DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
441 G Street, NW
Washington, D.C. 20314-1000

* ER 1110-1-8153

CEMP-CED

Regulation
No. 1110-1-8153

15 October 2020

Engineering and Design
MILITARY MUNITIONS SUPPORT SERVICES ROLES AND RESPONSIBILITIES

1. Purpose. This regulation, in conjunction with the programmatic requirements, roles, and responsibilities established in other Engineering Regulations (ERs), Memoranda of Agreement (MOA) or Understanding (MOU), and other controlling policy or guidance documents for the programs which execute Military Munitions Support Services (M2S2) activities, establishes policies and responsibilities regarding the efficient use and coordination of technical resources within the U.S. Army Corps of Engineers (USACE). The foundation of USACE environmental work is the Environmental Operating Principles as specified in ER 200-1-5.

2. Applicability. This regulation applies to all Headquarters, U.S. Army Corps of Engineers (HQUSACE) elements and all USACE organizations involved, directly or indirectly, with projects and activities which include a military munitions component or explosives safety related issue regardless of requiring agency or component. This document focuses on the coordination of USACE organizations for technical support of M2S2 activities.

3. Distribution Statement. Approved for public release; distribution is unlimited.

FOR THE COMMANDER:

JOHN P. LLOYD
COL, EN
Chief of Staff

1 Appendix
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*This regulation supersedes ER 1110-1-8153, dated 29 April 2016.

SUMMARY of CHANGE

ER 1110-1-8153
United States Army Corps of Engineers (USACE)

Engineering and Design: MILITARY MUNITIONS SUPPORT SERVICES (M2S2) ROLES AND RESPONSIBILITIES

This revision, dated 15 October 2020

- Reiterates requirements for USACE districts to engage and utilize the technical resources and services of an authorized Military Munitions Design Center (MMDC) in the planning and execution of USACE work where military munitions have been, will be, or are suspected to be encountered. This includes involvement in the acquisition process.

- Expands the definition of mandatory technical disciplines required to be on the project delivery team.

- Identifies minimum required training and experience an individual should have in order to be considered qualified to perform that function independently.

- Provides mentoring plans/checklists for use by individuals and their supervisors to track required training and mentoring activities in order to be considered M2S2 qualified to perform their designated mandatory functional role.

File this Summary Sheet in front of the publication for reference purposes

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3. Distribution Statement. Approved for public release; distribution is unlimited.

4. References. All referenced documents may be updated periodically, thus the most recent version of the applicable reference or the document which supersedes it should be used.

a. Department of Defense Instruction (DoDI) 4000.19, Support Agreements. https://www.esd.whs.mil/dd/

b. DoDI 4715.07, Defense Environmental Restoration Program. https://www.esd.whs.mil/dd/

c. Department of Defense Manual (DoDM) 4715.20, Defense Environmental Restoration Program Management. https://www.esd.whs.mil/dd/

d. Defense Explosives Safety Regulation (DESR) 6055.09, DESR. https://www.denix.osd.mil/ddes/home/

e. Army Regulation (AR) 350-19, The Army Sustainable Range Program. https://armypubs.army.mil/

f. Department of Army (DA) Pamphlet (PAM) 385-64, Ammunition and Explosives Safety Standards. https://armypubs.army.mil/
(Note: If work is performed for other agencies or components, agency or component specific explosives safety standards and regulations may apply.)

g. Deputy Assistant Secretary of the Army for Environmental Safety and Occupational Health (SAIE–ESOH) memorandum of 1 April 2009, Interim Guidance for Chemical Warfare Materiel Responses (or subsequent guidance provided by the Army as the Department of Defense (DoD) Executive Agent for

the Recovered Chemical Warfare Material (RCWM) Program within the United States or issued by DoD as a DoD issuance). Contact the Chemical Warfare Materiel (CWM) Design Center, see Table 2 for information. https://team.usace.army.mil/sites/HQ-MP/CE/FUDS/SitePages/Resources.aspx

h. ER 5-1-10, Corps-wide Area of Work Responsibility. https://www.publications.usace.army.mil/

i. ER 5-1-11, USACE Business Process. https://www.publications.usace.army.mil/

j. ER 10-1-22, U.S. Army Engineering and Support Center, Huntsville. https://www.publications.usace.army.mil/

k. ER 10-1-50, U.S. Army Corps of Engineers Environmental and Munitions Mandatory Center of Expertise. https://www.publications.usace.army.mil/

l. ER 200-1-5, Policy for Implementation and Integrated Application of the U.S. Army Corps of Engineers Environmental Operating Principles and Doctrine. https://www.publications.usace.army.mil/

m. ER 200-3-1, Formerly Used Defense Sites (FUDS) Program Policy. https://www.publications.usace.army.mil/

n. ER 385-1-95, Safety and Health Requirements for Operations and Activities Involving Munitions and Explosives of Concern (MEC) Operations. https://www.publications.usace.army.mil/

o. Engineer Manual (EM) 200-1-15, Technical Guidance for Military Munitions Response Actions. https://www.publications.usace.army.mil/

p. EM 385-1-97, Explosives Safety and Health Requirements Manual. https://www.publications.usace.army.mil/

q. Engineer Pamphlet (EP) 75-1-3, Recovered Chemical Warfare Materiel (RCWM) Response Process. https://www.publications.usace.army.mil/

r. HQUSACE Directorate of Military Programs (CEMP-CE) Memorandum, Subject: Environmental Division (ENV DIV), CEMP-CE Process for Endorsement of Command Service Executive (CSE) Validation Proposals for Environmental Program Acquisitions, dated 5 May 2019. https://team.usace.army.mil/sites/HQ-MP/CE/FUDS/SitePages/Resources.aspx

s. HQ USACE Directorate of Resource Management (CERM-F) Memorandum 2019-43, 26 Subject: Updated Accounting Policy for a Single/Multiple Award Task Order Contracts (SATOC/MATOC), dated 26 June 2019. https://team.usace.army.mil/sites/HQ-MP/CE/FUDS/SitePages/Resources.aspx

5. Records Management (Recording) Requirements. The records management requirement for all record numbers, associated forms, and reports required by this regulation are addressed in the Army Records Retention Schedule—Army (RRS-A). Detailed information for all related record numbers are in Army Records Information Management System (ARIMS)/RRS-A at https://www.arims.army.mil. If any record numbers, forms, and reports are not current, addressed, and/or published correctly in ARIMS/RRS-A, see Department of Army Pamphlet (DA PAM) 25-403, Guide to Recordkeeping in the Army.

6. Explanation of Abbreviations and Terms. Abbreviations/acronyms used in this regulation are explained in the Glossary.

7. Overview of Military Munitions Support Services.

a. The M2S2 activities consist of work performed by USACE involving military munitions responses or actions to address unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC), including conventional munitions and/or chemical warfare materiel, for range clearance operations, readiness support, explosives contaminated facilities, and support services during construction, dredging and environmental activities. M2S2 also includes activities in support of Outside the Continental United States (OCONUS) missions involving munitions (such as those performed in Iraq and Afghanistan).

b. The objective of M2S2 is to ensure that M2S2 activities are performed safely, consistently, and efficiently across the executing programs. This requires effective communication among project team members; full and appropriate utilization of existing military munitions response contracts; awareness of advances in technology; and control of total project costs. Three overarching imperatives should permeate all programs executing M2S2 work; 1) safety is the first priority, 2) quality is ensured by a trained and experienced M2S2 workforce, and 3) Project Delivery Teams (PDT), especially virtual PDTs, must be cohesive and well-coordinated. This guidance is intended to foster the institutionalization of these three imperatives within the execution of the programs which perform M2S2 activities. See Table 1.

Table 1
M2S2 Imperatives

1. Safety is the first priority for all USACE M2S2 work.
2. Quality is ensured by a trained and experienced M2S2 workforce.
3. PDTs delivering M2S2 are high performing virtual teams.

