the area indicate training would have included use of training items with energetic components?

	No	
--	----	--

Sources reviewed and comments

MD and MEC items found at the site contained energetic components (ground illumination signal, practice and smoke grenades, and practice rocket). These were apparently disposed or discarded within the site boundaries. There is no indication that training with these items occurred onsite

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

15. Were items found in a localized area (possibly the remnants of a cleanup action)?

Yes	No	Inconclusive
Yes		

Sources reviewed and comments

A majority of the smoke (MEC) and practice hand grenades and practice hand grenade fuzes (MD) were found buried onsite during the fuel break clearance work on Broadway Road.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

16. Has the site been divided into sectors to focus on areas of common usage, similar topography and vegetation, and/other unique site features?

	No	
--	----	--

Sources reviewed and comments

The site was not divided into sectors based on site usage or site features.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

17. Should current site boundaries be revised?

	No	
--	----	--

Sources reviewed and comments

Current site boundaries include the area identified as the Range Headquarters on Army training and facility maps. The boundaries also include undeveloped areas surrounding the Range Headquarters.

References:

USAEDH, 1997; UXB, 1994b; USA, 2000, Parsons, 2006; and Shaw, 2010; Army, 1945 "After 1953"; 1956a; 1956b; 1957; 1958; 1965; 1967a; 1967b; 1969; 1972a; 1972b; 1972c; 1972d; 1971-1976; 1977; 1980; 1984a; 1984b; 1984c; 1987.

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

18. Was equipment used capable of detecting items suspected at the site at the maximum expected depth?

Yes	No	Inconclusive
Yes		

Sources reviewed and comments

No MEC or MD items were suspected to be present at the site based on documented past site use. Schonstedt Models GA 52/C or GA 72/Cv magnetometers were used by UXB prior to October 1994 and Schonstedt Model GA-52CX was used by UXB after October 1994 and by USA and Parsons during surface munitions clearance and removal work in 1998 and 2001. Results of the ODDS study indicate that these instruments are capable of detecting ferrous MEC or MD items if present at this site. Work conducted by Shaw 2010 used an EM-61 for a DGM survey. A prove out was conducted at a previous site which documented the ability of the EM-61 to detect items expected at the site.

References:

Parsons, 2001 and 2006, Shaw 2010

19. Was equipment used capable of detecting the types of items (e.g., non-ferrous) suspected at the site?

		X
--	--	---

Sources reviewed and comments

No munitions-related items were expected to be found at the site based on past use. Equipment used was capable of detecting munitions with ferrous components.

References:

USAEDH, 1997; UXB, 1994b; USA, 2000; Parsons, 2001; and 2006; Shaw, 2010; Army, 1945 "After 1953"; 1956a; 1956b; 1957; 1958; 1965; 1967a; 1967b; 1969; 1972a; 1972b; 1972c; 1972d; 1971-1976; 1977; 1980; 1984a; 1984b; 1984c; 1987.

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

20. Do the results of the ODDS indicate that items suspected at the site would have been detected by the instrument used at the time of investigation?

Yes	No	Inconclusive
		X

Sources reviewed and comments

Schonstedt Models GA 52/C or GA 72/Cv magnetometers were used by UXB prior to October 1994 and Schonstedt Model GA-52CX was used by UXB after October 1994 and by USA and Parsons during surface munitions clearance and removal work in 1998 and 2001. An EM-61 was used by Shaw in 2009. The results of the ODDS indicate that these magnetometers are capable of detecting the ferrous MEC if it were present at this site.

References:

Parsons, 2001 and 2006

21. Do results of the investigation indicate that suspected items could be detected with a high level of confidence at observed and expected depth ranges?

Yes		
-----	--	--

Sources reviewed and comments

Results of the ODDS suggest that the equipment used should be able to detect ferrous MEC at shallow depths.

References:

Parsons, 2001 and 2006; Shaw, 2010

22. Were all the instruments used to evaluate the site maintained and calibrated in accordance with associated work plan and manufacturer's specifications?

