
**PROGRAM MANAGEMENT MANUAL
FOR
MILITARY MUNITIONS RESPONSE PROGRAM (MMRP)
ACTIVE INSTALLATIONS**



**INFORMATION FOR MANAGING AND OVERSEEING
MMRP PROJECTS AT US ARMY ACTIVE
INSTALLATIONS**

FINAL

SEPTEMBER 2009

Prepared By:

**US Army Environmental Command
Aberdeen Proving Ground, MD 21010-5401**

This page left blank

TABLE OF CONTENTS

1. INTRODUCTION	1
2. PURPOSE	1
3. BACKGROUND	2
3.1. DERP AND CERCLA.....	2
3.2. MUNITIONS RESPONSE PROGRAM CREATION	2
3.3. NEW TERMINOLOGY	3
3.3.1. Defense Site.	3
3.3.2. Unexploded Ordnance.	4
3.3.3. Discarded Military Munitions.....	4
3.3.4. Munitions Constituents.....	4
3.3.5. Munitions and Explosives of Concern (MEC).	4
3.3.6. Munitions Response Area (MRA).	4
3.3.7. Munition Response Site.	4
4. RESPONSIBILITIES	4
4.1. DEPARTMENT OF DEFENSE	4
4.2. OFFICE OF THE SECRETARY OF DEFENSE	5
4.3. DEPARTMENT OF THE ARMY	5
4.3.1. US Army Environmental Command (USAEC)	5
4.3.2. US Army Technical Center for Explosives Safety (USATCES).....	6
4.3.3. US Army Center for Health Promotion and Preventive Medicine (USACHPMM).....	6
4.3.4. US Army Corps of Engineers, Environmental and Munitions Center.....	6
of Expertise (USACE EM CX)	6
4.3.5. Installations	6
5. PROGRAM DEVELOPMENT AND MANAGEMENT.....	7
5.1. US ARMY RANGE INVENTORY	7
5.1.1. Inventory Overview.....	7
5.1.2. Operational Range Inventory.....	7
5.1.3. Closed, Transferring and Transferred (CTT) Range and Site Inventory.....	8
5.2. MUNITIONS RESPONSE ELIGIBILITY CRITERIA FOR DERP	9
5.3. MMRP ELIGIBILITY CRITERIA	9

Funds appropriated for the MMRP	9
5.4. MUNITIONS RESPONSE ELIGIBILITY UNDER THE IRP	11
5.5. PROGRAM MANAGEMENT TASKS.....	12
5.5.1. Army Environmental Database – Restoration (AEDB-R).....	12
5.5.2. Cost-to-Complete Estimates (CTC).....	13
5.5.3. Installation Action Plan (IAP).....	14
5.5.4. Munitions Response Site Prioritization Protocol (MRSPP).	14
5.5.5. Prioritization of Munitions Response Sites.	16
5.5.6. Funding and Reporting.....	17
5.5.7. Environmental Restoration Information System (ERIS).....	17
5.5.8. Permanent Cleanup Document Repository (PCDR).	17
6. PROGRAM PROCEDURES.....	18
6.1. DECISION DOCUMENTS (DD)	18
6.2. OFF-SITE RESPONSE.	18
6.3. STAKEHOLDER PARTICIPATION.	19
6.4. PUBLIC PARTICIPATION.	19
6.4.1. Community Relations Plan (CRP).	19
6.4.2. Restoration Advisory Board (RAB).	20
6.4.3. Technical Assistance for Public Participation (TAPP).	20
6.5. DEFENSE SITE MEMORANDUM OF AGREEMENT (DSMOA).....	20
6.6. LAND TRANSFER.....	20
6.7. UXO SAFETY EDUCATION PROGRAM.	21
6.8. MMRP CONTRACTING	21
7. MMRP SPECIFIC TOPICS.	24
7.1. INTRODUCTION.	24
7.2. EXPLOSIVE SAFETY.	25
7.2.1. Safety Submissions.....	25
7.2.2. Types of Safety Submissions.	26
7.2.3. Safety Submission Approval Processes.	28
7.2.4. Safety Submittal Amendments.	28
7.2.5. Safety Submittal Corrections.	29
7.3. MUNITIONS EMERGENCY RESPONSE.....	29

7.4. CHEMICAL WARFARE MATERIAL.....	30
7.5. IMPROVED CONVENTIONAL WEAPONS.....	31
7.6. ANOMALY AVOIDANCE.	32
7.7. GEOPHYSICAL PROVE-OUT.....	32
7.8. DISPOSITION OF MEC.....	33
7.8.1. MEC Handling Qualifications.....	33
7.8.2. Disposition of Chemical Agent-filled MEC or Munitions with an Unknown Liquid Fill.	33
7.9. ENGINEERING CONTROLS FOR EXPLOSIVE SAFETY.....	34
7.10. MATERIAL POTENTIALLY PRESENTING AN EXPLOSIVE HAZARD (MPPEH).	35
7.11. MUNITIONS AND EXPLOSIVES OF CONCERN HAZARD ASSESSMENT (MEC HA).	36

APPENDICES

Appendix A	39
Appendix B	41
Appendix C	51

LIST OF TABLES

5-1 Military Munitions Response Program Eligibility Determination	
Example Scenarios	10
5-2 Installation Restoration Program Eligibility Determination	
Example Scenarios	11

This page left blank

1. INTRODUCTION

1.1. The Military Munitions Response Program (MMRP) was created by Congress in 2001, as a sister program to the Installation Restoration Program (IRP) under the Defense Environmental Restoration Program (DERP). This revision to DERP tasked the Department of Defense (DoD) to develop and maintain an inventory of defense sites which are known or suspected to contain unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC); create a new prioritization system for the sites; and establish a funding program element for the program. At approximately the same time, DoD named and added the MMRP to its Management Guidance for the DERP, September 2001.

1.2. References, definitions, and acronyms can be found in Appendices 1, 2, and 3, respectively.

2. PURPOSE

2.1. The purpose of this guide is to provide Remedial Project Managers (RPMs) with information, resources, and tools to implement the MMRP at US Army active installations. Following a brief introduction to the DERP and MMRP, along with a discussion of the program drivers and roles and responsibilities, this guide details the MMRP process, highlighting those requirements that deviate from the well-established IRP. This MMRP guide builds upon the Management Guidance for the DERP, dated September 2001. The Management Guidance for the DERP provides direction and policy for implementation consistent with Office of the Deputy Under Secretary of Defense (Installations and Environment) (ODUSD(I&E)) goals and objectives. Additionally, the Army DERP Management Guidance for Active Installations, November 2004, provides Army specific guidance on implementing the DERP at active and excess property installations. Both of these guides are invaluable resources detailing the elements of the program from eligibility through planning, budgeting, and execution.

2.2. This MMRP guide provides specific guidance for the investigation and response of defense sites on US Army active and excess property installations, including associated off-post properties not owned or controlled by the US Army. The DERP actions at these types of installations are funded out the Environmental Restoration, Army (ER,A) account. This guide does not apply to Formerly Used Defense Sites (FUDS) or Base Realignment and Closure (BRAC) properties. Because funding and management activities for BRAC and FUDS differ from those for active installations, the US Army is implementing the MMRP for each of these property categories independently.

3. BACKGROUND

3.1. DERP AND CERCLA

In 1975, under the IRP, DoD began its environmental cleanup activities. The IRP was instituted to address past practices that often did not take long-term environmental effects into account. The primary law driving the present DERP is the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (1980), commonly known as Superfund. The DERP was formally established by Section 211 of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and is codified in Sections 2701–2710 of Title 10 of the United States Code (USC). The SARA set requirements for the DERP and its funding mechanism, the Defense Environmental Restoration Account (DERA). The DERA funding was available in 1984, before the formal establishment of the DERP. The Army’s cleanup process follows the requirements of the National Contingency Plan (NCP) as promulgated under CERCLA and as amended by SARA. In addition, Army response actions may also be addressed under the Resource Conservation Recovery Act (RCRA) corrective action process that addresses the releases from solid waste management units.

The DoD’s implementation of the DERP is governed by Department of Defense Directive (DoDD) 4715.1, Environmental Security; and DoD Instruction (DoDI) 4715.7, Environmental Restoration Program. These two documents establish overall policy, guidance, and responsibilities for the DERP.

The CERCLA provides broad federal authority to respond directly to releases or potential releases of hazardous substances, pollutants or contaminants that may endanger public health or the environment. The law established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous wastes at these sites, and established a trust fund to provide for cleanup when no responsible party could be identified. The CERCLA also enabled the revision of the NCP. The NCP provides the organizational structure and procedures for preparing and responding to discharges of oil and releases of hazardous substances, pollutants and contaminants. The 1986 SARA amendments added important provisions to CERCLA, such as enforcement authorities and settlement tools, requirements for increased state involvement and citizen participation, and increased focus on human health.

3.2. MUNITIONS RESPONSE PROGRAM CREATION

The National Defense Authorization Act (Fiscal Year (FY) 2002) modified the DERP to require DoD to:

- Develop and maintain an inventory of defense sites that are known or suspected to contain UXO, DMM, and/or MC.

- Develop a site prioritization protocol to apply to Munition Response Sites (MRSs).
- Establish a new program element to specifically address the remediation of UXO, DMM, and MC.

The UXO, DMM, and MC can originate from military activities such as training and weapons testing on military ranges, munitions manufacturing and maintenance at ammunition plants and depots, and munitions demilitarization. For example, UXO are generated when munitions fired on ranges malfunction; DMM is present on many ranges as a result of the historic and now prohibited practice of burying unwanted or excess munitions; and munitions degradation can create MC, e.g., a release of propellant from a broken munitions casing. Common examples of MC include cyclotrimethylene trinitramine (RDX), cyclotetramethylene tetranitramine (HMX), trinitrotoluene (TNT), and lead. These chemicals may be present in environmental media (i.e., soils, surface water, and groundwater) at MRSs. In many cases, MRSs that contain neither UXO nor DMM may still be eligible for the MMRP. The MC, such as lead on small arms ranges, will be addressed under the MMRP when eligible in a manner comparable to typical IRP projects.

When UXO and/or DMM are found on other than operational range property, they may be viewed as a "pollutant or contaminant" under the CERCLA. Response actions to address UXO or DMM on other than operational ranges are appropriate where the items pose an imminent and substantial endangerment to public health. If the UXO or DMM is actively managed for treatment (i.e., destruction), it may be considered a RCRA regulatory solid waste. If the items also meet a RCRA characteristic, they can be considered a RCRA hazardous waste. In these cases, the UXO or DMM are also considered a CERCLA hazardous substance. However CERCLA is the preferred response mechanism to address UXO on property other than operational ranges.

3.3. NEW TERMINOLOGY

When Congress and DoD created the MMRP, they also created a series of new terms and acronyms that are generally not well known to most of the Army personnel working under DERP. This section is provided to educate the reader on these new terms. Appendix B contains a much more robust list of key MMRP terminology.

3.3.1. Defense Site. A defense site is defined as a location that is or was owned by, leased to, or otherwise possessed or used by DoD. A defense site does not include any operational range, operating storage or manufacturing facility, or a facility that is used or was permitted for the treatment or disposal of military munitions.

3.3.2. Unexploded Ordnance. UXO is defined as military munitions that have been:

- Primed, fused, armed or otherwise prepared for action.
- Fired, dropped, launched, projected, or placed in such a manner to constitute a hazard to operations, installations, personnel, or material.
- Remain unexploded either by malfunction, design, or any other cause.

3.3.3. Discarded Military Munitions. A munition is a DMM if it was abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. This term does not include UXO. Additionally, DMM does not include military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

3.3.4. Munitions Constituents. An MC is defined as any material originating from UXO, DMM or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

3.3.5. Munitions and Explosives of Concern (MEC). In 2003, DoD and the Department of the Army (DA) started using the term MEC in place of “ordnance and explosives (OE)” to describe UXO and DMM, as well as MC when it is present in high enough concentrations to pose an explosives safety risk (generally 10% or higher).

3.3.6. Munitions Response Area (MRA). An MRA is an area on a defense site that is known or suspected to contain UXO, DMM or MC contamination. An MRA must contain at least one MRS, but multiples are allowed.

3.3.7. Munition Response Site. An MRS is a discrete location on an MRA known or suspected to need a munitions response. All MRSs are located on an MRA.