8. Policy.

a. The U.S. Army Corps of Engineers executes M2S2 work in accordance with applicable laws, regulations, policies, and specific program or sponsoring agency requirements. For example, Defense Environmental Restoration Program (DERP) Military Munitions Response Program (MMRP) projects will be conducted in accordance with DoDI 4715.07 Defense Environmental Restoration Program; DoDM 4715.20 Defense Environmental Restoration Program Management; (for FUDS) ER 200-3-1 Formerly Used Defense Sites Program Regulation and implementing guidance. In the event any conflicts arise between this guidance and the referenced regulations, standards, guidance or other agreements, such conflicts will be brought to the attention of the Environmental Division, HQUSACE and the appropriate National Program Manager (NPM). HQUSACE will provide guidance on the resolution of any such potential conflicts.

b. All USACE activities will be performed in accordance with the explosive's safety standards in DESR 6055.09 Defense Explosives Safety Regulation, DA PAM 385-64 Ammunition and Explosives Safety Standards, and ER 385-1-95 Safety and Health Requirements for Operations and Activities Involving MEC Operations, as applicable.

c. Elements of USACE performing reimbursable services for a customer outside of DoD or for another DoD component, must have a duly authorized and executed Memorandum of Agreement (MOA) in place to conduct that work in accordance with DoDI 4000.19 Support Agreements.

d. Military Munitions Support Services work conducted outside the United States or territories will be performed in accordance with applicable DoD and host nation requirements consistent with international agreements.

e. Program Management Plans are developed for all programs, and Project Management Plans (PMP) are utilized as the primary planning mechanism, management tool and roadmap for quality for all M2S2 work, in accordance with ER 5-1-11 USACE Business Process.

f. Districts are required to utilize the services of a Military Munitions Design Center (MMDC) for work that involves the potential to encounter munitions, to include planning, procurement, and execution. Military Construction (MILCON) and Civil Works contracts executed by USACE that may include incidental military munitions scope must be coordinated through a MMDC Chief.

g. Districts must engage and utilize the technical resources and services of an authorized MMDC in the planning and execution of USACE work where military munitions have been, will be, or are suspected to be encountered. See paragraph 14 and Appendix A.

h. Districts are required to keep National Program Managers (NPMs) informed on the status of MMRP projects and identify which MMDC is involved.

i. HQUSACE authorizes or establishes MMDCs for the purpose of ensuring the 3 imperatives are achieved for the delivery of M2S2 across all programs and projects therefore all USACE organizations conducting M2S2 activities must engage the services of a MMDC. This regulation authorizes five MMDCs; four for conventional munitions and one for CWM. See Table 2 for contact information.

(1) The four authorized Military Munitions Design Centers for conventional munitions include: Baltimore District (CENAB); Omaha District (CENWO); South Pacific and Southwestern Divisions Range Support Center (CESPD/CESWD-RSC); and Huntsville Center (CEHNC).

(2) The MMDC for CWM is located at CEHNC. The CWM Design Center is the only Design Center authorized to contract for or execute any phase of a CWM response project or to conduct associated Pre-Operational Surveys. Districts will not perform activities involving any Chemical Agent Identification Sets (CAIS) or Chemical Agent Contaminated Media (CACM). When encountering these items, districts are required to seek support from the CWM Design Center in Huntsville. An MRS that is known or suspected to contain CWM or CAIS is referred to as a CWM site. A munitions response at a CWM site is referred to as a CWM response. The Huntsville CWM Design Center is the only Design Center authorized to execute any phase of a CWM project. Army policy authorizes the handling, storage, and treatment of certain CAIS as hazardous material after it has been positively identified using non-intrusive means to determine if it is chemical agent (CA) or industrial compounds. Soil, water, debris or other media contaminated with low concentrations of CA are not CWM provided no CA hazards exist from these materials. Health-based environmental safety concentrations (HBESCs) are used to determine if a CA hazard exists in CACM. HBESCs are concentrations of individual CA in environmental media, which, if not exceeded, are unlikely to present a human health hazard for specific exposure scenarios.

Table 2
Points of Contact for MM and CWM Design Centers

Contact	Telephone Number
Baltimore District MMDC	410-962-2207
Omaha District MMDC	402-995-2736
South Pacific and Southwestern Division, Range Support Center MMDC	505-342-3475
Huntsville Center MMDC (Through written agreement, LRL supports the Huntsville MMDC)	256-895-1238
CWM Design Center (for reporting chemical events-USACE)	256-895-1598 (24hr) Voicemail only 256-895-1240 (Duty Hours)

j. The Engineering and Support Center of Expertise (EM CX) will review all FUDS MMRP acquisition packages for all base contracts and task orders in accordance with FUDS policy.

9. Organizational Structure.

a. Organizations and offices with M2S2 related functions include: HQUSACE, the Advisory Board, NPMs, Divisions/Regional Business Centers (RBC), MMDCs, Project Management (PM) Districts, the Engineering and Research Development Center (ERDC), and the EM CX.

b. The roles and responsibilities of the organizational elements which are involved in M2S2 activities are described in paragraphs 10-18 below. Such M2S2 roles and responsibilities often fall within the general roles and responsibilities already established in regulation and policy defining management or execution responsibilities.

c. Authorities for Corps-wide Areas of Responsibility are defined in ER 5-1-10.

d. Funding for M2S2 activities will be apportioned appropriately based upon the participants role and responsibility and the type of work being supported.

10. Headquarters, U.S. Army Corps of Engineers.

a. The responsibilities of HQUSACE include:

(1) Overall coordination and quality management of all programmatic activities.

(2) Development of USACE technical and safety guidance.

(3) Designation of NPMs.

b. The following HQUSACE organizations have primary responsibility for coordination, management, and oversight of M2S2 activities.

(1) Environmental Division. The Environmental Division is the HQUSACE organization assigned to coordinate M2S2 activities. It is responsible for the dissemination and coordination of M2S2 specific guidance to the executing programs and with organizational elements within USACE including safety, engineering, construction, counsel, real estate, public affairs, procurement, financial management, and Army policy or defense policy elements. The Environmental Division will:

(a) Scope, review, and approve development of M2S2 specific policy, guidance, and criteria documents for programs which fall within the management of the HQUSACE Environmental Division.

(b) Coordinate M2S2 policy issues within HQUSACE and with DA and other DoD elements.

(c) Develop procedures for the periodic evaluation of USACE MMDC to ensure they maintain technical capabilities to support and execute required M2S2 functions.

(d) Designate an individual within the Environmental Division to act as the M2S2 Action Officer to accomplish the following:

- Promote coordination and collaboration for all M2S2 issues.
- Ensure implementation of this ER.
- Track M2S2 workload and trends, through coordination with USACE NPMs.
- Through coordination with the Advisory Board and NPMs, provide recommendations to Chief, Environmental Division and to USACE senior leadership on M2S2 related issues.
- Participate in meetings with USACE, DA, and other DoD organizations, regulators, stakeholders, sponsoring agencies, and contractors to stay abreast of and communicate emerging policies, issues, or concerns.
- Work with the appropriate NPM and MMDC to coordinate USACE efforts when M2S2 assistance is requested from internal and external sources.
- Identify and share best practices for creating consistency and accountability within M2S2 programs.
- Plan, coordinate, and facilitate M2S2 Advisory Board meetings and act as chair in the absence of the Environmental Division chief.
- Keep all NPMs informed of new developments, technology, issues, and Army, DoD, requesting agencies and contractor concerns regarding M2S2.
- Refer concerns about individual programs or projects to the responsible NPM.
- Be the Environmental Division advocate for Command Service Executive (CSE) Validation for M2S2 acquisitions in coordination with NPMs.

(2) The Corps of Engineers Safety Office (CESO) is the HQUSACE point of contact for the explosives safety and occupational health program. CESO has responsibilities that include safety, occupational health, and other supporting issues related to the safe implementation and execution of the M2S2 activities under USACE management. Safety and occupational health requirements for M2S2 activities are currently specified in ER 385-1-95, Safety and Health Requirements for Operations and Activities Involving MEC Operations, and EM 385-1-97, Explosives Safety and Health Requirements Manual.

11. Advisory Board. The Advisory Board serves in an advisory capacity; providing recommendations to HQUSACE on organizational policy, technical and safety issues, resource allocation, and acquisitions. The Advisory Board meets quarterly, or as directed by its Chairperson, to discuss the delivery of M2S2. The Advisory Board is composed of:

a. Chairperson - Environmental Division Chief.

b. Environmental Division M2S2 Action Officer.

c. Chiefs of the five Military Munitions Design Centers.

d. Chief, Military Munitions Division from the Environmental and Munitions Center of Expertise.

e. Chief, DoD Environmental Programs Branch

f. Chief, Environmental Support Branch

g. Support, as needed, from NPMs, RBCs, EM CX, CESO, HQ USACE Office of Counsel, and ERDC.

12. Environmental and Munitions Mandatory Center of Expertise. The EM CX provides a key role in quality assurance of M2S2 through its support to the programs which request the CX's services or when a program is directed by regulation or policy to seek review or concurrence of its actions. The EM CX will provide a member to serve on the M2S2 Advisory Board.