Yes		
-----	--	--

Sources reviewed and comments

During work performed by UXB the Quality Control Specialist calibrated and recorded the operational condition of the equipment on a daily basis. Equipment was calibrated at a frequency recommended by the manufacturer. Prior to geophysical searches source material was utilized to verify the accuracy of the equipment. During work performed by USA/CMS, instruments and equipment requiring maintenance and/or calibration were checked prior to the start of each workday. Batteries were replaced as needed and the instruments were checked against a known source. Work conducted by Shaw followed the workplan requirements.

References:

UXB, 1994a; USA, 2000; Shaw, 2010.

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

23. Based on the anticipated target density (MEC items per acre) has the minimal amount of sampling acreage been completed in accordance with the scope of work or contractor work plan?

Yes	No	Inconclusive
Yes		

Sources reviewed and comments

There is no anticipated density of items. The items left on the surface were probably inadvertently left at the site and generally were considered as "munitions debris". Sampling was performed in accordance with the scope of work and work plans.

24. Based on sampling procedure (e.g., grids, transects, and/or random walks) was a percentage of the site completed to provide 95% confidence in a MEC density estimate, and if so, provide total area investigated and the MEC density estimate.

		NA
--	--	----

Sources reviewed and comments

The site was 100% sampled at the surface and subsurface was cleared over approximately 10% of the site. Munitions debris were found. Only one item was identified as MEC-DMM (Discarded military munitions).

Total Area: Approx. 13.02 acres	
MEC Density:	Not calculated

References:

UXB, 1994b; USA, 2000, Parsons, 2006; and Shaw, 2010

25. What percentage of the anomalies were intrusively investigated?

Sources reviewed and comments

100 percent of the anomalies were intrusively investigated. However only 10 percent of the grids at the site (7 grids) were investigated.

References:

UXB, 1994b.

Total % of anomalies investigated:	100
------------------------------------	-----

26. Was the appropriate data processing scheme used for the site, how was the data processed?

	Not Applicable
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Sources reviewed and comments

Data were collected using Schonstedt magetometers, EM-61 data processing was conducted according to the site specific workplan.

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

Yes No Inconclusive

27. Has the field data been collected and managed in accordance with quality control standards established for the project?

Yes		
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Sources reviewed and comments

Contractors working at the site followed work plans and quality assurance plans

References:

UXB, 1994b; USA, 2000; Parsons, 2006; and Shaw, 2010

Result of Sampling Evaluation

Does the sampling evaluation provide sufficient evidence to warrant further investigation?

	No	
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Comments

MEC surface clearance and removal activities resulted in a high degree of certainty that discarded munitions related material on the ground surface had been identified and removed, but that there was potential for other material to be buried in and around the site. Because there is no reason to believe that there may be additional munitions disposed in the subsurface at the site, no further investigation is considered necessary.

References

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_____, "After 1953". Fort Ord Map.

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ATTACHMENT 1
 EVALUATION OF PREVIOUS WORK: MRS-35
 EVALUATION CHECKLIST PART 2: SAMPLING EVALUATION

	Yes	No	Inconclusive
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USA Environmental , Inc (USA), 2000. Final OE Surface Removal After Action Report, Inland Range Contract, Former Fort Ord, California, Site OE-35. December 29.			
UXB, 1994b. Final Report for Ordnance and Explosive Removal Action, Fort Ord, California, Fort Ord Range Control.			

ATTACHMENT 2

Military Munitions Found At BLM-Headquarters and MRS-35

ATTACHMENT 2
MILITARY MUNITIONS FOUND AT MRS-35

For each of the MEC/MD items potentially remaining at the site, the following discussions provide information on: (1) how the item was designed to function, (2) the likelihood the item would function if found onsite and handled, and (3) the type of injury the item could cause if it functioned.

Hand Grenades

Fuze, Grenade, Model Unknown – Grenade fuzes are components of hand grenades. M228, M201A1, M205, M10A3, M26A1, and M26 grenade fuzes are discussed below in the context of individual grenades.

