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US ARMY INSTALLATION MANAGEMENT COMMAND  
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FORT GEORGE G. MEADE, MARYLAND 20755-5000

REPLY TO  
ATTENTION OF:

September 27, 2012

Environmental Division

Mr. John Burchette (3HS11)  
NPL/BRAC/Federal Facilities Branch  
U.S. Environmental Protection Agency  
1650 Arch Street  
Philadelphia, PA 19103-2029

Dear Mr. Burchette:

This letter serves as notification that the *Fort George G. Meade Former Mortar Range (Operable Unit 40/FGGM-003-R) Record of Decision (ROD)* dated September 2012, has been finalized. The ROD has been revised based on comments received from the United States Environmental Protection Agency (USEPA) on September 25, 2012. Maryland Department of the Environment (MDE) responded with no comments on the Draft ROD on August 22, 2012. Copies of the ROD have been furnished to Mick Butler and Walter Chahanovich (Fort George G. Meade), Francis Coulters and Susan Ryan (U.S. Army Environmental Command), Dr. Elisabeth Green (MDE), Jeffrey Williams (Department of Defense) and the Fort George G. Meade Restoration Advisory Board.

If you have any questions, please feel free to contact Ms. Denise Tegtmeyer at (301) 677-9559 or me at (301) 677-9365.

Sincerely,

A handwritten signature in black ink that reads "Paul V. Fluck".

Paul V. Fluck, PG, REP  
Program Manager, Installation Restoration Program  
Directorate of Public Works-Environmental  
Division

Enclosure



Imagine the result



# FINAL Record of Decision

## Former Mortar Range Munitions Response Area Fort George G. Meade, Maryland

September 2012





**RECORD OF DECISION  
FOR FORMER MORTAR RANGE  
MUNITIONS RESPONSE AREA  
(OPERABLE UNIT 40 / FGGM-003-R)**

**FORT GEORGE G. MEADE  
MARYLAND**

**National Superfund Database Identification Number  
MD9210020567**

**SEPTEMBER 2012**

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## LIST OF ACRONYMS AND ABBREVIATIONS

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amsl	above mean sea level
AR	Army Regulation
Army	United States Army
ARAR	Applicable or Relevant and Appropriate Requirement
BRAC	Base Realignment and Closure Act
cal	caliber
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (1980)
COC	Chemical of Concern
D.C.	District of Columbia
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munitions
DoD	U.S. Department of Defense
EC	Engineering Control
EOD	Explosives Ordnance Disposal
FFS	Focused Feasibility Study
FGGM	Fort George G. Meade
ft	feet
GIS	Geographical Information System
HHRA	Human Health Risk Assessment
HRR	Historical Records Review
IC	Institutional Control
LTM	Long-Term Management
LUC	Land Use Control
MC	Munitions Constituents
MD	Maryland
MDE	Maryland Department of the Environment
MEC	Munitions and Explosives of Concern
mm	millimeter
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MRA	Munitions Response Area
MRS	Munitions Response Site
NCP	National Oil and Hazardous Substances Pollution Contingency Plan

## LIST OF ACRONYMS AND ABBREVIATIONS

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OESS	Ordnance and Explosive Safety Specialist
O&M	Operation and Maintenance
PP	Proposed Plan
RA	Remedial Action
RAB	Restoration Advisory Board
RAO	Remedial Action Objective
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act (1986)
SI	Site Inspection
SLERA	Screening Level Ecological Risk Assessment
U. S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
UXO	Unexploded Ordnance

## **1.0 DECLARATION**

### **1.1 SITE NAME AND LOCATION**

Fort George G. Meade (FGGM) is located in Anne Arundel County, Maryland (MD), almost midway between the cities of Baltimore, MD, and Washington, District of Columbia (D.C.). FGGM lies approximately 4 miles east of Interstate 95 and immediately east of the Baltimore-Washington Parkway (MD Route 295), between MD Routes 175 and 32. FGGM is located near the communities of Odenton, Laurel, Columbia, and Jessup. Following implementation of the requirements of the 1988 Base Realignment and Closure Act (BRAC), the installation covers approximately 5,100 acres.

The 322-acre former Mortar Range Munitions Response Area (MRA)<sup>1</sup> (FGGM-003-R) is a former range located in the west-central portion of FGGM, and is comprised of two distinct Munitions Response Sites (MRS)<sup>2</sup> based on past training activities: the 62-acre Mortar Area MRS (FGGM-003-R-01) and the 260-acre Training Area MRS (FGGM-003-R-02). These MRSs are presented in **Figure 1-1**. This Record of Decision (ROD) addresses munitions and explosives of concern (MEC) and Munitions Potentially Presenting an Explosive Hazard (MPPEH) risks at the former Mortar Range MRA. This document was prepared in accordance with the requirements of the Military Munitions Response Program (MMRP) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

### **1.2 STATEMENT OF BASIS AND PURPOSE**

This *Record of Decision for the Former Mortar Range MRA* presents the selected Remedial Action (RA) for the former Mortar Range MRA, comprised of the Mortar Area MRS and the Training Area MRS. The RA is selected in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The information supporting the decision on the selected RA is contained in the Administrative Record file for the MRA. This ROD is issued by the United States (U.S.) Army (Army) as the lead agency, in conjunction with the U.S. Environmental Protection Agency (USEPA), the lead regulatory agency, in consultation with the Maryland Department of the Environment (MDE).

### **1.3 ASSESSMENT OF THE SITE**

The RA selected in this ROD is necessary to protect public health and welfare and the environment from explosive risks from MEC/MPPEH at the Mortar Area MRS and the Training Area MRS that comprise the former Mortar Range MRA.

### **1.4 DESCRIPTION OF THE SELECTED RESPONSE ACTION – LAND USE CONTROLS WITH LONG TERM MANAGEMENT**

Based on past investigations, MEC/MPPEH risks exist at both the Mortar Area MRS and the Training Area MRS on the former Mortar Range MRA. The selected RA for the former Mortar Range MRA consists of the implementation of land use controls (LUCs) with long term management (LTM) to control explosive risks from MEC/MPPEH to mitigate the potential physical hazard posed to current and future site users. LUCs generally include physical and/or administrative/legal mechanisms that minimize the potential for exposure by limiting land use. The selected RA can effectively control exposure to MEC/MPPEH by restricting access to these areas.

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<sup>1</sup> A Munitions Response Area (MRA) is a discrete location within a range or training area that is known to require a munitions response. A MRA may contain more than one MRS.

<sup>2</sup> A Munitions Response Site (MRS) is a discrete location within a range or training area that is known to require a munitions response. A MRS may be part of a MRA.

Under the selected RA, existing LUCs, including institutional controls (ICs) and engineering controls (ECs) at the Mortar Area MRS and the Training Area MRS will be maintained and enhanced. ICs are administrative measures put in place to restrict human activity, in order to control future land use. ECs include a variety of engineered or constructed barriers to control human activity and restrict access to MEC/MPPEH. The LUCs are incorporated into the Installation Master Plan and included in the Installation Geographical Information System (GIS).

Most of the required ICs are already in place as elements of required procedures at FGGM. These elements include requirements to obtain dig permits from the Directorate of Public Works for any intrusive activity at FGGM; Master Plan Regulations; and the FGGM GIS Database. These ICs will be formalized into CERCLA required procedures at the former Mortar Range MRA. The ICs will be supplemented by the requirement for Unexploded Ordnance (UXO) Construction Support for all intrusive construction projects, and UXO avoidance procedures for any other intrusive activity. Residential land use at the former Mortar Range MRA will be prohibited as part of the LUCs. This prohibition will be added to the Installation Master Plan.

ECs, including signage (warning signs) specific to both the Mortar Area MRS and the Training Area MRS will be installed. These warning signs will describe the restrictions on site use at key locations within each of the MRSs. Annual inspections of each of the MRSs will be performed to confirm that all on-site LUCs (for example, MRS-specific signage) are in good condition and to confirm that the land use of the site remains consistent with the limitations specified in the ROD. An annual instrument-assisted surface sweep will ensure that no MEC, MPPEH, or munitions debris has been exposed through erosion or frost heave.

As part of the LTM, the annual land use certifications / surface sweeps and the five year review process will be used to verify and document that continuing land use is industrial and the remedy remains protective. Additionally, the remedial design will specify notification requirements to the USEPA should a change in land use occur or be planned. The Army owns the property, and there are no plans to close FGGM in the future.

A pit, containing several thousand expended 0.22-caliber (cal) short cartridge casings, was identified on the Training Area MRS during the Remedial Investigation (RI) fieldwork. Prior to implementing the selected RA, the expended 0.22-cal short cartridge casings will be recovered and recycled as scrap metal or disposed of properly. This will be done as a preliminary maintenance activity to prepare the Training Area MRS for the LUC program.

The selected RA was chosen based on protection of human health and the environment and to effectively address the MEC/MPPEH risks presented at the site. In addition, the selected RA is the most implementable and cost-effective remedial alternative considered, and also satisfies the remaining selection criteria.

## 1.5 STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the RA (unless justified by a waiver), is cost-effective, and utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable.

The selected remedy complies with the action-specific applicable or relevant and appropriate requirements (ARARs) and additional performance standards which are presented in **Table 1-1**. Chemical- and location- specific ARARs were not applicable and, therefore, not identified for this site.

Based on past investigations, MEC/MPPEH risks exist at both the Mortar Area MRS and the Training Area MRS on the former Mortar Range MRA. The selected RA was chosen to control explosive risks from MEC/MPPEH to mitigate the potential physical hazard posed to current and future site users. The selected RA was chosen over other remedial alternatives considered, which included full surface and subsurface removal, after considering the threshold, balancing, and modifying criteria, including overall

protection of human health and the environment, compliance with ARARs, reduction of toxicity, mobility, or volume through treatment, long and short term effectiveness, implementability, cost, and regulatory and community acceptance. As part of the selected remedy, LTM will be established, including annual land use certifications / surface sweeps to verify and document that continuing land use is industrial and the remedy remains protective.

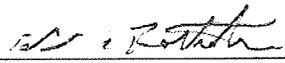
Based on the results of the Human Health Risk Assessment (HHRA) and the Screening Level Ecological Risk Assessment (SLERA) performed as part of the 2011 RI, munitions constituents (MC) are not of concern at this MRA. There are no Chemicals of Concern (COCs) associated with the training activities conducted at the Mortar Area MRS and the Training Area MRS.

#### 1.6 DATA CERTIFICATION CHECKLIST

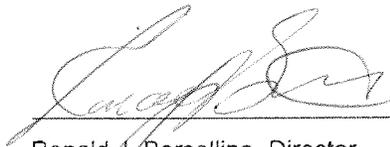
The following information is included in the Decision Summary (Section 2) of this ROD. This decision is based on information that can be found in the Administrative Record file for the MRA.

- There are no COCs at either of the MRSs (Section 2.5).
- Baseline risk represented by the COCs is not applicable.
- Cleanup levels established for COCs and the basis for these levels are not applicable.
- Current and future land use assumptions used in the ROD (Section 2.2.2 and Section 2.6).
- How source materials constituting principal threats will be addressed (Section 2.11)
- Expected outcome as a result of the selected RA (Section 2.12.4)
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (Section 2.9.1; 2.12.3; and **Table 2-1**)
- Key factors that lead to selecting the remedy (i.e., a description of how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, with emphasis on the criteria key to the decision) (Section 2.10.1 and 2.10.2; 2.12.1).

1.7 AUTHORIZING SIGNATURE AND SUPPORT AGENCY ACCEPTANCE OF REMEDY

  
\_\_\_\_\_  
Edward C. Rothstein  
Colonel, Military Intelligence, Commanding

26 SEP 2012  
Date

  
\_\_\_\_\_  
Ronald J. Borsellino, Director  
Hazardous Site Cleanup Division  
United States Environmental Protection Agency, Region III

September 27, 2012  
Date

## 2.0 DECISION SUMMARY

### 2.1 SITE NAME, LOCATION, AND DESCRIPTION

This ROD describes the selected RA at the former Mortar Range MRA located at FGGM in Odenton, Anne Arundel County, MD. The National Superfund Database Identification Number for the site is MD9210020567. The Army is the lead agency for CERCLA actions at this site, and the USEPA Region III and MDE are the lead and support regulatory agencies, respectively, with oversight responsibilities.