13. Divisions or Regional Business Centers (RBC). Divisions provide command and control over PM Districts executing programs with M2S2 activities within their Area of Responsibility (AOR). Divisions also maintain command and control over authorized MMDC's within their organizational structure.

a. ER 5-1-10 will be followed by all USACE elements when asked to perform work outside their AORs. Divisions will monitor and coordinate District activities to ensure compliance with the Military Directorate Policy Memorandum; Adherence to Mission Assignments and Alignment of Acquisitions with Missions dated 20 May 2013 and subsequent revisions.

b. Divisions will ensure Districts are sustaining any local M2S2 resources used to fulfill the mandatory, technical, or support functional roles on M2S2 work (refer to Appendix B), monitor activities to ensure MMDCs are involved in projects as required, and ensure technical and contracting resources of an MMDC are included in PDTs as required or appropriate, using the appropriate appropriations for the mission being served.

c. Additionally, RBCs should adhere to the HQ USACE Directorate of Military Programs (CEMP-CE) Memorandum, 5 May 2019, Subject: Environmental Division (ENV DIV, CEMP-CE) Process for Endorsement of Command Service Executive (CSE) Validation Proposals for Environmental Program Acquisitions. This allows the Environmental Division to be the advocate for RBC acquisitions that have been accounted for in the RBCs Regional Environmental Acquisition Management Plans.

d. With respect to funding contract pre-award costs and minimum guarantees, RBCs should ensure that district offices adhere to HQ USACE Directorate of Resource Management (CERM-F) Memorandum 2019-43, 26 June 2019, Subject: Updated Accounting Policy for a Single/Multiple Award Task Order Contracts (SATOC/MATOC). Both documents are posted on the FUDS Portal at https://team.usace.army.mil/sites/HQ-MP/CE/FUDS/SitePages/Resources.aspx.

14. U.S. Army Engineering and Support Center, Huntsville. Sustains a conventional MMDC and CWM Design Center in accordance with ER 10-1-22 U.S. Army Engineering and Support Center, Huntsville. The Huntsville Center is also assigned:

a. Specified mission assignments for military munitions support to the Army's Sustainable Range Program per AR 350-19 The Army Sustainable Range Program.

b. Specified mission assignments for USACE M2S2 international contingency operations in support of U.S. and allied forces outside of the U.S. and its territories.

c. Range and Training Lands Mandatory Center of Expertise.

15. Military Munitions Design Centers. Authorized MMDCs provide project planning, procurement and execution services to the PM Districts. Districts are required to utilize the services of an MMDC for work that involves the potential to encounter munitions, to include planning, procurement, and execution. This work can include historical records review, site surveys, probability assessments, required explosives safety submissions, engineering controls design, scope/specifications development, independent government estimate, proposal evaluations, technical review of project submittals, field inspection and oversight, and MMDC reports and documentation review. The MMDCs will provide all personnel to fulfill the mandatory functional roles as defined in Appendix B, Table B-1, with the exception of the PM. The PM resides in the PM District. See PM District roles below for other exceptions. The MMDCs will:

a. Maintain qualified technical resources and contracting vehicles needed to support PM Districts for M2S2 related activities.

b. Assign an M2S2 qualified Technical Lead to the PDT to coordinate and provide technical services during any M2S2 activity. The Technical Lead is responsible for coordinating M2S2 related aspects of safety, quality, and acquisitions in support of the PM. The Technical Lead:

(1) Has the training and experience to fulfill one of the mandatory PDT disciplines identified in Table B-1.

(2) Coordinates with MMDC resource providers and the District PM for the assignment of M2S2 qualified personnel to the PDT.

(3) Provides input to the PMP on M2S2 related aspects of the work.

(4) Coordinates the technical activities of the mandatory, technical, and support functional roles/disciplines on the PDT for the delivery of M2S2 work.

(5) In conjunction with the PDT, develops and implements the project Quality Assurance Surveillance Plan (QASP).

(6) Ensures the overall quality of project documents and that appropriate PDT members are involved in project planning, document preparation and technical review.

(7) Contacts SMEs at the EM CX as necessary to address M2S2 related questions and issues as they arise, including resolution of regulatory issues and comments or USACE independent technical review comments. Recommends to the PM when M2S2 related work products should be submitted to the EM CX for independent technical review as required by specific program policy or as necessary to achieve the project objectives. Where the mission is outside of a USACE delegated mission, any exchanges with regulatory agencies of final decisions on courses of action lie with the agency seeking USACE service. USACE review of such matters are advice to the agency, however, USACE will determine safety protocol for any matters in which USACE personnel or contractors are involved.

a. Provide M2S2 qualified personnel to perform the mandatory (other than PM) and technical functional roles (Appendix B) as part of the PDT for the execution of M2S2 activities.

b. Sustain M2S2 technical capabilities and maintain contract capacities as necessary to fulfill the responsibilities of a MMDC and any HQUSACE approved mission assignments. Contracting Officer and Contracting Officer Representative functions will reside at the supporting MMDC unless agreed to otherwise.

c. Publish an MMDC Management Plan that explains how the design center is organized, funded, identifies key personnel, and establishes the MMDC's plans and objectives. The plan will clearly address the topics of recruitment, training, acquisitions, safety, quality management, stakeholder engagement, lines of communication, and teaming arrangements at a minimum. The plan will be reviewed and updated at least biennially.

d. Provide a member to serve on the M2S2 Advisory Board.

16. Project Management Districts. The PM District serves as the overall manager for the lifecycle of assigned projects and assigns a qualified PM to manage the project. PM Districts are responsible for the delivery of M2S2 within its AOR or as assigned by program specific policy. PM Districts will:

a. Assign qualified project managers. The PM will have required training and experience (see Appendix B) when munitions response is the primary objective for the project.

b. Utilize the technical and procurement services of an authorized MMDC for M2S2 related activities (see paragraph 14 and Appendix A). In coordination with the MMDC, develop and approve a PMP in accordance with ER 5-1-11, documenting concurrence with the PMP by the supporting MMDC. The PMP serves as the execution agreement between the PM District and the MMDC for a project. The PMP includes assignment of all mandatory roles and responsibilities required for project execution, definition of project goals, programmed schedule and budget for execution and exit strategy, as coordinated with the sponsoring agency.

c. Ensure qualified personnel (See Appendix B) are an integral part of the PDT for the execution of M2S2 project activities. For conventional munitions related projects, a qualified OESS at the District may be utilized, but services must be rendered to the project through the MMDC, this includes following MMDC Standard Operating Procedures (SOPs) and reporting requirements.

d. Led by the Project Manager, the PDT is responsible for project success and is empowered to make project decisions within the bounds of the approved PMP. The District PM:

(1) Performs all project manager functions as required by ER 5-1-11, the USACE Project Management Business Process, and any program specific policy and guidance.

(2) Forms the PDT in conjunction with the MMDC Technical Lead using concepts of virtual teaming as necessary to meet all project requirements for safety, quality, and acquisitions.

(3) Must utilize qualified personnel from a MMDC to perform the mandatory functional roles unless approved otherwise by the Chief of the supporting MMDC.

(4) Is responsible for all activities related to public affairs, real estate (i.e., rights of entry), regulatory coordination, legal and regulatory compliance, as appropriate based upon the mission and the responsibilities of the agency implementing the project.

(5) Leads the PDT in developing the PMP and is responsible for obtaining input from the PDT and resource providers and their commitment to the PMP. For M2S2 work, the PMP incorporates information on the delivery of M2S2 with input from the supporting MMDC; includes the names of all PDT members filling the mandatory, technical, and support functional roles; and provides information necessary for the successful performance of the virtual team in terms of safety, quality, acquisitions (including PWS/Scope of Work (SOW) development), and communications. The M2S2 related aspects of the PMP should be reviewed and updated at least annually.

(6) In coordination with the MMDC Technical Lead, contacts SMEs at the EM CX as necessary to assist with M2S2 related questions and issues as they arise. Ensures that all M2S2 related work products are submitted to the EM CX for independent technical review as required by specific program policy or as necessary to achieve the project objectives.

(7) Ensures PDT members agree with responses to regulatory review comments and comments generated through the USACE independent technical review process prior to formal submission.

(8) Elevates any M2S2 related issues for resolution as needed.