Fuze, Grenade, Hand, Practice, M228 – The M228 fuze is used with the M69 practice grenade to replicate the fuze delay of the M67 fragmentation hand grenade. The time delay element is a powder train with a four- to five-second delay burn.

Grenade, Hand, Practice, MK II – The MK II practice hand grenade used the M205 or the M10A3 fuze on earlier models, and was designated to train personnel to arm and throw hand grenades. It was identical to the MK II fragmentation grenade, except for a filling hole in the base and a cork stopper to close the hole after the black powder strips had been inserted. The black powder strips provided noise and smoke without fragments upon functioning. It was functioned when a soldier removed the safety pin from the safety lever and threw the grenade allowing the safety lever to fly free, releasing the spring-loaded striker to strike the primer. The primer ignited the delay element in the fuze, which burned for a period of 4.0 and 5.0 seconds before igniting the black powder strips forcing the cork out of the hole in the base and causing spotting charge (*Navy, 1947*). These could be caused to function by incidental contact by movement, i.e., stepping on, picking up, or kicking the grenade. The safety lever is made of thin metal and if exposed to the elements for long periods of time, will deteriorate to eventually allow the safety pin to break free. This will allow the functioning sequence mentioned above to take place. If caused to function, the type of injury that could be sustained would be burns from the black powder spotting charge. The functioning fuze is not designed to have sufficient force to fragment the grenade itself.

Summary: It is possible that a person could cause a practice grenade to function if one were found at the site and be burned by the black powder filler; the practice grenade itself would not fragment. However, the grenade would have to contain a live fuze, and these components would have been exposed to moisture degradation and weathering for many years, which could decrease their effectiveness (*Army, 2006b*).

Grenade, Hand, Practice, M30 – The M30 practice hand grenade is used for training in care, handling and throwing of fragmentation grenades M26A1 and M26. The M26A1 and M26 hand grenade is used to supplement small arms fire against the enemy in close combat (*Army, 1994*). The body is not loaded with high explosive filler but may have a small, separate black powder charge. Hand grenade fuzes M205A1 and M205A2 are pyrotechnic delay-igniting fuzes. Removal of the safety pin permits release of the safety lever. When the safety lever is released it is forced away from the grenade body by a striker acting under the force of the striker spring. If the grenade were to be activated, the igniter would initiate the black powder charge. A loud report, like that of a firecracker, and a puff of white smoke would follow. These could be caused to function by incidental contact by movement, (i.e., stepping on, picking up, or kicking the grenade). If caused to function, the type of injury that could be sustained would be burns from the black powder, or possibly, exposure to metal fragments from the detonator. The detonator is part of the fuze and is contained within the grenade housing. The functioning fuze is not designed to have sufficient force to fragment the grenade itself.

Summary: It is possible that a person could cause the hand grenade to function if one were found at the site and be burned or exposed to metal fragments from the exploding detonator housed within the grenade, the practice grenade itself would not fragment. However, the grenade would have to contain a live fuze and functioning detonator, and these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Grenade, Hand, Smoke, M18 – The M18 is a colored smoke hand grenade used for ground-to-air or ground-to-ground signaling. The grenades may be filled with any one of four smoke colors: red, green, yellow, or violet. Each grenade will emit smoke for 50 to 90 seconds. The grenade body is of thin sheet metal and is filled with smoke composition and topped with a starter mixture. The hand grenade fuze, M201A1, is a pyrotechnic delay igniting fuze. The body contains a primer, first-fire mixture, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever, and safety pin with a pull ring. The grenade weighs 19 ounces and contains 11.5 ounces of smoke composition. It was functioned when a soldier removed the safety pin from the safety lever and threw the grenade allowing the safety lever to fly free, releasing the spring-loaded striker to strike the primer. The percussion primer ignited the first fire mixture. The fuze delay element, which burns for 0.7 to two seconds, ignition mixture, and grenade starter mixture and filler, are ignited by the preceding component. The pressure sensitive tape is blown off the emission holes from which colored smoke emits (*Army, 1977c*). Assuming an M18 smoke grenade was discovered in an unfired condition and caused to function, the type of injuries that could be sustained would be burns from the burning smoke composition. Due to the heat generated, it is unlikely that a person who found a grenade and caused it to function would hold

onto it after ignition. Given that these items have been exposed to the elements for many years, moisture can penetrate and degrade the pressure sensitive tape, the smoke composition, and the condition of the sheet metal case of the grenade.