As described in Section 1.1, the former Mortar Range MRA (FGGM-003-R) is a former range and training area located in the west-central portion of FGGM, and is comprised of two distinct MRSs: the 62-acre Mortar Area MRS (FGGM-003-R-01) and the 260-acre Training Area MRS (FGGM-003-R-02). These MRSs are presented in **Figure 1-1**.

### 2.2 SITE HISTORY AND ENFORCEMENT ACTIVITIES

#### 2.2.1 Fort George G. Meade Background

FGGM's mission is to provide base operations support for facilities and infrastructure and quality of life and protective services in support of Department of Defense (DoD) activities and federal agencies. The wide range of support is provided to over 80 partner organizations from all four DoD military services and several federal agencies (URS, 2012).

#### 2.2.2 Mortar Range MRA Background

The former Mortar Range MRA is a former range and training area located in the west-central portion of FGGM (Figure 1-1). The former mortar range was first identified on a 1923 Special Military Map for Camp Meade as an approximately 59-acre range (Figure 2-1). The former mortar range is also shown on a 1924 War Game Map for Camp Meade but does not appear on any maps after 1924, and no reference is made to it in historical documents. As presented in the 2011 RI and based on historical maps and evidence collected during the RI, the site was used as a mortar range beginning in the early 1920s (Malcolm Pirnie, 2006). Training was assumed to have ended in the 1940s based on munitions debris found during the RI (ARCADIS / Malcolm Pirnie, 2011).

The majority of the former Mortar Range MRA has been used as a golf course since 1956. A jogging trail was present along the western edge of the golf course. The northwestern portion of the site is a secure DoD facility and is developed with buildings and associated paved surfaces (i.e., roadways, parking lots, and walkways). Construction as part of the expansion of the secure DoD facility is currently underway on a majority of the MRA and its surroundings. The golf course and jogging trail are permanently closed as a result of the construction/expansion.

During the RI, no MEC (except small arms ammunition not presenting a unique explosive hazard) were found on the MRA; however, munitions debris from 60 and 81 millimeter (mm) training mortar rounds, 3-inch Stokes training mortar rounds, a training landmine, expended flares, practice grenades, a dummy grenade, and casings from expended small arms ammunition were found during the RI MEC field activities (**Figure 2-2**). The training mortar rounds, identified during the RI MEC field activities, were concentrated in an area corresponding to the original location of the former mortar range shown on maps from the 1920s. An analysis of historical aerial photographs, performed during the RI, confirmed the Mortar Area MRS boundary. Additionally, a number of training areas within the former Mortar Range MRA were observed on the historical aerial photographs, and the former Mortar Range MRA boundary was found to extend east to Taylor Avenue beyond the boundary established during the 2007 Site Inspection (SI). As a result of these findings, the boundary was revised and the acreage of the former Mortar Range MRA was increased from a total of 291 acres to 322 acres. Based on the evidence of two distinct historical uses as a general troop training area and a training range, the former Mortar Range MRA (FGGM-003-R) was divided into the 62-acre Mortar Area (FGGM-003-R-01) and the 260-acre Training Area (FGGM-003-R-02) MRSs.

On 16 December 2011, a 3-inch training Stokes mortar (no fuze) was encountered near the ground surface during tree clearing activities. The item was found within the boundaries of the Mortar Area MRS. The United States Army Corps of Engineers (USACE) Ordnance Explosive Safety Specialist (OESS), onsite when the item was encountered, stated that this item was retained by the USACE for their future use as a training device. On 8 February 2012, a 75-mm Mk1 shrapnel projectile with an Mk3A1 fuze was encountered approximately six feet below ground surface during excavation activities. The item was found within the boundaries of the Training Area MRS. Fort Meade Department of Emergency Services contacted the on duty Explosive Ordnance Disposal (EOD) response team from Andrews Air Force Base. The item was blown-in-place by the EOD response team, as it was too degraded to move. Based on the review of the EOD report and photographs by a UXO Technician, it was determined that the item was not a training item and had never been fired. Construction support was employed during both of these incidents, which facilitated the safe and appropriate handling of the items encountered. These examples validate the appropriateness of the selected RA and demonstrate the need for the selected RA at the site.

No future residential development is planned within the MRA boundary; the MRA is intended for future professional and industrial use (Atkins, 2011). As stated previously, construction as part of the expansion of the secure DoD facility is currently underway on a majority of the MRA and its surroundings. A portion of the area will also be retained for open space and a forested area.

### **2.2.3 Enforcement Activities**

No formal enforcement activities have occurred at the former Mortar Range MRA.

## **2.3 COMMUNITY PARTICIPATION**

The former Mortar Range MRA has been the topic of presentations at the FGGM Restoration Advisory Board (RAB). A copy of the Proposed Plan (PP) (ARCADIS, 2012b) was provided to the FGGM RAB members. A Final PP for the former Mortar Range MRA was completed and released to the public on July 11, 2012 at the information repositories listed below:

Fort Meade Environmental Division Office  
239 Chisholm Avenue  
Fort Meade, MD 20755

Anne Arundel County Library, West County Area Branch  
1325 Annapolis Rd  
Odenton, MD 21113

A newspaper notification was made to inform the public of the start of the PP comment period, to solicit comments from the public, and to announce the public meeting. The notification was published in the Capital Gazette Newspaper on July 5, 2012. A copy of the certificate of publication is provided in **Appendix A**. A public meeting was held on July 19, 2012 to inform the public about the selected RA for the former Mortar Range MRA and to seek public comments. At this meeting, representatives from the U.S. Army, USEPA, and MDE were present to answer questions about the site and the remedial alternatives under consideration. A fact sheet was provided to the public as part of the meeting. A public comment period was held from July 19, 2012, to August 18, 2012, during which written comments from the public were received. Public comments and prepared responses are presented in Section 3.0 of this ROD.

Information regarding the former Mortar Range MRA is available on the FGGM Website: <http://www.ftmeade.army.mil/environment>. Information available on the website includes site background, the most recent site documents, a fact sheet, notices, community safety information, contact information, and the locations of the Administrative Record.

## 2.4 SCOPE AND ROLE OF RESPONSE ACTION

This RA represents the final selected remedy for the former Mortar Range MRA. The Site is one of many sites at FGGM that are in the CERCLA process. The Site Management Plan (URS, 2012) provides details on other sites at FGGM that will be addressed in separate RODs. The anticipated schedule for each of those sites is also provided in the Site Management Plan.

This ROD addresses the selection of an RA for the Mortar Area MRS and the Training Area MRS that comprise the former Mortar Range MRA. The selected RA will address the potential risks associated with MEC/MPPEH that, based on previous investigations, may be present on the former Mortar Range MRA. The selected RA for the former Mortar Range MRA is designed to provide protection to human health and the environment. The selected RA for the former Mortar Range MRA consists of LUCs with LTM.

As part of the selected RA, existing LUCs, including ICs and ECs, at the sites will be maintained and enhanced. ICs are administrative measures put in place to restrict human activity, in order to control future land use. ECs which include a variety of engineered, constructed barriers, to restrict human activity in order to control future land use, will also be maintained. The LUCs are incorporated into the Master Plan and included in the Installation GIS.

Most of the LUCs evaluated are already in place as elements of required procedures at FGGM. These elements include; requirements to obtain dig permits from the Directorate of Public Works for any intrusive activity at FGGM; Master Plan Regulations; and the FGGM GIS Database. No future residential development is planned within the MRA boundary; residential land use at the former Mortar Range MRA will be prohibited through the LUCs. This prohibition will be added to the Installation Master Plan. Additionally an education program will be initiated for potential future site workers, users, and emergency responders of the MRA. The LUCs will be supplemented by the requirement for UXO Construction Support for all intrusive construction projects, and UXO avoidance procedures for any other intrusive activity. Because the Mortar Area MRS and Training Area MRS are both considered low probability sites for MEC/MPPEH, an Explosive Safety Submission or Explosive Site Plan is not required. ECs, including MRS-specific signage describing restrictions on site use at key locations of the MRS, will be installed.

The LTM process will be added as part of the LUCs. Annual inspections will be performed to confirm that the land use of the site has not changed, and to confirm through instrument-assisted surface sweeps that no MEC/MPPEH or munitions debris has been exposed through erosion or frost heave.

A pit, containing several thousand expended 0.22-cal short cartridge casings, was identified on the Training Area MRS during the RI fieldwork. The expended 0.22-cal short cartridge casings were left in place per the direction of the USACE OESS. The casings do not pose an explosive hazard, and adjacent soil samples were evaluated during the RI MC investigation and showed no impact to soils. The casings will be recovered and recycled as scrap metal under the RCRA exclusion or properly disposed prior to the implementation of the selected RA for the Training Area MRS. This will be done as a preliminary maintenance activity to prepare the MRS for the LUC program.

Consistent with CERCLA guidance, and for the purpose of comparison, the cost estimate for this RA has been prepared to assume that LUCs with LTM, including annual certification, would be maintained for 30 years.

## 2.5 SITE CHARACTERISTICS

The former Mortar Range MRA, comprised of the Mortar Area MRS and the Training Area MRS, is situated in the west-central portion of the installation and encompasses approximately 322 acres. The former Mortar Range MRA is bounded to the west by a secure DoD facility, to the north by Rockenbach Road, to the east by Taylor Avenue, and to the south by Mapes Road. Undeveloped property is located to the southwest of the MRA. The eastern portion of the MRA overlapped the former golf course. The aforementioned secure DoD facility occupies buildings on the northwest corner of the former Mortar Range MRA. As of early 2012, construction as part of the expansion of the secure DoD facility is currently underway on a majority of the MRA and its surroundings.

The former Mortar Range MRA slopes slightly radially from a topographic high in the northeastern portion of the site and to the southwest from a secondary topographic high in the central portion of the site. Elevations range from approximately 256 feet (ft) above mean sea level (amsl) in the northeastern portion of the former Mortar Range MRA to approximately 151 ft amsl in the southeast portion of the MRA (Berger/EA, 2004).

The Mortar Area MRS and a majority of the Training Area MRS overlapped a portion of the former FGGM golf courses. A jogging trail is present along the western edge of the golf course in the Training Area MRS. The northwestern portion of the Training Area MRS overlaps a secure DoD facility and is developed with buildings and associated paved surfaces (i.e., roadways, parking lots, and walkways). As a result of the construction/ expansion of the secure DoD facility the golf course and jogging trail are now permanently closed.

The golf course was designed and built after the former Mortar Range MRA stopped operational activities; any fill material brought to the site for regrading (including building of mounds for tee boxes or greens) would have altered the natural topography.

The former Mortar Range MRA lies within the drainage of the Little Patuxent River. Midway Branch is located approximately 700 ft east of the former Mortar Range MRA and flows south through Allen Lake (also identified as Soldier Lake). Approximately 1.25 miles south of the MRA, Midway Branch eventually empties into the Little Patuxent River. One unnamed tributary is located in the southeast corner of the former Mortar Range MRA and flows southeast to join Midway Branch. Additional unnamed tributaries are located to the west and south of the former Mortar Range MRA and flow southwest toward the Little Patuxent River. However, these tributaries are impacted by development, and they were not visible during the field investigation.

There are three distinct aquifers underlying the MRA: the Patuxent Formation, the lower Patapsco unit, and the upper Patapsco unit. The Patapsco Formation is separated from the Patuxent Formation by the Arundel clay.

The initial investigation of the former Mortar Range MRA was the Closed, Transferring, and Transferred Range and Site Inventory in 2003 followed by the Environmental Baseline Study conducted in 2004. A Historical Records Review (HRR) and SI were conducted in 2006 and 2007, respectively. Subsequent to the HRR / SI activities, the RI field activities were conducted from January to March 2008 for MEC activities and in January 2010 for MC activities (ARCADIS/Pirnie, 2011). Surface soil samples were collected and analyzed during the RI in order to perform a comprehensive evaluation.