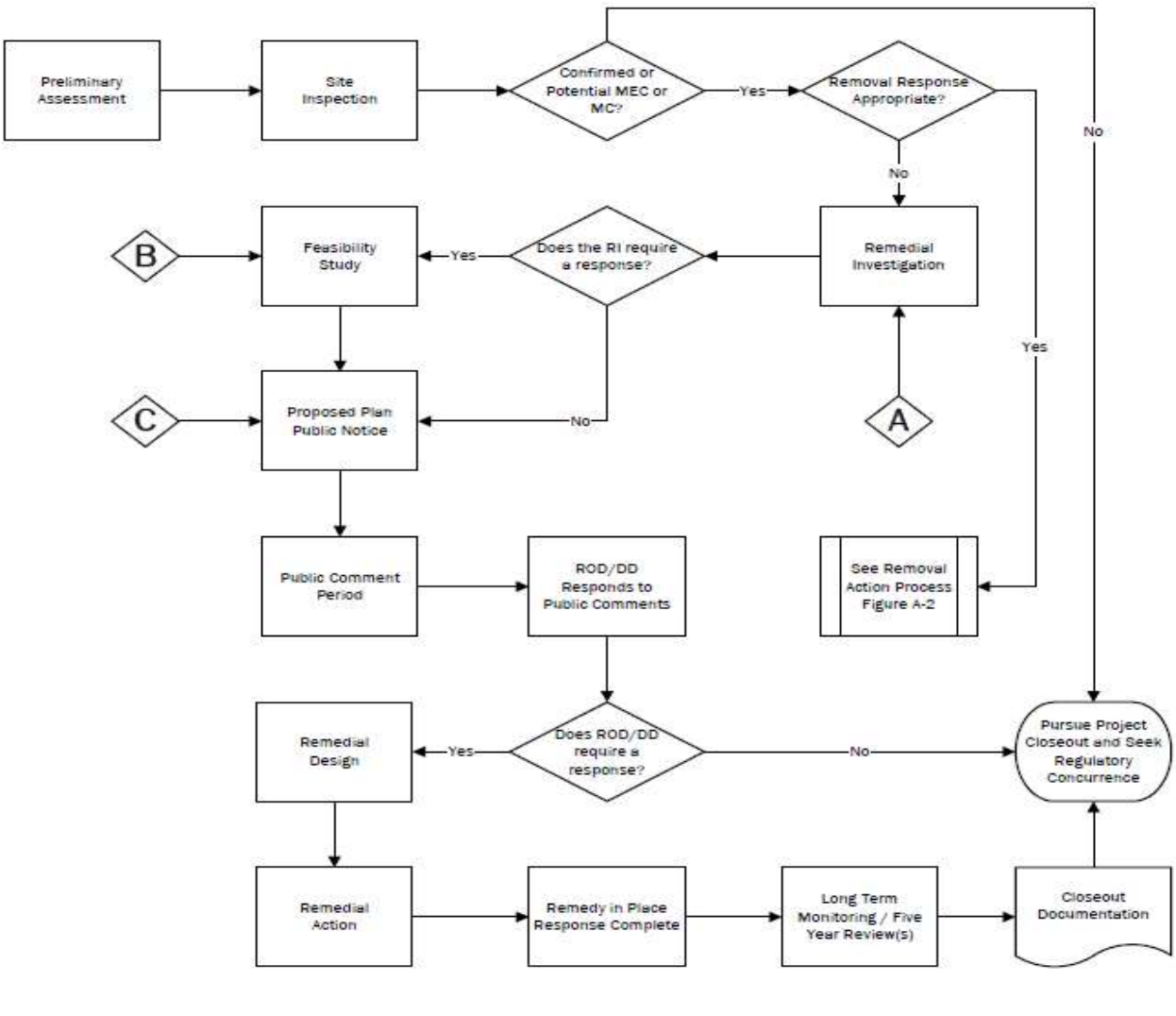
17. Engineer Research and Development Center. The ERDC:

a. Conducts research, development, test, and evaluation (RDT&E) activities in support of M2S2 and operational range sustainment activities.

b. Provides Subject Matter Expert (SME) technical assistance to USACE organizations on M2S2 related RDT&E topics as requested.

18. Project Delivery Team Member Qualifications. To better define and promote development of qualified PDT members, Appendix B contains a table indicating minimum qualifications and training required for mandatory PDT members (Table B-1) and knowledge/training/experience desired of technical and support functional disciplines (Table B-2 and B-3) typically assigned to address the M2S2 related aspects of a project. Appendix C provides example mentoring plans and checklists for each mandatory PDT discipline (Table B-1) and can be used to document training taken or planned, and to indicate that basic documents and processes have been discussed with each individual. These checklists can be maintained by the individual's supervisor or assigned mentor and used to foster career development.

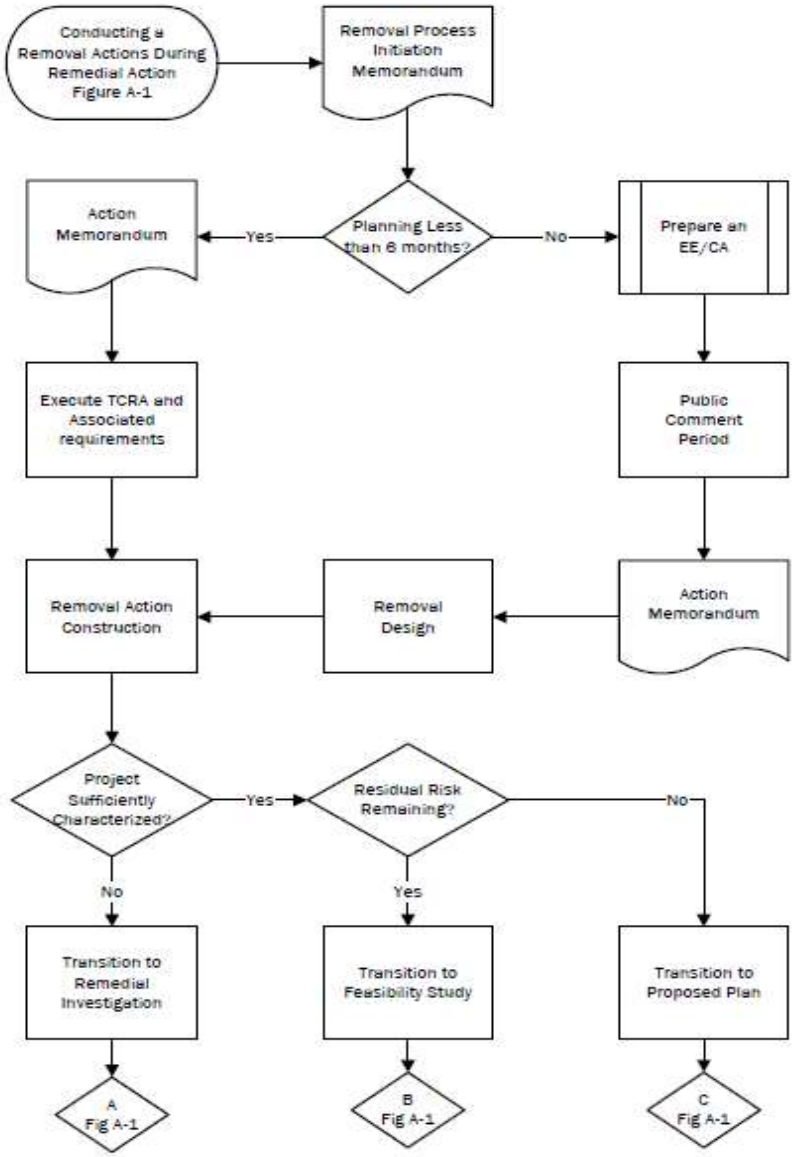
Appendix A
Military Munitions Response Program Processes Requiring MMDC Involvement



- All phases of CWM projects will be executed by the CWM Design Center.
- PM Districts must utilize qualified personnel from a MMDC to perform the mandatory functional roles (see Appendix B) unless approved otherwise by the Chief of the supporting MMDC.
- For FUDS projects, the determination of the laws and regulations governing environmental aspects for a specific MMRP project will be made in consultation with the appropriate Office of Counsel pursuant to the FUDS ER 200-3-1. In the event of any sort of dispute with a regulator over the governing laws on a FUDS project, the District providing general legal services will consult with the Headquarters Office of Counsel (CECC-E) and unless otherwise directed represent the agency in negotiations or adversary proceedings. The Office of Counsel at the EM CX is available for consultation and assistance. For non-FUDS projects performed by USACE, the appropriate legal representative of the sponsoring agency will be the lead counsel for all legal matters, although USACE counsel will be available for consultation.

Figure A-1 CERCLA Remedial Response Process

Figure A-1 – CERCLA Remedial Response Process



NOTES:

- All phases of CWM projects will be executed by the CWM Design Center.
- PM Districts must utilize qualified personnel from a MMDC to perform the mandatory functional roles (see Appendix B) unless approved otherwise by the Chief of the supporting MMDC.
- For FUDS Projects, the determination of the laws and regulation governing environmental aspects for a specific MMRP project will be made in the consultation with the appropriate Office of Counsel pursuant to the FUDS ER 200-3-1. In the event of any sort of dispute with a regulator over the governing laws on a FUDS project, the District providing general legal services will consult with the Headquarters Office of Counsel (CECC-E) and unless otherwise directed represent the agency in negotiations or adversary proceedings. The Office of Counsel at the EMCX is available for consultation and assistance. For non-FUDS projects performed by USACE, the appropriate legal representative of the sponsoring agency will be the lead counsel for all legal matters, although USACE counsel will be available for consultation.