Summary: It is possible that a person could cause the smoke grenade to function if one were found at the site and be burned, but it would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

Signals

Signal, Illumination, Ground, M125 Series – The M125 series illumination signal is classified as a pyrotechnic. Pyrotechnics are chemical materials used to create fire, light, heat, noise, or gas emission, but not explosions. Pyrotechnic devices include flares, smoke grenades, and military incendiaries.

Star cluster signals consist of five-star illuminant assemblies and a rocket motor propulsion assembly contained in a hand-held aluminum launching tube. The base of the launching tube contains a primer and an initiating charge. As shipped, the firing pin cap is assembled to the forward end and must be reversed for firing. Stabilizing fins on the tail assembly of the rocket are folded parallel to the axis of the signal. A bolt, which also transfers the initiating charge flash to the propellant, extends into the center of the solid propellant, which fills the propulsion assembly. The illuminant assembly is mounted on top of the propulsion assembly with a delay assembly and an expelling charge between. A label specifying firing procedures is secured to the body of the signal (*Army, 1977b*).

When the firing cap is placed on the initiator end in preparation for firing the signal, the firing pin is aligned with the primer. Striking the primer with the firing pin fires the initiating charge to ignite the rocket propellant. As the rocket emerges from the launching tube, the fins extend for flight stability. Before rocket motor burnout at 200 feet, the black powder expelling charge is ignited performing the two-fold function of expelling and igniting the 5-star illuminant assemblies. Burning time is 6 to 10 seconds with burnout occurring at 250 to 300 feet above the ground.

Summary: It is highly unlikely a person would be able to cause a M125 series illumination signal to function through casual contact. This is supported by the following reasons: (1) it would require precise placement of components and a hard blow to function, and (2) the signal would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

The M125 series illumination signal contains no explosives. It only poses a burn hazard if functioned.

Practice Rockets

Rocket, Practice, 3.5-inch, Model M29A2 – No evidence of training with rockets, either high explosive or practice, is identified on any training maps covering MRS-35. It appears that the expended 3.5-inch practice rocket found within MRS-35 was discarded. The M29 series 3.5-inch rockets are fired from a Bazooka-type launcher at ground targets. The rocket was designed to be effective against the armor plate of tanks and armored vehicles. The M29 series practice rounds were inert warheads and loaded to conform to the characteristics of a live round (*Hogg, 2001*). The complete round consists of a rocket head, a fuze, and a rocket motor which contains the propellant and igniter. A tail assembly is rigidly attached to the rear of the motor. The fuze body, threaded at both ends, serves also as a coupling for the rocket head and motor. The same model rocket motor is common to all complete rounds. The motor assembly is threaded externally at the forward end to engage the fuze. The rocket motor propelling charge consists of 12 nonperforated cylindrical extruded grains of M7 solvent propellant. Each grain is five inches long, approximately 3/8 inch in diameter and weighs 0.03 pound. The propellant grains are positioned lengthwise, three in each of four compartments. The rocket was typically filled with plaster of paris.