Based on the results of the HHRA and SLERA, MC are not of concern at this MRA. There are no COCs associated with the training activities conducted at the Mortar Area MRS and the Training Area MRS.

The MEC fieldwork conducted from January to March 2008 included a geophysical and an intrusive investigation. The geophysical investigation identified 6,228 anomalies within the portion of the site intrusively investigated by transects or step-out boxes (approximately 29 linear miles). Of these, 1,805 were identified as cultural features (e.g., buried utilities). The 4,423 remaining anomalies were evaluated, and 1,333 anomalies were investigated during the intrusive investigation. A high amount of non-munitions-related scrap metal was identified at the site, such as horseshoes and nails. No MEC (except small arms ammunition not presenting a unique explosive hazard) were found at the site; however, munitions debris from 60 and 81mm training mortar rounds, 3-inch Stokes training mortar rounds, a training landmine, flares, training and dummy grenades, and discarded small arms ammunition was found during the field effort. By definition, the discarded small arms ammunition is considered discarded military munitions (DMM) and, hence, MEC; however, the small arms ammunition does not present a unique explosive hazard.

The training mortar rounds were concentrated in an area corresponding to the original location of the former Mortar Range shown on maps from the 1920s. The historical aerial photographs and the MEC fieldwork results support that the surrounding area was used for general troop training.

The MEC Conceptual Site Models for the Mortar Area MRS and Training Area MRS are included as **Figure 2-3** and **Figure 2-4**, respectively. The MEC pathway analyses shows that there are incomplete pathways for human and ecological receptors in the surface soil.

Currently the Army is in the process of evaluating several Installation Restoration Program sites co-located with the MRA and these sites are currently at the Preliminary Assessment / SI stage. These parcels were associated with former landfills or dumpsites located within the Training Area MRS; these dumpsites were well outside the boundary of the Mortar Area MRS. These sites were associated with general dumping activities rather than munitions use (URS, 2010); therefore, they are not covered under the MMRP and are not included in this ROD.

## 2.6 CURRENT AND POTENTIAL FUTURE LAND USE

The majority of the former Mortar Range MRA has been used as a golf course since 1956. A jogging trail was present along the western edge of the former golf course. The northwestern portion of the site is DoD property and is developed with buildings and associated paved surfaces (i.e., roadways, parking lots, and walkways).

Based on discussions at the 12 June 2008 Technical Project Planning meeting and subsequent planning by the DoD, no future residential development is planned within the MRA boundary. The MRA is intended for future professional and industrial use (Atkins, 2011). Construction as part of DoD expansion has been proposed for the majority of the MRA and its surroundings. A portion of the area will also be retained for open space use, outdoor recreation, and a forested area. As mentioned previously, the golf course and jogging trail are now permanently closed as a result of the construction/expansion of the secure DoD facility. Groundwater and surface water from this MRA are not currently used, and use is not planned for the future.

## 2.7 SUMMARY OF SITE RISKS

A revised Conceptual Site Model, Qualitative Explosive Risk Assessment, and Munitions Response Site Prioritization Protocol were completed based on the 2011 RI results. No MEC (except small arms ammunition not presenting a unique explosive hazard) was identified on the MRA during the RI. Therefore, a qualitative explosive risk assessment was conducted to assess potential risks associated with MEC/MPPEH. However, given the historical use of the MRA as a training area and a MEC find in February 2012, a minimal residual risk of explosive hazard remains despite the physical evidence uncovered. It is important to note that once a MEC source area is identified, there will always be a residual risk of exposure regardless of the RA chosen. The limit of technology for the detection and removal of MEC combined with the nature of the hazard (explosive), results in a residual risk that must be considered when selecting an RA. MEC/MPPEH may be exposed through erosion or frost heave.

Based on the HHRA and the SLERA conducted during the RI, no risk exists for MC at the Mortar Area MRS or the Training Area MRS.

The RA selected in this ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

## 2.8 REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) are based on human health and environmental factors, which are considered in the formulation and development of Response Actions. Such objectives are developed based on the criteria outlined in Section 300.430(e) (2) of the NCP and Section 121 of CERCLA.

The RAO for the former Mortar Range MRA is based on the continued management of safety hazards associated with the potential for MEC/MPPEH that may be within the MRA. The RAO for the site is:

*Control and minimize the potential for direct physical contact of receptors with possible MEC at the surface and within the subsurface.*

Due to the nature of MEC, there will always be a residual risk of exposure regardless of the RA chosen.

## 2.9 DESCRIPTION OF REMEDIAL ALTERNATIVES

Based on past investigations, a risk of MEC/MPPEH at both the Mortar Area MRS and the Training Area MRS on the former Mortar Range MRA exists. Explosive risks from MEC/MPPEH must be eliminated or controlled to mitigate the physical hazard posed to current and future site users.

Remedial alternatives for the former Mortar Range MRA were developed and evaluated in the Focused Feasibility Study (FFS) (ARCADIS, 2012a). The remedial alternatives considered during the evaluation presented in the FFS included:

- No action,
- LUCs with LTM, and
- Surface and subsurface removal with LUCs and LTM.

The remedial alternatives are described below with their respective estimated capital costs, estimated cost for O&M activities, and an estimate of the present worth costs for each alternative.

### 2.9.1 Remedy Components

#### 2.9.1.1 Remedial Alternative 1: No Action

<i>Capital Costs:</i>	\$0
<i>Total Annual Costs (cost over 30 years, 7% discount):</i>	\$0
<i>Total Present Worth of Annual Costs:</i>	\$0
<i>Total Present Worth of Capital and Annual Costs</i>	\$0

CERCLA and the NCP require that a No Action alternative be evaluated at every site to establish a baseline for the comparison of other alternatives. Under this remedial alternative, no remedial action would take place on the Mortar Area MRS or the Training Area MRS.

#### 2.9.1.2 Remedial Alternative 2: LUCs with LTM

<i>Capital Costs:</i>	\$215,100
<i>Total Annual Costs (cost over 30 years, 7% discount):</i>	\$365,700
<i>Total Present Worth of Annual Costs:</i>	\$124,700
<i>Total Present Worth of Capital and Annual Costs</i>	\$339,800

Under Remedial Alternative 2, existing LUCs at the Mortar Area MRS and the Training Area MRS would be maintained and enhanced. Most of the required LUCs are already in place as elements of required procedures at FGGM. These elements include requirements to obtain dig permits from the Directorate of Public Works for any intrusive activity at FGGM; Master Plan Regulations; and the FGGM GIS Database. These LUCs would be incorporated into CERCLA required procedures at the former Mortar Range MRA. LUCs would be supplemented by the requirement for UXO Construction Support for all intrusive construction projects, and UXO avoidance procedures for any other intrusive activity. Additionally, an education program would be initiated for potential future site workers, users, and emergency responders at the MRA.

Residential land use at the former Mortar Range MRA would be prohibited as part of the LUCs. This prohibition would be added to the Installation Master Plan.

ECs, including signage (warning signs) specific to both the Mortar Area MRS and the Training Area MRS, describing restrictions on site use at key locations of the site would be installed. Annual inspections of each MRS would be performed to establish that all on-site LUCs (e.g., MRS-specific signage) are in good condition; to confirm that the land use of the site had not changed; and, through an instrument-assisted surface sweep, that no MEC/MPPEH or munitions debris had been exposed through erosion or frost heave.

The 5-year review process, the annual land use certifications, and the surface sweeps would be used to document that continuing land use was industrial and that the remedy remained protective. Additionally,

the remedial design would specify notification requirements to the USEPA and MDE should land use change occur or be planned.

Prior to implementing Remedial Alternative 2, the pit containing several thousand expended 0.22-cal short cartridge casings, that was identified on the Training Area MRS during the RI fieldwork, would be removed. The expended 0.22-cal short cartridge casings were left in place per the direction of the USACE OESS. The casings do not pose an explosive hazard, and adjacent soil samples evaluated during the RI MC investigation showed no impact to soils. The casings would be recovered and recycled as scrap metal under the RCRA exclusion or properly disposed as part of the selected RA for the Training Area MRS. This would be done as a preliminary maintenance activity to prepare the Training Area MRS for the implementation of the LUC program.

### 2.9.1.3 Remedial Alternative 3: Surface and Subsurface Removal with LUCs and LTM

<i>Capital Costs:</i>	\$6,785,950
<i>Total Annual Costs (cost over 30 years, 7% discount):</i>	\$365,700
<i>Total Present Worth of Annual Costs:</i>	\$124,700
<i>Total Present Worth of Capital and Annual Costs</i>	\$6,911,000

Remedial Alternative 3 would include the full MEC/MPPEH clearance within the surface and the subsurface across the entire former Mortar Range MRA including both the Mortar Area MRS and the Training Area MRS. Location surveys, brush cutting, and a surface sweep throughout both of the MRSs would be conducted prior to the start of MEC activities.

Subsurface anomalies could be identified by either using a process commonly referred to as “mag and dig” or by Digital Geophysical Mapping (DGM). The mag and dig process consists of employing a magnetometer to identify subsurface anomalies followed by an intrusive investigation (hand dig and inspect). DGM surveys have a higher level of quality control and provide the ability for advanced processing to limit the number of intrusive investigations. The detection limit of geophysical instruments is approximately 11 times the diameter of MEC and, therefore, the success of these instruments depends on the size of the metallic item in the subsurface. Intrusive investigations in a subsurface removal action would be limited to four ft below ground surface (approximate equipment detection depth). During the RI field work, 102 munitions debris items and approximately 2,500 pounds of non-munitions-related metal waste were recovered from the Mortar Area MRS and the Training Area MRS. It is also expected that numerous anomalies would be detected during the surface and subsurface clearance.

Should any MEC/MPPEH items found on site be safe to move, these items would be consolidated and demolition operations conducted in a remote portion of the construction area to reduce the number of demolition events/detonations and impacts on nearby Installation mission activities. If they cannot be moved, the items would be blown-in-place. Munitions debris would be handled under chain-of-custody protocols, thermally treated to neutralize explosive characteristics, and disposed of or recycled properly. Non-munitions-related scrap would be removed from the site and properly disposed of or recycled in accordance with RCRA requirements.

It is important to note that limitations of technology for the identification and removal of MEC/MPPEH on site would result in a residual MEC hazard. Due to this small but possible residual MEC/MPPEH hazard after the removal action, LUCs would still need to be put in place to effectively control and prevent explosive hazard exposure to potential human receptors. The LUCs for the former Mortar Range MRA have been described under Remedial Alternative 2.

Prior to implementing Remedial Alternative 3, the pit containing expended 0.22-cal short cartridge casings would be excavated and the casings would be recycled as scrap metal or disposed of properly. This would be done as a preliminary maintenance activity to prepare the Training Area MRS for the implementation of the LUC program.

## 2.9.2 Common Elements and Distinguishing Features of Each Alternative

Remedial Alternative 1 does not protect human health and the environment, but provides a baseline for comparison purposes. With the exception of the no action alternative, the common elements of the remedial alternatives evaluated are as follow:

- Require LUCs, including ICs and ECs;
- Require an education program for potential future site workers, users, and emergency responders at the MRA;
- Require the annual land use certifications, and the surface sweeps, to document that continuing land use is industrial and the remedy remains protective;
- Land use and groundwater use will remain unchanged; and
- Ongoing O&M Costs will be incurred.

Distinguishing features of the remedial alternatives are as follows:

- Estimated remedial design and implementation timeframe (Remedial Alternative 3 has the longer timeframe);
- Capital and net present value costs (Remedial Alternative 2: \$225,100 and \$339,800, respectively; Remedial Alternative 3: \$6,785,950 and \$6,911,000, respectively); and
- Remedial Alternative 2 includes no excavation or management of munitions debris or possible MEC/MPPEH. Remedial Alternative 3 will involve the excavation and management of munitions debris and possible MEC/MPPEH. Excavation and management activities would also include characterization of solid waste (MEC/MPPEH, munitions debris, or metallic scrap found during the surface and subsurface removal), excavation and temporary storage of hazardous waste in containers, and transportation of hazardous wastes/materials for off-site disposal; excavation, handling and transport of MEC/MPPEH for disposal; erosion and sediment control.