Figure A-2 CERCLA Removal Action Process

Figure A-2 – CERCLA Removal Action Process

Comparable Phases of the Remediation Process – CERCLA and the RCRA are the two main Federal Statutes under which remediation of contaminated properties occurs. CERCLA is the preferred regulatory framework under DERP to conduct MMRP munitions response projects, however, where RCRA Corrective Actions have been implemented, RCRA may apply. The table below provides a crosswalk of comparable CERCLA and RCRA phases to assure proper MMDC engagement.

Table A-1

CERCLA/RCRA Phase Comparison

	CERCLA	RCRA
Record search	Preliminary Assessment (PA)	RCRA Facility Assessment (RFA)
Sampling to confirm or refute	Site Inspection (SI)	No direct equivalent. However, there is an optional phase known as “Phase I RFI” or “Release Assessment” that can be used to determine whether interim/stabilization measures are needed and/or to focus the RFI.
Determining nature and extent of contamination	Remedial Investigation (RI)	RCRA Facility Investigation (RFI)
Evaluate alternatives	Feasibility Study (FS)	Corrective Measures Study (CMS)
Proposed action	Proposed Plan (PP)	Statement of Basis (or Fact Sheet)
Decision document	Record of Decision (ROD)	Permit modification or responses to comments (RTC)
Action Implementation	Remedial Design/Remedial Action (RD/RA)	Corrective Measures Implementation (CMI)
Interim action (can occur at any point in the process)	Removal Action (Time Critical or non-Time Critical)	Interim/Stabilization Measure (ISM)

Appendix B
Project Delivery Team Member Qualifications

The following tables list the types of training and experience necessary to successfully execute M2S2 work. The tables are divided into 3 categories; Mandatory PDT members, Technical Support PDT members, and Additional Functional Support. Each Table lists typical functional roles, or disciplines, that make up PDTs, their general role on a PDT and the required Training, Knowledge and Experience an individual should have in order to be considered qualified to perform that function independently. Junior staff with no, or little, M2S2 related Knowledge/Training/Experience can be assigned to M2S2 PDTs but are expected to be assigned a mentor who will ensure they complete the minimum required training as well as a MMDC or EM CX mentoring program (See Appendix C for example mentoring plans). Individuals and supervisors can use these tables to help plan and promote career development.

Mandatory Functional Roles – The mandatory disciplines shown below are always required on the PDT when developing and awarding contracts, planning, or executing military munitions response actions and range clearance projects. For all other M2S2 activities, these functions may be modified or combined depending on the scope of sponsoring agency requirements and complexity of the project. Known sources of required training are provided below however, the requirement can be met by equivalent training or experience from other sources.

Table B-1
Mandatory PDT Members

Discipline	Roles/Responsibilities	Minimum Required Training and Experience	Recommended Knowledge/Training/Experience
Project Manager (M2S2 qualified)	Assigned to achieve the project objectives where delivery of a MMRP project is the primary goal; manages scope, schedule, quality, and budget while leading the PDT.	Meets organization requirements for assignment as PM, **and** Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and** CERCLA & RCRA Concepts (PROSPECT Course 356, **OR** EPA Course Superfund 101, **OR** equivalent training, education, or experience), **and** Advanced Classification Business Model (FUDS Course 208)	Systematic Project Planning; Explosives Safety Concepts; Utilization of Historical Records and Common Operations Reports; MRSPP Process including Delineation; Five Year Reviews; Basic Geophysics Concepts;

Technical Lead (M2S2 qualified)	Coordinates all munitions response related technical activities in support of the PM and PDT with a focus on safety, quality, and acquisitions.	Meets organization requirements for assignment to perform one of the Mandatory disciplines/functional roles defined in this table, **and,** CERCLA & RCRA Concepts (PROSPECT Course 356, **OR** EPA Course Superfund 101, **OR** equivalent training, education, or experience), **and** Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and** Geophysics Concepts (FUDS Course 418, **OR** ITRC Course "Geophysical Classification for Munitions Response), **and** Munitions Constituent Concepts (FUDS Course 425), **and** Explosives Safety Concepts (FUDS Course 404)	Basic Munitions Constituent Concepts Green and Sustainable Remediation Munitions Classification Concepts; Interim Risk Management; Advanced Munitions Constituents; Incremental Sampling Methodology; Chemical Data Quality Management; MMRP Removal Actions; Green and Sustainable Remediation; Environmental Statistics; Uniform Federal Policy for Quality Assurance Project Plans; Environmental Data Management Human and Ecological Risk assessment; For FUDS Specific training see the FUDS Training Plan at https://fudstraining.usace.army.mil/login.aspx?ReturnUrl=%2f Recommend for all: SERDP & ESTCP Webinar Series https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series Recommend for Chem, Geo, Risk, etc.: SERDP & ESTCP Program Area – Managing Contaminants on Ranges https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminants-on-Ranges
Ordnance and Explosives Safety Specialist (OESS)	Ensures the safe delivery of M2S2 IAW DoD, Army, and USACE explosives safety requirements including the MEC probability assessment, required explosives safety submissions, review of contractor qualifications and document submittals, quality assurance functions during field operations as defined in the QASP, and facilitates and supports EOD and emergency response personnel as required.	Graduate of a U.S. Military EOD School Minimum training requirements as established in DDESB TP 27 and DA PAM 385-64, **and** MMRP Principles & Practices (AEC MMRP 101, **OR** NGB Course 101), **and** Geophysics Concepts (FUDS Course 418, **OR** ITRC Course "Geophysical Classification for Munitions Response), **and** CERCLA & RCRA Concepts (PROSPECT Course 356, **OR** EPA Course Superfund 101, **OR** equivalent training, education, or experience), **and** MMRP Risk Management Method (FUDS Course 428), **and** Explosives Safety for OE Safety Specialists (FUDS Course 204), **and**	

		DDESB TP-16 Tools, **and** Has completed required mentoring under a qualified MMDC or EM CX OESS.	
Geophysicist	Provides technical expertise and quality oversight of all geophysical activities during project planning, acquisitions, field operations, data submissions, and reporting.	Meets organization requirements for assignment as geophysicist, **and,** Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and** Advanced Classification Business Model (FUDS Course 208), **and** Geophysics Concepts (FUDS Course 418, **OR** ITRC Course "Geophysical Classification for Munitions Response), **and** CERCLA & RCRA Concepts (PROSPECT Course 356, **OR** EPA Course Superfund 101, **OR** equivalent training, education, or experience), **and** Visual Sample Plan (VSP), **and** Has completed required mentoring under a qualified MMDC or EM CX geophysicist.	
Chemist	Provides technical expertise and quality oversight of all chemistry activities during project planning, acquisitions, field operations, data submissions, and reporting.	Meets organization requirements for assignment as chemist, **and,** Advanced Munitions Constituents Concepts (FUDS Course 203 **OR** equivalent training or education) **and** CERCLA & RCRA Concepts (PROSPECT Course 356 **OR** EPA Course Superfund 101, **OR** equivalent training, education, or experience), **and** Incremental Sampling Methodology; (ITRC Soil Sampling and Decision Making Using Incremental Sampling Methodology - Parts 1 and 2, Archived at clu-in.org **OR** equivalent training), **and** Data Quality Objectives (DQO) Process for Chemical Contaminants	

		(FUDS 318 **OR** equivalent training or education), **and** Project-Specific Chemical Data Quality Management (FUDS 323 **OR** equivalent training or education), **and** Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and** Has completed required mentoring under a qualified MMDC or EM CX chemist.	
Risk Assessor	Provides technical expertise and quality oversight of all risk assessment activities during project planning, acquisitions, field operations, data submissions, and reporting.	Meets organization requirements for assignment as a risk assessor, **and,** Geophysics Concepts (FUDS Course 418, OR ITRC Course "Geophysical Classification for Munitions Response), **and** CERCLA & RCRA Concepts (PROSPECT Course 356, OR EPA Course Superfund 101, OR equivalent training, education, or experience), **and** CERCLA Human Health Risk Assessment (FUDS Course 316, OR equivalent training), **and** CERCLA Ecological Risk Assessment (FUDS Course 317, OR equivalent training), **and** MC Planning-Reporting-Execution (FUDS Course 203), **and** Advanced MC Update (FUDS Course 425), **and** Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and** Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and** Visual Sample Plan (VSP), **and**	

		MMRP Risk Management Method (FUDS Course 428), **and** Has completed required mentoring under a qualified MMDC or EM CX risk assessor.	