Summary: It is unlikely a live round would be encountered onsite or that a person would be able to cause a practice 3.5-inch rocket to function through casual contact. The rockets did not contain an explosive charge, but did contain a propellant and igniter which could cause burns if encountered and functioned. The rocket would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

APPENDIX A

GLOSSARY OF MUNITIONS RESPONSE PROGRAM TERMS

GLOSSARY

Closed Range:	A military range that has been taken out of service and either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component. Source: (3).
Discarded Military Munitions (DMM):	Generally, military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations. Purposes of the Basewide Munitions Response Program being conducted at the former Fort Ord, DMM does not include small arms ammunition .50 caliber and below.
Engineering Control (EC):	A variety of engineered remedies to contain and/or reduce contamination, and/or physical barriers intended to limit access to property. Some examples of ECs include fences, signs, guards, landfill caps, soil covers, provision of potable water, slurry walls, sheet pile (vertical caps), pumping and treatment of groundwater, monitoring wells, and vapor extraction systems. Source: (1).
Expended:	The state of munitions debris in which the main charge has been expended leaving the inert carrier. Source: (2).
Explosive Ordnance Disposal (EOD) Personnel	Military personnel who have graduated from the Naval School, Explosive Ordnance Disposal (NAVSCOLEOD); are assigned to a military unit with a Service-defined EOD mission; and meet Service and assigned unit requirements to perform EOD duties, EOD personnel have received specialized training to address explosive and certain Chemical Agent (CA) hazards during both peacetime and wartime. EOD personnel are trained and equipped to perform Render Safe Procedures (RSP) on nuclear, biological, chemical, and conventional munitions, and on improvised explosive devices. Source (8).

Explosive Soil:	<p>Explosive soil refers to mixtures of explosives in soil, sand, clay, or other solid media at concentrations such that the mixture itself is explosive.</p> <p>(a) The concentration of a particular explosive in soil necessary to present an explosion hazard depends on whether the particular explosive is classified as “primary” or “secondary.” Guidance on whether an explosive is classified as “primary” or “secondary” can be obtained from the Ordnance and Explosives Mandatory Center of Expertise (OE MCX) or Chapters 7 and 8 of TM 9-1300-214, Military Explosives.</p> <p>(b) Primary explosives are those extremely sensitive explosives (or mixtures thereof) that are used in primers, detonators, and blasting caps. They are easily detonated by heat, sparks, impact, or friction. Examples of primary explosives include Lead Azide, Lead Styphnate, and Mercury Fulminate.</p> <p>(c) Soils containing 2 percent or more by weight of any primary explosive or mixture of primary explosives presents an explosive hazard and shall be treated as HD 1.1. Soil containing less than 2 percent by weight of any primary explosive do not present an explosive hazard. This information is provided in Department of Defense (DoD) 6055-09-STD (DoD) Ammunition and Explosive Safety Standards dated February 29, 2008, administratively Reissued August 4, 2010.</p> <p>(d) Secondary explosives are bursting and boosting explosives (i.e., they are used as the main bursting charge or as the booster that sets off the main bursting charge). Secondary explosives are much less sensitive than primary explosives. They are less likely to detonate if struck or when exposed to friction or electrical sparks. Examples of secondary explosives include Trinitrotoluene (TNT), Composition B, and Ammonium Picrate (Explosive D).</p> <p>(d) Soil containing 10 percent or more by weight of any secondary explosive or mixture of secondary explosives is considered “explosive soil.” This determination was based on information provided by the USACE as a result of studies conducted and reported in USACE Report AMXTH-TE-CR 86096.</p> <p>(e) Soil containing propellants (as opposed to primary or secondary high explosives) may also present explosion hazards. (ER 1110-1-8153). Source: (5).</p>
Feasibility Study (FS):	An evaluation of potential remedial technologies and treatment options that can be used to clean up a site. Source: (2).
Impact Area:	The impact area consists of approximately 8,000 acres in the southwestern portion of former Fort Ord, bordered by Eucalyptus Road to the north, Barloy Canyon Road to the east, South Boundary Road to the south, and North-South Road to the west. Source: (2).
Institutional Control (IC):	A legal or institutional mechanism that limits access to or use of property, or warns of a hazard. An IC can be imposed by the property owner, such as use restrictions contained in a deed, or by a government, such as a zoning restriction. Source: (1).

Land Use Controls (LUC):	LUC are physical, legal, or administrative mechanisms that restrict the use of, or limit access to, real property, to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineering remedies to contain or reduce contamination or physical barriers to limit access to real property, such as fences or signs. Source: (6).
Magnetometer:	An instrument used to detect ferromagnetic objects. Total field magnetometers measuring the strength of the earth's natural magnetic field at the magnetic sensor location. Gradient magnetometers, sensitive to smaller near-surface metal objects, use two sensors to measure the difference in magnetic field strength between the two sensor locations. Vertical or horizontal gradients can be measured. Source: (2).
Military Munitions Response Program (MMRP):	DoD-established program to manage the environmental, health and safety issues presented by MEC. Source: (2).
Military Munitions:	<p>Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof.</p> <p>The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, other than non nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101) (e) (4). Source: (7).</p>
Munitions Constituents (MC)	Generally, any materials originating from UXO, DMM, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. Source: (6).
Munitions Debris:	Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarizations, or disposal. Source: (7).
Munitions and Explosives of Concern (MEC):	<p>Distinguishes specific categories of military munitions that may pose unique explosives safety risks, such as: UXO, as defined in (10 U.S.C. 101) (e) (5); discarded military munitions, as defined in (10 U.S.C. 2710) (e) (2); or munitions constituents (e.g., TNT, Cyclotrimethylene trinitramine [RDX]), as defined in (10 U.S.C. 2710) (e) (3), present in high enough concentrations to pose an explosive hazard. Source: (7).</p> <p>For the purposes of the Basewide Munitions Response Program being conducted for the former Fort Ord, MEC does not include small arms ammunition .50 caliber and below.</p>

Munitions Response Area (MRA):	Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples are former ranges and munitions burial areas. A MRA comprises of one or more munitions response sites. Source: (7).
Munitions Response Site (MRS):	A discrete location within a MRA that is known to require a munitions response. Source: (7).
Mortar:	Mortars typically range from approximately one inch to 11 inches in diameter or larger, and can be filled with explosives, toxic chemicals, white phosphorus or illumination flares. Mortars generally have thinner metal casing than projectiles but use the same types of fuzing and stabilization. Source: (1).
MEC Sampling:	Performing MEC searches within a site to determine the presence of MEC. Source: (2).
Operating Grids:	Typically, 100-foot by 100-foot parcels of land as determined by survey and recorded by GPS, marked at each corner with wooden stakes. Sites are divided into operating grids prior to the commencement of work by brush removal or OE sweep teams. A single grid may be occupied by only one team at any time, and the grid system facilitates the maintenance of safe distances between teams. They are identified sequentially using an alpha-numeric system (e.g., E-5). Source: (2).
Projectile:	An object projected by an applied force and continuing in motion by its own inertia, as a bullet, bomb, shell, or grenade. Also applied to rockets and to guided missiles. Source: (4).
Range-Related Debris:	Debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., target debris, military munitions packaging and crating material). Source: (6).
Remedial Investigation (RI):	Exploratory inspection conducted at a site to delineate the nature and extent of chemicals, and in this case OE, present at the site. Source: (2).
Removal Depth:	The depth below ground surface to which all ordnance and other detected items are removed. Source: (2).
SiteStats/GridStats:	Programs developed by QuantiTech for the Huntsville Corps of Engineers to predict the density of ordnance on sites with spatially random dispersal of ordnance. Source: (2).
Technology-Aided Surface Removal:	A removal of UXO, DMM, or chemical warfare material (CWM) on the surface (i.e., top of the soil layer) only, in which the detection process is primarily performed visually, but is augmented by technology aide (e.g., hand-held magnetometers or metal detector) because vegetation, the weathering of UXO, DMM or CWM, or other factors make visual detection difficult. Source: (6).
Track 0 Areas	Areas of the former Fort Ord that contain no evidence of MEC and have never been suspected of having been used for military munitions-related activities of any kind. This definition has been clarified in the <i>Explanation of Significant Differences, Final Record of Decision, No Action Regarding Ordnance-related Investigations (Track 0 ROD), former Fort Ord, California (March 2005)</i> to include areas not suspected as having been used for military munitions-related activities of any kind, but where incidental military munitions have been discovered.

Track 1 Sites	Sites at the former Fort Ord where military munitions were suspected to have been used, but based on the results of the MR RI/FS each site falls into one of the following three categories: Category 1: There is no evidence to indicate military munitions were used at the site (i.e., suspected training did not occur); or Category 2: The site was used for training, but the military munitions items used do not pose an explosive hazard (i.e., training did not involve explosive items); or Category 3: The site was used for training with military munitions, but military munitions items that potentially remain as a result of that training do not pose an unacceptable risk based on site specific evaluations conducted in the Track 1 OE RI/FS. Field investigations identified evidence of past training involving military munitions, but training at these sites involved only the use of practice and/or pyrotechnic items that are not designed to cause injury. In the unlikely event that a live item of the type previously observed at the site is found, it is not expected that the item would function by casual contact (i.e., inadvertent and unintentional contact).
Track 2 Sites	Sites at the former Fort Ord where MEC items were present, and MEC removal has been conducted (i.e., Parker Flats MRA).
Track 3 Sites	Track 3 Sites are those areas where MEC is suspected or known to exist, but investigations are not yet complete or need to be initiated, or any area identified in the future. Source: (2).
Transferred Range:	A military range that is no longer under military control and has been leased, transferred, or returned to another entity, including Federal entities. This includes a military range that is no longer under military control but was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. Source: (3).
Transferring Range:	A military range that is proposed to be leased, transferred, or returned from the DoD to another entity, including Federal entities. This includes a military range that is used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the Federal land manager. An active range will not be considered a “transferring range” until the transfer is imminent. Source: (3).
Unexploded Ordnance (UXO):	<p>Military munitions that:</p> <p>(A) Have been primed, fuzed, armed, or otherwise prepared for action;</p> <p>(B) Have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or materials; and</p> <p>(C) Remain unexploded, whether by malfunction, design, or any other cause. (100 U.S.C. 101) (c) (5). Source: (7).</p> <p>For the purpose of the Basewide Munitions Response Program being conducted for the former Fort Ord, UXO does not include small arms ammunition .50 caliber and below.</p>

UXO Technician	Personnel who are qualified for and filing Department of Labor, Service Contract Act, and Directory of Operations contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III. (6)
UXO- Qualified Personnel	Personnel who have performed successfully in military EOD positions, or are qualified to perform in the following Department of Kabor, Service Contract Act, Directory of Operations contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor. (6)

Sources:

- (1) Compendium of Department of Defense Acronyms, Terms, and Definitions: The Interstate Technology and Regulatory Council (ITRC) Work Group (Unexploded Ordnance Work Team), December 2000.
- (2) Non-standard definition developed to describe Fort Ord-specific items, conditions, procedures, principles, etc. as they apply to issues related to the MEC cleanup.
- (3) Management Guidance for the Defense Environmental Restoration Program published by the office of the Under Secretary of Defense (Installations and Environment), September 2001.
- (4) "Unexploded Ordnance (UXO): An Overview", October 1996. DENIX.
- (5) Ordnance and Explosives Response Engineer Manual (EM) 1110-1-4009. U.S. Army Corps of Engineers, June 15, 2007.
- (6) Department of Defense Manual, Number 6055.09, Volume 8, February 29, 2008. Administratively reissued August 4, 2010.
- (7) Federal Register/Volume 70. No. 192/Wednesday, October 5, 2005/Rules and Regulations, 32 CFR Part 179, Munitions Response Site Prioritization Protocol, Department of Defense, Final Rule. October 2005.
- (8) Department of Defense Explosives Safety Board Technical Paper 18 (Minimum Qualification for Unexploded Ordnance [UXO]. Technicians and Personnel). December 20, 2004.