## 2.10 COMPARATIVE ANALYSIS OF RESPONSE ACTIONS

The advantages and disadvantages of each of the remedial alternatives were compared using the nine CERCLA evaluation criteria established by the USEPA in Section 300.430(e) of the NCP, as described below.

Overall Protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Compliance with ARARs is used to determine whether an alternative would meet all applicable or relevant and appropriate requirements of federal and state environmental statutes and regulations or facility siting laws that pertain to the Site.

Long-term effectiveness and permanence refers to expected residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time, once clean-up levels have been met. This criterion includes the consideration of residual risk that will remain onsite following remediation and the adequacy and reliability of controls.

Reduction of toxicity, mobility, and volume through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedial alternative.

Short-term effectiveness addresses the period of time needed to implement the alternative and any adverse impacts that may be posed to workers, the community and the environment during construction and operation of the remedy until cleanup levels are achieved.

Implementability addresses the technical and administrative feasibility of executing an alternative from design through construction and operation. Factors such as availability of services and

materials, administrative feasibility, and coordination with other governmental entities are also considered.

Cost is a detailed cost analysis of alternatives. The expenditures required to complete each measure are estimated in terms of both capital and annual O&M costs. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State acceptance evaluates the technical and administrative issues and concerns the state may have regarding each of the alternatives.

Community acceptance evaluates the issues and concerns the public may have regarding each of the alternatives as expressed during a public comment period lasting 30 days.

The detailed comparative analysis of all the remedial alternatives is provided in the FFS for the former Mortar Range MRA; a summary of this comparison is provided in the following text. **Table 2-2** presents a comparative analysis of the remedial alternatives compared to the seven CERCLA threshold and balancing evaluation criteria.

## **2.10.1 Threshold Criteria**

### **2.10.1.1 Overall Protection of Human Health and the Environment**

Remedial Alternative 1 would not meet the threshold criteria since MEC/MPPEH is potentially located at the site; and no action would be taken to control or eliminate the exposure pathway to receptor populations; thus, it would not be protective of human health and the environment. Therefore, Remedial Alternative 1 will not be discussed further in this analysis.

Both Remedial Alternatives 2 and 3 would be protective of human health and the environment because they would reduce the risk/explosive hazard of potential receptor exposure to MEC/MPPEH through LUCs. Remedial Alternative 3 also would reduce the volume of potential MEC/MPPEH and munitions debris on-site.

### **2.10.1.2 Compliance with ARARs**

Remedial Alternatives 2 and 3 would comply with action-specific ARARs relevant to the remedial components included in each alternative. These ARARs would apply to the following remedial components: characterization of solid waste, excavation and temporary storage of hazardous waste in containers, and preparation for off-site disposal of hazardous waste; excavation and handling of MEC/MPPEH, and preparation for transport and disposal of MEC/MPPEH; and erosion and sediment control. No chemical- or location-specific ARARs were identified.

## **2.10.2 Balancing Criteria**

### **2.10.2.1 Long-Term Effectiveness**

Remedial Alternatives 2 and 3 would both be effective in the long-term to reduce the potential for human receptor interaction with MEC at the site. Remedial Alternative 3 would be slightly more effective in the long-term than Alternative 2 because potential MEC on the surface and subsurface would be removed. However, LUCs, including revising the established dig permit process to require MEC construction support at both MRSs, would still be required in the future along with LTM as part of Remedial Alternative 3.

### **2.10.2.2 Reduction of Toxicity, Mobility, and Volume through Treatment**

Remedial Alternative 2 does not reduce the volume of MEC/MPPEH at the MRA; however, it is important to note that during the extensive RI fieldwork, no MEC, with the exception of small arms ammunition (not presenting a unique explosive hazard), was found at the site. Remedial Alternative 3 would potentially reduce the volume of MEC/MPPEH through removal and destruction/detonation, if any is present. However, there is a residual risk of MEC/MPPEH even following a removal action and, therefore, LTM would still be required.

### **2.10.2.3 Short-Term Effectiveness**

Remedial Alternative 2 has no short term risk associated with it. It is also effective in the short term, as all of the proposed LUCs can be implemented relatively quickly. Remedial Alternative 3 has a controlled short term risk to site workers and possibly Installation personnel and contractors during removal and construction activities. Remedial Alternative 3 is not fully effective until the removal and construction activities have been completed. However, as with Remedial Alternative 2, the LUCs can be implemented in a timely manner. Remedial Alternative 3 would also significantly impact the environment as a result of the intrusive nature of the removal activities.

### **2.10.2.4 Implementability**

Remedial Alternative 2 is the most feasible, as all of the proposed LUCs are easy to implement. Remedial Alternative 3 is considered feasible, but non-optimal, due to its long implementation time, destruction of the environment, and site worker safety risk for minimal increased benefit.

### **2.10.2.5 Cost**

Remedial Alternative 2 is less costly (while still protective of the environment) than Remedial Alternative 3. Remedial Alternatives 2 and 3 are both protective of the environment; however, Remedial Alternative 3 costs approximately 20 times as much as Remedial Alternative 2. Therefore, the benefit of the significant effort associated with Remedial Alternative 3 may not justify the cost.

## **2.10.3 Modifying Criteria**

### **2.10.3.1 State/Support Agency Acceptance**

The MDE concurs with the selection of Remedial Alternative 2 as the selected remedy in this ROD.

### **2.10.3.2 Community Acceptance**

Community acceptance is addressed in the Responsiveness Summary (Section 3) of this ROD. The community concurs with the selection of Remedial Alternative 2 as the selected remedy in this ROD.

## **2.11 PRINCIPAL THREAT WASTE**

The NCP establishes an expectation that USEPA will use treatment to address the principal threats posed by a site wherever practicable [NCP 300.430(a) (1) (iii) (A)]. Identifying principal threat wastes combines concepts of both hazard and risk. In general, principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. MEC/MPPEH would be considered a principal threat because it presents a serious risk to human receptors. Although the probability of MEC/MPPEH being encountered is low, the acute nature of the hazard warrants consideration of a munitions response action. As discussed in Section 2.9, MEC/MPPEH would be addressed by LUCs with LTM (Remedial Alternative 2) or a surface and subsurface removal action coupled with LUCs and LTM (Remedial Alternative 3).

## **2.12 SELECTED REMEDIAL ACTION**

This ROD presents the selected RA for the Mortar Area MRS and the Training Area MRS at FGGM, Anne Arundel County, MD, developed in accordance with CERCLA as amended and consistent with the NCP. Based on the results of the comparative analysis and comments received from the MDE and the public, the selected RA is:

§ Remedial Alternative 2: LUCs with LTM

### **2.12.1 Summary of the Rationale for the Selected Remedial Action**

The selected RA achieves the RAOs, meets the threshold criteria, and provides the best balance of tradeoffs with respect to the balancing and modifying criteria. The selected RA addresses the risk posed

by MEC/MPPEH effectively, is the most implementable remedy, and is more cost effective than the other alternative considered. The selected RA is also consistent with CERCLA.

### 2.12.2 Detailed Description of the Selected Remedial Action

As described in Section 2.10.2, existing LUCs at the Mortar Area MRS and the Training Area MRS will be maintained and enhanced. The selected RA will prevent exposure by restricting access to MEC/MPPEH on the surface and/or in the subsurface soil. Additionally, an education program will be initiated for potential future site workers, users, and emergency responders of the MRA.

**Land Use Controls** Most of the required LUCs are already in place as elements of required procedures at FGGM. These elements include requirements to obtain dig permits from the Directorate of Public Works for any intrusive activity at FGGM; Master Plan Regulations; and the FGGM GIS Database. The LUCs will be formalized into CERCLA required procedures at the former Mortar Range MRA. The Remedial Design (RD) will be submitted consistent with the RD schedule provisions of the Federal Facility Agreement and will include the details of LUC implementation and maintenance (including periodic inspections). LUCs will be supplemented by the requirement for UXO Construction Support for all intrusive construction projects, and UXO avoidance procedures for any other intrusive activity. Additionally, an education program will be initiated for potential future site workers, users, and emergency responders at the MRA.

Residential land use at the former Mortar Range MRA will be prohibited as part of the LUCs. This prohibition will be added to the Installation Master Plan. LUCs will be implemented throughout the MRA. The extent of the LUCs is shown in **Figure 2-5**. A detailed map delineating the extent of application of the LUCs, specifically the location of signage, at the former Mortar Range MRA will be included as part of the RD.

The following LUCs are already in place at FGGM:

- **Master Plan Regulations, Army Regulation (AR) 210-20:** The Army issued Master Planning for Army Installations, AR 210-20, on 16 May 2005 updating an earlier regulation dated 13 July 1987. AR 210-20 “establishes the requirement for an Installation Master Plan and planning board and specifies procedures for developing, submitting for approval, updating, and implementing the Installation Master Plan.” This regulation provides for comprehensive planning at Army installations and not only allows, but requires incorporation of existing land-use and conditions into the Master Plan. The master plan regulations provide a framework for comprehensive planning through the use of component plans, which include, but are not limited to, the following:
  - Natural Resources Plan,
  - Environmental Protection Plan,
  - Installation Layout Vicinity Plan,
  - Land-use Plan, and
  - Future Development Plan.

The overall objective is to provide each installation with a master plan through the integration of each component plan into the Installation Master Plan. The component plans form a series of narrative, tabular, and graphic plans. Their integration into an Installation Master Plan provides many benefits as outlined in AR 210-20, including “the mechanism for ensuring that installation projects are sited to meet operational, safety, physical security, and environmental requirements.”

- **FGGM GIS Database:** FGGM maintains a comprehensive installation-wide GIS database. The database includes descriptions of existing land and environmental restrictions, locations of known contamination, and locations of MRAs / MRSs. This information will allow future end-users and tenants of FGGM to make rapid and accurate inquiries regarding sites within FGGM and will specify the LUCs in-place at specific locations. Existing wells, chemical contamination, building restrictions, MEC concerns, and many other lines of inquiry will quickly be available to support the decision making process.

- **FGGM Access Regulations:** Access regulations are in place at FGGM. Although not closed to the public, access to FGGM is strictly controlled by fencing surrounding the installation and guards at the gates. However, this may not prevent trespassing. Trespassing and unauthorized activities on FGGM are illegal. The secure DoD facility within FGGM does have secure gates, fencing, and guards to prevent trespassing.
- **Army Military Construction Program Development and Execution:** AR 415-15 outlines pre-construction environmental survey procedures. Prior to construction activities, the Army categorizes the proposed construction site based on an environmental survey. Under this regulation, the Army must determine wetland status of the site, historical significance, and endangered species habitat identification.

The Army will be responsible for implementation, maintenance, periodic inspection, reporting on, and enforcement of LUCs in accordance with the RD and this ROD. Although the Army may transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army will remain responsible for:

- conducting CERCLA Section 121(c) five year reviews;
- notifying USEPA and MDE and/or local government representatives of any known LUC deficiencies or violations;
- obtaining access to the property to conduct periodic inspections and any necessary response; and
- ensuring that the LUC objectives are met to protect the integrity of the selected remedy.

The Army shall not modify or terminate LUCs, implementation actions, or modify land use without approval by USEPA and MDE. The Army will seek prior concurrence from USEPA and MDE before taking any action that would disrupt the effectiveness of the LUCs.

If the Army transfers property in the areas addressed by this ROD, the Army will ensure that the restrictions on site activities are included in the deed to the property recorded in the local property records and that notification of the restrictions in the deed is filed with the appropriate agencies, so that current and future property owners will be aware of these restrictions. At the earliest possible time, but no later than 60 days prior to leasing or transferring Army-owned property under this LUC to another agency, person, or entity (including federal to federal transfers) the Army will provide notice to USEPA and MDE of such intended lease or transfer. Specific deed restriction language and the appropriate agencies will be identified in the approved RD. While the Army retains ultimate responsibility for LUC enforcement, the Army may require the transferee or lessee, in cooperation with other stakeholders, to assume responsibility for LUC implementation actions. Third-party LUC responsibility will be incorporated into pertinent contractual, property and remedial documentation, such as a purchase agreement, deed, lease and RD addendum.

To the extent permitted by law, a transfer deed shall require the LUCs imposed as part of a CERCLA remedy to run with the land and bind all property owners and users. If the Army intends to transfer ownership of any site, the Army may, if federal and/or state law allows, upon transfer of fee title, grant the state an environmental covenant or easement that would allow the state to enforce LUC terms and conditions against the transferee(s), as well as subsequent property owner(s) or user(s) or their contractors, tenants, lessees or other parties. This covenant will be incorporated by reference in the transfer deed and will run with the land in accordance with state realty law. This state enforcement right would supplement, not replace, the Army's right and responsibility to enforce the LUCs.

### **Engineering Controls**

ECs, including signage (warning signs) specific to the Mortar Area MRS or the Training Area MRS will be installed. These warning signs will describe the restrictions on site use at key locations on each MRS.

### LTM / Five Year Review

Annual Inspections of each of the MRSs will be performed to establish that all on-site LUCs (for example, MRS-specific signage) are in good condition and to confirm that the land use of the site remains consistent with the limitations specified in this ROD. An instrument-assisted surface sweep, performed concurrently with the annual inspection, will ensure that no MEC/MPPEH or munitions debris has been exposed through erosion or frost heave.

The five year review process and the annual land use certifications / surface sweeps will be used to verify and document that continuing land use is industrial and the remedy remains protective. Additionally, the remedial design will specify notification requirements to the USEPA should land use change occur or be planned. The Army owns the property, and there are no plans to close FGGM in the future.

Consistent with CERCLA guidance, and for the purpose of comparison, the cost estimate for this alternative has been prepared to assume that LUCs with LTM, including annual certification, would be maintained for 30 years.

### Small Arms Casings Pit Removal

The pit containing several thousand expended 0.22-cal short cartridge casings was identified on the Training Area MRS during the RI fieldwork. Prior to implementing the RA, the expended 0.22-cal short cartridge casings will be recovered and recycled as scrap metal or disposed of properly. This will be done as a preliminary maintenance activity to prepare the Training Area MRS for the implementation of the LUC program.

### 2.12.3 Summary of Estimated Remedial Action Costs

The costs associated with the implementation of LUCs with LTM are provided in **Table 2-1** and summarized in the following list:

#### Capital Costs

§	Administrative Actions	
-	Land Use Restrictions	\$5,000
-	Planning	\$87,000
-	Installation Coordination and Educational Program	\$30,000
§	General Actions and Site Preparation	
-	MPPEH / Munitions Debris Handling	\$3,500
§	Implementation Costs	
-	Administration and Legal	\$ 6,300
-	Procurement	\$ 6,300
-	Project Management	\$ 15,100
-	RA Completion Report	\$ 18,000
-	Cost Contingency	\$ 43,900
	<b>Total Capital Costs</b>	<b>\$ 215,100</b>

#### O&M Costs (30 Years)

§	Long Term Management, Monitoring, and Review	
-	Surface Sweep and Site Maintenance	\$ 228,00
-	Five Year Review reports	\$ 90,000
§	Implementation Costs	
-	O&M Contingency	\$ 47,700
	<b>Total Present Worth O&amp;M Costs (30 years, 7 % discount,)</b>	<b>\$ 124,700</b>
	<b>TOTAL PRESENT WORTH of Capital and Annual Costs</b>	<b>\$ 339,800</b>

The costing information in this section is based on the estimates created in support of the FFS (ARCADIS/Malcolm Pirnie, 2012a). The information in this cost estimate summary table is based on the best available information regarding the anticipated scope of the RA. Changes in the cost elements are likely to occur as a result of new information and data collected during the Remedial Design phase. Major

changes may be documented in the form of a memorandum in the Administrative Record file, an Explanation of Significant Differences, or a ROD amendment. This is an order-of-magnitude engineering cost estimate that is expected to be within +50 to -30 percent of the actual project cost.

#### **2.12.4 Expected Outcomes of the Selected Remedial Action**

As stated previously, construction as part of the expansion of the secure DoD facility is currently underway on a majority of the MRA and its surroundings, providing additional jobs in the short- and long-term. A portion of the area will also be retained for open space and a forested area. Remedial Alternative 2 was selected based on this planned future land use and is, therefore, compatible with the Installation Master Plan. Groundwater use will remain unchanged. Potential exposure risks will be decreased due to reduction or elimination of MEC/MPPEH pathways through the implementation of the LUCs, including ICs, signage, and annual surface sweeps. Clean up levels for MEC/MPPEH are not applicable.

### **2.13 STATUTORY DETERMINATIONS**

Under CERCLA § 121 and the NCP, the lead agency must select remedies that are protective of human health and the environment, comply with ARARs (unless a statutory waiver is justified), are cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduces the volume, toxicity or mobility of hazardous wastes as a principal element, and a bias against offsite disposal of untreated wastes. The following sections discuss how the selected RA meets these statutory requirements.

#### **2.13.1 Protection of Human Health and the Environment**

The selected RA will protect human health and the environment because it controls or eliminates the exposure pathway between receptor populations and potential MEC/MPPEH through LUCs.

#### **2.13.2 Compliance with Applicable or Relevant and Appropriate Requirements**

The implementation of LUCs with LTM to control or eliminate the exposure pathway between receptor populations and potential MEC/MPPEH will comply with ARARs. The ARARs and other performance standards are presented in **Table 1-1**.

#### **2.13.3 Cost Effectiveness**

In the lead agency's judgment, the selected RA is cost-effective and represents a reasonable value for the money to be spent. In making this determination, the following definition was used: "A remedy shall be cost-effective if its costs are proportional to its overall effectiveness" [NCP §300.430(f) (1) (ii) (D)]. This determination was accomplished by evaluating the "overall effectiveness" of those response actions that satisfied the threshold criteria (i.e., were both protective of human health and the environment and ARAR-compliant). Overall effectiveness was evaluated by assessing three of the five balancing criteria in combination (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; and short-term effectiveness). A comparison of the costs to the overall effectiveness was conducted to determine cost effectiveness. The relationship of the overall effectiveness of the selected RA was determined to be proportional to its costs; hence, the selected RA represents a reasonable value for the money to be spent.

#### **2.13.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource Recovery) Technologies to the Maximum Extent Practicable**

The lead agency has determined that the selected remedy represents the maximum extent to which permanent solutions and alternative treatment technologies can be utilized in a practicable manner at the site.

The selected remedy satisfies the criteria for long-term effectiveness and permanence through the implementation of LUCs with LTM by reducing the potential for human receptor interaction with

MEC/MPPEH at the site. The selected remedy does not employ treatment or resource recovery technologies to reduce the volume of MEC/MPPEH at the MRA.

#### **2.13.5 Preference for Treatment as a Principal Element**

The selected remedy does not satisfy the preference for treatment as a principal element to permanently and significantly reduce the toxicity, mobility or volume of MEC/MPPEH. Treatment is not preferred, as it is not practicable due to high costs and the length of implementation time.

#### **2.13.6 Five-Year Review Requirements**

Because this RA will result in explosive hazards remaining on the site, statutory reviews will be conducted every five years after RA initiation. Five-year reviews will ensure that the selected RA is, or will be, protective of human health and the environment.

### **2.14 DOCUMENTATION OF SIGNIFICANT CHANGES FROM PREFERRED REMEDIAL ALTERNATIVE FROM PROPOSED PLAN**

The PP for the Mortar Range MRA was released for public comment on July 11, 2012. The PP identified Alternative 2, LUCs with LTM, as the Preferred Alternative. The Army reviewed all written and oral comments submitted during the public comment period. It was determined that no significant changes to the remedy, as originally identified in the PP, were necessary or appropriate.

### 3.0 RESPONSIVENESS SUMMARY

The purpose of the Responsiveness Summary is to provide a summary of the stakeholders' comments, concerns, and questions about the PP for the former Mortar Range MRA and the Army's responses to these concerns.

The former Mortar Range MRA has been the topic of presentations at the FGGM RAB. The PP for the former Mortar Range MRA was issued on July 11, 2012, and made available to the public at the information repositories listed in Section 2.3. A copy of the PP (ARCADIS, 2012b) was also provided to the FGGM Environmental RAB members.

A newspaper notification was published to inform the public of the start of the PP comment period, to solicit comments from the public, and to announce the date, time and location of the public meeting. The notification for the public meeting was run in the Capital Gazette Newspaper on July 5, 2012. A copy of the certificate of publication is provided in **Appendix A**. A public meeting was held on July 19, 2012, to inform the public about the potential remedial alternatives for the former Mortar Range MRA and to seek public comments. At this meeting, representatives from the Army, USEPA, and MDE were present to answer questions about the site and the remedial alternatives under consideration. A fact sheet was provided to the public as part of the meeting. A public comment period was held from July 19, 2012, to August 18, 2012, during which written comments from the public were received.

In general, the community accepts the selected RA. All comments and concerns summarized below have been considered by the Army, USEPA, and MDE in selecting the final remedy for the former Mortar Range MRA at FGGM.

#### 3.1 PUBLIC ISSUES AND LEAD AGENCY RESPONSES

Comments received during Mortar Range MRA public comment period on the PP are summarized below. The comments are categorized by source.

##### 3.1.1 Summary of Written Comments Received during the Public Comment Period

No written comments from the public were received during the public comment period.

##### 3.1.2 Summary of Comments Received during the Public Meeting on the Proposed Plan and Agency Responses

One oral comment specific to the selected RA was received during the public meeting held on July 19, 2012. Transcripts from the public meeting have been included in the Administrative Record (located at the information repositories listed in Section 2.3).

The comments received on the selected RA are summarized as follows:

**Comment No. 1:** A community member of the FGGM RAB asked if a hybrid alternative could be developed, combining aspects of Remedial Alternatives 2 and 3 and targeting areas where there are elevated concentrations for removal.

**Response No. 1:** Mr. Paul Fluck, FGGM, stated that the results of the investigation did not produce the kind of data that would warrant that type of analysis. He reiterated that all the items found were training items. He stated that, had more items been found, or items of a different kind, then it would have been appropriate to consider a hybrid alternative.

#### 3.2 TECHNICAL AND LEGAL ISSUES

No technical or legal issues were raised on the selected RA.

## 4.0 REFERENCES

- ARCADIS/Malcolm Pirnie. 2011. *Final Former Mortar Range Munitions Response Area Remedial Investigation Report*. September.
- , 2012a. *Final Former Mortar Range Munitions Response Area Focused Feasibility Study*. June.
- , 2012b. *Final Former Mortar Range Munitions Response Area Proposed Plan*. July.
- Atkins. 2011. *Real Property Master Plan Update. 90% Submission*. October.
- URS Group. 2010. Fort George G. Meade. *Draft Work Plan Preliminary Assessment / Site Inspection Multiple Sites*
- , 2012. *Site Management Plan 2012 Annual Update Fort George G Meade, Maryland*. September.
- Malcolm Pirnie, Inc. 2006. *Final Historical Records Review, Fort George G. Meade, Maryland*.
- United States (U.S.) 2005. *Army Regulation (AR) 210-20. Real Property Master Planning for Installations*. May.
- , 2006. *AR 415-15 Army Construction and Nonappropriated-Funded Construction Projects*. June.
- United States Environmental Protection Agency (USEPA). 1999. *A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents*. July.
- , 2000. *Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups*. Office of Solid Waste and Emergency Response Directive No. 9355.0-74.
- , 2010. *Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites*. Office of Solid Waste and Emergency Response Directive No. 9355.0-89. November.

# TABLES

**Table 1-1  
Action-Specific ARARs and Selected Performance Standards  
Mortar Range Munitions Response Area, Fort Meade, Maryland**

Action-Specific ARARs and selected Performance Standards are the substantive requirements found in the regulations and guidance manuals cited below.

<b>Action</b>	<b>Regulation</b>	<b>Synopsis</b>	<b>Status</b>
Characterization of solid waste	Generation of Solid Waste COMAR <sup>1</sup> 26.13.03.02	This regulation establishes the requirement to determine whether a substance is a solid waste and whether it is a listed or characteristic hazardous waste or an excluded waste.	ARAR <sup>2</sup>
	Generation of RCRA <sup>3</sup> Hazardous Waste for Storage, Treatment, and Disposal COMAR 26.13.05.02	This regulation states that a detailed chemical and physical analysis must be obtained on a representative sample of the waste(s), which at a minimum contains all the information that must be known to treat, store, or dispose of the waste.	ARAR
	Generation of RCRA Hazardous Waste for Storage, Treatment, and Disposal COMAR 26.13.03.02	This regulation states that each EPA <sup>4</sup> Hazardous Waste Number (waste code) applicable to the waste must be determined in order to determine the applicable treatment standards and the hazardous constituents in the characteristic waste. It also must be determined if the hazardous waste meets the treatment standards by testing in accordance with prescribed methods or use of generator knowledge of waste.	ARAR
Disposal and Transport of MEC <sup>5</sup> /MPPEH <sup>6</sup>	Safety and Health Requirements Manual EM <sup>7</sup> 385-1-97	This guidance document prescribes the safety and health requirements for all USACE <sup>8</sup> activities and operations that involve explosives related work.	Performance Standard
	Military Munitions Response Actions EM 1110-1-4009	This guidance document provides the USACE personnel with the procedures to be used to perform engineering and design activities for all phases of the Military Munitions Response Program (MMRP).	Performance Standard

**Table 1-1  
Action-Specific ARARs and Selected Performance Standards  
Mortar Range Munitions Response Area, Fort Meade, Maryland**

Action-Specific ARARs and selected Performance Standards are the substantive requirements found in the regulations and guidance manuals cited below.

Action	Regulation	Synopsis	Status
Erosion and Sediment Control	Erosion and Sediment Control <i>COMAR</i> <sup>9</sup> 26.17.01.05 26.17.01.07 26.17.01.08 26.17.01.11	These regulations are applicable when excavation or on-site storage of contaminated soil and waste is contemplated. It sets criteria and procedures to protect the lands and waters comprising the watersheds of the state.	ARAR
Excavation and Off-site Disposal	Disposal of Controlled Hazardous Substances <i>COMAR</i> 26.13.03 and 26.13.05	These regulations provide for the prevention, abatement, and control of contamination by addressing the identification and disposal of hazardous substances.	ARAR
MEC/MPPEH Disposal	Explosive Ordnance Disposal <i>TM</i> <sup>9</sup> 60A-1-1-31	This guidance document specifies how Ordnance and Explosives operations should be performed on project sites.	Performance Standard
MEC/MPPEH Handling	Ammunition and Explosives Safety <i>DoD</i> <sup>10</sup> 6055.09- <i>STD</i> <sup>11</sup>	This guidance establishes uniform safety standards applicable to ammunition and explosives throughout their life-cycle, to protect associated personnel and property, unrelated personnel and property, and the environment from the potential damaging effects of an accident involving ammunition and explosives.	Performance Standard
Temporary storage of hazardous waste in containers	Accumulation of RCRA hazardous waste on site <i>COMAR</i> 26.13.03.05E	This regulation provides for the temporary storage systems.	ARAR

**Table 1-1**  
**Action-Specific ARARs and Selected Performance Standards**  
**Mortar Range Munitions Response Area, Fort Meade, Maryland**

Action-Specific ARARs and selected Performance Standards are the substantive requirements found in the regulations and guidance manuals cited below.

Action	Regulation	Synopsis	Status
Transportation of hazardous materials	Preparation and initiation of shipment of hazardous waste off-site COMAR 26.13.03.01-.05	This regulation states that waste must be in compliance with the generator requirements for manifesting, packaging labeling, marking, placarding and record keeping requirements, and for obtaining an EPA ID number.	ARAR

Notes:

- <sup>1</sup>COMAR=Code of Maryland Regulations
- <sup>2</sup>ARAR= Applicable or Relevant and Appropriate Requirement
- <sup>3</sup>RCRA=Resource Conservation and Recovery Act
- <sup>4</sup>EPA=Environmental Protection Agency
- <sup>5</sup>MEC=Munitions and Explosives of Concern
- <sup>6</sup>MPPEH= Material Potentially Presenting an Explosive Hazard
- <sup>7</sup>EM=Engineering Manual
- <sup>8</sup>USACE=United States Army Corps of Engineers
- <sup>9</sup>TM=Technical Manual
- <sup>10</sup>DoD=Department of Defense
- <sup>11</sup>STD=Standard

Table 2-1 -  
Preferred Response Action Cost - Land Use Controls with Long Term Management

ITEM	QUANTITY	UNITS <sup>(1)</sup>	UNIT COST <sup>(2)</sup>	CAPITAL COST	ANNUAL O&M COST	PRESENT WORTH COST <sup>(3)</sup>	ASSUMPTIONS <sup>(4)</sup>	
<b>I. ADMINISTRATIVE ACTIONS</b>								
1. Land-Use Restrictions	Labor & Materials	1	LS	\$5,000	\$5,000	\$0	---	Engineering estimate for materials (signs [\$3000]) and labor (20 hrs x \$100/hr) to implement LUCs to manage any intrusive activity that may occur at the MRA
2. Planning								
a. Remedial Design	Labor	30	Hour	\$150	\$4,500	\$0	---	Engineering estimate for labor to draft, submit, and finalize the remedial design
b. Remedial Action Work Plan (i.e., Land Use Control Plan)	Labor	550	Hour	\$150	\$82,500	\$0	---	Engineering estimate for labor to draft, submit, and finalize the remedial action work plan (i.e., land use control plan)
3. Installation Coordination and Educational Program	Labor	200	Hour	\$150	\$30,000	\$0	---	Engineering Estimate for labor to coordinate with installation personnel during removal activities and develop educational programs for on-site workers
SUBTOTAL					\$122,000	\$0	\$0	
<b>II. GENERAL ACTIONS AND SITE PREPARATION</b>								
1. MPPEH/MD Handling	Labor & Materials	1	LS	\$3,500	\$3,500	\$0	---	Engineering estimate to dispose 200 lbs of small arms ammunition casings that were discarded at the MRA in a burial pit; costs include labor and materials
SUBTOTAL					\$3,500	\$0	\$0	
SUBTOTAL (I and II)					\$125,500	\$0	\$0	
<b>III. LONG-TERM MANAGEMENT, MONITORING &amp; REVIEW</b>								
1. Surface Sweep and Site Maintenance	Labor & Materials	30	Years	\$7,600	\$0	\$228,000	\$94,300	Engineering estimate to conduct surface sweep by 2 UXO/field technicians (2 technicians x 40 hrs x \$75/hr), report (12 hrs x \$100/hr), and maintain/replace (\$400) signage
2. Five-Year Review Reports	Labor	6	LS	\$15,000	\$0	\$90,000	\$10,700	Engineering estimate to compile the Draft, Draft Final, and Final versions of the Five-Year Review Report for the Mortar Range MRA
SUBTOTAL					\$0	\$318,000	\$105,000	
SUBTOTAL (I, II and III)					\$125,500	\$318,000	\$105,000	
<b>IV. IMPLEMENTATION COSTS</b>								
1. Administration and Legal	5% of Capital Costs	1	LS	\$6,300	\$6,300	\$0	---	
2. Procurement	5% of Capital Costs	1	LS	\$6,300	\$6,300	\$0	---	
3. Project Management	12% of Capital Costs	1	LS	\$15,100	\$15,100	\$0	---	
4. Remedial Action Completion Report	Labor	120	Hour	\$150	\$18,000	\$0	---	Engineering estimate to compile the Draft, Draft Final, and Final versions of the Remedial Action Completion Report for the Mortar Range MRA
5. Cost Contingency	35% of Capital Costs	1	LS	\$43,900	\$43,900	\$0	---	
6. O&M Contingency	15% of O&M Costs	1	LS	\$47,700	\$0	\$47,700	\$19,700	
SUBTOTAL					\$89,600	\$47,700	\$19,700	
SUBTOTAL (I, II, III, and IV)					\$215,100	\$365,700	\$124,700	
A. TOTAL CAPITAL COSTS					\$215,100			
B. TOTAL ANNUAL COSTS						\$365,700		
C. TOTAL PRESENT WORTH OF ANNUAL COSTS							\$124,700	
<b>TOTAL PRESENT WORTH OF CAPITAL AND ANNUAL COSTS (A + C)</b>							<b>\$339,800</b>	

LS - Lump Sum

(1) Labor categories for reporting tasks includes project engineer. Project manager costs are captured under IV.3. - Project/Construction Management as a 12% of the total capital costs. Labor categories for O&M includes 2 UXO/field technicians.

(2) All unit costs are an engineering estimate

(3) Present worth costs are calculated using 7% interest and year 2011 dollars

(4) All numbers are rounded to the nearest thousand

All construction assumed to be conducted in Level D PPE

**Table 2-2  
Comparative Analysis of the Remedial Alternatives  
Former Mortar Range MRA  
Fort George G. Meade, Maryland**

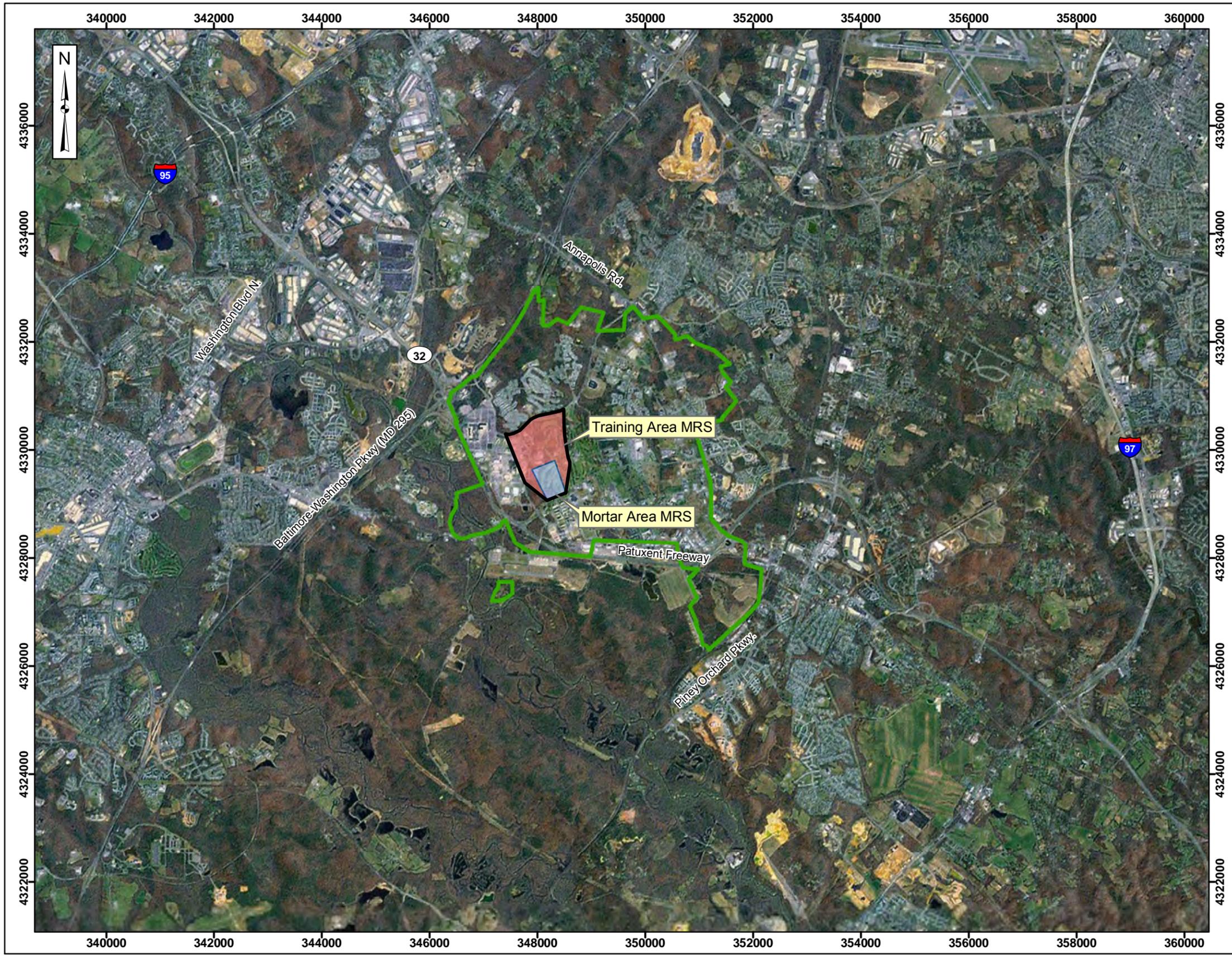
<b>Criteria</b>	<b>Remedial Alternative 1 No Action</b>	<b>Remedial Alternative 2 LUCs with LTM</b>	<b>Remedial Alternative 3 Surface and Subsurface Removal with LTM</b>
Overall Protection of Human Health and the Environment	Does not meet the threshold criteria since MEC/MPPEH is potentially located at the site; and no action would be taken to control or eliminate the exposure pathway to receptor populations, thus, it is not protective of human health and the environment.	Protective of human health and the environment because it reduces the risk/explosive hazard of potential receptor exposure to MEC/MPPEH through LUCs.	Protective of human health and the environment because it reduces the risk/explosive hazard of potential receptor exposure to MEC/MPPEH through LUCs. Remedial Alternative 3 also would reduce the volume of potential MEC / MPPEH / munitions debris on-site.
Compliance with ARARs	ARARs are not identified for the no action alternative.	Would comply with action-specific ARARs relevant to the implementation of this Alternative. Location- and chemical-specific ARARs were not identified for this alternative.	Would comply with action-specific ARARs relevant to the implementation of this Alternative; however, impacts to erosion control would have to be carefully addressed to ensure compliance. Location- and chemical-specific ARARs were not identified for this alternative.
Long-Term Effectiveness and Permanence	Magnitude of the residual risk would remain unchanged and the adequacy and reliability of this alternative would be poor.	Land use controls would be effective in the long-term. In order for the protections afforded by this Alternative to have a permanent effect, LUCs must be maintained consistently.	Effective in the long-term because potential MEC on the surface and in the subsurface would be removed. However, LUCs, including dig permits for construction support, would still be required in the future along with LTM.
Reduction of Toxicity, Mobility, and Volume through Treatment	No reduction of toxicity, mobility or volume.	No reduction of toxicity, mobility or volume.	Would potentially reduce the volume of MEC / MPPEH through removal and destruction/detonation, if any is present. However, there is a residual risk of MEC even following a removal action and, therefore, LTM would still be required.
Short-Term Effectiveness	Because there is no change to the existing risk to human health, this	This alternative is effective in the short-term, as all of the proposed LUCs can be	Controlled short term risk to site workers and possibly Installation personnel and

**Table 2-2  
Comparative Analysis of the Remedial Alternatives  
Former Mortar Range MRA  
Fort George G. Meade, Maryland**

<b>Criteria</b>	<b>Remedial Alternative 1 No Action</b>	<b>Remedial Alternative 2 LUCs with LTM</b>	<b>Remedial Alternative 3 Surface and Subsurface Removal with LTM</b>
	alternative is considered ineffective.	implemented in a timely manner (a few months).	contractors during removal and construction activities. Not fully effective until the removal and construction activities have been completed. LUCs can be implemented in a timely manner. Remedial Alternative 3 would also significantly impact the environment as a result of the intrusive nature of the removal activities.
Implementability	No implementation necessary, since no action will be taken.	Readily implemented.	Non-optimal, due to its long implementation time, destruction of the environment, and site worker safety risk for minimal increased benefit over Alternative 2.
Cost	No cost because of no capital or overhead costs.	Low capital cost and low O&M cost (Total Present Worth Cost - \$339,800)	High capital cost and low O&M cost (Total Present Worth Cost - \$6,911,000)

# FIGURES

\\arcadis-us.com\office\data\WhitePlains-NY\WHI\_GIS\GIS\_data\Projects\ARMY\Installations\Fort\_Meade\_MD\2118130\_Mortar\_Range\MXD\RODI\Figure\_1-1\_Site\_Location.mxd



**Fort George G. Meade  
Record of Decision**



**ARCADIS**

**Figure 1-1  
Site Location**

**Legend**

-  Installation Boundary
-  Mortar Range MRA
-  Mortar Area MRS
-  Training Area MRS



Data Sources: ESRI, ArcGIS Online, Aerial Photo, 2002  
FGGM, GIS Data, 2005

Coordinate System: UTM Zone 18  
Datum: NAD 1983  
Units: Meters

Date: September 2012

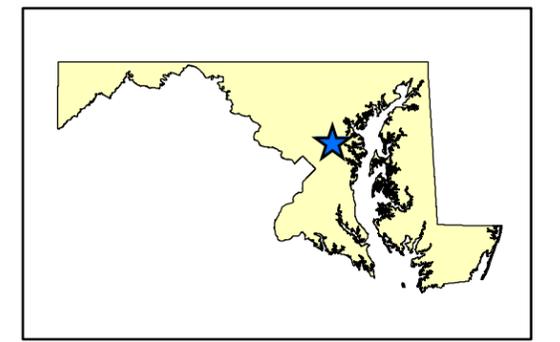
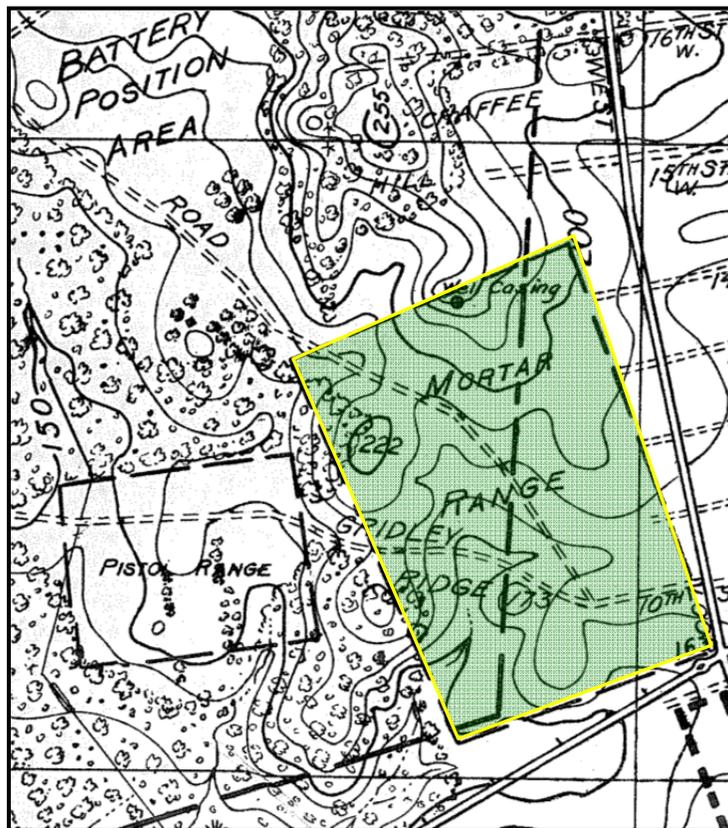


Figure 2-1  
1923 Special Military Map with Mortar Range  
Fort George G. Meade, Maryland



Source: U.S. Army. 1923. *Special Military Map. Maryland: Camp Meade.*

Fort George G. Meade  
Record of Decision



ARCADIS

Figure 2-2  
Munitions Debris Locations

Legend

- Installation Boundary
  - Mortar Range MRA
  - Training Area MRS
  - Mortar Area MRS
- Munitions Debris Items Found\***
- 81 mm Training Mortar Round
  - 60 mm Training Mortar Round
  - 3-inch Stokes Training Mortar Range
  - Expended 60 mm Illumination Mortar
  - Dummy Grenade
  - Practice Grenade
  - Practice Landmine
  - Expended Flare Trip M48
  - Expended Flare
  - Small Arms Ammunition Box
  - Small Arms Ammunition Casing Disposal Pit\*\*

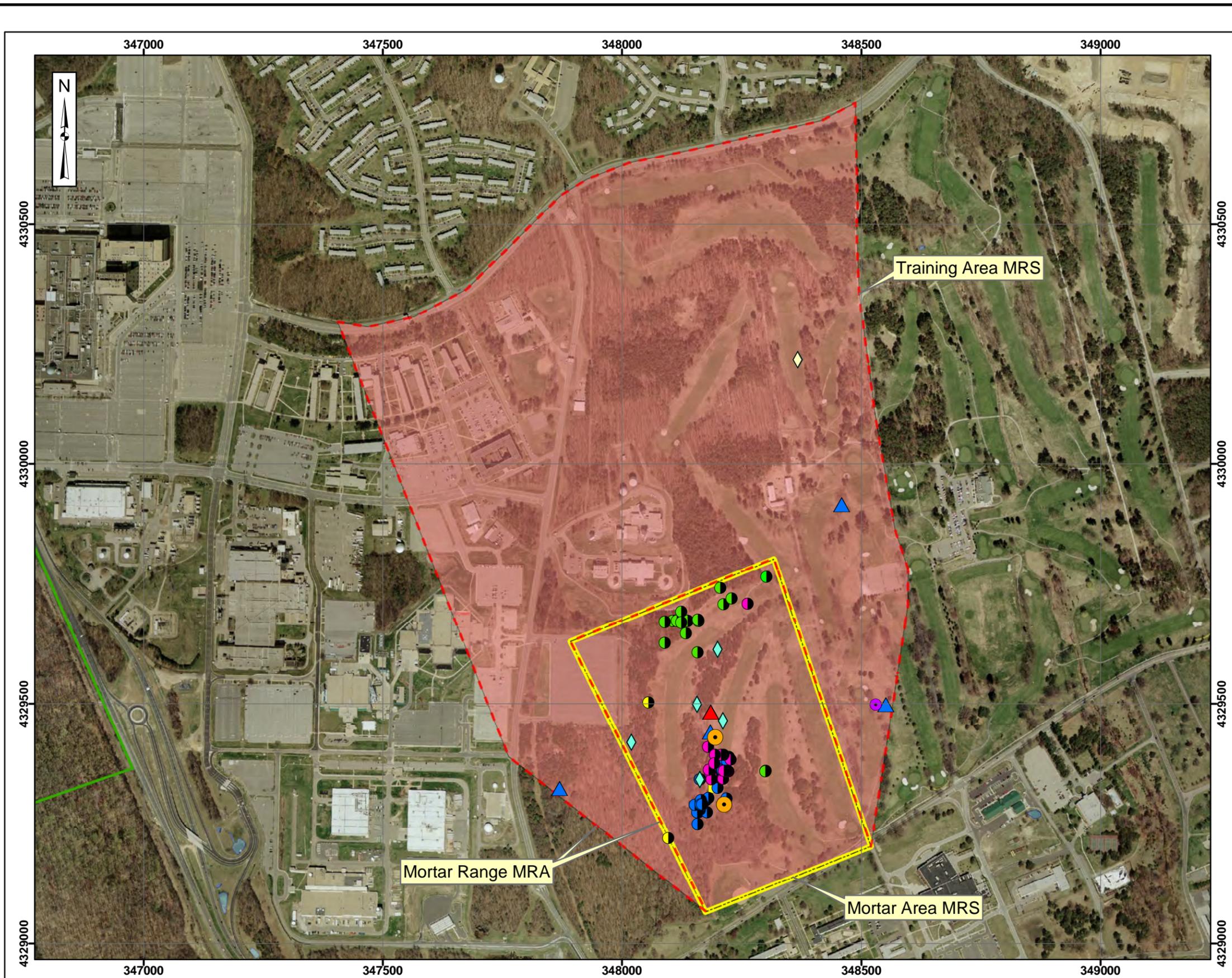
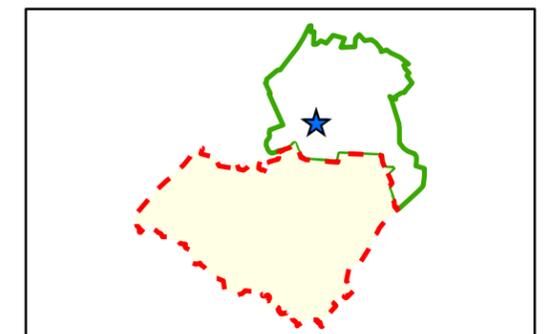
\*Symbol may represent multiple munitions debris.  
\*\*Left in place