Technical Functional Roles – The technical disciplines shown below are required on the PDT when delivering these specific technical functions in support of a military munitions project. These tables are intended to identify M2S2 competencies rather than provide a list of specific courses or training providers. Competency can be achieved from a combination of demonstrated knowledge, training, and/or experience.

Table B-2
Technical Functional Roles (as needed)

Discipline	**Roles/Responsibilities**	**Qualified PDT Members will have some combination of Knowledge/Training/Experience in the topics shown here depending on type and complexity of the work to be performed.**
Geologist/ Hydrologist/ Hydrogeologist	Provides technical expertise and quality oversight of all geologic/hydrologic/ hydrogeologic activities during project planning, acquisitions, field operations, data submissions, and reporting.	Advanced Geology Principles, or Advanced Hydrologic Principles, or Advanced Hydrogeologic Principles Surface/Subsurface Characterization Explosives Safety Concepts Systematic Project Planning (TPP, UFP QAPP, DQO) MMRP Principles & Practices CERCLA & RCRA Concepts Chemical Data Quality Management Basic Geophysics Concepts Basic Munitions Constituent Concepts Munitions Classification Concepts Incremental Sampling Methodology
Biologist	Provides technical expertise to ensure that all project activities are performed in compliance with all applicable regulatory requirements, including identifying any potential critical habitats and/or threatened or endangered species during project execution.	MMRP Principles & Practices Explosives Safety Concepts

Discipline	Roles/Responsibilities	Qualified PDT Members will have some combination of Knowledge/Training/Experience in the topics shown here depending on type and complexity of the work to be performed.
Archaeologist/ Cultural Expert	Provides technical expertise to ensure that all project activities are performed in compliance with all applicable regulatory requirements, and must meet the Secretary of the Interior's Professional Qualification Standards for Archaeology.	MMRP Principles & Practices Explosives Safety Concepts
Regulatory Specialist	Provides technical expertise to ensure that all project activities are performed in compliance with all applicable regulatory requirements.	MMRP Principles & Practices Utilization of Historical Records and Common Operations Reports CERCLA & RCRA Concepts Federal Regulations Concepts DoD & Service Regulations & Policies Selection of ARARs Explosives Safety Concepts Systematic Project Planning (TPP, UFP QAPP, DQO) Basic Geophysics Concepts Basic Munitions Constituent Concepts
Environmental/Chemical/ Civil Engineer	Provide technical expertise and quality oversight all project engineering activities during project planning, acquisitions, treatment technology evaluation, design submissions, operations optimization, and reporting.	Environmental Engineering Principles MC Treatment Processes/Systems Explosives Safety Concepts Green and Sustainable Remediation Systematic Project Planning (TPP, UFP QAPP, DQO) MMRP Principles & Practices CERCLA & RCRA Concepts Basic Geophysics Concepts Munitions Classification Concepts Basic Munitions Constituent Concepts

Discipline	Roles/Responsibilities	Qualified PDT Members will have some combination of Knowledge/Training/Experience in the topics shown here depending on type and complexity of the work to be performed.
Industrial Hygienist	Ensures the safe delivery of M2S2 IAW all Federal, DoD, Army, and USACE safety and occupational health requirements including the assessment of site and activity hazards, and application of appropriate industrial hygiene controls, review of contractor qualifications and document submittals, proper selection and implementation of PPE, monitoring, and engineering controls.	Industrial Hygiene Principles as Applied to Cleanup Operations Application of OSHA's HAZWOPER Standard (29 CFR 1910.120) to M2S2 General Construction Safety Principles Explosives Safety Concepts Basic Geophysics Concepts Basic Munitions Constituent Concepts

Support Functional Roles – The supporting disciplines shown below are needed on the PDT when delivering these specific support functions. These tables are intended to identify M2S2 suggested competencies rather than provide a list of specific courses or training providers. The table is intended to provide guidance and consideration in staffing a PDT and to promote career development.

Table B-3
Support Functional Roles (as needed)

Discipline	Roles/Responsibilities	Qualified PDT Members will have some combination of Knowledge/Training/Experience in the topics shown here depending on type and complexity of the work to be performed.
Attorney	Provides legal support as needed to the PM and PDT.	MMRP Principles & Practices CERCLA & RCRA Concepts Federal Regulations Concepts DoD & Service Regulations & Policies
Public Affairs Specialist	Provide public affairs support as needed to the PM and PDT.	MMRP Principles & Practices Explosives Safety Concepts Basic Geophysics Concepts Basic Munitions Constituent Concepts
Cost Engineer/ Estimator	Provide cost estimating support as needed to the PM and PDT.	MMRP Principles & Practices CERCLA & RCRA Concepts Basic Geophysics Concepts Basic Munitions Constituent Concepts Munitions Classification Concepts

Discipline	Roles/Responsibilities	Qualified PDT Members will have some combination of Knowledge/Training/Experience in the topics shown here depending on type and complexity of the work to be performed.
Contracting Officer	Serve as Contracting Officer when a M2S2 related contract is needed.	MMRP Principles & Practices Explosives Safety Concepts
Contracting Officer's Representative (COR)	Serve as COR when a M2S2 related contract is needed.	MMRP Principles & Practices CERCLA & RCRA Concepts Systematic Project Planning (TPP, UFP QAPP, DQO) Explosives Safety Concepts Basic Geophysics Concepts Basic Munitions Constituent Concepts Munitions Classification Concepts
Contracting Specialist	Provide contracting support as needed to the PM and PDT.	MMRP Principles & Practices Explosives Safety Concepts
Real Estate Specialist	Provide real estate support as needed to the PM and PDT.	MMRP Principles & Practices

Appendix C
Project Delivery Team Member
Mentoring Plans and Checklists

This appendix provides example mentoring plans/checklists for use by individuals and their supervisors to track required training and mentoring activities in order to be considered M2S2 qualified to perform the designated mandatory functional role identified in Table B-1. These sample plans and checklists can be modified as needed or incorporated into existing training plans. Mentoring plans and checklists for the following mandatory functional roles are included: Project Manager; Technical Lead; OESS; Geophysicist; Chemist; and Risk Assessor. Note there is no specific checklist for a Technical Lead as they are required to also be qualified to fulfill one of the other mandatory roles (See Table B-1 for minimum training requirements). Individuals and supervisors can use these tables to help plan and promote career development.

- Project Manager Mentoring Plan and Checklist
- OESS Mentoring Plan and Checklist
- Geophysicist Mentoring Plan and Checklist
- Chemist Mentoring Plan and Checklist
- Risk Assessor Mentoring Plan and Checklist

Table C-1
M2S2 Project Manager Mentoring Plan and Checklist

M2S2 Project Manager Mentoring Plan and Checklist

Name:		Organization:	
Activity	Source	Initials and Date (Indicating activity completed/planned)	Comments/Notes
Training			
Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab) AEC and NGB – Contact EM CX for class sessions and locations		
Advanced Classification Business Model (FUDS Course 208)	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
CERCLA & RCRA Concepts (PROSPECT Course 356, **OR** equivalent training, education, or experience)	USACE Learning Center (PROSPECT) - http://ulc.usace.army.mil/		
USACE Reading List			
EM 200-1-15	Technical Guidance for Military Munitions Response Actions https://www.publications.usace.army.mil/		
ER 200-3-1	FUDS Program Policy https://www.publications.usace.army.mil/		
ER 1110-1-8153	Military Munitions Support Services https://www.publications.usace.army.mil/		
EM 385-1-97	Explosives – Safety and Health Requirements Manual https://www.publications.usace.army.mil/		
DoD Reading List			
DoDM 4715.20	DERP Management https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/471520m.pdf?ver=2018-12-03-112553-333		
MR QAPP Toolkit	https://denix.osd.mil/index.cfm?LinkServID=D8DDB6FF-6BE4-D851-6CD1611A947B56BF		

AGC QAPP	https://www.epa.gov/sites/production/files/2016-05/documents/agc-gapp_amf_051016_0.pdf		
DA Reading List			
EPA Reading List			
ITRC Reading List			
Quality Considerations for Multiple Aspects of Munitions Response Sites (QCMR-1) – April 2018	https://itrcweb.org/Guidance		
Geophysical Classification for Munitions Response (GCMR-2) Aug 2015	https://itrcweb.org/Guidance		
Other Reading List			
MMDC/District Management Plan	Employee's Supervisor/assigned mentor		
Local SOP's	Employee's Supervisor/assigned mentor		
Program Overview			
Terminology	Employee's Supervisor/assigned mentor		
Project Documents and Reporting	Employee's Supervisor/assigned mentor		
Contracting	Employee's Supervisor/assigned mentor		
Lines of communication	Employee's Supervisor/assigned mentor		
Key organizations (EM CX, EPA, ITRC, DDESB, USATCES, etc.…)	Employee's Supervisor/assigned mentor		
Organizational chain of command	Employee's Supervisor/assigned mentor		
Key personnel	Employee's Supervisor/assigned mentor		
Project Management and PDTs	Employee's Supervisor/assigned mentor		
Occupational and Explosives safety	Employee's Supervisor/assigned mentor		