4. RESPONSIBILITIES

The roles and responsibilities applicable to the active installations’ IRP also apply to the MMRP. This discussion only includes those roles and responsibilities which are specific to the MMRP.

4.1. DEPARTMENT OF DEFENSE

The ODUSD(I&E) establishes DERP policy. The ODUSD(I&E) also appoints and is directly advised by the Chairman of the Department of Defense Explosives Safety Board (DDESB).

The DDESB establishes explosives safety standards (DoD 6055.09-STD, DoD Ammunition and Explosives Safety Standards, February 2008), policy, and guidance applicable to the life cycle of DoD-titled military munitions (e.g., research, development, and testing; hazard classification; production; transportation; handling; storage; inspection; maintenance; and demilitarization and disposal). Chapter 12 of DoD 6055.09-STD specifically addresses explosives safety requirements to be implemented during the conduct of munitions responses. The DDESB approves Explosives Safety Submissions (ESS), Chemical Safety Submissions (CSS), Explosive Site Plans (ESP), and/or Chemical Warfare Material (CWM) Site Plans (CSP) required for munitions responses. In addition, the DDESB approves the explosives safety provisions of any plans to transfer real property from DoD control that is known or suspected to contain MEC.

4.2. OFFICE OF THE SECRETARY OF DEFENSE

The Office of the Secretary of Defense (OSD) established specific goals and objectives for the DERP in June 2006, through the DoD Financial Management Regulation, DoD 7000.14-R, Volume 2B, Chapter 13, "Defense Environmental Restoration." The current goals for DERP MMRP sites are:

- Complete preliminary assessments (PA) or equivalent for 100% of all munitions response sites by end of FY2007.
- Complete site inspections (SI) or equivalent for 100% of all munitions response sites by end of FY2010.

Additionally, in September 2008, OSD set a goal for each DoD component requiring response complete (RC) or remedy-in-place (RIP) at all MRSs by 2020. This goal applies to MRSs in the system as of 30 September 2008. The MRSs added after this date will be subject to rolling goals which will be detailed in the next version of the DERP Guidance.

4.3. DEPARTMENT OF THE ARMY

4.3.1. US Army Environmental Command (USAEC)

The USAEC is a subordinate command of the Installation Management Command (IMCOM). The USAEC supports the Army's environmental programs and is the program manager for the ER,A funded DERP response actions. The USAEC oversees the implementation of the MMRP on ER,A installations and coordinates program activities and requirements through assigned program coordinators with the IMCOM installations, Army Commands (ACOMs) for the Army Materiel Command (AMC), Army Medical Command and the National Guard Bureau (NGB) installations, and the BRAC Division for the non-BRAC excess installations.

The USAEC has centrally managed execution of the Munitions Response (MR) Program through its PA and SI phases. The central program execution responsibilities have included

updating site cost-to-complete (CTC) estimates, prioritizing sites for response actions and updating data in the Army Environmental Database - Restoration (AEDB-R). Since FY2008, and continuing through FY2010, USAEC has been transitioning installations from central program execution once they initiate a post-SI-level project (such as a Remedial Investigation (RI) or a removal action). However, USAEC will continue to provide support and program management oversight consistent with IRP management after this transition.

4.3.2. US Army Technical Center for Explosives Safety (USATCES)

The USATCES develops explosives safety policy for real property known or suspected to contain MEC, develops US Army explosives and chemical safety policies, procedures, and regulations that apply to munitions responses, reviews US Army explosives safety documents (particularly ESSs, CSSs, ESPs and CSPs) for consistency with US Army regulations, DoD policy, and DoD 6055.09-STD, provides Army approval of required submissions, and approves their submission to the DDESB for review and approval.

4.3.3. US Army Center for Health Promotion and Preventive Medicine (USACHPPM)

The USACHPPM provides medical and health-related oversight of restoration activities. For the MMRP, USACHPPM will focus on MC and not the potential explosive hazards posed by MEC. These activities include the preparation of public health assessments, health consultations, health studies, responses to citizens' petitions, and health education activities. The USACHPPM reviews and concurs on human health risk assessments and Records of Decision (RODs) and/or Decision Documents (DDs) for the Army Surgeon General. Ecological risk assessments are also evaluated by USACHPPM.

4.3.4. US Army Corps of Engineers, Environmental and Munitions Center of Expertise (USACE EM CX)

The USACE EM CX provides environmental and munitions technical support to USACE Design Centers and Districts. The EM CX provides guidance and oversight, but generally does not execute project work. Execution is performed by authorized Design Centers and Remedial Action Districts throughout USACE. The services of the EM CX may be reimbursable or centrally funded. Additionally, the EM CX prepares technical manuals and guidance documents related to munitions response and provides USACE technical experts in the MMRP field.

4.3.5. Installations

Installations are responsible for providing data on suspected and known MMRP sites to USAEC, executing their installation's MR program and for providing the public and stakeholders with information and opportunities for participating in MRS issues in their communities. Installations are also responsible for preparing documentation regarding proper explosives safety considerations for munitions response at MRSs. As such, installations will:

- Bring MRSs and conditions which require immediate action to the attention of USAEC.
- Seek stakeholder involvement, as appropriate, and in compliance with CERCLA or RCRA Corrective Action.
- Develop and submit ESS, CSS, and explosive or CWM site plans to USATCES for review, Army approval, and to be forwarded to the DDESB for its review and approval.
- Communicate with, and educate, the local community about the potential hazards associated with MEC and the method by which the US Army is addressing these hazards.
- Ensure that federal and state agencies, Native American or Alaskan Native Tribes, local community stakeholders, and the current landowner (if the MRS is outside US Army control) are offered opportunities as early as possible and throughout the process to participate in the application of the Munitions Response Site Prioritization Protocol (MRSPP) and make response sequencing recommendations.

5. PROGRAM DEVELOPMENT AND MANAGEMENT

5.1. US ARMY RANGE INVENTORY

The US Army Range Inventory is a comprehensive inventory of operational ranges (formerly referred to as active and inactive ranges), former ranges (formerly referred to as closed, transferring and transferred (CTT) ranges) and other defense sites that are not ranges but contain UXO, DMM, or MC. The inventory serves as the basis for estimating cleanup costs to support congressional reporting and consolidates the requirements of various other drivers.

5.1.1. Inventory Overview. The US Army began its range inventory in 2000, and completed it in December 2003, via a three phase effort. Phase 1, referred to as the Advance Range Survey, involved a data call issued to each Army Command, requesting general information about operational and former ranges on their installations and those associated with FUDS. A more detailed follow-on inventory was accomplished in two phases: an Operational Range Inventory and a CTT Range and Site Inventory.

5.1.2. Operational Range Inventory. DoDD 4715.11 (Environmental and Explosives Safety Management on Operational Ranges Within the United States) and DoDD 4715.12 (Environmental and Explosives Safety Management on Operational Ranges Outside the United States) require the establishment and maintenance of an operational range inventory. Upon completion of the Operational Range Inventory in December 2002, (i.e., the Phase 2 Inventory), preparation for the sustainment phase of the inventory started. In June 2004, the centralized Operational Range Inventory Sustainment program began and currently, the data is being updated at the installation level. Information on every operational range the US Army owns and uses is updated based on a recurring schedule.

5.1.3. CTT Range and Site Inventory. The third phase of the Inventory evaluated defense sites to identify former ranges and other areas with UXO, DMM or MC. Congress, through the FY2002 Defense Authorization Act, specifically excluded the following areas from inclusion in this inventory.

- Operational ranges.
- Operating storage or manufacturing facilities.
- Facilities that are used for or were permitted for the treatment or disposal of military munitions.

The data elements collected during the CTT Range and Site Inventory included:

- Unique identifier for each MRS.
- Current location status of the MRS (on or off-post).
- Name and address of a point of contact at the responsible US Army component.
- An appropriate record showing the location, boundaries, and aerial extent of the MRS, including counties, tribal reservations, independent cities and towns in which the range MRS is located, as well as all states in which the MRS is located.
- Historical range or site use and current land use of the property.
- Physical information concerning the MRS (topography, vegetation, and soil type).
- Types of munitions fired or present at the MRS.
- Known entities, other than a DoD Component, with current ownership interest or control of the land or its resources.
- Any land use restrictions currently in place that might affect the potential for exposure to MEC or MC known or suspected to be present.

A CTT Range and Site Inventory Report was prepared for each installation where qualifying sites were identified. Each MRS identified during the Phase 3 Inventory was entered into AEDB-R. A memorandum was prepared for each installation where no qualifying ranges or sites were found.

The nature and extent of the data collected during the CTT Inventory meets the substantive requirements of a PA for all the inventoried sites found eligible for the MMRP. The CTT Inventory Report marks the completion of the PA phase of the CERCLA process for these sites. This is significant because suspected environmental restoration sites are not eligible for ER,A funding until they have undergone a PA, meet program eligibility, and have a completed CTC estimate. All inventoried sites found to be MMRP eligible were entered into AEDB-R in 2003.

5.2. MUNITIONS RESPONSE ELIGIBILITY CRITERIA FOR DERP

The Army uses the ER,A account to fund DERP projects. There are three sub-accounts within the ER,A account, the IR, the MR and Compliance Restoration (CR). Munitions responses at US Army active installations can occur within the DERP under only the MMRP or the IRP, but most will be captured under the MMRP. Program eligibility changed on 29 Dec 08 when DoD revised the DERP eligibility criteria via an interim policy (DoD, Interim Policy for DERP Eligibility, 29 Dec 08), as summarized below.

5.3. MMRP ELIGIBILITY CRITERIA

Funding appropriated to the ER,A account can be used to conduct identification, investigation, removal actions, remedial actions, or a combination of removal and remedial action to address UXO, DMM and/or MC under the MMRP where:

- The location qualifies as a defense site. A defense site is defined as a location that is or was owned by, leased to, or otherwise possessed or used by the DoD. The term does not include the following areas: (1) operational ranges; (2) operating munitions storage or manufacturing facilities; and (3) facilities that are used for or were permitted for the treatment or disposal of military munitions (i.e., RCRA permitted sites).
- If the location does not meet the defense site definition, the location may still be eligible provided the UXO, DMM or MC at the site is attributed to DoD and it has either migrated to the non-defense site location (e.g., by groundwater) or has come to be located at the site from a defense site (e.g., munitions were fired from a defense site and landed on non-defense site property and were not promptly removed).
- The actions at the location are driven primarily by UXO, DMM or MC or the site's cost to complete is more than 50% attributable to UXO, DMM or MC.

Funds appropriated for the MMRP cannot be used for:

- Locations outside the United States or its territories.
- The presence of military munitions resulting solely from combat or operational ranges.
- Indoor firing ranges.

- Explosives or munitions emergency responses
- Responses at State National Guard properties not formerly owned by, leased to, possessed by or otherwise under the jurisdiction of the Secretary of Defense, at the time of actions that caused the release of hazardous substances or other environmental damage. This includes sites identified under the Non-Department of Defense Owned Non-Operational Defense Site (NDNODS) Program.

IR and MR sites may be co-located, but treated as separate sites due to the focus of each site (i.e., IR site is non-munitions related media contamination and MR site is munitions related). Additionally, if an installation received Army permission to address UXO or DMM under the IRP prior to the creation of the MMRP in FY02, that site stays under the IRP even though it otherwise meets the MMRP eligibility criteria. Table 5-1 shows several examples that demonstrate the MMRP eligibility and non-eligibility determination for MRSs at US Army active installations.

Table 5-1. MMRP Eligibility Determination Example Scenarios

MMRP ELIGIBLE
A historical pyrotechnics training range was used between 1940 and 1969 and it is not located within the footprint of an operational range.
An installation transferred a 20-acre parcel to Bureau of Land Management in 1992, outside of the BRAC process. A site within the parcel is identified as a former small arms range used in the 1960s.
A live grenade training range was used from the 1950's until 2007 when the Army closed this operational range following AR 350-19 (August 2005) to construct a new maintenance facility.
A former artillery range used from 1941 to 1952 was converted to a recreational area on the installation. However, an IRP site is co-located over part of this old range. The IRP site addresses only solvent contamination from historical activities not related to the range activities. The CTC for the IRP site only addresses the solvent and does not include costs for munitions responses. Munitions responses at this old range are eligible for the MMRP. The response actions to address the solvent contamination will remain in the IRP.
NOT MMRP ELIGIBLE
A former range on an Army installation was used from 1975 to 1983 and contains UXO and DMM. The range was closed in August 1985 and borders a housing development. The installation was given approval to address MEC in 2001 and the site and its associated response actions and costs were incorporated into the IRP. The response actions began in 2006 and are ongoing. This site is ineligible for the MMRP since it is completely captured under the IRP.
A disposal pit for DMM was discovered on an operational range at an Army installation. Because this site is located on an operational range, it is ineligible for the MMRP.
An open burning/open detonation (OB/OD) site on an Army installation received a RCRA permit in 1990. The installation stopped using the OB/OD site in 1999. Since this OB/OD site was permitted, RCRA closure requirements apply and this site is not eligible for the MMRP.