Data Sources: FGGM, Digital Orthophoto, 2003  
FGGM, GIS Data, 2005  
CTT Inventory Data, 2005

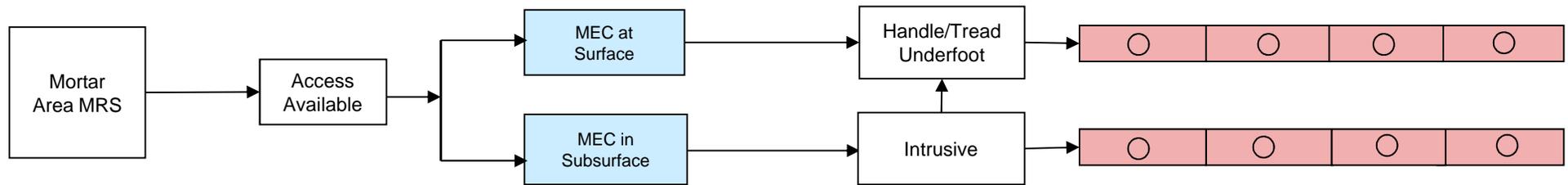
Coordinate System: UTM Zone 18  
Datum: NAD 1983  
Units: Meters

Contract: W912DR-05-D-0004



Source Area	Access	MEC Location/ Release Mechanisms	Activity	Receptors
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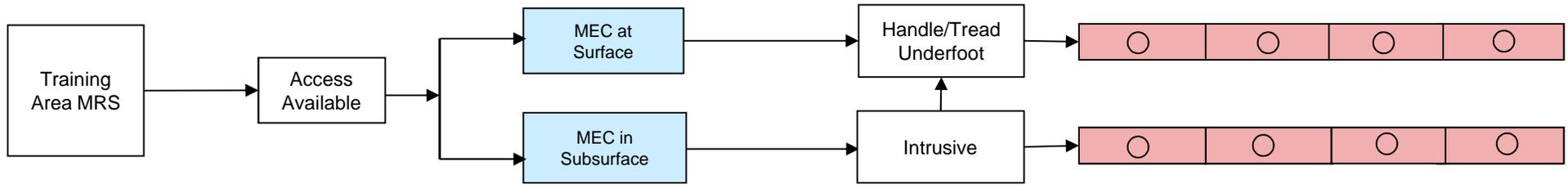
Authorized Installation Personnel	Contractors/ Visitors/ Construction Workers	Trespasser	Biota
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● Complete Pathway
○ Incomplete Pathway
◐ Potentially Complete Pathway

Source Area	Access	MEC Location/ Release Mechanisms	Activity	Receptors
-------------	--------	----------------------------------	----------	-----------

Authorized Installation Personnel	Contractors/ Visitors/ Construction Workers	Trespasser	Biota
-----------------------------------	---	------------	-------



● Complete Pathway
○ Incomplete Pathway
◐ Potentially Complete Pathway

Fort George G. Meade  
Record of Decision

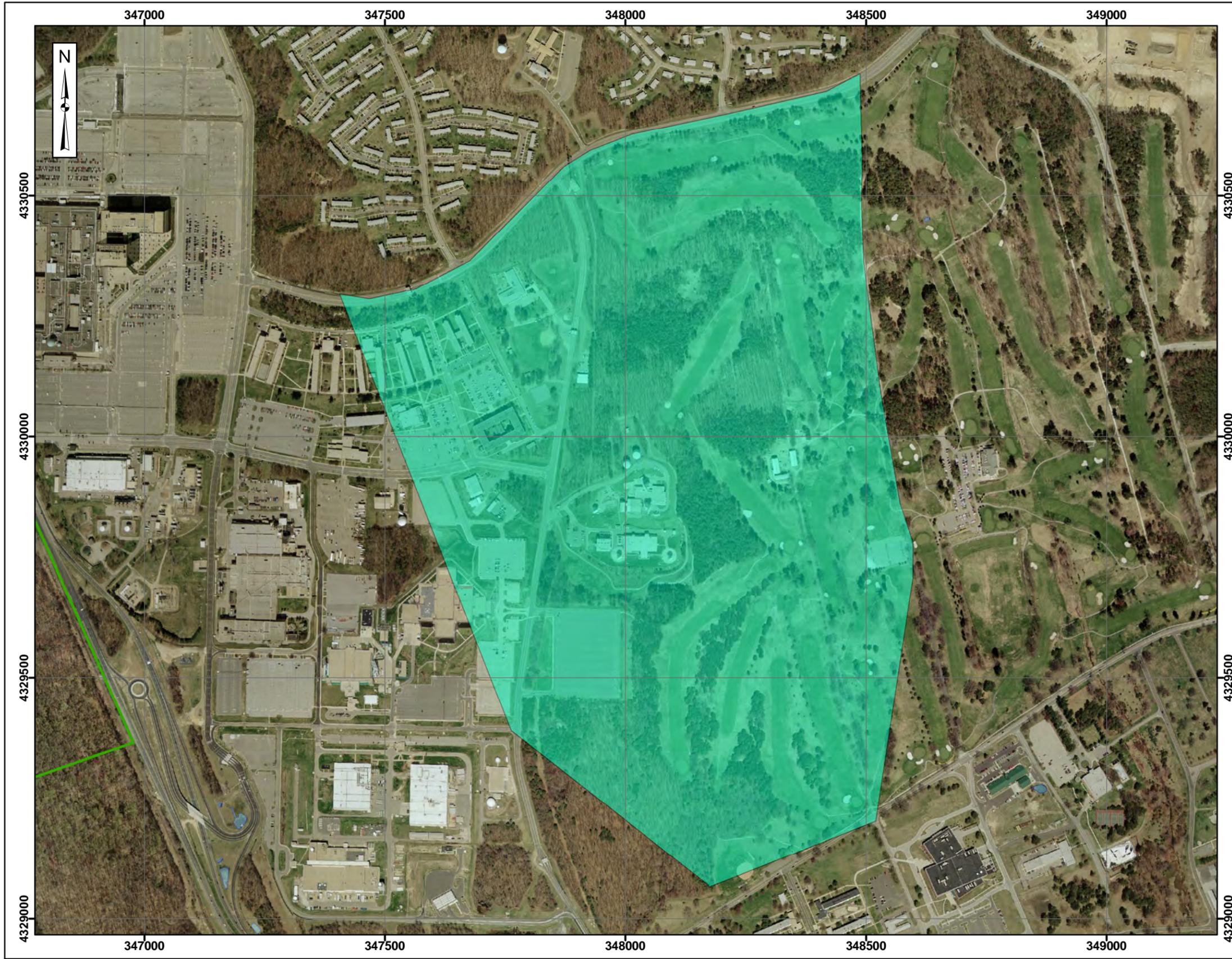


ARCADIS

Figure 2-5  
Land Use Controls

Legend

- Installation Boundary
- Extent of Land Use Controls



Data Sources: FGGM, Digital Orthophoto, 2003  
FGGM, GIS Data, 2005

Coordinate System: UTM Zone 18  
Datum: NAD 1983  
Units: Meters

Contract: W912DR-05-D-0004

**APPENDIX A**  
**CERTIFICATE OF PUBLICATION FOR PUBLIC NOTICES**

OFFICE OF

# The Capital

Published by

**Capital Gazette Communications, Inc.**

HOLDER OF CONTRACT FOR ANNE ARUNDEL COUNTY ADVERTISING

## CERTIFICATE OF PUBLICATION

Annapolis, MD, July 5<sup>th</sup>, 20 12

We hereby certify that the annexed \_\_\_\_\_

Mortar Range MRA

was published in The Capital, a newspaper published in the City of  
Annapolis, Anne Arundel County, MD

once a week for one successive weeks

before the 19<sup>th</sup> day of July, 20 12.

The insertions being made the 5<sup>th</sup> day of July  
\_\_\_\_\_, 20 12.

**Capital Gazette Communications, Inc.**

By Carlynn 486758

## PUBLIC NOTICE

### U.S. ARMY INVITES PUBLIC COMMENT ON PROPOSED PLAN FOR FORMER MORTAR RANGE MUNITIONS RESPONSE AREA (MRA) FORT GEORGE G. MEADE, MARYLAND

The U.S. Army at Fort George G. Meade (Fort Meade) invites the public to comment on a Proposed Plan (PP) that evaluates proposed remedial action alternatives to address low level hazards posed by munitions and explosives of concern (MEC) at the former Mortar Range Munitions Response Area (MRA) at Fort George G. Meade, Maryland. The former Mortar Range is located in the west-central portion of Fort Meade.

#### PROPOSED PLAN FOR FORMER MORTAR RANGE

The site was used as a training mortar range beginning in the early 1920s; the training ended during the 1940s. The site was used as the Installation golf course since the 1950s but is now under redevelopment for use as professional buildings and support structures. Based on the results of fieldwork and research, this site has been split into two munitions response sites (MRSs): the Mortar Area MRS and the Training Area MRS. Investigations uncovered training, practice and discarded items resulting in a low risk to current and future users.

#### ALTERNATIVES EVALUATED

The PP evaluates the following remedial action alternatives:

**Alternative 1:** No Further Action.

**Alternative 2:** Land Use Controls (LUCs) with Long Term Monitoring (LTM)

**Alternative 3:** Surface and Subsurface Clearance with LUCs and LTM.

#### PREFERRED RESPONSE ACTION

Alternative 2 is the Preferred Response Action for the former Mortar Range MRA at Fort Meade. Land Use Controls would include provisions for MEC specialists to be present during intrusive/construction activities; annual site inspections; signage; and, educational outreach. This alternative provides an optimum balance between the selection criteria and is protective of human health and the environment. The Preferred Response Action may be modified or a new alternative may be developed based on public input. The final Response Action selected will be documented in a Record of Decision that summarizes the decision-making process. The Army will summarize and respond to comments received during the comment period as part of the Record of Decision.

#### PUBLIC COMMENT PERIOD

Starting July 19, 2012, copies of the PP will be available for review at:

**[www.ftmeade.army.mil/environment](http://www.ftmeade.army.mil/environment) (click the links for Clean-up Program, Program Sites, and former Mortar Range)**

or for a paper copy go to

**Fort Meade Environmental Division Office**

239 Chisholm Ave  
Fort Meade, Maryland 20755-7068  
(301) 677-9648  
Hours: 8 a.m. to 4 p.m., Mon-Fri  
(Fort Meade residents only)

or the

**West County Area Library**

1325 Annapolis Road  
Odenton, MD 21113  
(410) 222-6277  
Hours: 9 a.m. to 9 p.m., Mon-Thurs,  
9 a.m. to 5 p.m., Fri and Sat, and  
1 p.m. to 5 p.m., Sunday

The public may submit written comments during the 30-day comment period (July 19 to August 18, 2012). Comments must be postmarked by August 18, 2012, and sent to Mr. Paul Fluck, U.S. Army Garrison Fort George G. Meade, 2212 Chisholm Ave, Suite 5115, Fort Meade, MD, 20755-7058. Following the 30-day public comment period, written responses will be prepared and included in the Administrative Record.

#### PUBLIC MEETING

The U.S. Army invites the public to attend a meeting on **July 19, 2012, 6:30 p.m., at the Captain John Smathers Army Reserve Center** on MD HWY 175 (Annapolis Road) between 20<sup>½</sup> and 21<sup>st</sup> Streets, Odenton, MD to discuss the proposed action.

Community members are also invited to attend the Fort Meade Restoration Advisory Board (RAB) meetings held bi-monthly. The next RAB meeting is scheduled to follow the public meeting and will be held at the same location and provide the public an opportunity to participate in Fort Meade's environmental restoration program.

For additional project information, please visit Fort Meade's Environmental Management System website at [www.ftmeade.army.mil/environment](http://www.ftmeade.army.mil/environment) (click the links for Clean-up Program, Program Sites, and former Mortar Range) or contact the Fort Meade Public Affairs Office at (301)-677-1361.