Table C-2
M2S2 OESS Mentoring Plan and Checklist

M2S2 OESS Mentoring Plan and Checklist

Name:		Organization:	
Activity	Source	Initials and Date (Indicating activity completed/planned)	Comments/Notes
Training			
DDESB TP 27 (Appendix F) Required Training	https://ddesb.altess.army.mil/products/Handler.ashx?ID=54		
DA Pam 385-64 (paragraph 1-8) Required Training	https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/p385_64.pdf		
MMRP Principles & Practices (AEC MMRP 101, OR NGB Course 101),	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab) AEC and NGB – Contact EM CX for class sessions and locations		
Geophysics Concepts (FUDS Course 418, **OR** ITRC Course "Geophysical Classification for Munitions Response), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab) ITRC - https://itrcweb.org/Training/ListEvents?TopicID=16&SubTopicID=38		
CERCLA & RCRA Concepts (PROSPECT Course 356, **OR** equivalent training, education, or experience), **and**	USACE Learning Center (PROSPECT) - http://ulc.usace.army.mil/		
MMRP Risk Management Method (FUDS Course 428)	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Explosives Safety for OE Safety Specialists – FUDS Course 204	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
DDESB TP-16 Tools	DDESB		
USACE Reading List			
EM 200-1-15	Technical Guidance for Military Munitions Response Actions https://www.publications.usace.army.mil/		

ER 200-3-1	FUDS Program Policy https://www.publications.usace.army.mil/		
ER 1110-1-8153	Military Munitions Support Services https://www.publications.usace.army.mil/		
ER 385-1-95	Safety and Health Requirements for Operations and Activities Involving MEC https://www.publications.usace.army.mil/		
EM 385-1-97	Explosives – Safety and Health Requirements Manual https://www.publications.usace.army.mil/		
HNC-ED-CS-S-00-3	Use of Water for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions https://eko.usace.army.mil/usacecop/environmental/subcops/htrw/munitions_response/		
HNC-ED-CS-S-96-8 (Revision 1)	Guide for Selection and Siting of Barricades for Selected UXO https://eko.usace.army.mil/usacecop/environmental/subcops/htrw/munitions_response/		
HNC-ED-CS-S-98-7 (Amendment 1)	Use of Sandbags for Mitigation of Fragmentation and Blast Effects due to Intentional Detonation of Munitions https://eko.usace.army.mil/usacecop/environmental/subcops/htrw/munitions_response/		
HNC-ED-CS-S-98-8 (Revision 2)	Miniature Open Front Barricade https://eko.usace.army.mil/usacecop/environmental/subcops/htrw/munitions_response/		
HNC-ED-CS-S-99-1	Open Front and Enclosed Barricades https://eko.usace.army.mil/usacecop/environmental/subcops/htrw/munitions_response/		
DoD Reading List			
DESR 6055.09	Defense Explosive Safety Regulation https://www.denix.osd.mil/ddes/home/home-documents/desr-6055-09-edition-1/		
DoDI 4140.62	Material Potentially Presenting an Explosive Hazard https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/414062p.pdf?ver=2019-02-26-085857-147		
DDESB TP 16	Methodologies for Calculating Primary Fragment Characteristics		

	https://ddesb.altess.army.mil/documents/TechnicalPapers.aspx		
DDESB TP 18	Minimum Qualifications for UXO Techs and Personnel https://ddesb.altess.army.mil/documents/TechnicalPapers.aspx		
DDESB TP 27	Explosive Safety Training https://ddesb.altess.army.mil/documents/TechnicalPapers.aspx		
DA Reading List			
DA PAM 385-64	Ammunition and Explosives Safety Standards https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/p385_64.pdf		
EPA Reading List			
ITRC Reading List			
Quality Considerations for Multiple Aspects of Munitions Response Sites (QCMR-1) – April 2018	https://itrcweb.org/Guidance		
Geophysical Classification for Munitions Response (GCMR-2) Aug 2015	https://itrcweb.org/Guidance		
Other Reading List			
MMDC/District Management Plan	Employee's Supervisor/assigned mentor		
Local SOP's	Employee's Supervisor/assigned mentor		
Program Overview			
Terminology	Employee's Supervisor/assigned mentor		
Project Documents and Reporting	Employee's Supervisor/assigned mentor		
Contracting	Employee's Supervisor/assigned mentor		
Lines of communication	Employee's Supervisor/assigned mentor		
Key organizations (EM CX, EPA, ITRC, DDESB, USATCES, etc.…)	Employee's Supervisor/assigned mentor		
Organizational chain of command	Employee's Supervisor/assigned mentor		
Key personnel	Employee's Supervisor/assigned mentor		
Project Management and PDTs	Employee's Supervisor/assigned mentor		
Occupational and Explosives safety	Employee's Supervisor/assigned mentor		

Table C-3
M2S2 Geophysicist Mentoring Plan and Checklist

M2S2 Geophysicist Mentoring Plan and Checklist

Name:		Organization:	
Activity	Source	Initials and Date (Indicating activity completed/planned)	Comments/Notes
Training			
Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab) AEC and NGB – Contact EM CX for class sessions and locations		
Advanced Classification Business Model (FUDS Course 208)	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Geophysics Concepts (FUDS Course 418, **OR** ITRC Course "Geophysical Classification for Munitions Response), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab) ITRC - https://itrcweb.org/Training/ListEvents?TopicID=16&SubTopicID=38		
CERCLA & RCRA Concepts (PROSPECT Course 356, OR equivalent training, education, or experience), **and**	USACE Learning Center (PROSPECT) - http://ulc.usace.army.mil/		
Visual Sample Plan (VSP) on-line, **and**	https://vsp-training.teachable.com/p/visual-sample-plan-vsp-general-training		
USACE Reading List			
EM 200-1-15	Technical Guidance for Military Munitions Response Actions https://www.publications.usace.army.mil/		
ER 200-3-1	FUDS Program Policy https://www.publications.usace.army.mil/		
ER 1110-1-8153	Military Munitions Support Services https://www.publications.usace.army.mil/		
DoD Reading List			
DoDM 4715.20	DERP Management https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/471520m.pdf?ver=2018-12-03-112553-333		

MR QAPP Toolkit	https://denix.osd.mil/index.cfm?LinkServID=D8DDB6FF-6BE4-D851-6CD1611A947B56BF		
AGC QAPP	https://www.epa.gov/sites/production/files/2016-05/documents/agc-gapp_amf_051016_0.pdf		
DA Reading List			
EPA Reading List			
ITRC Reading List			
Quality Considerations for Multiple Aspects of Munitions Response Sites (QCMR-1) – April 2018	https://itrcweb.org/Guidance		
Geophysical Classification for Munitions Response (GCMR-2) Aug 2015	https://itrcweb.org/Guidance		
Other Reading List			
MMDC/District Management Plan	Employee's Supervisor/assigned mentor		
Local SOP's	Employee's Supervisor/assigned mentor		
Program Overview			
Terminology	Employee's Supervisor/assigned mentor		
Project Documents and Reporting	Employee's Supervisor/assigned mentor		
Contracting	Employee's Supervisor/assigned mentor		
Lines of communication	Employee's Supervisor/assigned mentor		
Key organizations (EM CX, EPA, ITRC, DDESB, USATCES, etc.…)	Employee's Supervisor/assigned mentor		
Organizational chain of command	Employee's Supervisor/assigned mentor		
Key personnel	Employee's Supervisor/assigned mentor		
Project Management and PDTs	Employee's Supervisor/assigned mentor		
Occupational and Explosives safety	Employee's Supervisor/assigned mentor		