5.4. MUNITIONS RESPONSE ELIGIBILITY UNDER THE IRP

Funding appropriated to the ER,A account can be used to conduct responses to UXO, DMM or MC under the IRP where:

- The location must qualify as a defense site. A defense site is defined as a location that is or was owned by, leased to, or otherwise possessed or used by the DoD. The term does not include the following areas: (1) operational ranges; (2) operating munitions storage or manufacturing facilities; and (3) facilities that are used for or were permitted for the treatment or disposal of military munitions (i.e., RCRA permitted sites).
- If the location does not meet the defense site definition, the location may still be eligible provided the UXO, DMM or MC at the site is attributed to DoD and it has either migrated to this location (e.g., by groundwater) or has come to be located at this site from a defense site (e.g., munitions were fired from a defense site and landed on non-defense site property and were not promptly removed).
- The actions at the location are not primarily driven by UXO, DMM or MC or the site's cost to complete is less than 50% attributable to UXO, DMM or MC.

Table 5-2 shows several examples that demonstrate the IRP and non-IRP eligibility for UXO, DMM or MC at US Army active installations.

Table 5-2. IRP Eligibility Determination Example Scenarios

IRP ELIGIBLE
A closed range is currently listed in AEDB-R as an IRP site. The installation sought and obtained Headquarters approval to address UXO under the IRP ten years ago before the creation of the MMRP. This site will continue to be IRP eligible.
Pesticide-contaminated soils are being investigated on an IR site which is adjacent to a closed artillery range (an MR site). Incidental UXO identification and avoidance is being employed as a safety precaution. These incidental UXO-related costs are IRP eligible.
NOT IRP ELIGIBLE
A munitions disposal pit was found on an operational range. Responses at this site are ineligible for ER,A funding due to it being located on an operational range.
An IRP response to address solvents in a housing area discovered a large DMM burial pit. Since the DMM discovery is beyond the scope of anomaly avoidance, the DMM should be handled under the MMRP as a new site.

5.5. PROGRAM MANAGEMENT TASKS

The US Army employs several implementation tools to manage both the sites and resources of the ER,A program and the MMRP. Among them are AEDB-R (for tracking the progress and funding of MRSs), methods to estimate CTC and compile such estimates for programming and budgeting, and methods to assign relative priorities to each MRS based on the overall risks known or suspected to be present. Execution and implementation of the MMRP is meant to be similar to and compatible to the IRP.

Since its creation in FY2002, USAEC has centrally managed execution of the MMRP for active installations. By performing central program execution for the MMRP, USAEC has prepared CTCs, updated AEDB-R, created and managed the obligation plan, and scheduled and closely oversaw response actions. In FY2008, USAEC began the transition of some installations out of central program execution. As installations complete their SI phase and begin post-SI activities, such as RI/FS, they will be transitioned out of central program execution. Once this central execution ends, the installations will manage their MR sites as they do for their IRP sites and USAEC will provide technical assistance and program management oversight consistent with the IRP.

5.5.1. Army Environmental Database – Restoration. The US Army uses AEDB-R to track active installations and BRAC program IRP and MMRP sites. The database is used to report data up to US Army Headquarters, DoD, and Congress. Within AEDB-R, the definition of a “site” is a discrete area where contamination has been verified and a response is required. For the MR Program, this is the equivalent to the MRS. MRSs use the following format for AEDB-R number assignment:

ABCD- ###-R-##

where :”ABCD” is a 3-5 character installation abbreviation; “-###” is the 3 number MRA identifier; “-R” is assigned to all MRSs (it originally stood for “range”); and “-##” is the 2 number site number on the MRA. For example, CPW-001-R-01 stands for the 1st site on Camp Wood’s 1st MRA and FTSW-002-R-03 stands for the 3rd site on Fort Swampy’s 2nd MRA.

All MRSs identified during the CTT Range/Site Inventory were entered into AEDB-R in 2003. The MR eligible sites identified during the centrally managed SI program are also being inputted to AEDB-R, as the SI serves as both the PA and SI. Sites identified after the installation’s SI phase is complete may be entered into AEDB-R only if they are MMRP eligible and have an installation completed PA. The MRSs with a PA status of “underway” or “future” cannot be entered into AEDB-R.

MRSs require specific data elements in AEDB-R beyond those required for IRP or CR sites. The key MRS-specific data elements provide more detailed information on the physical and geophysical attributes of the sites; the relative hazard associated with the MEC or MC; and the

historic use and munitions characteristics of the sites. MMRP specific AEDB-R data elements include:

INSTALLATION LEVEL DATA ELEMENTS

- MR Installation Progress
- MR Areas
 - Name & ID
 - CTT Status
 - MRA a historic range?
 - MRA & associated MRS acreages
 - Location
 - Centroid
- MR Map

SITE LEVEL DATA ELEMENTS

- MRS Attributes
 - CTT status, size, topography, vegetation & soil type
- Contaminant Information
 - Drinking water, groundwater depth, Environmental Protection Agency (EPA) designated sole source aquifer, MC constituent contamination & MC media
- Site Use Info
 - Land use access controls, public accessibility, historic use, current use, site ownership and locations, ownership and control & property lease information
- MEC Data
 - Ordnance types & munition density
- MRSP Information
 - Overall Priority
 - Explosive Hazard Evaluation (EHE) Score
 - Chemical Hazard Evaluation (CHE) Score
 - Health Hazard Evaluation (HHE) Score
 - Reason for changing overall score
 - Reason for addressing an MRS out of sequence
 - Score change due to Quality Assurance (QA) Panel
 - MRSP Documentation (score sheets)

5.5.2. Cost-to-Complete Estimates. The CTC estimate for environmental restoration projects is an important planning tool in the budget process. The CTCs are used to support Program Objectives Memorandum submissions and the DERP Annual Report to Congress, as well as other fiscal reporting mechanisms. A CTC estimate identifies all requirements and/or costs to complete environmental cleanups or explosive safety actions for a particular site on an

installation. The CTC estimates must be reliable, complete, up-to-date, and supported by sufficient documentation to withstand an audit.

Under central program execution, USAEC developed an MRS cleanup exit strategy and associated costing method to price out each site's liabilities using the limited data available from either the CTT Inventory or the SI Report. Each MRS was put into one of the following categories for cost determination:

- Small Arms Ranges (sites with no MEC).
- Multi-Use Ranges (sites with MEC and MC.)
- Multi-Use Ranges with the Potential for Groundwater Contamination.
- Buried CWM Sites (sites with chemical agents).

Generic assumptions were built for each category and the CTCs were run using the Remedial Action Cost Engineering and Requirements (RACER) Model. For example, at a small arms range, the contamination is primarily lead in soil and the remediation would consist of excavation of contaminated soil, off-site transportation, stabilization and disposal. No MEC cleanup components were calculated for small arms sites. Site specific data, such as site location, size, topography, vegetation cover and munitions type, were used to customize the generic cleanup scenario.

Once an installation's SI is complete and they initiate a post-SI phase, the installation transitions out of central program execution and they, not USAEC, will be responsible for the annual update of the site's CTC using cleanup assumptions specific for that site, not the generic assumptions.

5.5.3. Installation Action Plan (IAP). The IAP is the tool used to capture and present the DERP cleanup project information at the installation level (IRP, MMRP and CR). The IAP presents an integrated and coordinated approach to achieving the installation's environmental restoration goals. The plan defines all IRP, MMRP and CR requirements and proposes a comprehensive approach for response actions (from investigation to site closeout) at an installation. The MMRP data are presented separately from IRP or CR data in an IAP, but the information required is the same for both site types.

5.5.4. Munitions Response Site Prioritization Protocol (MRSP). The FY2002 Defense Authorization Act required DoD to develop and implement a site prioritization protocol for assigning a relative priority for munitions response based on the overall conditions at each MRS, taking into consideration various factors related to safety and environmental hazards. The MRSP was published final in the Federal Register, 32 Code of Federal Regulations, Section 179, in October 2005. The MRSP is comparable to the Relative Risk Site Evaluation

(RRSE) for IRP sites. Initial MRSPP scores were developed during the SI phase. Site scores are required to be evaluated annually and updated as new information becomes known.

Stakeholder & Regulatory Coordination. To comply with the Federal Register requirements, installations should ensure federal and state agencies, Native American or Alaskan Native Tribes, local community stakeholders, and the current landowner (if the site is located on land is outside Army control) are offered opportunities, as early as possible and throughout the process, to participate in the application of the protocol and making response sequencing recommendations. Installations will notify these stakeholders and records of the notification should be placed in the Administrative Record and Information Repository for the MRSs. Installations shall also publish an announcement in a local community publication requesting information pertinent to prioritization or sequencing decisions. USAEC, in coordination with the installations, executed these public participation requirements during each installation's centrally managed site-wide SI. If new sites are discovered, additional public outreach should be conducted.

Scoring Concepts. The MRSPP uses three modules to determine a site's relative priority. These are the EHE Module, which evaluates the known or suspected presence of an explosive hazard; the CHE Module, which evaluates the chemical hazards associated with the physiological effects of chemical warfare material (CWM); and the HHE, which provides a consistent DoD-wide approach for evaluating the relative risk to human health and the environment posed by MC or incidental non-munitions contamination present at an MRS. The process results in a numerical priority score of 1 (highest risk) through 8 (lowest risk), along with three alternative ratings of "no longer required," "no known or suspected hazard," and "evaluation pending."

The EHE and CHE modules use very similar types of data to score a site. These factors include:

- Type of munitions or CWM.
- Location of munitions or CWM.
- Source of the hazard.
- Ease of site access.
- Population density of county or city and the population near the site.
- Types of activities near the site.
- Property status (ownership).
- Ecological and cultural resources.

The third module is the HHE. The HHE is an enhanced version of the RRSE model. The RRSE has historically been used to evaluate the relative risks of chemical contaminants in the environment at IRP sites. Within the HHE, the data and the process by which the data are evaluated are the same as within the RRSE. The distinction between them lies in the greater number of outcomes possible within the HHE (i.e., seven versus three).

Army MRSPP QA Panel. In FY2007, in compliance with the Federal Register, the US Army created an MRSPP QA Panel and required that the first priority score for each MRS be reviewed and verified by the QA Panel prior to the site score being loaded into AEDB-R. The QA Panel meets several times per year to review site scores to ensure consistency of application between the Active Army, BRAC, and FUDS Programs.

Guidance. In April 2007, an MRSPP Primer was developed by DoD. The Primer is an instruction manual for munitions response project managers and other environmental personnel that are responsible for applying the MRSPP. It contains information about DoD's development of the Protocol and provides a step-by-step guide for applying the Protocol.

The Assistant Chief of Staff for Installation Management (ACSIM) is developing additional MRSPP guidance that will supplement the Primer.

5.5.5. Prioritization of Munitions Response Sites. As program manager for the MMRP, USAEC, using all available inputs (e.g., MRSPP scores and other factors), applies a risk management approach to prioritize, plan, and implement environmental and explosive safety restoration activities. Generally, those MRSs presenting a greater relative risk to human health and the environment, as determined by the prioritization score, will be addressed before MRSs presenting less risk, although other factors are also considered. Projects to address the imminent threats to human health assist in the transfer of land at excess property installations, and those that support base re-stationing or BRAC 2005 construction will be given priority. Other considerations which have an impact on funding prioritization include:

- Concerns expressed by stakeholders.
- Cultural and social factors.
- Economic factors.
- Health, safety, or ecological risk assessments or evaluations.
- Future land use.
- Issues related to Tribal trust lands.

- Implementation and execution considerations to include funding availability, availability of the necessary equipment and people to implement a particular action, examination of alternatives to responses that entail significant capital investments, a lengthy period of operation, or costly maintenance, considering alternatives to removal or treatment of contamination when existing technology cannot achieve established standards (e.g., Remedial Action Objectives (RAOs)).
- The availability of technology to detect, discriminate, recover, and destroy MEC.
- Standing commitments including those in formal agreements with regulatory agencies, requirements for continuation of remedial action operations until response objectives are met, other long term management (LTM) actions, and program administration.
- Established program goals and initiatives.

5.5.6. Funding and Reporting. The MMRP is funded through the ER,A account. The ER,A account is used exclusively for activities eligible under the DERP. The USAEC is responsible for consolidating installation requirements and developing the ER,A budget. The budget is built from information contained in AEDB-R and is programmed for installation projects based on risk (MRSP scores) and CTC estimates. The ER,A funds may only be used for sites in AEDB-R. New MRSs require a PA and a MRSP score before uploading into AEDB-R. Funding, budgeting and reporting requirements for MRSs are equivalent to those for IRP sites.

5.5.7. Environmental Restoration Information System (ERIS). The ACSIM requires the storage of ER,A media sampling data in a centralized database. All installations that receive ER,A funds to collect environmental restoration data must enter that data into ERIS. The MMRP data collection requirements are the same as those for IRP sites. Contracts for post-SI actions should contain requirements for data upload into ERIS.

5.5.8. Permanent Cleanup Document Repository (PCDR). The PCDR is required by the 2003 Army Environmental Cleanup Strategy and AR 200-1 and was instituted by the ACSIM in 2004. It is an electronic library containing copies of selected environmental cleanup program documents from US Army installations. The PCDR is managed and maintained by the USAEC. The USAEC is responsible for uploading installation cleanup documents finalized prior to FY2006. Installations are responsible for uploading documents finalized thereafter. The MMRP requirements are the same as those for IRP sites. Documents are uploaded to USAEC's Repository of Environmental Army Documents (READ) database. All centrally managed MMRP PA and SI documents have been or will be uploaded into PCDR by USAEC. Installations will be required to upload all MMRP documents after the centrally managed SI is complete.

6. PROGRAM PROCEDURES.

6.1. DECISION DOCUMENTS

The term “decision document” includes both RODs and Action Memoranda for remedial actions and removals, as well as Statements of Basis for RCRA corrective actions. The procedures and protocols for preparing, staffing and signing DDs are the same for the MMRP and the IRP.

6.2. OFF-SITE RESPONSE.

Although this Guidance applies to active installations, many MRSs identified in the Phase 3 Inventory are located outside of installation boundaries on lands not under US Army control and not eligible for the FUDS program. The Army has the authority to conduct response actions off the installation where the Army is reasonably certain they are the sole source of the release. Off-site investigations and responses can be very complex and might require extensive stakeholder coordination and public interaction.

If access is required to a MRS not on Army property, a right of entry (ROE) must be obtained prior to entry to the MRS. To gain access to other federal property, the installation should seek a special-use permit from the controlling federal agency under the terms of the Federal Land Policy and Management Act (FLPMA). The FLPMA coordinates land use rights-of-way, agency requirements/rules, and scope of reasonable permitted impacts, while upholding natural resource conservation and land use longevity (43 USC 1701–1784.)

To gain access to a MRS located on lands not federally held, the installation should enter into a Memorandum of Agreement for a land use easement outlining the reasonable land use permitted for investigation and/or response. In such cases, the installation should coordinate with a local USACE District Real Estate Branch. The USACE District Office will provide the expertise to coordinate notifications to landowners for securing access to the property with the appropriately documented legal instrument prior to entering the property for the conduct of munitions response activities. The available real estate instruments and options must be evaluated by experts to ensure response goals are met and to ensure that the government does not commit to real estate transactions without proper legal authority, fiscal resources, and political support. The potential range of support provided by the USACE Real Estate Branch may include:

- Coordination of real estate actions with response objectives.
- Landowner notification of need for access to real estate.
- Authority for acquisition of real estate.
- Execution of real estate requirements.

- Determination and documentation of acceptable liabilities for restoration agreements.
- Execution of any necessary (temporary or permanent) relocation of landowners to facilitate munitions response.
- Drafting of real estate worksheets.

Per the Management Guidance for Active Installations (November 2004), Garrison Commanders have the authority to approve off-site data collection activities. Approval authority for an off-post removal or remedial action is dependent on the action's cost and is the same as IRP actions.

6.3. STAKEHOLDER PARTICIPATION.

Early stakeholder involvement is key to developing the trust necessary for ensuring that the munitions response will meet expectations and requirements. Installation stakeholder activities likely to occur during the munitions response process will include:

- Introductory meetings with key stakeholders (e.g., property owners, regulators, and concerned public) on the MMRP and site-specific activities and conditions.
- Presentations to the existing installation Restoration Advisory Board (RAB) on the MMRP and site-specific activities and conditions.
- If no RAB exists, determining whether one is needed and organizing one.
- Soliciting stakeholder input during project planning activities, including the MRSP scoring of sites.

The process of soliciting input to munitions response starts at the SI phase and should continue through the program. A methodology which has been widely used for soliciting stakeholder input is documented in the USACE Technical Project Planning (TPP) process. For more information on the TPP process, see USACE Engineer Manual (EM) 200-1-2, *Technical Project Planning (TPP) Process*.

6.4. PUBLIC PARTICIPATION.

6.4.1. Community Relations Plan (CRP). The CRP is a foundation for the community involvement process used by the installation. It summarizes community concerns identified through community interviews. Further, the plan outlines specific outreach activities the US Army will use to facilitate two-way communication, address community concerns and expectations, and encourage community involvement throughout the munitions response process. A CRP is required for all remedial actions and is highly recommended for all removal actions. The NCP requires that a CRP be in place before RI field activities start. The CRP

requirements are similar for MMRP and IRP sites. At installations with ongoing IRP efforts, existing CRPs should be modified to include MMRP efforts.

6.4.2. Restoration Advisory Board. The RAB is the installation's forum for communicating with interested stakeholders regarding environmental restoration activities under the DERP. The RAB participation is voluntary; includes representatives from DoD, EPA, state and local governments, tribal governments, and the community; and should reflect the diverse makeup of the community. The purpose of the RAB is to give stakeholders the opportunity to participate in the cleanup process, monitor cleanup progress, and make their views known to the decision-makers. Documents related to RAB proceedings or communications will be included in the Administrative Record. The RAB may be adjourned when there is no longer a need or community interest declines. Policy on the role of RABs is contained in DA PAM 200-1, Environmental Protection and Enhancement.

According to Army policy, if an installation does not have a RAB, that installation should reassess community interest for a RAB at least every 24 months. If an assessment finds sufficient and sustained community interest, the installation shall establish a RAB. Due to the non-contiguous nature of the MMRP SI and RI/FS phases, unless a RAB already exists, installations should only begin RAB solicitation once RI/FS funding is received. Other than that difference, the RAB rules are the same for IRP and MMRP sites.

6.4.3. Technical Assistance for Public Participation (TAPP). The TAPP program provides community members of RABs with access to independent technical support. Under the program, the US Army pays for an outside, non-involved contractor (maximum of \$25,000/year and \$100,000/installation) to provide technical assistance to the RAB. The TAPP projects are funded from an installation's allocation of ER,A funds for program management and are not to be used to pay community participants for their time. There are no differences between the IRP and the MMRP regarding the TAPP program.

6.5. DEFENSE SITE MEMORANDUM OF AGREEMENT (DSMOA).

Under the DSMOA Cooperative Agreement programs, state environmental regulatory agencies are reimbursed for providing technical services in support of the US Army DERP. This is meant to accelerate cleanup processes while improving DoD cooperation among state/territorial regulatory communities. Cooperative Agreements should include both IR and MMRP requirements. The DSMOA rules are the same for the MMRP and the IRP.

6.6. LAND TRANSFER

In cases when property to be transferred is known or suspected to contain MEC, the explosives safety provisions of the transfer documents, to include the lease, must be provided through USATCES to the DDESB for approval. The USACE District Office will provide the expertise to coordinate these provisions in land transfer documentation. The available real estate instruments and options must be evaluated by experts to ensure response goals are met and to

ensure that the government does not commit to real estate transactions without proper legal authority, fiscal resources, and political support.

6.7. UXO SAFETY EDUCATION PROGRAM.

The UXO Safety Education Program is a public service program run under the control of DoD dealing with explosive safety. The program was designed by the Army for DoD as a toolkit from which installations and the public could use individual tools to enhance or supplement local safety programs. The toolkit is available on the DoD DENIX web site (www.denix.osd.mil – search ‘Environment,’ then ‘UXO Safety Education Program’) and consists of ready-to-use products and materials for home, community or classroom use. The following items are available in the toolkit:

- UXO educational material.
- Glossary of terminology.
- Posters.
- Activity books for children.
- Tailorable, ready to use briefings and presentations.
- Frequently asked questions about UXO.
- Videos.
- A gallery of UXO photographs.

6.8. MMRP CONTRACTING.

MMRP studies and actions can be contracted multiple ways including using the Corps of Engineers, AEC, self executions by installation staff and execution by others such as the NGB or other Army Commands. Whichever path is chosen, it is critical that the scoping team employ the correct mix of specialties to ensure the contract is prepared properly. Beyond the normal subject matter experts that a typical IRP contract scoping team would occupy (environmental engineer, chemist, geologist, hydrogeologist, risk assessor and cost engineer); MMRP teams should also include persons knowledgeable about munitions, such as OE safety specialists and geophysicists.

Current Army guidance requires most, but not all contracts to be procured under a performance based acquisition. Exceptions to this guidance should be negotiated and approved by AEC in advance of starting the procurement process.

Corps of Engineers Execution.

Due to the uniqueness of the MMRP, the USACE has developed a concentration of MMRP technical and contract capabilities in four Military Munitions Design Centers located in Huntsville, Baltimore, Omaha, and South Pacific Division and a separate Chemical Warfare Design Center also located in Huntsville. Policy, oversight, and support for these 5 Design Centers is provided by the USACE EM CX. By Corps policy, one of these five Design Centers **MUST BE INVOLVED** with MMRP procurement if MEC or chemical agents are involved. This does not mean no other Corps District can be involved; in fact, in many cases, another district will serve as the Project Management District.

Roles and responsibilities for the Design Centers are:

- Either serves as the Project Management District or provides technical and contracting support to the Project Management District.
- Provides resources as an integral part of the project team during investigations and design phases of work.
- Executes CERCLA/RCRA MMRP investigations or design phases of work on behalf of the installation.
- Perform munitions removal/remedial actions if requested.

Each project has an official Project Management District. This District is usually the local district that works directly with the installation on other environmental projects (i.e., IRP), but it can also be one of the Design Centers. By Corps policy, Project Management Districts have the primary responsibility for ensuring that all MMRP projects are performed in accordance to USACE protocols.

Roles and responsibilities for the Project Management District are:

- Responsible for all project management activities to include initiating, planning, executing, monitoring and controlling, and closing MMRP projects.
- Forms the Corps project team and ensures that appropriate resources are integrated into the project.
- Serves as the “One Door to the Corps” point of contact for MMRP customers (installations and AEC).
- Supports customers in the development of IAPs, CTC estimates and obligation plans.

Execution of activities beyond the site characterization and design phases can be performed only by one of 10 designated USACE Military Munitions Remedial Districts (which also includes the Design Centers). The 10 Remedial Districts are: Baltimore, Fort Worth, Honolulu, Huntsville Center, Los Angeles, Louisville, Mobile, Omaha, Sacramento and Savannah.

7. MMRP SPECIFIC TOPICS.

7.1. INTRODUCTION.

Most sites being addressed under the MMRP present unique explosive or chemical agent hazards due to the presence of MEC. Responses at sites where explosive MC is not in concentrations high enough to present an explosive hazard or where there are only heavy metal contaminants will mirror the well established IRP process for any other environmental contaminant.

Munitions responses, both removal and remedial actions, are typically executed through the normal CERCLA process that includes the following five general types of activities, with a few special twists due to the explosive or CWM hazard associated with the site:

- Discovery and Site Evaluation (e.g., Preliminary Assessment (PA)/SI).
- Detailed Site Investigation and Assessment (e.g., RI/Feasibility Study (FS)).
- Decision and Documentation (e.g., DD or ROD).
- Planning (e.g., ESS, CSS, ESP, CSP, Work Plan, CRP, Remedial Design).
- Implementation (e.g. Remedial or Removal Actions).

The level of detail, timeline, and scope of these activities typically differ based on whether a removal or remedial action is being conducted. Generally speaking, a removal action is a short-term, limited response to a problem of limited scope, while a remedial action involves a longer term, more permanent solution to a more complex problem. Remedial and removal actions are not mutually exclusive. For example, a site with very complex conditions involving several sub-sites with multiple sources and multiple types of MEC and MC will likely be addressed under the remedial process. These multiple sub-sites may also involve individual removal actions. When a removal action is conducted within or in conjunction with the remedial response, the removal action should, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action.

While the remedial and removal processes are the same in the MMRP as they under the IRP, it is the unique explosive or CWM safety hazard that exists at many MRSs that make these projects different. The remainder of this section discusses the unique explosive safety or CWM procedures and considerations that span the entirety of a munitions response project.

7.2. EXPLOSIVE SAFETY.

Safety is the number one priority during a munitions response, regardless of whether it is DERP eligible or performed under another program. Whether conducting site characterization or removing MEC, safety plans are developed and implemented that describe the protective measures taken to ensure that the work in question is conducted in a safe manner. Specific safety plans, their contents, and their submission guidelines are described in detail throughout this section.

There are four types of safety submissions required per DoD 6055.09-STD (Chapter 12) that are necessary to safely conduct all activities associated with munitions response:

- Explosive Safety Submission.
- Explosives Site Plan.
- Chemical Safety Submission.
- CWM Site Plan.

These plans provide safety specifications for the execution of intrusive investigations, cleanup alternatives and management of explosives material. All safety plans and their approvals shall be kept as part of the Administrative Record.

7.2.1. Safety Submissions. The ESSs, CSSs, ESPs and CSPs ensure applicable DoD and DA explosives safety standards are applied during all phases of a munitions response and that the action to be taken will provide adequate explosives safety given the reasonably anticipated future land use. The DDESB-approved ESS, ESP, CSS or CSP, or a combination, thereof, is required for:

- The MRS investigation or characterization (e.g., Engineering Evaluation/Cost Analysis (EE/CA) or RI/FS) that involve the intentional physical contact with MEC or chemical agent (CA), regardless of CA configuration.
- A determination of “No DoD Action Indicated” (NDAI) or “No Further Action” (NFA).
- Time Critical Removal Action (TCRA) or Non-Time Critical Removal Action (NTCRA) at a site with MEC or CWM.
- Construction Support at a site with potential MEC or CWM.
- Execution of the explosives safety or CA safety aspects of the selected response at an MRS.

Safety submissions are not required for:

- Munitions or explosives emergency response performed by military EOD or Technical Escort Unit (TEU).
- The PA or SI activities (e.g., site visits in conjunction with an archival search) when intentional physical contact with MEC or CA, regardless of CA configuration, or the conduct of ground-disturbing or other intrusive activities are not intended.
- Clearance activities on operational ranges.
- Munitions responses on former ranges used exclusively for training with small arms ammunitions.
- On-call construction support for sites with a low probability of encountering MEC.
- Anomaly avoidance activities.

7.2.2. Types of Safety Submissions. Explosive or Chemical Agent safety submittals are required before the start of munitions response activities (e.g., field activities) that involve the placement of explosives on a site; the intentional physical contact with MEC or CA, regardless of configuration, or the conduct of ground-disturbing or other intrusive activities in areas known or suspected to contain MEC or CA, regardless of configuration. The submittal must be approved prior to the implementation of the recommended remedial or removal action project. The four different types of safety submittals are described below.

ESP – Investigations or site characterization activities (i.e., SI, RI/FS or EE/CA) that involve the intentional physical contact with MEC require the preparation and approval of an Explosives Site Plan. This plan addresses areas (e.g., magazines) used to store commercial or military demolition explosives and/or MEC, planned or established demolition or disposal areas, the MRA and/or MRS response area boundaries and Explosive Safety Quantity-Distance (ESQD) maps, which are derived by the munition at the site with the greatest fragmentation distance (MGFD) in an explosion.

ESS – ESSs are used for a variety of purposes, to include:

- Execution of a MEC response action. The ESS provides the safety specifications for execution of the selected response alternatives, to include the application of LUCs, when such application is the only planned response. The ESSs accompany the ROD/DD to provide a complete understanding of the activities and safety measures to be taken to ensure that the response is protective of human health and the environment and that it is conducted in the safest possible manner.
- Execution of a TCRA. A streamlined version of the ESS is available for TCRAs.

- Construction Support. When construction support is being conducted at a site and the probability of encountering MEC is considered moderate or high, an ESS is required.
- No Further Action Decision at an MRS. An ESS is required if the MRS response alternative is a NFA recommendation. However, only the following information must be provided: site identifier, site location, and justification for the decision.
- Site Characterization or investigation (i.e., EE/CA or RI/FS). While an Explosives Site Plan may meet the safety requirements at a site with little information, sites with a greater quantity of munitions information may choose to submit an ESS rather than a site plan.

CSP – Investigations or site characterization activities (i.e., SI, EE/CA or RI/FS) that involve the intentional physical contact with chemical agent, regardless of its configuration, require the preparation and approval of a CWM Site Plan. This plan addresses areas (e.g., magazines) used to store commercial or military demolition explosives and/or CA, regardless of its configuration, planned or established demolition or disposal areas, the MRA and/or MRS response area boundaries and ESQD maps, if applicable.

CSS – CSSs are used for a variety of purposes, to include:

- Execution of a CWM response action (remedial or removal). The CSS provides the safety specifications for execution of the selected response alternatives, to include the application of LUCs, when such application is the only planned response. The CSSs accompany the ROD/DD to provide a complete understanding of the activities and safety measures to be taken to ensure that the response is protective of human health and the environment and that it is conducted in the safest possible manner.
- Execution of a TCRA. A streamlined version of the CSS is available for TCRA.
- Construction Support. When construction support is being conducted at a site and the probability of encountering CA, regardless of configuration, is considered moderate or high, a CSS is required.
- No Further Action Decision at an MRS. A CSS is required if the MRS response alternative is a NFA recommendation. However, only the following information must be provided: site identifier, site location and justification for the decision.
- Site Characterization or investigation. While a CWM Site Plan may meet the safety requirements at a site with little information, sites with a greater quantity of CWM information may choose to submit a CSS rather than a site plan.

7.2.3. Safety Submission Approval Processes. The approval process for Safety Submissions at Army installations varies depending on whether the installation is within the purview of IMCOM or is being overseen by an ACOM or the Army National Guard (ARNG).

IMCOM Installations.

- The installation prepares the submission.
- The installation forwards three copies of the submission to USATCES with a courtesy copy to the IMCOM safety office.
- The USATCES approves the submission and forwards one copy to DDESB for final approval.
- The DDESB reviews and provides final approval

ACOM or ARNG Installations.

- The installation prepares the submission.
- The installation forwards five copies of the submission to the ACOM or ARNG with courtesy copies to the appropriate safety office.
- The ACOM or ARNG submits three copies of the submission to USATCES.
- The USATCES approves the submission and forwards one copy to DDESB for final approval.
- The DDESB reviews and provides final approval.

For planning purposes, the anticipated review times are as follows; 60 to 90 days for USATCES and another 60 to 90 days for DDESB (total review and approval time is 4-6 months). An abbreviated safety submittal and expedited review is performed for TCRAs (total review and approval time is anticipated to be less than a month). The project team should anticipate these review and approval times in order to appropriately plan future actions. The DDESB approval is required before implementation of the selected response can begin. Site preparation activities (e.g., surveying, identifying sampling locations, and locating anomalies) may be conducted while awaiting DDESB approval of a safety submittal. The use of anomaly avoidance techniques and the appropriate safety precautions, allows site investigative activities such as site visits, surface and intrusive sampling, and engineering studies, to occur without DDESB approval.

7.2.4. Safety Submittal Amendments. Amendments, which require DDESB approval before the affected munitions response can continue, are only required when a change to an approved ESS or CSS increases explosives safety or CA risks, identifies requirements for

additional or increased explosive or CA hazard controls, or increases or decreases an ESQD arc. Most amendments to DDESB-approved ESSs/CSSs do not require resubmission of the complete submission package. However, sufficiently detailed information must be submitted to identify the specific ESS/CSS or site plan being amended, the affected portions, and the precise amendments. The following changes necessitate a safety submittal amendment:

- Constraints in funding, technology, access, and other site-specific conditions that impact the degree of removal addressed in the approved ESS/CSS.
- Any increase or decrease of the ESQD arcs.
- Change in operations requiring explosives siting.
- Change in planned end use of the property.
- Change in planned land use restrictions.

7.2.5. Safety Submittal Corrections. Corrections, which do not require approval by DDESB, address changes to an approved safety submittal that do not increase explosives safety or CWM risks or exposures. These minor corrections may be made by letter to DDESB. Corrections should be submitted to the chain of command for information only. Corrections are primarily administrative in nature and provided for informational purposes. An example of a minor correction is a decrease in acreage to be remediated.

7.3. MUNITIONS EMERGENCY RESPONSE.

Explosives or munitions emergency responses, which may occur at any time during a munitions response to address an actual or potential imminent threat to human health or the environment, are not formally part of DoD's CERCLA-based munitions response process and are not eligible for MMRP funding. For this reason, this guide discusses this special category of response.

An explosive or munitions emergency response includes any immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential explosives threat to people or property. Examples of MEC emergency response include:

- A rifle grenade is discovered by a contractor in the rough of a golf course. An EOD team responds and blows the item in place.
- A utility worker uncovers an old rocket while excavating a utility line. An EOD team responds, safely removes the item from the excavation, and blows it up on the installation's OB/OD range.

Within DoD, only DoD EOD personnel and, in some cases, TEU personnel will respond to military or civilian authority requests for support of an explosives or munitions emergency. The Military Munitions Rule exempts explosives or munitions emergency response specialists from compliance with the generator, transporter, treatment, storage, disposal, and permitting requirements of RCRA during immediate responses to explosives or munitions emergencies. If an immediate response is not required (i.e., the response can be delayed without increasing the risk to human health or the environment), an emergency permit, issued for a specific time and specific place, may be required by the state's environmental regulators and health and safety officials. Explosives and munitions emergency responses can occur either on or off an active military installation and at any time during the MMRP process. However, during an on-going MR project, an emergency response only occurs when an unforeseen munitions condition arises. Emergency responses are not a routine part of an MMRP response. Additional information on explosives or munitions emergency responses is available in the Department of Defense Policy to Implement the EPA's Military Munitions Rule.

7.4. CHEMICAL WARFARE MATERIAL.

CWM responses address MRSs that are known or suspected to contain CA-filled munitions and CA in other than munitions configurations. The MRSs that may require a CWM response are referred to as CWM sites. The CWM sites make up only a small portion of DoD's MRS inventory.

Because the conduct of CWM responses requires specialized technical expertise and procedures, this guidebook provides only a general discussion on how the MMRP applies to such sites. The CWM specific guidance and support can be obtained from the USACE CWM Design Center in Huntsville, Alabama.

The CWM responses are munitions responses and they follow the same general procedures as response actions to MEC, with some important distinctions as indicated below:

- A CWM response requires the submission of a CSS or CWM site plan to the DDESB for approval.
- Each CSS/CWM Site Plan must include a CWM site plan for an Interim Holding Facility (IHF) and, when the use of on-site destruction technology is planned, for the site at which those destruction activities will occur.
- Any recovered CWM (RCWM), suspected or confirmed, regardless of configuration, must be stored separately from serviceable munitions and from other MEC.
- When CA hazards are known or suspected to exist within a response area (e.g., the MRA or MRS), the CA downwind hazard must be considered when determining the minimum separation distance (MSD).

- A CSS is not required for certain activities on a site with a history of CA-related activities when an installation or district commander, or a command-designated representative, has approved a probability assessment finding for such activities stating that the probability of discovering CA is expected to be “seldom” or “unlikely.” However, the site safety and health plan (SSHP) must include contingency plans providing for the safe and expeditious evacuation of the site in the event CA is discovered.
- Should CA, regardless of configuration, be discovered during these activities, all on-site activities shall be halted until the need for a CWM response is evaluated and a decision is approved by the Service-level explosives safety office. If it is decided a CWM response is necessary, response actions that involve the intentional physical contact with CA, regardless of configuration, and/or the conduct of ground-disturbing or other intrusive activities in areas known or suspected to contain CA shall not begin until the required CSS or CWM site plan is approved by the DDESB.
- Should an unexpected CA discovery, regardless of its configuration, occur during munitions responses to MEC, all on-site activities shall be halted until the need for a CWM response is evaluated and a decision is approved by the Service-level explosives safety office. If it is decided that a CWM response is necessary for an unexpected CA discovery, response actions which involve the intentional physical contact with CA, regardless of configuration, and/or the conduct of ground disturbing or other intrusive activities in areas known or suspected to contain CA shall not begin until the required CSS or CWM site plan is approved by the DDESB.

7.5. IMPROVED CONVENTIONAL WEAPONS.

Munitions characterized by the delivery of two or more anti-personnel or anti-materiel and/or anti-armor sub-munitions are known as improved conventional munitions (ICM). These items are also sometimes referred to as sub-munitions. Because of the particular explosives safety concerns posed by ICM, installations or USACE Districts must obtain a waiver prior to taking actions in areas where ICM (or other sub-munitions) are known to be present.

Requests for waivers are submitted by the installation commander or USACE District according to Department of the Army Pamphlet 385–63, Range Safety. Heads of tenant activities will forward requests through the installation commander (IC). The request will require inclusion of:

- Purpose and scope of actions.
- Site location.
- Current, past, and proposed future property use and ownership.
- Site and terrain characterization.

- Origins of ICM as well as ICM and other munitions suspected on-site.
- Response and detection technologies planned for use.
- Explosives safety risks and controls.
- Explosives storage locations.
- Roles and responsibilities of organizations and personnel involved to include the TEU, Explosive Ordnance Disposal (EOD), and contractor support roles.
- The USATCES provides support in preparing waiver requests.

7.6. ANOMALY AVOIDANCE.

Anomaly avoidance refers to techniques employed by EOD or UXO-qualified personnel at MRSs known or suspected to contain MEC to avoid any potential surface or subsurface metallic anomalies. Surface and subsurface metallic anomalies are identified through visual or instrument-aided inspection and are avoided during investigation activities. Intrusive anomaly investigation is not authorized during anomaly avoidance operations, but the geographic location of anomalies and MEC should be noted for future investigation/response. Anomaly avoidance projects do not require safety submissions to USATCES or DDESB.

7.7. GEOPHYSICAL PROVE-OUT.

Geophysical prove-out (GPO) is used to determine the appropriateness of specified technologies and methods for geophysical investigation to achieve desired results for a munitions response situation. During GPO, geophysical systems are tested, evaluated, and demonstrated to confirm their capabilities as technology appropriate for site-specific conditions. This means that MEC items similar to those expected at the site are buried at different depths and the equipment is tested to see how well it can find the items and to see how well it can differentiate against non-MEC items such as buckets and debris. In this test, a land area with characteristics similar to the MRS area to be searched is planted with MEC-like or inert munitions and non-MEC items. The MEC items used in the GPO should be similar to those expected to be found at the MRS and should be placed at various depths and orientations throughout the GPO grid. The same geophysical equipment to be used during the geophysical survey at the MRS is used during the GPO. This test can then evaluate the ability of the geophysical equipment to accurately identify MEC below the surface in the same environment as the MRS. Geophysical investigators can use the data quality objective (DQO) process to specify what data and information is needed from the technologies, enabling the design of data collection to capture the right information.

In general, GPO follows the steps similar to those used to establish and execute a remedy during a munitions response:

- Design: develop objectives, select site and design, and prepare work plan.
- Construction: prepare site and plant test objects for detection.
- Implementation: test candidate or proposed detection systems.
- Reporting: document performance of candidate technologies.

Sufficiency of geophysical technologies and methods to perform at assigned locations and conditions is measured in terms of the probability of detection (Pd), the false alarm rate (FAR) (i.e., potential for false positive identification of presence or location of MEC), the ability to detect MEC as depth increases, and the capacity to discriminate among types of MEC and non-MEC items. All of these performance characteristics must also be weighed against the speed and cost of the detection and discrimination capability needed for the site.

7.8. DISPOSITION OF MEC.

There are no fail-safe procedures for moving, rendering safe, or destroying MEC, but merely procedures considered less dangerous. Destruction-in-place or Blow-in-place (BIP) is the least dangerous and, therefore, the preferred method of MEC disposal. The Army is responsible for protecting the surrounding people, property, and the environment from potential explosive or CA hazards at an MRS. The Army is equally responsible for protecting personnel who respond to address such hazards.

The Army response personnel must work collaboratively with regulators and safety officials to resolve differences concerning the disposition of MEC. Should disposition of MEC be delayed, protective measures (e.g., ESQD arcs, MSDs) must be maintained throughout the delay.

7.8.1. MEC Handling Qualifications. Only UXO-qualified personnel will perform intrusive MEC investigations. Detected MEC will be identified and detonated in place per DoD general practice. Exceptions to this general practice can only be made by technically qualified individuals who have determined that the risks associated with alternative actions (e.g., movement) are acceptable and comparable to those associated with employing BIP procedures (see DDESB Technical Paper (TP) 18, Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel). Exceptions must be approved with management and safety controls in place.

7.8.2. Disposition of Chemical Agent-filled MEC or Munitions with an Unknown Liquid Fill. Because of the potential downwind hazard, the DoD general practice of BIP does not normally apply to UXO known or suspected to contain CWM or for which the liquid fill cannot be determined. By policy, the responsible DoD Component, at the Deputy Assistant Secretary

level, may specifically approve exceptions. Such exceptions should only be approved after discussions with appropriate elected representatives and/or environmental regulators and safety officials from those communities that could potentially be impacted by the munitions disposition. The installation must make sure that protective measures to ensure explosives safety are maintained during any delay in disposition.

7.9. ENGINEERING CONTROLS FOR EXPLOSIVE SAFETY.

Engineering controls are used to mitigate the effects of unintentional or intentional detonation that occur during responses to MEC. The DDESB-approved engineering controls can be used to improve personnel safety, to reduce the MSD, or to limit the ESQD arc.

The engineering control most used to mitigate the impact of an unintentional detonation is the placement of barricades. Barricades are designed to capture fragmentation and reduce overpressure from detonations. The project team should design barricades per approved DoD standards.

The most common engineering controls used during intentional detonations are either soil cover or sandbags. If soil is proposed to be used, the project team may use one of several computerized models to determine the required thickness of soil cover necessary for the intentional detonation. The use of soil as an engineering control reduces the fragment and soil ejected distances. Sandbags may be used for a munitions item no larger than 155mm.

Another engineering control that may be proposed for on-site intentional detonation of certain types of recovered munitions, which qualified personnel have determined can be moved with an acceptable level or risk, is the DDESB-approved ordnance demolition container. This container is designed to contain all significant explosion pressures for a total net explosive weight (NEW) of up to 6 lb of TNT or its equivalent. The ordnance demolition container is designed to capture all fragmentation from certain munitions with fragmentation characteristics up to those of an 81mm mortar.

Another DDESB-approved engineering control that may be proposed for use for intentional detonation of certain types of recovered munitions, which qualified personnel have determined can be moved with an acceptable level of risk, is the T-10, T-25 or T-60 portable contained detonation chamber (CDC). The container is designed to contain all significant explosion pressures for a specified NEW based on chamber size. The CDC is designed to capture all fragmentation from certain munitions with defined fragmentation characteristics including some munitions that contain white phosphorus.

7.10. MATERIAL POTENTIALLY PRESENTING AN EXPLOSIVE HAZARD (MPPEH).

There is a high probability that MPPEH may be present on a MRS. MPPEH is a broad category of materials and includes the following:

- Material potentially containing explosives or munitions (e.g., munitions containers and packaging material; munitions debris remaining after munitions use, demilitarization, or disposal; and range-related debris).
- Material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization, or disposal operations).

It may be very hard for someone without the appropriate training to discern what materials on an MRS are or are not considered MPPEH. Due to its explosive potential, MPPEH is dangerous and regulations for its identification and disposal have been prepared (DoDI 4140.62 *Material Potentially Presenting an Explosive Hazard* and DoD 6055.9-STD *Ammunition and Explosives Safety Standards*). The following is a brief summary of MPPEH management requirements.

MPPEH will be managed and processed (e.g., identified, consolidated, stored, handled, and transported,) to prevent its unauthorized use, transfer, or release and to protect personnel and property from uncontrolled exposures to potential explosive hazards. Prior to MPPEH transfer within DoD or release from DoD control, technically qualified personnel certified by the installation commander or responsible authority will either:

- Perform an initial 100% visual inspection and an independent 100% re-inspection
or
- Perform processing by DDESB-approved means with appropriate post-processing inspection (e.g., sampling)

After technically qualified personnel have inspected or processed the material, they will document the explosives safety status of the material as either:

- Safe. Material documented as safe (MDAS) is MPPEH that has been assessed and documented as not presenting an explosive hazard and for which the chain of custody has been established and maintained. This material is no longer considered to be MPPEH.
or
- Explosive Hazard. Material documented as an explosive hazard (MDEH) is MPPEH that cannot be documented as MDAS, that has been assessed and documented as to the maximum explosive hazards the material is known or suspected to present, and for which the chain of custody has been established and maintained. This material can only be transferred to a qualified receiver and is no longer considered to be MPPEH.

MPPEH generating components must segregate MPPEH that is awaiting documentation of its explosives safety status from material that has been documented as either hazardous (i.e., MDEH) or safe (i.e., MDAS). MPPEH generating components and qualified receivers must also segregate material documented as safe from material documented as hazardous. To prevent commingling, use a suitable combination of methods such as controlled access areas, separate storage locations within the storage site, moveable signs and ribbon barriers, locked gates and facilities, locked containers, waterproof documentation of explosive safety status attached to boxes, container seals traceable to the transfer documentation, or other locally approved methods included in written operating procedures.

MPPEH generating components must ensure the integrity of explosives safety documentation by maintaining chain of custody and accountability records for the documented material until it is released from DoD control. A legible copy of the explosives safety documentation must accompany documented material upon its transfer out of DoD control. If the chain of custody is broken while the material is still under DoD control, the explosives safety documentation is no longer valid. The affected material is considered MPPEH and must undergo either re-inspection or reprocessing by DDESB-approved methodology. The explosives safety status of such material and the chain of custody must be re-established.

All internal cavities of MPPEH must be vented prior to transfer or release as part of the disposition process. The only exception is when the receiver is qualified to receive the material and has undergone an explosives risk evaluation that evaluates the adequacy of their management controls (e.g., training, oversight, record keeping) and operations (e.g., processing methods, equipment, storage facilities). When internal cavities are not vented prior to transfer or release, the qualified receiver must be notified in writing of their existence and of the potential explosive hazards. When practicable, military munitions or wholly inert munitions items will not resemble munitions upon their release from either DoD or a qualified receiver.

Locations used for collected MPPEH processing operations (e.g., consolidation, inspection, sorting, storage, transfer, release) must have explosives safety siting approval. DDESB site approval is not required for locations on operational ranges that are used temporarily during range clearance activities for intermediate management of collected MPPEH (MPPEH collection points) prior to transfer to a MPPEH processing. Containers and holding areas for material being processed must be secured and clearly marked as to the explosive hazard, if any, that may be present and processed in a manner that maintains chain of custody and prevents MPPEH from being commingled with other material.

7.11. MUNITIONS AND EXPLOSIVES OF CONCERN HAZARD ASSESSMENT (MEC HA).

The MEC HA was developed in 2008 by a Technical Work Group chaired by EPA and made up of representatives from DoD, the US Department of Interior, the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), and the Tribal Association for Solid

Waste and Emergency Response. The purpose of the MEC HA is for assessing potential explosive hazards to human receptors at MRSs. The MEC HA does not address environmental or ecological concerns.

The MEC HA is a tool used to evaluate a site's explosive hazard, compare the effects of alternatives identified in the alternatives analysis and/or evaluate changes to land use on the explosive hazard of an MRS. It is used in the RI and again during the evaluation of baseline hazards in both EE/CAs and FSs. The MEC HA is not equivalent to the MRSPP, but rather supplements the MRSPP. The MEC HA satisfies the requirement to establish a baseline hazard assessment.

Although the Army was involved in its creation, several legal issues were identified that prevented the Army from concurring with the MEC HA. However, in Dec 08, the Army decided to approve the use of the MEC HA for a 2-year trial run (during 2009 and 2010). DASA(ESOH) has requested that any installations that use the tool during this timeframe provide written comments on its strengths and weaknesses to their office. After this trial run is over, the Army will evaluate the results and determine whether it should be approved for continued use or dropped from use totally.

This page left blank

Appendix A

References.

Cullison, English, Furlong, and Turkeltaub 1996. Relative Risk Site Evaluation Primer, 30 July.

DDESB 2004. Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel, TP 18, 20 December.

DoD 2004a. Environmental and Explosives Safety Management on Operational Ranges Within the United States, DoDD 4715.11, May 10.

DoD 2004b. Environmental and Explosives Safety Management on Operational Ranges Outside the United States, DoDD 4715.12, July 12.

DoD 2004c. Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH), DoDI 4140.62, December 3.

DoD 2005. Environment, Safety, and Occupational Health (ESOH), DoDD 4715.1E, March 19.

DoD 2006, DoD Financial Management Regulation, DoD 7000.14-R, Volume 2B, Chapter 13. "Defense Environmental Restoration.", June

DoD 2008. DoD Ammunition and Explosives Safety Standards, DoD 6055.09-STD, February 29.

EPA 1997. Military Munitions Rule, Federal Register: February 12, Volume 62, Number 29, Pages 6621-6657.

EPA 2000. Guidance for the Data Quality Objectives Process, EPA/600/R-96/055, August.

EPA 2003. Handbook on the Management of Ordnance and Explosives at Closed, Transferred, and Transferring Ranges, Draft, EPA 505-B-01-001.

HQDA 2000. The Army Safety Program, AR 385-10, 29 February.

HQDA 2001. The Army Chemical Agent Safety Program, AR 385-61, 12 October.

HQDA 2002. Environmental Protection and Enhancement, DA PAM 200-1, 17 January.

HQDA 2003. Chemical Accident or Incident Response and Assistance (CAIRA) Operations, DA PAM 50-6, 26 March.

Appendix A

References. (Cont)

HQDA 2005. Real Property Master Planning for Army Installations, AR 210-20, 16 May.

HQDA ACSIM 2004. Army Defense Environmental Restoration Program: Management Guidance for Active Installations, 22 November.

OSD 2001. Management Guidance for the Defense Environmental Restoration Program, September.

USACE 1998. Technical Project Planning (TPP) Process, EM 200-1-2, 31 August.

USACE 2003. Explosives Safety Submission, EP 385-1-95b, 28 March.

USACE 2005. Ordnance and Explosives Toolbox: Safety Technologies for OE Programs.

USACE 2006, Engineering and Design – Ordnance and Explosives Response Proponent, EP 1110-1-18, 3 April.

USAEC 1998. US Army Restoration Advisory Board and Technical Assistance for Public Participation Guidance, April.

USAEC 2001. Interim Land Use Controls (LUCs) Management Plan, August.

USAEC 2004a. "Army Environmental Database – Restoration Module (AEDB-R)."

USAEC 2004b. User Manual for Army Environmental Database-Restoration (AEDB R), Version 2, 29 October.

US Army Engineering and Support Center 1998. Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions, HNC-ED-CS-S-98-7, August.

Appendix B

Definitions.

Active Installation - An active installation is an installation under the custody and control of DoD to include operating installations, installations in a standby or layaway status, and installations awaiting closure.

Anomaly - An anomaly is any item that is seen as a subsurface irregularity after geophysical investigation. This irregularity should deviate from the expected subsurface ferrous and non-ferrous material at a site (pipes, power lines, etc.).

Anomaly Avoidance - Techniques employed on property known or suspected to contain MEC or CA, regardless of configuration, to avoid contact with potential surface or subsurface explosive or CA hazards, to allow entry to the area for the performance of required operations.

Army Environmental Database–Restoration (AEDB-R) - AEDB-R is a reporting system and a centralized and integrated collection of Army environmental data and cost-to-complete estimates used by active Army and BRAC installations.

Base Realignment and Closure (BRAC) - BRAC is a program governing the scheduled closing of DoD sites (Base Closure and Realignment Act of 1988, Public Law 100-526, 02 Stat. 2623, the Defense Base Closure and Realignment Act of 1990, Public Law 101-510, 104 Stat. 1808, etc.).

Building Demolition/Debris Removal Program - The Building Demolition/Debris Removal Program provides funds for the demolition and removal of unsafe buildings or structures at installations and formerly-owned or used properties.

Chemical Safety Submission (CSS) - A CSS provides safety specifications for conducting work activities during a CWM response. It details the scope of the project, planned work activities, potential site hazards, and methods of controlling the hazards. A Safety Submission is required when removal activities (e.g., surface removal of RCWM or excavations when the intent is to uncover, characterize, and remove geophysical anomalies that have the potential to be RCWM items) will be performed (USACE 2002a).

Chemical Warfare Materiel (CWM) - Items generally configured as a munition containing a chemical compound that is intended to kill, seriously injure, or incapacitate a person through its physiological effects. The CWM includes V- and G-series nerve agents or H-series (mustard) and L-series (lewisite) blister agents in other-than-munition configurations; and certain industrial chemicals (e.g., hydrogen cyanide (AC), cyanogens chloride (CK), or carbonyl dichloride (called phosgene or CG)) configured as a military munition.

Appendix B

Definitions. (Cont)

Due to their hazards, prevalence, and military-unique application, chemical agent identification sets (CAIS) are also considered CWM. The CWM does not include riot control devices, chemical defoliants and herbicides; industrial chemicals (e.g., AC, CK, or CG) not configured as a munition; smoke and other obscuration producing items; flame and incendiary producing items; or soil, water, debris, or other media contaminated with low concentrations of CAs where no CA hazards exist.

Chemical Warfare Materiel (CWM) Response - CWM response includes munitions responses and other responses to address the chemical safety, explosives safety, when applicable, human health, or environmental risks presented by CWM regardless of configuration (see Munitions Response).

Chemical Warfare Materiel (CWM) Site Plan - A CWM Site Plan is required when an area is known or suspected to contain CWM to address requirements for an interim holding facility and, when the use of on-site CWM destruction technology is planned, for the site at which those destruction activities will occur.

Closed Range - A closed range is a military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a DoD component. Closed ranges cannot occupy an area that has been identified as an operational range. Closed ranges are those areas of land that used to be operational and are still owned by the US Army, but are now used for non-range purposes.

Community Relations Plan (CRP) - The CRP serves as the framework for establishing a successful information exchange with the public for munitions responses. The CRP follows guidelines set forth under CERCLA and SARA. Each CRP must be tailored to fit the individual site and situation and should also accommodate any site-specific agreements between the US Army and EPA or state environmental agencies. The CRP is not a static document and should be revised to reflect the project's development/ progress.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) - The CERCLA authorizes federal action to respond to the release or threatened release of hazardous substances into the environment or a release or threat of release of a pollutant or contaminant into the environment that may present an imminent or substantial danger to public health or welfare.

Appendix B

Definitions. (Cont)

Cost-to-Complete (CTC) – The DoD requires that all services develop a comprehensive estimate, by site, of the total cost for completing environmental cleanup under the IRP/MMRP.

Data Quality Objective (DQO) – The DQOs are project-specific statements that clarify the study objective, define the most appropriate type of data to collect, determine the most appropriate conditions from which to collect the data, and specify tolerable limits on decision errors (used in establishing the quantity and quality of data needed).

Decision Document (DD) – The DDs serve to provide the reasoning for the choice of or changes to a Superfund site cleanup plan. The DDs include Proposed Plans, RODs and ROD Amendments, Explanations of Significant Differences (ESDs), along with other associated memoranda and files. The DDs are required by Section 117 of CERCLA, as amended by SARA, for remedial actions taken pursuant to Sections 104, 106, 120, and 122. Sections 300.430(f)(2), 300.430(f)(4), and 300.435(c)(2) of the NCP establish the regulatory requirements for these DDs.

Defense Environmental Restoration Program (DERP) - Established in 1984, DERP promotes and coordinates efforts for the evaluation and cleanup of contamination at DoD installations.

Defense Site - Locations that are or were owned by, leased to, or otherwise possessed or used by DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used for or was permitted for the treatment or disposal of military munitions (10 USC 2710(e)(1)).

Discarded Military Munitions (DMM) – The DMM includes military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include UXO, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations (DoD and EPA 2000) (10 USC 2710(e)(2)).

DoD Explosives Safety Board (DDESB) – The DDESB is the DoD organization charged with promulgating ammunition and explosives safety policy and standards and reporting on the effectiveness of the implementation of such policy and standards.

Appendix B

Definitions. (Cont)

Engineering Evaluation/Cost Analysis (EE/CA) - An EE/CA is prepared for all NTCRAs as required by the NCP. The goals of the EE/CA are to identify the extent of a hazard, identify the objectives of the removal action, and analyze the various alternatives that may be used to satisfy these objectives for cost, effectiveness, and implementability.

Environmental Restoration, Army (ER,A) - The Defense Appropriation Act of 1984 established DERA to fund the IRP and MMRP for DoD installations within the Continental United States. Beginning in FY97, DERA was devolved into five separate accounts, one for each military department, a defense-wide account for defense agencies, and the FUDS program. The Army transfer account is known as ER,A (HQDA ACISM 2004).

Explosive Ordnance Disposal (EOD) – The EOD is the detection, identification, field evaluation, rendering safe, recovery, and final disposal of UXO or munitions.

Explosives or Munitions Emergency Response - Explosives or munitions emergency response includes all immediate response activities by an explosives and munitions emergency response specialist to control, mitigate, or eliminate the actual or potential threat encountered during an explosives or munitions emergency. An explosives or munitions emergency response may include in-place treatment or destruction of the explosives or munitions, and/or transporting those items to another location to be rendered safe, treated, or destroyed. Any reasonable delay in the completion of an explosives or munitions emergency response caused by a necessary, unforeseen, or uncontrollable circumstance will not terminate the explosives or munitions emergency. Explosives and munitions emergency responses can occur on either public or private lands and are not limited to responses at RCRA facilities (Military Munitions Rule).

Explosive Site Plan - An Explosive Site Plan is a document that serves as the specification for conducting munitions response activities involving MEC. The plan addresses the areas used to store commercial/military explosives, demolition or disposal areas, MRS site and boundary and ESQD maps.

Explosives Safety Submission (ESS) - An ESS is a document that serves as the specification for conducting munitions response activities involving MEC. The ESS details the scope of the project, planned response activities, potential hazards (including the maximum credible event), and methods for their control. It is more comprehensive than an Explosive Site Plan.

Appendix B

Definitions. (Cont)

Explosive Soil - Explosive soil refers to mixtures of explosives in soil, sand, clay, or other solid media at concentrations such that the mixture itself presents an explosive hazard, generally considered to be 10% explosives or greater.

Finding of Suitability to Lease (FOSL) - A FOSL is the document that conveys the results of the evaluation process used to determine that DoD property is environmentally suitable to lease. The determination of suitability to lease property is made only when the intended use of the leased property is consistent with protection of human health and the environment and will not interfere with any existing or planned environmental restoration activities (DoD 1996d).

Formerly Used Defense Sites (FUDS) – The FUDS include those properties previously owned, leased, or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense; or manufacturing facilities for which real property accountability rested with DoD but were operated by contractors (government owned, contractor operated) and which were later legally disposed of.

Health Hazard Evaluation (HHE) – The HHE is one of the three modules in the Military Munitions Response Prioritization Protocol used by all DoD components to evaluate prioritize Munitions Response Sites for funding. A HHE evaluates MC at an MRS in relation to other sites.

Historical Records Review (HRR) – The HRR is the collection, analysis, and documentation of historical information pertaining to an MRS to provide the basis for the MRS investigation and response. The HRR replaces the ASR as the means of conducting historical review of potential MRS or IRP site (ITRC 2003).

Installation Action Plan (IAP) - The IAP outlines the total multi-year integrated, coordinated approach to achieving an installation's restoration goals. The IAP is a living document that is updated annually.

Installation Restoration Program (IRP) - The IRP for active (non-closing) Army installations is authorized by the DERP, codified in 10 USC 2701–2708 and 2810. It is implemented subject to and in a manner consistent with CERCLA, as amended by SARA and CERCLA's implementing regulation, the NCP, codified in 40 CFR 300. Although CERCLA drives the IRP, RCRA is applicable to numerous IRP projects.

Appendix B

Definitions. (Cont)

Land Use Control (LUC) - Land use controls are legal, physical, or administrative mechanisms that restrict the use of, or limit access to, real property to manage risks to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to real property, such as fences or signs.

Material Potentially Presenting an Explosive Hazard (MPPEH) – The MPPEH is material potentially containing explosives or munitions (e.g., munitions containers and packaging material, munitions debris remaining after munitions use, demilitarization, or disposal, and range-related debris) or material potentially containing a high enough concentration of explosives such that the material presents an explosive hazard (e.g., equipment, drainage systems, holding tanks, piping, or ventilation ducts that were associated with munitions production, demilitarization, or disposal operations). Excluded from MPPEH are munitions within DoD's established munitions management system and other hazardous items that may present explosion hazards (e.g., gasoline cans, compressed gas cylinders) that are not munitions and are not intended for use as munitions.

Military Munitions - Military munitions are all ammunition products and components produced for or used by armed forces for national defense and security, including ammunition products or components under the control of DoD, the US Coast Guard, the US Department of Energy, and the National Guard. The term military munitions includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components of the above.

The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 USC 2011 et seq.), as amended, have been completed (10 USC 101(e)(4)(A) through (C)).

Military Range (or “Range”) - A military range, as used in the Military Munitions Rule (40 CFR 266.201), is “Designated land and water areas set aside, managed, and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordnance or weapons systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test

Appendix B

Definitions. (Cont)

pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.”

Munitions Constituents (MC) – The MC includes any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 USC 2710(e)(3))

Munitions Debris - Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Munitions and Explosives of Concern (MEC) - This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means (1) UXO, as defined in 10 USC 101(e)(5)(A) through (C); (2) DMM, as defined in 10 USC 2710(e)(2); or (3) MC (e.g., TNT, RDX), as defined in 10 USC 2710(e)(3), present in high enough concentrations to pose an explosive hazard.

Munitions Response - Response actions, including investigation, removal actions, and remedial actions to address the explosives safety, human health, or environmental risks presented by UXO, DMM, or MC.

Munitions Response Area (MRA) - Any area on a defense site that is known or suspected to contain UXO, DMM, or MC. Examples include former ranges and munitions burial areas. An MRA is comprised of one or more MRSs.

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

National Oil and Hazardous Substance Pollution Contingency Plan (NCP) - The NCP provides the regulatory framework for responses under CERCLA. The NCP designates DoD as the removal response authority for explosive hazards associated with military munitions.

Non-Time Critical Removal Action (NTCRA) – The NTCRAs are actions initiated in response to a release or threat of a release that poses a risk to human health, welfare, or the environment. Initiation of removal cleanup actions may be delayed for 6 months or more (USACE 2000b).

Operational Range - An operational range is a range that is under the jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities or, although not currently being used for range activities, is still considered by the Secretary

Appendix B

Definitions. (Cont)

to be a range and has not been put to a new use that is incompatible with range activities (10 USC 101(e)(3)(A) and (B)). Also includes “military range,” “active range,” and “inactive range” as those terms are defined in 40 CFR 266.20.

Qualified Receiver - A qualified receiver includes entities that have personnel who are, or individuals who are, trained and experienced in the identification and safe handling of used and unused military munitions, and any known or potential explosive hazards that may be associated with the MPPEH they receive; and are licensed and permitted or otherwise qualified to receive, manage, and process MPPEH.

Quantity-Distance - Quantity-distance is defined as the quantity of explosives material and distance separation relationships that provide defined types of protection. These relationships are based on levels of risk considered acceptable for the stipulated exposures and are tabulated in the appropriate quantity-distance tables provided in DoD 6055.09, DoD Explosives Safety Board (DDESB) and DoD Component Explosives Safety Responsibilities. Separation distances are not absolute safe distances but are relative protective safe distances. Greater distances than those shown in the quantity-distance tables will be used whenever possible.

Range - A range is a designated land or water area that is set aside, managed, and used for range activities of DoD. The term includes firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access, and exclusionary areas. The term also includes airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration (10 USC 101(e)(1)(A) and (B)).

Range-Related Debris - Range-related debris is debris, other than munitions debris, collected from operational ranges or from former ranges (e.g., targets).

Recovered Chemical Warfare Materiel (RCWM) – The RCWM is CWM that as a result of a munitions response or other actions has been recovered (USACE 2002a).

Remedial Action Cost Engineering and Requirements (RACER) – The RACER is the primary tool for preparing programming cost estimates for environmental remediation.

Remedial Project Manager (RPM) - An RPM is the official designated by the lead agency to coordinate, monitor, and direct remedial or other response actions (DoD and EPA 2000).

Appendix B

Definitions. (Cont)

Resource Conservation and Recovery Act (RCRA) – The RCRA is the federal statute that governs the management of all hazardous waste from cradle to grave. The RCRA covers requirements regarding identification, management, and cleanup of waste, including (1) identification of when a waste is solid or hazardous; (2) management of waste - transportation, storage, treatment, and disposal; and (3) corrective action, including investigation and cleanup, of old solid waste management units (DoD and EPA 2000).

Small Arms Ammunition - Small arms ammunition includes ammunition, without explosive-containing projectiles (other than tracers), that is .50 caliber or smaller, or for shotguns.

Stakeholders - Stakeholders include federal, state, and local elected or appointed officials, community organizations, property owners, and others directly or indirectly impacted by the potential hazards present, munitions response activities, or the sufficiency and/or protectiveness of the response.

Superfund Amendments and Reauthorization Act (SARA) - Enacted in 1986, this legislation establishes standards for cleanup activities, requires federal facility compliance with CERCLA, and clarifies public involvement requirements.

Technical Escort Unit (TEU) – The TEU is a DoD organization manned with specially trained personnel that provide verification, sampling, detection, mitigation, render safe, decontamination, packaging, escort, and remediation of chemical, biological, and industrial devices or hazardous material.

Technical Assistance for Public Participation (TAPP) - The TAPP program provides community members of RABs and TRCs access to independent technical support through the use of government purchase orders. Community members of the RAB or TRC apply to the IC for independent assistance in interpreting scientific and engineering issues with regard to the nature of environmental hazards and restoration activities at the installation. The principal criterion for obtaining TAPP is that the technical assistance is likely to contribute to:

- The efficiency, effectiveness, or timeliness of environmental restoration activities at the installation or
- Community acceptance of environmental restoration activities at the installation (USAEC 1998b).

Appendix B

Definitions. (Cont)

Transferred Range - A transferred range is a military range that is no longer under military control and has been leased by DoD, transferred, or returned by DoD to another entity, including federal entities. This includes a military range that is no longer under military control, but that was once used by the US Army. This includes use under the terms of an executive order, special use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager.

Transferring Range - A transferring range is a military range that is proposed to be leased, transferred, or returned by DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An active range will not be considered a “transferring range” until the transfer is imminent.

Unexploded Ordnance (UXO) – The UXO includes military munitions that (1) have been primed, fuzed, armed, or otherwise prepared for action; (2) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material; and (3) remain unexploded either by malfunction, design, or any other cause (10 USC 101(e)(5)(A) through (C) and 40 CFR 266.201).

UXO-Qualified Personnel – The UXO-qualified personnel have performed successfully in military EOD positions or are qualified to perform in the following Department of Labor, Service Contract Act, Directory of Occupations, and contractor positions: UXO Technician II, UXO Technician III, UXO Safety Officer, UXO Quality Control Specialist, or Senior UXO Supervisor.

UXO Technicians – The UXO technicians are qualified for filling Department of Labor, Service Contract Act, Directory of Occupations, and contractor positions of UXO Technician I, UXO Technician II, and UXO Technician III.

Waste Military Munitions (WMM) - A military munition is a waste military munition if it has been identified as (1) solid waste per the Munitions Rule (as described in the RCRA regulations at 40 CFR 266.202 Subpart M) or (2) hazardous waste per the RCRA regulations at 40 CFR 261 Subpart C or D (i.e., either listed as hazardous or fulfilling the criteria for one or more of the hazardous characteristics— ignitability, corrosivity, reactivity, or toxicity).

Appendix C

Acronyms.

ACOM	Army Command
ACSIM	Assistant Chief of Staff for Installation Management
AEDB-R	Army Environmental Database–Restoration
AMC	Army Materiel Command
ARNG	Army National Guard
ASTSWMO	Association of States and Territorial Solid Waste Management Officials
BIP	Blow-in-Place
BRAC	Base Realignment and Closure
CA	Chemical Agent
CDC	Contained Detonation Chamber
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHE	Chemical Hazard Evaluation
CR	Compliance Restoration
CRP	Community Relations Plan
CSP	Chemical Site Plan
CSS	Chemical Safety Submission
CTC	Cost to Complete
CTT	Closed, Transferring, and Transferred
CWM	Chemical Warfare Materiel
DA	Department of the Army
DD	Decision Document
DDESB	Department of Defense Explosives Safety Board
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	US Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DSMOA	Defense States Memorandum of Agreement
ODUSD(I&E)	Deputy Under Secretary of Defense for Installations and Environment
EE/CA	Engineering Evaluation/Cost Analysis
EHE	Explosive Hazard Evaluation
EM	Engineer Manual
EOD	Explosive Ordnance Disposal
EPA	US Environmental Protection Agency
ER,A	Environmental Restoration, Army

Appendix C

Acronyms. (Cont)

ERIS	Environmental Restoration Information System
ESQD	Explosives Safety Quantity-Distance
ESP	Explosives Site Plan
ESS	Explosives Safety Submission
FAR	False Alarm Rate
FLPMA	Federal Land Policy and Management Act
FS	Feasibility Study
FUDS	Formerly Used Defense Site
FY	Fiscal Year
GPO	Geophysical Prove-Out
HHE	Health Hazard Evaluation
HMX	Cyclotetramethylene Tetranitramine
IAP	Installation Action Plan
ICM	Improved Conventional Munitions
IHF	Interim Holding Facility
IMCOM	Installation Management Command
IRP	Installation Restoration Program
LTM	Long-Term Management
MC	Munitions Constituents
MDAS	Material Documented as Safe
MDEH	Material Documented as an Explosive Hazard
MEC	Munitions and Explosives of Concern
MEC HA	Munitions and Explosives of Concern Hazard Assessment
MGFD	Munition with the Greatest Fragmentation Distance
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MR	Munitions Response
MRA	Munitions Response Area
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
MSD	Minimum Separation Distance
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDAI	No DoD Action Indicated
NDNODS	Non-Department of Defense Owned Non-Operational Defense Site
NEW	Net Explosive Weight
NFA	No Further Action
NGB	National Guard Bureau
NTCRA	Non-Time Critical Removal Action

Appendix C

Acronyms. (Cont)

OB/OD	Open Burn/Open Detonation
ODUSD(I&E)	Office of the Deputy Under Secretary of Defense (Installations and Environment)
OE	Ordnance and Explosives
OSD	Office of the Secretary of Defense
PA	Preliminary Assessment
Pd	Probability of Detection
PCDR	Permanent Cleanup Document Repository
QA	Quality Assurance
RAB	Restoration Advisory Board
RACER	Remedial Action Cost Engineering and Requirements
RAO	Remedial Action Objective
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RCWM	Recovered Chemical Warfare Materiel
RDX	Cyclotrimethylene Trinitramine
READ	Repository of Environmental Army Documents
RI	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
ROE	Right of Entry
RPM	Remedial Project Manager
RRSE	Relative Risk Site Evaluation
SARA	Superfund Amendments and Reauthorization Act
SI	Site Inspection
SSHP	Site Safety and Health Plan
TAPP	Technical Assistance for Public Participation
TCRA	Time-Critical Removal Action
TEU	Technical Escort Unit
TNT	Trinitrotoluene
TP	Technical Paper
TPP	Technical Project Planning
USACE	US Army Corps of Engineers
USACE EM CX	USACE, Environmental and Munitions Center of Expertise
USACHPPM	US Army Center for Health Promotion and Preventive Medicine
USAEC	US Army Environmental Center
USATCES	US Army Technical Center for Explosives Safety
UXO	Unexploded Ordnance