Table C-4
Chemist (MC) Mentoring Plan and Checklist

Chemist (MC) Mentoring Plan and Checklist

Name:		Organization:	
Activity	Source	Initials and Date (Indicating activity completed/planned)	Comments/Notes
Training			
Advanced Munitions Constituents Concepts (FUDS Course 203 **OR** equivalent training or education) **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
CERCLA & RCRA Concepts (PROSPECT Course 356 OR equivalent training, education, or experience), **and**	USACE Learning Center (PROSPECT) - http://ulc.usace.army.mil/		
Incremental Sampling Methodology; (ITRC Soil Sampling and Decision Making Using Incremental Sampling Methodology - Parts 1 and 2, Archived at clu-in.org **OR** equivalent training), **and**	ITRC - https://itrcweb.org/Training/ListEvents?TopicID=11&SubTopicID=16		
Data Quality Objectives (DQO) Process for Chemical Contaminants (FUDS 318 **OR** equivalent training or education), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Project-Specific Chemical Data Quality Management (FUDS 323 **OR** equivalent training or education)	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
FUDS 209 Getting to the Remedy	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Visual Sample Plan (VSP) on-line	https://vsp-training.teachable.com/p/visual-sample-plan-vsp-general-training		
USACE Reading List			
ER 1110-1-8153	Military Munitions Support Services https://www.publications.usace.army.mil/		
ER 200-3-1 – Chapter 4 (Or FUDS Handbook Chapter 4)	FUDS Program Policy https://www.publications.usace.army.mil/		
ER 200-1-7	Chemical Data Quality Management for Environmental Restoration Activities https://www.publications.usace.army.mil/		

EM 200-1-6	Chemical Quality Assurance for HTRW Projects https://www.publications.usace.army.mil/		
EM 200-1-15	Technical Guidance for Military Munitions Response Actions https://www.publications.usace.army.mil/		
DoD Reading List			
DoD Environmental Field Sampling Handbook	https://www.denix.osd.mil/edqw/featured-content/manuals/dod-environmental-field-sampling-handbook/		
DA Reading List			
EPA Reading List			
EPA QA/G-4	https://www.epa.gov/quality/guidance-data-quality-objectives-process-epa-qag-4-august-2000		
EPA: EPA-505-B-04-900A DoD: DTIC ADA 427785	https://www.epa.gov/fedfac/assuring-quality-federal-cleanups#ufp-qapp		
ITRC Reading List			
Incremental Sampling Methodology (ISM-1) Feb 2012	https://itrcweb.org/Guidance		
Characterization and Remediation of Soils at Closed Small Arms Firing Ranges (SMART-1) Jan 2003	https://itrcweb.org/Guidance		
Other Reading List			
MMDC/District Management Plan	Employee's Supervisor/assigned mentor		
Local SOP's	Employee's Supervisor/assigned mentor		
Program Overview			
Terminology	Employee's Supervisor/assigned mentor		
Project Documents/Reporting	Employee's Supervisor/assigned mentor		
Contracting	Employee's Supervisor/assigned mentor		
Lines of communication	Employee's Supervisor/assigned mentor		
Key organizations (EM CX, EPA, ITRC, DDESB, USATCES, etc.…)	Employee's Supervisor/assigned mentor		
Organizational chain of command	Employee's Supervisor/assigned mentor		
Key personnel	Employee's Supervisor/assigned mentor		
Project Management and PDTs	Employee's Supervisor/assigned mentor		
Occupational and Explosives safety	Employee's Supervisor/assigned mentor		

Table C-5
M2S2 Risk Assessor Mentoring Plan and Checklist

M2S2 Risk Assessor Mentoring Plan and Checklist

Name:		Organization:	
Activity	Source	Initials and Date (Indicating activity completed/planned)	Comments/Notes
Training			
CERCLA Human Health Risk Assessment (FUDS Course 316, OR equivalent training), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
CERCLA Ecological Risk Assessment (FUDS Course 317, OR equivalent training), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
MC Planning-Reporting-Execution (FUDS Course 203)	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Advanced Classification Business Model (FUDS Course 208)	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Advanced MMRP Principles & Practices (FUDS Course 209, **OR** AEC MMRP 201, **OR** NGB Course 201), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
Geophysics Concepts (FUDS Course 418, **OR** ITRC Course "Geophysical Classification for Munitions Response), **and**	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab) ITRC - https://itrcweb.org/Training/ListEvents?TopicID=16&SubTopicID=38		
CERCLA & RCRA Concepts (PROSPECT Course 356, OR equivalent training, education, or experience), **and**	USACE Learning Center (PROSPECT) - http://ulc.usace.army.mil/		
Visual Sample Plan (VSP) on-line, **and**	https://vsp-training.teachable.com/p/visual-sample-plan-vsp-general-training		
MMRP Risk Management Method (FUDS Course 428),	FUDS - FUDS Portal: https://fudsportal.usace.army.mil/ (log in and navigate to the Training tab)		
USACE Reading List			

EM 200-1-15	Technical Guidance for Military Munitions Response Actions https://www.publications.usace.army.mil/		
ER 200-3-1	FUDS Program Policy https://www.publications.usace.army.mil/		
ER 1110-1-8153	Military Munitions Support Services https://www.publications.usace.army.mil/		
EM 200-1-4 Vol-01	Risk Assessment Handbook, Volume I https://www.publications.usace.army.mil/		
EM 200-1-4 Vol-02	Risk Assessment Handbook, Volume II https://www.publications.usace.army.mil/		
EP 200-1-15	Standard Scopes of Work for HTRW Risk Assessments https://www.publications.usace.army.mil/		
DoD Reading List			
DoDM 4715.20:	DERP Management https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/471520m.pdf?ver=2018-12-03-112553-333		
DA Reading List			
A Guide to Screening Level Ecological Risk Assessment	https://usaphcapps.amedd.army.mil/erawg/SLERA.pdf		
EPA Reading List			
Risk Assessment Guidance for Superfund (RAGS)	https://www.epa.gov/risk/risk-assessment-guidance-superfund-rags-part		
Ecological Risk Assessment Guidance for Superfund (ERAGS)	https://www.epa.gov/risk/ecological-risk-assessment-guidance-superfund-process-designing-and-conducting-ecological-risk		
ITRC Reading List			
Decision Making at Contaminated Sites: Issues and Options in in Human Health Risk Assessment (RISK-3) Jan-15	https://itrcweb.org/Guidance		
Bioavailability of Contaminants in Soil (BCS-1) Nov-17	https://itrcweb.org/Guidance		
Incremental Sampling Methodology (ISM)			
Other Reading List			

MMDC/District Management Plan	Employee's Supervisor/assigned mentor		
Local SOP's	Employee's Supervisor/assigned mentor		
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Glossary

Section I
Abbreviations and Acronyms

AOR	Area of responsibility
AR	Army Regulation
ARIMS	Army Records Information Management System
CA	Chemical Agent
CAIS	Chemical Agent Identification Sets
CEHNC	Corps of Engineers Huntsville Center
CEMP	Corps of Engineers Military Programs
CENAB	Baltimore District
CENWO	Omaha District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERM-F	Corps of Engineers Directorate of Resource Management-Financial Administration
CESO	Corps of Engineers Safety Office
CESPD	South Pacific Division
CESWD	Southwestern Division
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CSE	Command Service Executive
CWM	chemical warfare materiel
DA	Department of the Army
DC	Design Center
DERP	Defense Environmental Restoration Program
DESR	Defense Explosives Safety Regulation
DMM	discarded military munitions
DoD	Department of Defense
DoDI	Department of Defense Instruction
DoDM	Department of Defense Manual
EM	Engineer Manual
ENV DIV	Environmental Division
EP	Engineer Pamphlet
EM CX	Environmental and Munitions Center of Expertise
ER	Engineer Regulation
ERDC	Engineering and Research Development Center
FS	Feasibility Study
FUDS	Formerly Used Defense Sites

HBESC	Health-based environmental safety concentrations
HQ USACE	Headquarters, U.S. Army Corps of Engineers
ISM	Interim/Stabilization Measure
M2S2	Military Munitions Support Services
MATOC	Multiple Aware Task Order Contract
MC	munitions constituents
MEC	munitions and explosives of concern
MILCON	Military Construction
MMDC	Military Munitions Design Center
MMRP	Military Munitions Response Program
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NPM	National Program Manager
OCONUS	Outside the Continental United States
OESS	Ordnance and Explosives Safety Specialist
PA	Preliminary Assessment
PAM	Pamphlet
PDT	Project Delivery Team
PM	Project Management
PMP	Project Management Plan
PP	Proposed Plan
PWS	Performance Work Statement
QASP	quality assurance surveillance plan
RA	Remedial Action
RBC	Regional Business Centers
RCWM	Recovered Chemical Warfare Material
RD	Remedial Design
RDT&E	research, development, test, and evaluation
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
RTC	Response to Comment
RRS-A	Records Retention Schedule - Army
RSC	Range Support Center
SAIE-ESOH	Deputy Assistant Secretary of the Army for Environmental Safety and Occupational Health
SATOC	Single Award Task Order Contract
SI	Site Inspection
SME	Subject Matter Expert
SOW	Scope of Work

SOP	Standard Operating Procedure
SME	Subject Matter Expert
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance