FINAL

HISTORICAL RECORDS REVIEW/ SITE INSPECTION ADDENDUM WORK PLAN

Camp Blauvelt

AEDB-R Site ID NYHQ-007-R-01

Prepared for:

Army National Guard

Contracting Agency:

U.S. Army Corps of Engineers, Baltimore District

Contract No. W912DR-15-D-0020
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LIST OF ACRONYMS AND ABBREVIATIONS

AEDB-R	Army Environmental Database-Restoration Module
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
ARNG	Army National Guard
BRAC	Base Realignment and Closure
CA	Chemical Agent
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CPR	cardiopulmonary resuscitation
CSM	Conceptual Site Model
CTC	Cost-to-Complete
CWM	Chemical Warfare Material
DDESB	Department of Defense Explosive Safety Board
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DoD	Department of Defense
DQO	Data Quality Objective
DU	Decision Unit
EM	Engineering Manual
EPA	Environmental Protection Agency
EPP	Environmental Protection Plan
EZ	Exclusion Zone
FS	Feasibility Study
FY	Fiscal Year
FSP	Field Sampling Plan
FTL	Field Team Leader
FUDS	Formerly Used Defense Sites
GPS	Global Positioning System
HRR	Historical Records Review
HRS	Hazard Ranking System
IGD	Interim Guidance Document
IPaC	Information for Planning and Consultation
IRP	Installation Restoration Program
ISM	Incremental Sampling Methodology
ITRC	Interstate Technology and Regulatory Council
MC	Munitions Constituents
MD	Munitions Debris
MEC	Munitions and Explosives of Concern
MIDAS	Munitions Items Disposition Action System
MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol

LIST OF ACRONYMS AND ABBREVIATIONS

N/A	Not Applicable
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NDNODS	Non DoD-owned, Non-Operational Defense Site
NFA	No Further Action
NHA	National Heritage Area
NHL	National Historic Landmark
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHD	National Register of Historic Districts
NRHP	National Register of Historic Places
NYARNG	New York Army National Guard
NYDFG	New York Department of Fish and Game
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORAP	Operational Range Assessment Program
PA	Preliminary Assessment
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
ppm	Parts per million
PSL	Project Screening Level
PSV	Preliminary Screening Values
PWP	Programmatic Work Plan
PWS	Performance Work Statement
PZ	Piezoelectric
QA	Quality Assurance
QC	Quality Control
QR	Qualitative Reconnaissance
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROE	Right-of-Entry
ROTC	Reserve Officers Training Corp
RRD	Range Related Debris
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SAR	Small Arms Range
SARA	Superfund Amendments and Reauthorization Act
SDZ	Surface Danger Zone
SI	Site Inspection
SLRA	screening level risk assessment
SOP	Standard Operating Procedure
SOW	Scope of Work
SSHO	Site Safety and Health Officer
SVOT	Semi- Volatile Organic Compound

LIST OF ACRONYMS AND ABBREVIATIONS

SVT	Site Visit Team
T&E	Threatened and Endangered
TBD	To Be Determined
TP	Technical Paper
TPP	Technical Project Planning
U.S.	United States
UFP-QAPP	Uniform Federal Policy Quality Assurance Project Plan
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UU/UE	unlimited use/unrestricted exposure
UXO	Unexploded Ordnance
VS	Visual Survey
WP	Work Plan
YWCA	Young Women's Christian Association

GLOSSARY

Anomaly Avoidance – Techniques employed on property known or suspected to contain UXO, other munitions that may have experienced abnormal environments (e.g. DMM), munitions constituents in high enough concentrations to pose an explosive hazard, or chemical agent (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.

Defense Site – All locations that are or were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage, or manufacturing facility, or facility that is used or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM) – 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.

Formerly Used Defense Site (FUDS) – A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A FUDS property is eligible for the Military Munitions Response Program if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.

Military Munitions (MM) – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense (DoD), United States Coast Guard, Department of Energy (DOE), and National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components other than nonnuclear components of nuclear devices that are managed under the nuclear weapons program of the DOE after all required sanitization operations under the Atomic Energy Act of 1954 (42 United States Code [U.S.C.] 2011 et seq.) have been completed. (10 U.S.C. 101(e) (4) (A) through (C))

Munitions Constituents (MC) – 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 U.S.C. 2710(e) (3))

Munitions Debris (MD) – 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: (A) UXO, as defined in 10 U.S.C. 101(e)(5); (B) DMM, as defined in 10 U.S.C. 2710(e)(2); or (C) munitions constitutes (MC) (e.g., Trinitrotoluene (TNT), Cyclotrimethylenetrinitramine (RDX), as defined in 10 U.S.C. 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 munitions constituents (MC), or to support a determination that no removal or remedial action is required.

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. A munitions response area is comprised of one or more munitions response sites.

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

Range – A designated land or water area set aside, managed, and used for range activities of the 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.

Unexploded Ordnance (UXO) – Military munitions that: (a) have been primed, fused, armed, or otherwise prepared for action; (b) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (c) remain unexploded either by malfunction, design, or any other cause.

UXO Technician – Personnel who are qualified for and filling Department of Labor, Services Contract Act, Directory of Occupations, Contractor positions of UXO Technician I, Technician II, and UXO Technician III.

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

CHAPTER 1
INTRODUCTION AND PROJECT BACKGROUND

1.0 INTRODUCTION

1.0.1 Multiple investigations have previously taken place at the Camp Blauvelt Munitions Response Site (MRS) in New York including the Preliminary Assessment (PA), the Historical Record Review/ Work Plan (HRR/WP), the Site Inspection (SI), and the Remedial Investigation (RI). During RI field work, a Material Potentially Presenting an Explosive Hazard (MPPEH) was found and a stop work order was issued. In addition to the discovery of the MPPEH, several areas of potential interest were found that were not investigated during the SI. This HRR/WP Addendum addresses additional areas of concern at the Camp Blauvelt MRS under the Army National Guard (ARNG) Military Munitions Response Program (MMRP) in New York. The strategy and plans presented in this submittal are consistent with the ARNG's programmatic approach to SIs as defined in the Final Programmatic Work Plan (PWP) [Weston, 2011]. **Figure 1-1** shows the location of the MRS which is the subject of this SI Addendum.

1.0.2 The United States (U.S.) Congress established the MMRP under the Defense Environmental Restoration Program (DERP) to address active military installations and formerly used defense sites where unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) may be present as a result of past training activities. The Non-Department of Defense (DoD) owned, Non-Operational Defense Sites (NDNODS), defined as those defense sites that were exclusively used by the ARNG and were never owned, leased, or otherwise possessed or used by the Army or other DoD component, are a subcategory of MMRP. An MRS co-used by other DoD components or that fulfills other eligibility criteria may also be addressed under the ARNG SI program. Camp Blauvelt is not classified as NDNODS, but is still addressed under the ARNG SI program.

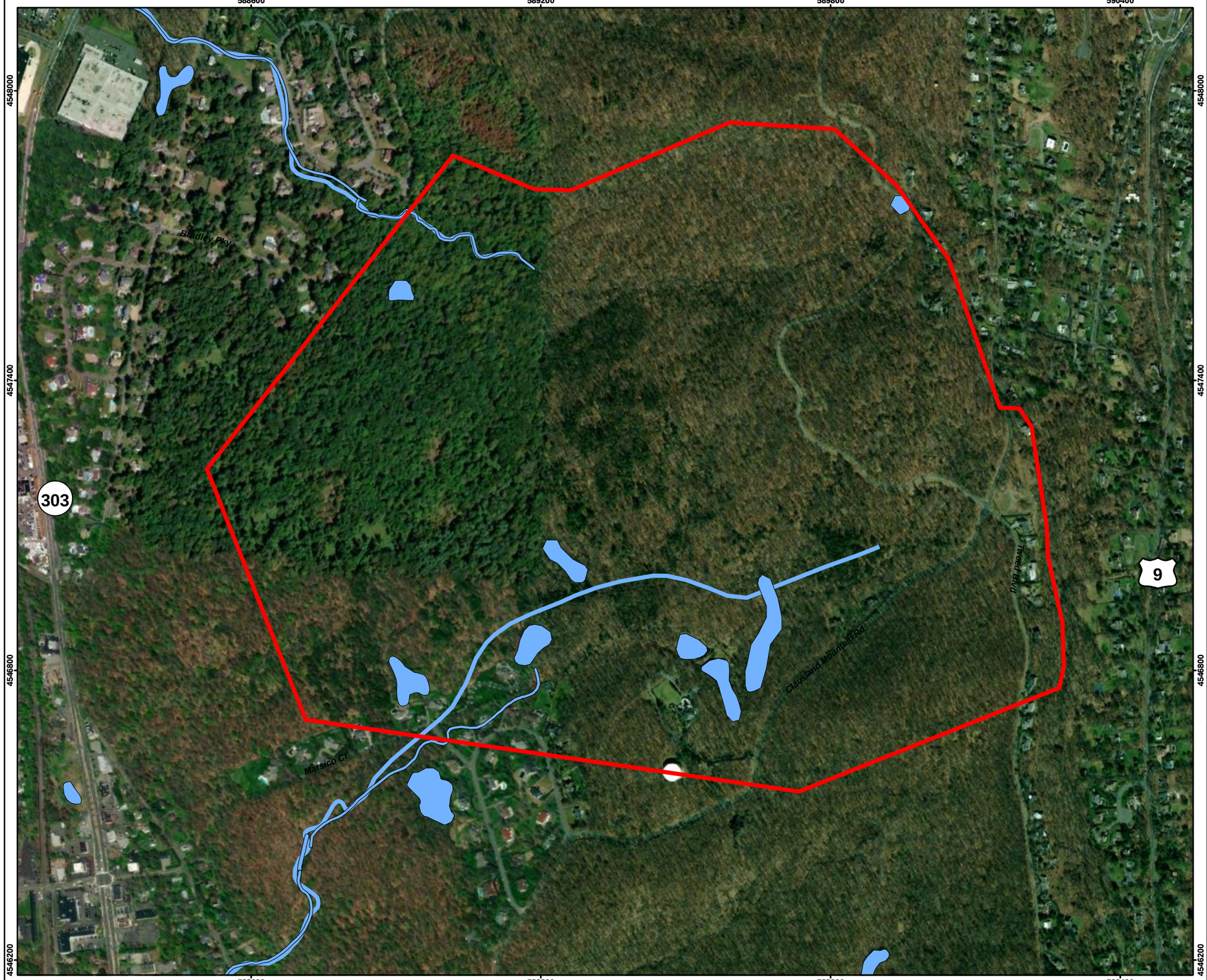
1.0.3 The process of evaluating MRSs in the MMRP follows the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process. The initial phase of the CERCLA process is the completion of a Preliminary Assessment (PA). The PA for Camp Blauvelt was achieved through the *Draft State/Territory Inventory Report National Guard Bureau Non-Department of Defense Owned Non-Operational Defense Sites Inventory New York* (Malcolm Pirnie, 2009). The Inventory Report meets the requirement of the PA and takes the place of the PA in the CERCLA process. The purpose of the SI Addendum for Camp Blauvelt is to investigate the additional areas of concern for presence or absence of munitions and explosives of concern (MEC) and/or MC at the MRS. The ARNG Directorate selected the U.S. Army Corps of Engineers (USACE) Baltimore District as the executing agent. Parsons has been contracted to complete the SI Addendum for Camp Blauvelt in New York under Contract Number W912DR-15-D-0020. The Camp Blauvelt MRS is located in Orangetown, Rockland County.

1.0.4 This HRR/WP Addendum supplements the *Final National Guard Bureau Non-Department of Defense Non-Operational Defense Sites Inventory, New York* (Malcolm Pirnie, 2009), the *Final Historical Records Review/Work Plan, New York* (Parsons, 2011), the *Final New York Site Inspection Report* (Parsons, 2012), the *Final Remedial Investigation Work Plan, Camp*

Figure 1-1

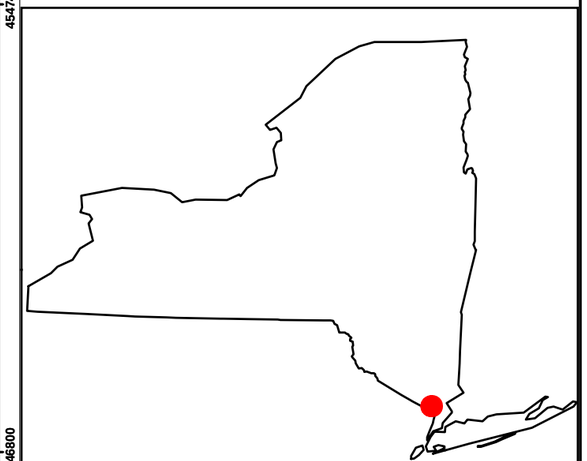
Site Location
Camp Blauvelt
AEDB-R # NYHQ-007-R-01

Rockland County, New York



Legend

- MRS Boundary
- Stream/Pond



Site Location in New York

N

200 100 0 200 Meters

PARSONS

DESIGNED BY: BT	Site Location
DRAWN BY: BT	SCALE: As Shown; PROJECT NUMBER: 100087.0538.110208.09002
CHECKED BY: AF	DATE: February 2022; PAGE NUMBER:
SUBMITTED BY: DS	FILE:

Blauvelt, New York (AECOM, 2018) and the *Final Remedial Investigation After Action Report* (AECOM, 2020). The HRR/WP Addendum presents pertinent site-specific information, plans, and protocol. This HRR/WP Addendum details the planned tasks necessary to complete this project and ensure conformance to the Performance Work Statement (PWS) updated June 2021.

1.0.5 Any revisions to the Final HRR/WP Addendum will be coordinated and resolved with the stakeholder team and documented as a revision to this submittal. This team includes the ARNG Directorate Project Manager (PM), the USACE – Baltimore District PM, the New York Army National Guard (NYARNG), the New York State Department of Environmental Conservation (NYSDEC), and the New York State Department of Health (NYSDOH).

1.1 PURPOSE AND SCOPE

1.1.1 This HRR/WP Addendum has two objectives, each of which contributes to ensuring the SI Addendum approach is complete and in compliance with associated federal guidance and standards. The purpose of the HRR Addendum is to: (1) identify data gaps in the current HRR and information presented in the PA, SI Report, and RI After Action Report; and (2) collect sufficient information regarding the history, use, and characteristics of the MRSs to support SI Addendum plans. The information presented in the HRR Addendum facilitates decision-making related to those areas where more information is needed to determine the next steps under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 ([CERCLA]; 42 United States Code [USC] 9601 et seq.), Superfund Amendments and Reauthorization Act (SARA) 1986, Executive Orders 12580 and 13016, and the National Oil and Hazardous Substances Pollution Contingency Plan ([NCP] 1984; 40 Code of Federal Regulations [CFR] Part 300). The HRR is consistent with Interstate Technology and Regulatory Council (ITRC) *Munitions Response Historical Records Review Technical/Regulatory Guidance* (ITRC, 2003).

1.1.2 The HRR/WP Addendum details the plans and protocol to ensure completion of the data quality objectives (DQOs) of the SI Addendum. The primary goal of the SI Addendum is to collect the appropriate amount of information and data necessary to make a decision to determine if the following actions are warranted at the site for additional areas of concern:

- MMRP Remedial Investigation/Feasibility Study
- Interim Remedial Action/Removal Action
- No Further Action (NFA) determination.

1.1.3 The SI Addendum is designed to determine the presence or absence of MEC and/or MC at additional areas of concern in Camp Blauvelt. Therefore, during the SI phase, the nature and extent of potential environmental contamination is not the SI objective. For small arms ranges, small arms ammunition (whether fired or unfired) is not considered to pose a unique explosive safety hazard and is not considered MEC, therefore, evaluation of the potential for MC is the primary driver for former ARNG small arms ranges.

1.2 PROJECT BACKGROUND

1.2.1 The National Guard, the oldest component of the Armed Forces of the United States and one of the nation's longest-enduring institutions, first mustered on December 13, 1636. The National Guard provided states with units trained and equipped to protect life and property and

provided the nation with units to defend the United States and its interests around the world. The National Guard still remains a dual state-federal force. In support of its dual mission, the ARNG conducted training on DoD installations, Non-DoD Federally Managed Lands, as well as State, Tribal, and privately owned properties. Over 400 ARNG sites have been identified in 48 states and two territories. Approximately 65% of ARNG defense sites are small arms ranges, 21% are maneuver areas, and 14% are suspected artillery ranges. As a result, some former ARNG defense sites historically used to accomplish the Defense Mission may contain UXO, DMM, and MC.

1.2.2 The U.S. Army conducted qualitative assessments at operational ranges to meet the requirement of the Department of Defense policy and to support the U.S. Army Sustainable Range Program. The operational range qualitative assessments were the first phase of the U.S. Army Operational Range Assessment Program (ORAP). In 2009, the NYARNG Non-Department of Defense Owned, Non-Operational, Defense Sites (NDNODS) Inventory was completed, including Camp Blauvelt, in accordance with the requirements set forth by the National Defense Authorization Act of Fiscal Year 2002. The goal of the NDNODs inventory is to collect specific information required per 10 United States Code 2710 at each Munitions Response Site. This inventory met the PA requirement under CERCLA. The NDNODS Inventory for New York consisted of historical research, including an archive search at the national, state, and local levels designed to identify eligible MRSs and their locations, periods of use, and associated types of munitions. The majority of the data was obtained through data collection activities, review of historical records, and interviews with personnel knowledgeable of the specific state training areas, including active and retired Guardsmen. When an access agreement was granted, a site visit was conducted.

1.2.3 As a follow-on to the NDNODS Inventory the ARNG contracted with Parsons to perform an SI for NDNODS Sites in New York, including at Camp Blauvelt. After the SI was completed, AECOM was contracted to perform an RI for Camp Blauvelt. During RI field activities, a MPPEH was found and a stop work order was issued. The ARNG contracted with Parsons to perform an SI Addendum for Camp Blauvelt for additional areas of concern. The executing agent for the SI Addendum is the USACE - Baltimore District. The USACE – Baltimore District is providing project management and technical support. The USACE- Baltimore District is coordinating the effort to obtain the Rights-of-Entry (ROE) for Camp Blauvelt. The following inspection activities may be performed: compilation and analysis of existing data and reports; preparation of an HRR Addendum/WP; conduct field work (visual surveys [VS], media sampling, and analysis); and analysis of results and preparation of an SI Addendum Report, including a Munitions Response Site Prioritization Protocol (MRSPP).

1.2.4 Key program drivers developed to date conclude that munitions response actions will be conducted under the process outlined in the NCP (40 CFR Part 300) as authorized by CERCLA. The key legislative, administrative, and historic precedents include the following:

- **DERP Management Guidance (September 2001)** – The DERP Management Guidance establishes an MMRP element for UXO, DMM, and MC defense sites. The history of DERP dates back to the SARA of 1986. The scope of the DERP is defined in 10 USC §2701(b), which states that the: "Goals of the program shall include the following: (1) The identification, investigation, research and development, and cleanup of contamination from a hazardous substance or pollutant or contaminant. (2) Correction of the environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment."

- **Army DERP Management Guidance for Active Installations (November 2004)** – The Army DERP Management Guidance provides guidance for active installations and non-base realignment and closure (BRAC) excess properties on the management of the Army Installation Restoration Program (IRP), the MMRP, and the Building Demolition and Debris Removal Program categories that are related to environmental cleanup. The Army DERP Management Guidance does not apply to Army restoration activities overseas, the BRAC Environmental Restoration Program, the Compliance-Related Cleanup Program, or the Formerly Used Defense Sites (FUDS) Restoration Program. The guidance document was provided to implement the Army's DERP in accordance with the DoD DERP Management Guidance (September 2001). The Army DERP Management Guidance supplements the roles, responsibilities, and procedures contained in Army Regulation 200-1 (AR 200-1) and the Department of Army Pamphlet 200-1 (DA PAM 200-1).
- **National Defense Authorization Act (Fiscal Year [FY]02) (Sections 311-313)** – Sections 311-313 of the National Defense Authorization Act of FY02 reinforced the DoD's 2001 DERP Management Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain UXO, DMM, or MC. Section 311 requires the DoD to develop a protocol for prioritizing defense sites for response activities in consultation with the States and Tribes. Section 312 requires the DoD to create a separate program element to ensure that the DoD can identify and track munitions response funding. Section 313 directs the DoD to provide a comprehensive assessment of UXO, DMM, and MC at defense sites in the FY02 DERP Annual Report to Congress.

1.2.5 The September 2001 DERP Management Guidance and the National Defense Authorization Act 2002, described above, established the MMRP. The DERP and the MMRP provide guidance and methods for conducting a baseline inventory of defense sites containing, or potentially containing UXO, DMM, and MC. The New York PA Report marked the completion of the PA phase of work under CERCLA. The 2012 New York SI Report marked the completion of the PA/SI requirement for Camp Blauvelt. The SI Addendum also contributes to the CERCLA process and will addend and complete the PA/SI requirement for Camp Blauvelt. The following subchapters list the previous environmental investigations and present the primary goals of the SI Addendum.

1.2.1 Previous Investigations

Four environmental assessments have been completed at Camp Blauvelt since 2009. These include:

- Final National Guard Bureau NDNODS Inventory New York, July 2009 (Preliminary Assessment [PA]; Malcolm Pirnie, Inc., 2009)
- Final Historical Records Review (HRR)/Work Plan, New York, July 2011 (Parsons, 2011)
- Final New York Site Inspection Report, ARNG MMRP, 2012 (Parsons, 2012)
- Final Remedial Investigation After Action Report, August 2020 (AECOM, 2020)

Detailed information on previous investigations can be found in each respective report and is further outlined in **Chapter 3** of this HRR Addendum/WP.

1.3 SITE INSPECTION APPROACH

1.3.1 The ARNG Directorate developed a baseline Programmatic Strategy to address all MRSs by site category (Weston, 2011). This approach was developed to ensure consistency across the country as the program is applied. MRSs confirmed or identified through the PA phase were subsequently categorized into three main range types based on munitions used:

- Small Arms Ranges
- Maneuver Areas
- Artillery Ranges

1.3.2 For Camp Blauvelt the types of ranges to be addressed in the SI Addendum are small arms ranges, an infiltration course, and a grenade course (which would fall into the maneuver area category).

1.3.3 Every attempt will be made to complete all activities within Camp Blauvelt during a single field mobilization. The USACE is in the process of obtaining an ROE from the Palisades Interstate Park Commission.

1.4 PROJECT OBJECTIVES AND PLANNED FIELD ACTIVITIES

1.4.1 The following project objectives were identified for Camp Blauvelt. These objectives were discussed with the project stakeholders (Technical Project Planning [TPP] Team) during TPP Meeting 1.

1.4.2 Primary Objective – Collect the appropriate amount of information necessary to determine whether further evaluation (RI/FS or interim removal/remedial action) is necessary for the additional areas of interest at Camp Blauvelt or whether an NFA recommendation is warranted. This objective will consist of the following tasks:

- Determine whether there is sufficient evidence to indicate MEC hazards are present at Camp Blauvelt including UXO, DMM, and MC (in high enough concentrations to pose an explosive hazard). Identification of a single MEC item during field activities (consisting of visual survey of the MRS ground surface) may be sufficient to prompt a recommendation for further evaluation of the additional areas of concern. For this project, confirmation of all types of MEC present, or to determine MEC densities or extent, is not necessary to determine a recommendation. As noted in Subchapter 1.1.3, small arms ammunition is not classified as MEC.
- Perform the appropriate field activities to determine if MC contamination is present at the additional areas of interest at Camp Blauvelt. Anomaly avoidance techniques, as discussed in Chapter 8 (Anomaly Avoidance) and the Munitions and Explosives of Concern Support Work Plan (**Appendix H**) of this HRR Addendum/WP, will be used. Samples will be collected from the known areas of interest unless there is compelling evidence for MEC or munitions debris (MD) in the other portions of the MRS. If MD is observed, samples may also be collected adjacent to the MD location. Samples collected at the small arms range locations will be analyzed for antimony, copper, lead, and zinc, the indicator metals for small arms munitions. Samples collected at possible locations of the infiltration course or former grenade course will be analyzed for aluminum, barium, chromium, copper, lead, and zinc indicator metals for hand grenades, illumination signals, and blasting caps. Additionally, all samples collected at the

firing lines and possible infiltration course or grenade course locations will be analyzed for explosives.

- Parsons will not collect "background" samples but rather "ambient"[1] samples to provide separation from the statistical-based and baseline risk assessment connotation. Two ambient surface soil and/or one to two ambient surface water and sediment samples will be collected in the least likely MEC or MC-contaminated areas and, therefore, will be expected to provide ambient condition data with regard to metals concentrations at the MRS.
- The media to be sampled at Camp Blauvelt includes soil, sediment, and surface water. The maximum detected concentration of each MC metal in the biased surface soil or sediment sample samples will be compared to ambient concentrations. Given that no site-specific statistical evaluation of background metals concentrations is available, the background concentrations for surface soil will be represented by the mean concentration of the two ambient surface soil samples. Only those MC metals detected at the site above ambient concentrations will be retained for further consideration in the screening level risk assessment (SLRA) along with any explosives detected.
- The maximum detected concentration of analytes in soil, sediment, and surface water retained for further consideration in the SLRA will be compared to the project screening levels (PSLs) presented in Worksheet 15 in the Uniform Federal Policy Quality Assurance Project Plan (UFP-QAPP) (**Appendix E**).

  If the data exceed (1) ambient values and (2) PSLs, a RI/FS recommendation should be considered. Ecological screening levels are often very conservative; therefore, comparison to ecological screening levels will not be the only driver for an RI/FS recommendation. In the SI Phase of CERCLA, collection of groundwater samples typically is not conducted.
- The SI Addendum is not intended to determine the nature and extent of contamination or to provide sufficient data to perform a baseline risk assessment. However, background data, as available, may be used to assist in evaluation of analytical results. Specific screening values are presented in Worksheet 15 in the UFP-QAPP (**Appendix E**).

1.4.3 Secondary Objective – Update the MRSPP and collect data to develop a cost-to-complete (CTC) for each MRS upon completion of the SI if further action is deemed necessary.

1.4.4 A TPP Summary Table is provided as **Table 1-1**. This table summarizes the MC and MEC activities and project objectives for Camp Blauvelt. Sampling and visual survey (VS) details are provided in the Field Sampling Plan (FSP) within this HRR Addendum/WP. Daily field activities will be documented in logbooks or on appropriate forms. The logbooks will document MEC or MD items, site conditions (e.g., vegetation, terrain, hazards, weather conditions, etc.) and modifications to the planned VS will be discussed. At the completion of the day's field activities, the Field Team Leader (FTL) will submit a Daily Report to the Parsons PM, who will distribute the report to the USACE and the NYARNG point of contact (POC).

[1] "Ambient Conditions" are concentrations of metals in soil/sediment in the vicinity of a site but which are unaffected by site-related activities. Ambient conditions are sometimes referred as "local background."

Table 1-1: TPP Summary Table

MRS	MEC SI Addendum Activities	MEC SI Addendum Purpose	MC SI Addendum Activities	MC SI Addendum Purpose
Camp Blauvelt	• Field team will conduct a VS of the entire MRS (approximately 20 line miles). Field team will walk in lines approximately 100 feet apart in the areas of heavy historical use and 200 feet apart for the rest of the MRS.	To determine presence or absence of MEC.	• Incremental soil samples will be collected at the firing line, rifle range, pistol ranges, concrete blocks behind firing lines, and selected locations of former shelters. • Collect discrete/grab samples for surface water and sediment behind the 300 yard target wall and at locations where the stream enters and exits the MRS. Samples will be paired. Number of samples will be determined by the field team.	Results will be used to determine if an RI/FS or NFA for MC is warranted at the additional areas of interest.

1.4.5 **Table 1-2** presents information on the MRS acreage, boundary, and acreage revisions, and the status of the ROEs.

Table 1-2: Camp Blauvelt MRS Acreage, Boundary Revisions, and ROE Concerns

Site Name/ Classification	Original AEDB-R #	Acreage in PA	MRS Division	Revised AEDB-R #	Revised Acreage	ROE Concerns
Camp Blauvelt SA-BRM-HUSE	NYHQ-007-R-01	447	No	Not Applicable (N/A)	N/A	None

1. SA= Small Arms
2. BRM= berm-like feature present
3. HUSE= moderate to heavy use

1.5 PROJECT ORGANIZATION

The project organization is presented on **Figure 1-2** and illustrates the lines of authority and communication for the project. Key contacts for this project are presented in **Table 1-3** below:

Table 1-3: Key Project Contacts

Name	Title	Phone Numbers	Email
Army National Guard Directorate (ARNG)			
John Haines	ARNG G-9 Project Manager	(703) 607-7986	John.B.Haines.ctr@mail.mil
United States Army Corps of Engineers (USACE)			
Wayne Davis	Program Manager	(410) 962-3506	Wayne.F.Davis@usace.army.mil
Joseph Bieberich	Project Manager	(410) 962-1749	Joseph.C.Bieberich@usace.army.mil
New York Army National Guard (NYARNG)			
Gregory Austin	Program Manger	(518) 786-4318	Gregory.T.Austin.nfg@mail.mil
New York State Department of Environmental Conservation			
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New York State Department of Health			
Sara Bogardus	Project Manager	(518) 402-7860	Sara.Bogardus@health.ny.gov
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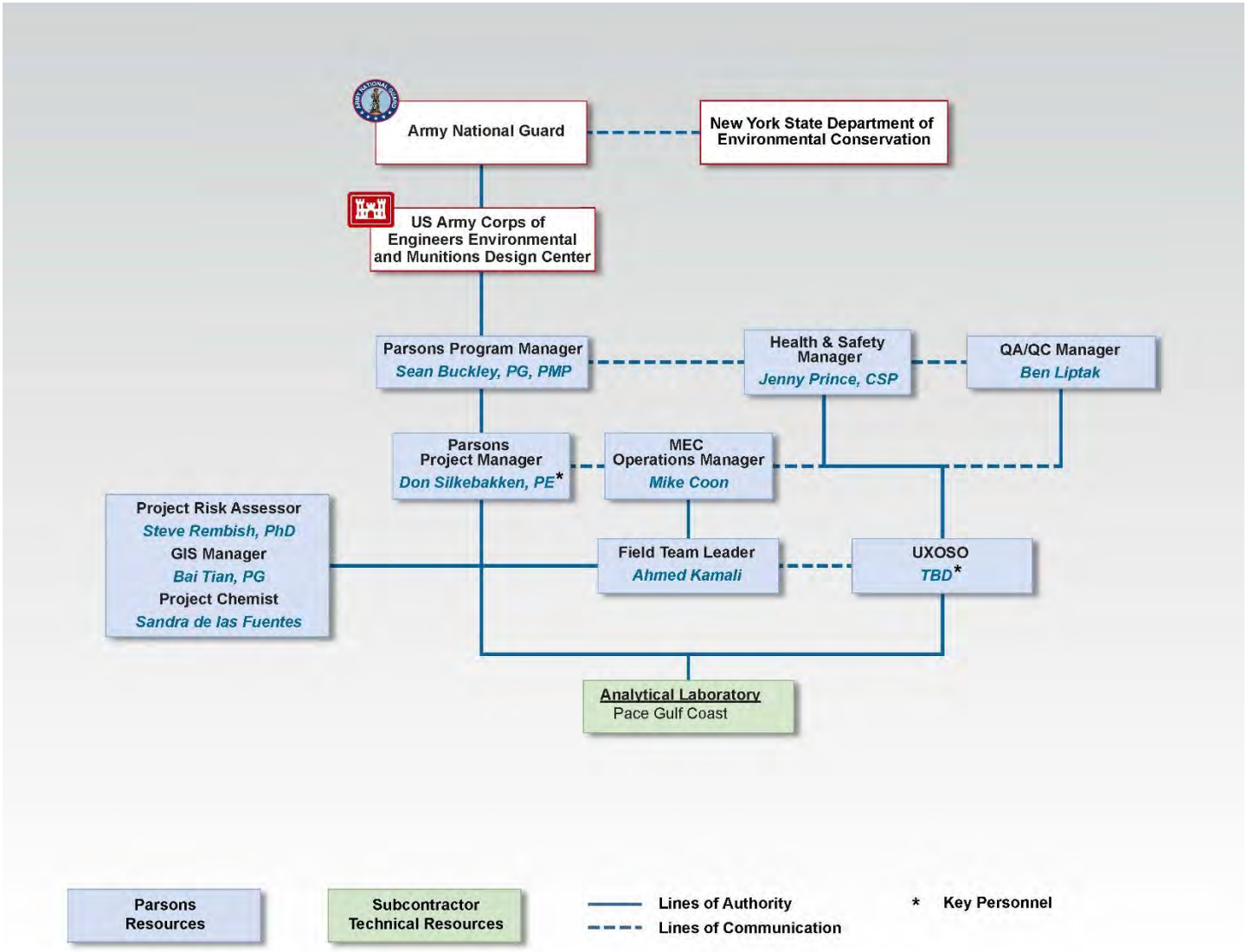
Don Silkebakken	Project Manager	(678) 969-2384	Don.Silkebakken@parsons.com

Name	Title	Phone Numbers	Email
Janelle Bartscherer	Deputy Project Manager	(303) 386-2414	Janelle.Bartscherer@parsons.com

Figure 1-2: Project Organization



1.6 PROJECT SCHEDULE

The project schedule (**Table 1-4**) has been established according to the performance of the following tasks:

Table 1-4: Project Schedule

Task	Planned Completion Date
ARNG Draft HRR Addendum/WP	February 2022
Stakeholder Draft HRR Addendum/WP	April 2022
TPP Meeting 1	June 2022
Final HRR Addendum/WP	August 2022
SI Addendum Field Work	September 2022
ARNG Draft SI Addendum Report	December 2022
Stakeholder Draft SI Addendum Report	February 2023
TPP Meeting 2	March 2023
Final SI Addendum Report	April 2023

The project schedule is subject to revision based on the progress of prior schedule items.

1.7 DOCUMENT ORGANIZATION

This HRR Addendum/WP covers all activities necessary to complete the SI Addendum at the Camp Blauvelt MRS. The HRR Addendum/WP is organized to address each component of the PWS in accordance with the Final PWP and comprises several sub-plans, each discussing a different aspect of the inspection. The chapters are summarized below.

- Introduction and Project Background: Chapter 1 details the purpose and background of the project and presents the SI Addendum approach and objectives, the project organization and schedule, and organization of the HRR Addendum/WP.
- Data Collection and Document Review Process: Chapter 2 details the data collection methods to be implemented during this SI Addendum.
- Site Descriptions and History: Chapter 3 details the PA, HRR, SI, RI After Action Report, and HRR Addendum findings for the MRS.
- Conceptual Site Models (CSM): Chapter 4 details the site conditions for the MRS.
- Data Quality Objectives: Chapter 5 contains the project DQOs for MEC and MC as agreed upon by the TPP Team.

- Sampling and Analysis Plan (SAP): Chapter 6 details the procedures for collecting environmental samples.
- Accident Prevention Plan (APP): Chapter 7 presents the hazards to the field team and the mitigation procedures that will be implemented to prevent harm (see **Appendix F**).
- Anomaly Avoidance: Chapter 8 details the procedures to be used by the field team to avoid encountering potential MEC.
- Rights of Entry/Site Access: Chapter 9 presents an overview of the land ownership for the MRS.
- Communication: Chapter 10 details the communication protocol before and during the field effort.
- Environmental Protection: Chapter 11 provides general information and lists applicable requirements for avoiding, minimizing, and mitigating potential impacts to environmental and cultural resources during field activities.
- Non-Munitions Related Waste: Chapter 12 details procedures the field team will follow if non-munitions related waste or hazardous substances are found during the field effort.
- References: Chapter 13 includes a list of references used in the preparation of this HRR Addendum/WP.

Additional information and plans are attached to this HRR Addendum/WP as appendices:

A. Sources Contacted: A list of the sources contacted by Parsons for the HRR Addendum is included in **Appendix A**.

B. Record Group Summary and Document Index: A summary of the record groups and an index of the documents collected by Parsons during the HRR Addendum are included in **Appendix B**.

C. Munitions Data Sheets: A detailed description of the munitions associated with the MRS is presented in **Appendix C**.

D. Field Sampling Plan: The FSP in **Appendix D** describes the procedures that will be implemented at the MRS to complete the required field work.

E. Quality Assurance Project Plan: The UFP-QAPP in **Appendix E** contains a list of the required analytes and the associated sampling procedures.

F. Accident Prevention Plan: The APP is attached as **Appendix F**. The APP describes the health and safety procedures, personal protection standards, and environmental health hazards applicable to this project.

G. Installation Communication Protocol and Ordnance Contact Form: The protocol to be followed if a munitions item is found during the SI Addendum, including the form to be completed, is defined in **Appendix G**.

H. Munitions and Explosives of Concern Support Work Plan: The work requirements and procedures for UXO support during SI Addendum activities are defined in **Appendix H**.

I. Technical Project Planning Meeting Minutes: Documentation from TPP meetings is included in **Appendix I**.

J. Copies of Right-of-Entry Permits: A copy of the Right-of-Entry secured by the USACE to conduct the field effort is included in **Appendix J**.

K. Electronic Files: **Appendix K** contains electronic files of supporting documentation and historical reports and figures.

CHAPTER 2
DATA COLLECTION AND DOCUMENT REVIEW PROCESS

2.0 INTRODUCTION

2.0.1 As discussed in Chapter 1, the purpose of the HRR Addendum is to collect sufficient information regarding the history, use, and characteristics of the Camp Blauvelt MRS to determine the presence or absence of MEC and MC hazards at additional areas of concern. The goals of the HRR Addendum are to perform a records search to document historical and other known information for the MRS, supplement the information developed during previous investigations, and support the TPP process.

2.0.2 This Chapter details the methods used to collect relevant HRR Addendum information and the agencies contacted. The Camp Blauvelt HRR Addendum results are further detailed in the HRR Addendum findings in Chapter 3.

2.0.3 The primary sources of information contacted during the Parsons HRR Addendum included:

- Library of Congress
- National Archives and Records Administration II – College Park, MD
- Hudson River Valley Heritage Historical Newspapers
- Nyack Library
- New City Library
- Town of Orangetown
- New York Heritage Digital collection
- Communications from Orangetown Resident

2.1 DATA COLLECTION METHODS

2.1.1 The following subchapters describe the data collection methods for the primary sources identified above. The sources contacted in conjunction with the Parsons Addendum to the HRR are described in detail in **Appendix A** and the record groups and documents collected during the Parsons HRR are located in **Appendix B**. The PA, which includes a list of sources contacted, and the associated references collected in conjunction with the PA HRR and 2011 HRR are located in **Appendix K**.

2.1.2 Potential HRR data sources include DoD and other federal agencies, state and local libraries and archives, private data sources, internet, and interviews. The type of data collected typically supports understanding of the range configuration and layout, munitions used, years of use, and other design and operational aspects of the range. The source documents vary in both the type of information available and its quality. Consistent with ITRC guidance Technical/Regulatory Guideline Munitions Response Historical Records Review (ITRC, 2003),

Parsons identified and evaluated the information obtained during the HHR Addendum and determined its quality based on the following criteria:

- High quality: Verifiable data source such as a document, map, or personal interview with supporting documentation.
- Medium quality: Written records, without the original source, or personal interviews where several interviewees provide similar accounts.
- Low quality: Original data source formerly verifiable but no longer available (for example, recollections of lost documents and maps) or personal interviews, without backup documentation or with contradictory documentation.

2.1.3 The quality of data collected during the PA was taken into consideration during the data gap analysis and subsequent 2011 HRR data collection effort. Based on the data collected, reviewed, and assessed from the PA, 2011 HRR, and the HRR Addendum, the information was determined to be relevant and of sufficient quantity and quality to support SI Addendum planning and execution. A discussion regarding site-specific data gap analysis is presented in the Historical Record Review subchapters of Chapter 3.

CHAPTER 3
SITE DESCRIPTIONS AND HISTORY

3.0 INTRODUCTION

This chapter provides a description and history of the Camp Blauvelt MRS, Site ID NYHQ-007-R-01.

3.1 SITE DESCRIPTION AND HISTORY

3.1.1 Camp Blauvelt, also known as Camp Bluefields, is the location of a former training camp. The NYARNG former range is located in Orangetown, Rockland County. Camp Blauvelt is approximately 447 acres and was used as a small arms range by the NYARNG. The range opened in 1910 and included 56 targets with 200-, 600-, and 1000-yard firing lines, and 30 targets with a 300-yard firing line. The range also included concrete bunkers and underground tunnels. The direction of fire of the rifle ranges was to the east/northeast. Potential munitions used were small arms (.22, .30, .38 and .45 caliber). The PA site visit team documented that the range features (concrete walls, tunnels, berms) are still present. Due to numerous complaints from nearby residents about the safety of the range, it was closed in 1913. According to the residents, stray bullets from the range were landing on the Boulevard and Shady Side Avenue.

3.1.2 After the NYARNG closed the range in 1913, Camp Blauvelt was used for a variety of training exercises and events by various organizations After its closure in 1913, operation of Camp Blauvelt was transferred to the Palisades Interstate Park Commission. Blauvelt was then turned over to the NY State Military Training Commission for use as a summer camp by the Reserve Officers Training Corps (ROTC). It is unknown how long ROTC used this camp. Camp Blauvelt was used by the U.S. Army for training exercises during WWII and possibly as an air raid post during WWII.

3.1.3 Currently, the MRS is located in Blauvelt State Park which is part of the New York State Parks system and is operated by the Palisades Interstate Park Commission. The range features were located in the central and northern portion of the MRS. The majority of the MRS is underdeveloped, forested land. There are a few residential properties within the southwestern portion of the MRS and there is a water tower on the southern border of the MRS.

3.2 PREVIOUS INVESTIGATION FINDINGS

3.2.1 Previous Investigations

This section summarizes investigations conducted at Camp Blauvelt thus far. This includes the 2009 Preliminary Assessment, 2011 Historical Records Review, the 2012 Site Inspection and the 2019 Remedial Investigation After Action Report.

3.2.1.1 Preliminary Assessment

The PA for Camp Blauvelt was written as part of the Draft PA Report for NDNODS sites in New York in July 2009 (Malcolm Pirnie, 2009). Critical sources for the 2009 Draft PA included articles, websites, and a site visit.

Camp Blauvelt was used as a training camp from approximately 1910 through 1913. The munitions most likely used included .22-caliber, .30 caliber, and .45-caliber.

The following critical sources were used (Malcolm Pirnie, 2009a) to determine range specific information (i.e., history, range location, range layout, and munitions type). One source, *Forest and Stream, New York's Rifle Range*, is located in Appendix K of the HRR/WP. The second source, *Rockland Audubon Society, Blauvelt State Park and Tackamack Town Park*, was not located during the HRR Addendum and was not included as part of the PA digital documents.

- **Forest and Stream, New York's New Rifle Range. 8 January 1910 (NY0108):** This document provides background information regarding approximate range location, range size, and land features. The article mentioned land differences between Camp Blauvelt and the pre-existing Creedmoor Rifle Range (Malcolm Pirnie, 2009).
- **Rockland Audubon Society, Blauvelt State Park and Tackamack Town Park, 4 August, 2008 (NY0214):** This document provided the history of the Blauvelt State Park and Tackamack Town Park from 1909 to the present. The document indicated the dates of operation were from 1910 to 1913. The historic information included range information and residential complaints of stray bullets impacting residential structures (Malcolm Pirnie, 2009).

  During the 9 October 2008 PA site visit, evidence of the former rifle range was observed. No MEC or MD was observed. Photographs taken during the site visit were included in the PA. The following range features were observed:
  - A berm, approximately 200 feet long by 50 feet wide and 15 feet tall, with small concrete monuments. The concrete monuments, approximately 6 inches by 12 inches with two, 1-inch diameter fitting, were on top of the berm. The berm orientation was north to south and likely was used as an observation platform.
  - A large concrete bunker, 50 feet long by 15 feet wide, and 25 feet tall, probably was used for ammunition storage.
  - A series of partially underground tunnels running from east and west of the bunker were observed. Historical documentation noted that the tunnels were installed to connect targets to the firing lines and to one another.
  - Several earthen and concrete target berms in a row with steel mounts for targets. Based on the location of the target berms, the firing occurred from west to east.

  The data gap identified based on the PA findings includes the exact dates of use.

3.2.1.2 Historical Records Review

A historical records review was conducted for Camp Blauvelt in 2011 as part of the Historical Records Review/Work Plan for New York (Parsons, 2011). During the Historical Records Review, Parsons reviewed and validated the information in the PA; however, no additional research in support of the HRR was decided to be necessary other than obtaining data on site characteristics.

The information collected, reviewed, and assessed was determined to be relevant and of sufficient quantity and quality to support SI planning and execution. No significant data gaps remained for this MRS. The exact dates of use were still unknown; however, this unknown was not considered a significant data gap since the range layout, orientation, and location were known.

During the HRR, a 1953 aerial image was investigated to determine whether current residential properties located at the southern MRS boundary were present (Parsons, July 2011). The residential properties were built post-1953; therefore, the HRR concluded that they were not present during range use.

3.2.1.3 Site Inspection

Parsons conducted a Site Inspection at Camp Blauvelt in September 2011. The SI field work included the collection of surface soil samples and a visual survey, both of which were completed within the site boundary. The sample collection focused on the firing line and the 200 yard, 300 yard, 600 yard, and 1000 yard target berms. The site visit team completed the soil sampling and approximately 7,472 meters (4.64 miles) of visual survey. MD, .30 caliber casings, were found at the backstop. No MEC were observed during the 2011 Site Inspection.

Eight biased surface soil samples (plus appropriate QC samples) were collected in locations expected to have the greatest likelihood of residual MC, if any. The samples were analyzed for small arms munitions indicator metals (antimony, copper, and lead) and one sample (plus the appropriate QC samples) was analyzed for explosives and indicator metals (antimony, copper, and lead).

The maximum detected concentration of antimony, copper, and lead in the biased surface soil samples exceeded the calculated background concentration (mean detected ambient concentration). The maximum detected concentration of antimony did not exceed the human health screening value. The maximum detected concentration of copper and lead exceeded the human health screening value. Based on the analytical results presented in this report, an impact to human health due to exposure to antimony in the surface soil is not expected and an impact to human health due to exposure to copper or lead in surface soil is possible. Based on the SI field effort, the analytical results, and the HRR, the Camp Blauvelt MRS was recommended for a Remedial Investigation/Feasibility Study.

3.2.1.4 Remedial Investigation

AECOM performed RI field work at the Camp Blauvelt MRS in May 2019. Planned RI field efforts include collecting discrete surface and subsurface soil samples to determine the lateral and vertical extent of contamination at the Firing Line and target areas. These were planned to be taken from decision units (DUs) at the Firing Line, 200, 300, 600 and 1000 yard target areas. Samples were also planned to be taken from what was previously thought to be an 800 yard target area, but during RI field work this was discovered to be the location of concrete structures for the former metal backstops. As the field team collected soil samples, the team encountered an item of MPPEH while collecting discrete soil samples. The item was suspected to be a hand grenade fuze. A stop work was issued in the field and intrusive RI field activities were ceased. The grenade fuze was discovered within the southern end of the 600-yard Target Wall DU. In addition, significant evidence of illicit dumping was observed in this portion of the DU.

After the stop work order was issued, AECOM conducted a site walk with the ARNG Project Manager (John Haines) where they conducted a visual inspection of newly identified area that contained former range structures that were not investigated during the SI. These areas are shown in **Figure 3-1**.

- Firing Line – AECOM noted that the Firing Line extends father to the south than 200 ft and is tiered with several elevations that line up with the downrange target walls.
- Pistol Ranges – AECOM discovered two pistol ranges between the Firing Line and the 200-yard Target Wall. Two shelters are present in this area; their functions are unclear.
- Concrete Block Areas/Backstop Structures – Multiple rows of concrete blocks were observed behind and/or adjacent to the 200-yard, 300-yard and 600-yard Target Wall DUs. Historical photos indicated that the concrete blocks are remnants of foundation structures associated with metal backstops that are no longer present.
- 300-Yard Target Wall Drainage Ditch- In addition to the concrete blocks located adjacent to and behind the 300-Yard Target Wall, a drainage ditch runs behind the wall on the northeastern side, where an intermittent stream travels north from the concrete tunnels through the drainage ditch to the concrete blocks adjacent to the 300-yard Target Wall.
- 200-Yard Target Wall Stormwater Runoff Pools – Stormwater runoff pools behind the 200-Yard Target Wall where an area of concrete block structures was observed.

3.3 HISTORIC RECORDS REVIEW ADDENDUM FINDINGS

3.3.1 Due to COVID-19 travel restrictions, no repositories were visited during the Parsons Addendum to the HRR data gap research. Multiple national and local libraries and archives were contacted and various internet sources (government and private websites) were used as sources to obtain data to support the technical approach and CSM development. A detailed list of organizations contacted and sources used for information can be found in **Appendix A** of this HRR/WP. A site visit was conducted from 17-18 August 2021 as part of this HRR. The following sections summarize the findings of the HRR Addendum, including an expanded timeline of activities and events that occurred at Camp Blauvelt and additional areas of concern identified at Camp Blauvelt. Documents and sources collected during the HRR Addendum are cited below and located in Appendix B.

3.3.2 Previous Activities/Historic Use

Since its initial construction in 1910, Camp Blauvelt has been used by multiple organizations for camps and training exercises. Various historical newspaper articles, books, and photographs were examined to determine a timeline of events at Camp Blauvelt.

- Blauvelt Rifle Range opened in October 1910 (“The Soldiers Come to Town”, 1910). Shortly after it opened, residents reported instances of bullets overshooting the rifle range going into nearby neighborhoods. The firing line faces the lowest part of South Mountain and there were multiple reports of bullets falling around the residents in the boulevard and Shadyside Avenue in Grand View (“Say Range is a Menace”, 1911 and “Those Deadly

Bullets Again", 1912). Large overhead screens were installed to keep the bullets from overshooting the rifle range in 1912, but the range closed in 1913 and was handed over to the Palisades Interstate Park Commission (Clyne, 1985)

- From 1913-1918, the Palisades Interstate Park Commission rented the land to the Young Women's Christian Association (YWCA), who used it as a summer camp for New York City working girls (Clyne, 1985).
- In 1918, The Range at Camp Blauvelt was turned over to the New York State Military Training Commission and was used as a state-run camp for the military training of young men between the ages of 16-19. ROTC units used the site during and following WWI (Clyne, 1985). In addition, the Comeback Club, consisting of wounded WWI veterans, built summer homes at Camp Blauvelt and held annual summer galas ("Veterans to Retain Camp", 1926).
- Camp Blauvelt was also used for several Army Reserve activities. In 1924, the Reserves constructed a miniature target gallery with a range of 1,000 inches for a Reserve training exercise. The plan was for the results of the exercise to be scaled to show results as on a standard 1,000 yard range. Service revolvers were used, with dummy cartridges capable of carrying less than 100 feet ("Nyack Alarm Relieved", 1924). The exact location of the 1,000 inch course is unknown. During the August 2021 site visit, several newer structures near the 100 yard pistol range were observed. These structures could be evidence of the 1000 inch course that was constructed in 1924.
- In August 1925, Reserve officers of the 77th training unit conducted War Game exercises at Camp Blauvelt for two weeks. During the two week training at Camp Blauvelt, the Reserve officers used the Colt automatic revolver at target practice ("Reserve Officers of 77th Division", 1925).
- In the 1930s, the Army sent soldiers to Camp Blauvelt periodically for training. When WWII broke out, Blauvelt became a training ground for soldiers from nearby Camp Shanks as well as an air raid post (Clyne, 1985). In addition, the local Boy Scouts group used Camp Blauvelt as a training area, including for advancement tests ("Boy Scouts Plan Drills", 1932).
- In September 1941, a local military reserve organization, the Nyack Preparedness Brigade, held all day maneuvers at Camp Blauvelt in the field near the camp. No munitions were recorded as used during this training exercise ("Nyack Brigade Holds All-Day Field Events", 1941).
- In October 1944, the Army conducted multiple days of training on an infiltration course by soldiers from nearby Camp Shanks. The infiltration course was constructed at Camp Blauvelt across from the 1,000 inch course ("Shanks GIs Will Soon Have Local Infiltration Course", 1944). Soldiers were to climb out of a pit and were fired upon by three, .30 caliber, water-cooled machine guns. Explosives in boxes and flares were used during these exercises (" 'Mental Hazard' Harder", 1944 and "Under Simulated Battle Conditions", 1944). The location of the infiltration course is not known; however, one hypothesis is that the infiltration course is located across from the newer structures observed close to the 50 yard pistol range.
- In November 1944, the Army sent men from Camp Shanks to conduct training on a grenade course constructed at Camp Blauvelt. The grenade course consisted of two kinds of targets: several craters and the windows of a small house. The men tossed live hand grenades from behind a six-foot wall towards the targets about 15 to 25 yards away

("Shanks Men To Toss Hand Grenades At Camp Blauvelt", 1944). The location of the grenade course is not known; however, two locations have been identified as possible locations of the grenade course. One shelter behind the 1000 yard target line shows signs of wear and could be a possible location of the grenade course. Another shelter behind the 600 yard target line could also be a possible location of the grenade course and is located close to where the grenade fuze was found.

3.3.6 **Areas of Concern**

Several areas of concern that were identified in previous reports and newspaper articles were further investigated during the August 2021 site walk. The following areas of concern were identified and will be included as part of the site inspection work plan:

- **Extended Firing Line** – the After Action Remedial Investigation Report noted that the Firing Line extended further south and was longer than originally thought. During the site walk, it was found that the Firing Line did extend further than previously thought.
- **50-yard and 75-yard Pistol Range** – References to multiple pistol ranges are noted in historical articles and maps, as well as in the After Action RI Report. During the site walk, two berms were found 50 yards and 75 yards from the Firing Line.
- **Pistol Range Concrete Structures** – Concrete structures were discovered near the 50-yard and 75-yard berms. The concrete blocks are made of a different material than the target berms and appear to have been constructed after the berms. It is possible that the concrete blocks were constructed as part of the 1,000 inch course during the 1924 Army Reserve exercises.
- **200-yard Concrete Blocks** – Photographs and historical articles detail metal backstops that were erected to deflect bullets and shield local towns from stray bullets at the rifle range. The concrete blocks are thought to have held the metals shields, which have since been taken down. There are approximately six blocks in this set behind the 200-yard Target Wall.
- **300-yard Concrete Blocks** – Two sets of concrete blocks are located behind the 300-yard Target Wall. One set consists of approximately 20 blocks, is located closer to the wall and is farther west. A second set consists of approximately 14 blocks, is located farther from the 300-yard Target Wall and is farther east. These concrete blocks are thought to have held the metal shields to deflect bullets.
- **600-yard Concrete Blocks** - Two sets of concrete blocks are located behind the 600-yard Target Wall. One set consists of approximately 44 blocks, is located closer to the wall and is farther west. A second set consists of approximately 18 blocks, is located farther from the 600-yard Target Wall and is farther east. These concrete blocks are thought to have held the metal shields to deflect bullets.
- **Intermittent Surface Water - 300-yard Target Wall** - The RI After Action report states that there is a drainage ditch behind the 300-yard Target Wall and an intermittent stream runs through the drainage ditch. These intermittent surface waters may travel through MC contaminated surface soil in the area. During the 2021 Site walk, the area

where the intermittent stream runs was located, but there was no surface water observed at that time.

3.3.7 Based on the data collected, reviewed, and assessed from the historic records review, remaining data gaps include: the location of the 1,000 inch firing range constructed during the 1924 Army Reserve activities, the location of the infiltration course constructed by the Army during the 1944 exercises for Camp Shanks, and the location of the grenade course, also constructed by the Army during 1944 exercises for Camp Shanks. These data gaps will neither create uncertainties regarding the completeness of the HRR nor result in deficiencies related to the proposed SI Addendum technical approach. The information was determined to be relevant and of sufficient quantity and quality (high) to support SI Addendum planning and execution.

3.4 SUSPECTED OR KNOWN MUNITIONS AND MUNITIONS AND EXPLOSIVES OF CONCERN

The National Guard Bureau Non-Department of Defense Non-Operational Defense Sites Inventory for New York (Malcom Pirnie, 2009) and historical articles were used to develop the list of potential munitions at the Camp Blauvelt MRS. The potential munitions are presented in **Table 3-1**. The table has been prepared as a visual and informational identification guide for use by the site visit team (SVT) to aid in proper MEC and MD documentation. This table is further expanded in **Appendix C** of this report to include fillers and chemical composition of MEC and potential MC and proposed MC sampling analytes. A summary of the findings of the munitions used are presented in **Table 3-2**.

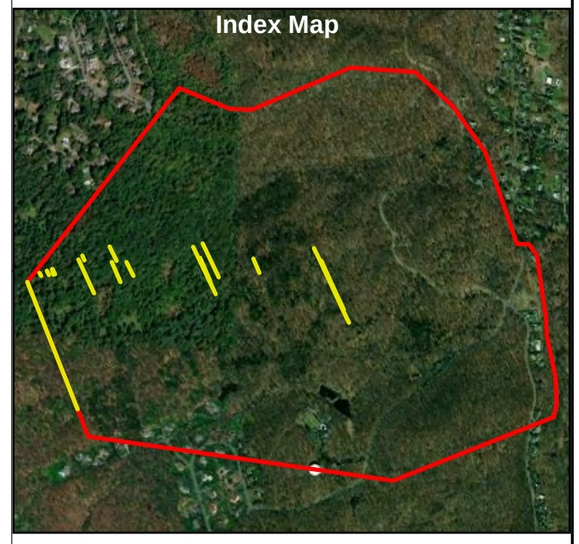
Figure 3-1

Small Arms Range
Camp Blauvelt
AEDB-R # NYHQ-007-R-01

Rockland County, New York

Legend

- MRS Boundary
- Firing Line
- Target Area
- Concrete Block
- Concrete shelter/structure behind target area
- Stream/Pond
- Potential location of infiltration course or grenade course



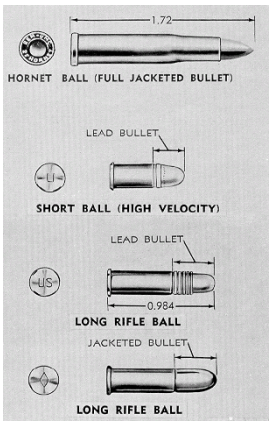
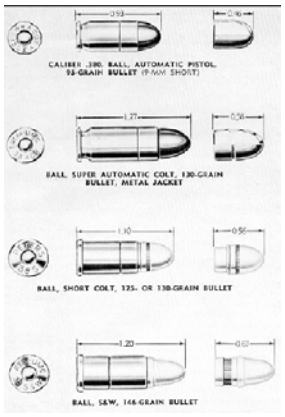
N

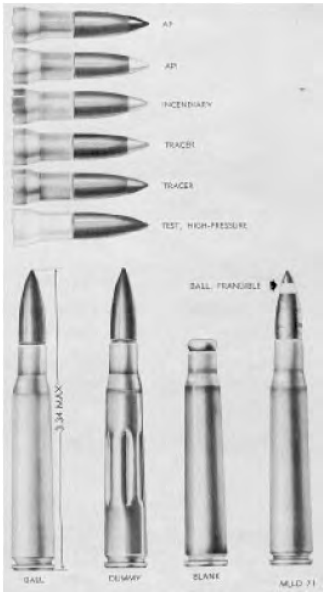
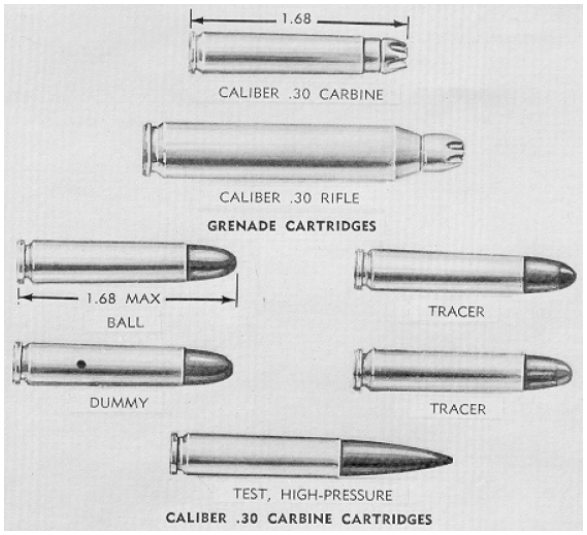
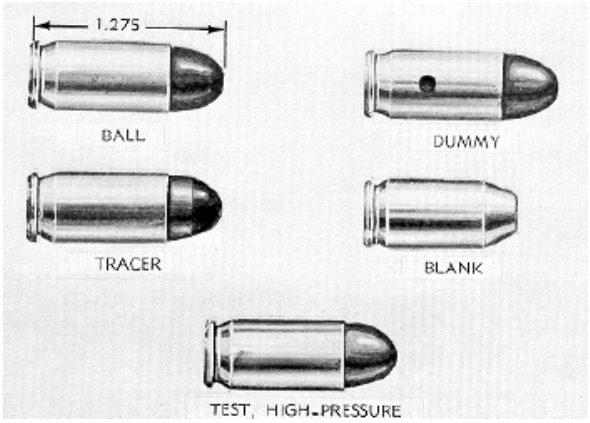
100 50 0 100 Meters

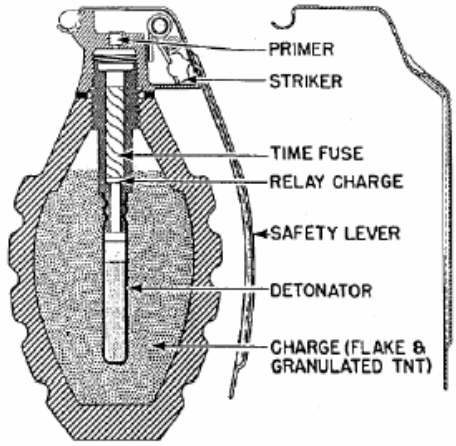
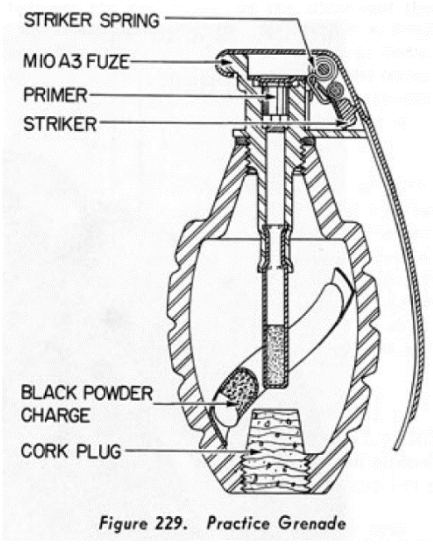
PARSONS

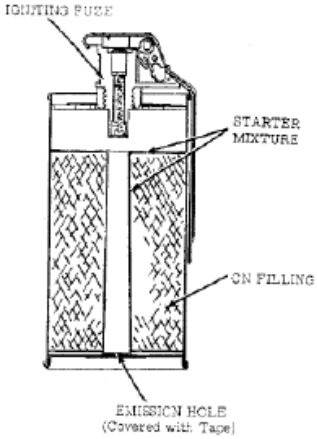
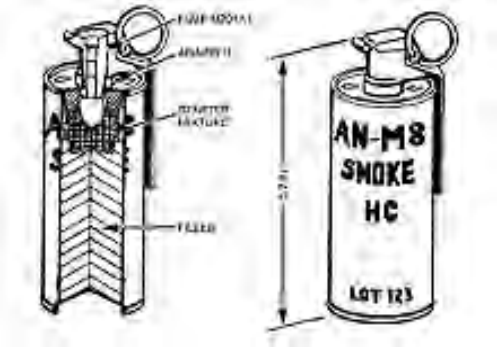
DESIGNED BY: BT	Small Arms Range		
DRAWN BY: BT			
CHECKED BY: AK	SCALE: As Shown	PROJECT NUMBER: 100087.0538.110208.09002	
SUBMITTED BY: DS	DATE: March 2022	PAGE NUMBER:	
	FILE:		

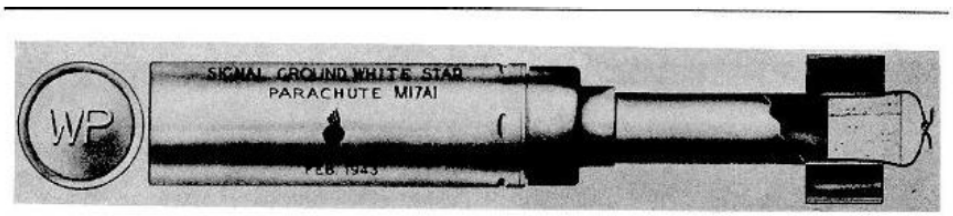
Table 3-1: Suspected or Known Munitions
Camp Blauvelt, New York

Munition	Photograph/Diagram
Cartridge, .22 caliber	
Cartridge, .38 caliber	

Munition	Photograph/Diagram
Cartridge, .30 caliber (includes Carbine)	 
Cartridge, .45 caliber	

Munition	Photograph/Diagram
Grenade , Hand, Fragmentation, MkII (1917 – Present)	
Grenade, Hand, Practice, MkII	 *Figure 229. Practice Grenade*

Munition	Photograph/Diagram
Grenade, Hand, Riot, M6; M7 (Lachrymatory)	
Grenade, Hand, Smoke, HC, AN-M8	

Munition	Photograph/Diagram
Signal, Illumination, Ground, Parachute: White Star, M17 Green Star, M19 Amber Star, M21 Red Star, M51 **Signal, Illumination, Ground, Cluster:** White Star, M18 Green Star, M20 Amber Star, M22 Red Star, M52	
Dynamite, Military, M1	

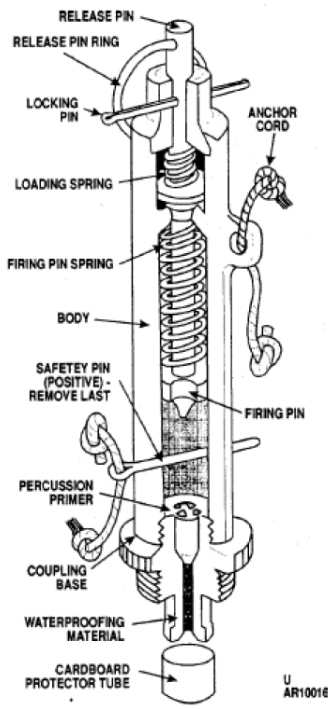
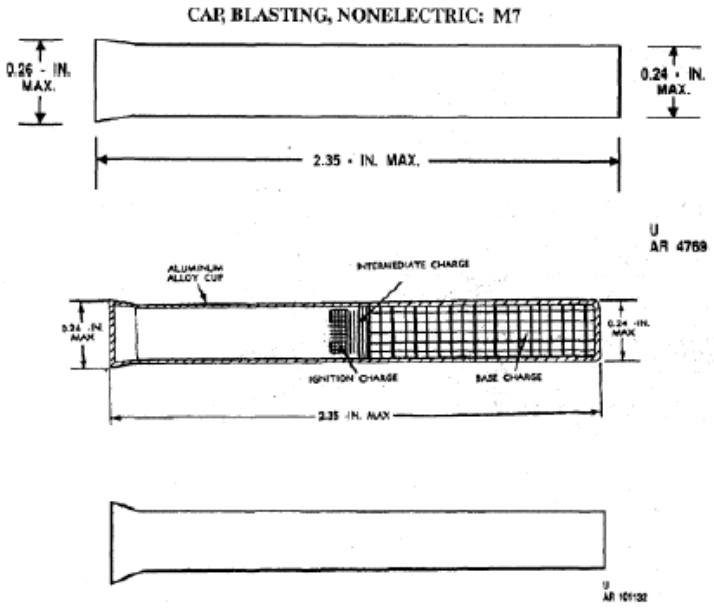
Munition	Photograph/Diagram
Firing Device, Demolition, Pull, M1	
Cap, Blasting, Non-Electric, M7	

Table 3-2: HRR Addendum Summary

MRS	AEDB-R #	Range Type	Munitions Used	Range Category	PA Acreage	PA Data Gaps	2011 HRR Data Gaps	HRR Addendum Results and Gaps
Camp Blauvelt	NYHQ-007-R-01	Small Arms	0.22 caliber 0.30 caliber 0.38 caliber 0.45 caliber Hand grenades (MkII) Flares Dynamite	SA-BRM-HUSE	447	Exact dates of use	MRS Revisions: None	MRS Revisions: None
							HRR Gaps: Exact dates of use	HRR Gaps: Exact Location of 1,000 inch course, infiltration course, and grenade course

SA= Small Arms
BRM= berm-like feature present
HUSE= moderate to heavy use

CHAPTER 4
CONCEPTUAL SITE MODELS FOR MUNITIONS RESPONSE SITES

4.0 INTRODUCTION

4.0.1 This chapter presents the CSM for Camp Blauvelt. This CSM has been prepared in accordance with the requirements of USACE Engineer Manual 200-1-12 *Conceptual Site Models* (USACE, 2012) and the Final PWP (Weston, 2011). A CSM expresses an MRS-specific, potential contamination concern through a series of diagrams, figures, and narrative. These diagrams, figures, and narratives are designed to illustrate the potential physical, chemical, and biological processes that transport contaminants from sources to receptors. The current CSM profile includes updates based on findings from the 2009 Preliminary Assessment (Malcolm Pirnie, 2009), the Parsons 2012 SI Report (Parsons, 2012), and the AECOM After-Action RI Report (AECOM, 2020).

4.0.2 The CSM is a description of an MRS and its environment that is based on existing knowledge and is developed through analysis of MRS profile information collected through the life of the study. The Project Team integrates this information to illustrate relationships between the potential sources and receptors that may be affected and conducts a pathway analysis to show how MRS conditions, including the exposure pathways, function as a system. The CSM describes complete, potentially complete, or incomplete exposure pathways; current, determined, or reasonably anticipated future use of property; and potential receptors (USACE, 2012).

4.0.3 The CSM serves as a planning instrument, a modeling and data interpretation aid, and a communication device for the team (USACE, 2012). It serves as a tool to aid communication with the public and assists with integration of information and decisions. The CSM provides a standard means to summarize and display what is known about the MRS, and to identify what additional information must be known to develop technically sound DQOs.

4.0.4 A preliminary CSM is developed during the first step of the DQO process and continues to evolve throughout the project as historical and recently collected data are evaluated, DQOs are updated, and risk assessments are refined. An effective CSM presents known or suspected conditions about receptors and potential source areas, and the interactions between them. In most cases, the needed information may be categorized into five “profile types” that address specific, yet overlapping types of information (USACE, 2012). These include:

1 Facility Profile – describes man-made features and potential sources at or near the site.
2 Physical Profile – describes natural factors that may affect release, fate and transport, or access.
3 Release Profile – describes the movement and extent of contaminants in the environment.
4 Land Use and Exposure Profile – provides information used to identify and evaluate applicable exposure scenarios, receptors, and receptor locations.
5 Ecological and Cultural Resources Profile – describes the natural habitats and ecological receptors present on and around the site.

4.0.5 Together, these CSM components and the DQOs present the current understanding of the potential contamination problem; outline existing data gaps and the sampling necessary to address these gaps; identify potential exposures that may result in existing human and ecological risks; and provide guidance for future project decision-making. The CSM is used to identify data gaps to support the SI objectives to:

- Eliminate from further consideration those releases that pose no significant threat to public health or the environment;
- Determine the potential need for removal action (time critical or non-time critical);
- Collect or develop data to support Hazard Ranking System (HRS) scoring by USEPA;
- Characterize the release for effective and rapid initiation of the RI/FS;
- Collect data to complete the Munitions Response Site Prioritization Protocol (MRSPP).

4.0.6 For Camp Blauvelt, the MRS-specific CSM is presented in the form of a table and figures. The CSM table summarizes conditions within the MRS that could result in human or ecological exposure to MEC and MC. It also describes the types of MEC/MD potentially present at the MRS; facility profile; and physical, ecological, land use, and exposure profiles. The CSM figure summarizes which potential receptor exposure pathways are (or may be) complete and which are (and are likely to remain) incomplete. An exposure pathway is not considered to be complete unless all four of the following elements are present:

- A source and mechanism for contamination release;
- An environmental transport and/or exposure media;
- A point of exposure at which the contaminant can interact with a receptor; and
- A receptor and a likely route of exposure at the exposure point.

4.0.7 The CSM table and figures for Camp Blauvelt are provided in the following sections. For Camp Blauvelt small arms ranges, unexpended small arms ammunition does not pose a unique explosive safety hazard and is not considered to be MEC, while expended small arms (MD) poses no explosive hazard (DOA 2009 and 2011). For this reason, MEC are assumed not to be present at ranges where munitions use was limited to small arms ammunition only. Based on historical records for Camp Blauvelt, the presence of MEC is possible due to the former use as an infiltration course and grenade course; therefore, a conservative approach to the CSM was applied and the potential presence acknowledged.

Table 4-1: Conceptual Site Model for Camp Blauvelt MRS

Profile Type	MRS Characterization
Facility Profile	Location and Area: Blauvelt State Park, approximately 0.5 miles west of the Governor Mario M. Cuomo Bridge in Orangetown, Rockland County, New York.
	Structures: There are a few residential properties within the southwestern portion of the MRS, outside of the area used for former firing activities, and a water tower is located on the southern border. The MRS is maintained as an active state park with hiking and biking trails. Camp Bluefields Road, a former carriage road, is unpaved and traverses the MRS in an east to west direction for the entire length of Blauvelt State Park. Range infrastructure remains intact within the MRS and includes concrete target walls at 200, 300, 600, and 1,000 yards from the firing line. The range also includes concrete bunkers, interconnected above- and belowground tunnels, and the foundation areas of former observation towers. Additionally, concrete foundations of former backstop structures that existed downrange of target walls are located behind the 200, 300 and 600 target walls. Two target areas for former pistol ranges are located at the 50-yard and 75-yard line, respectively.
	Security: No barriers to MRS access are present. Property is a public state park that has numerous hiking trails through undeveloped forest.
Physical Profile	Climate: The climate at Camp Blauvelt is classified as humid and subtropical characterized by hot summers and mild winters with high precipitation. Temperature varies from the 70s in the summer to the 30s in the winter. The warmest month of the year is July, with an average maximum temperature of 76° F. The coldest month of the year is January, with an average minimum temperature of 11° F. The annual average precipitation is 41.2 inches with rainfall evenly distributed throughout the year. The wettest month of the year is September, with an average rainfall of 4.73 inches (US Climate Data, 2022).
	Geology: The Camp Blauvelt MRS is in the Newark Basin within the Piedmont physiographic province in southern New York (Yager and Ratcliffe, 2010). The Newark Basin extends approximately 150 miles from Rockland County, New York, through New Jersey and into eastern Pennsylvania. The Basin was formed by faulting during the early rifting stage of the opening of the Atlantic Ocean. The Newark Basin is a half graben that contains a 2.5 to 3 mile thick sequence of westward dipping continental red beds and lake deposits with intrusive sheets of diabase and basalt flows, collectively known as the Newark Supergroup (Yager and Ratcliffe, 2010). The Ramapo Fault bounds the Newark Basin on the west within Rockland County. Sedimentary rocks of the Newark Supergroup range in age from Late Triassic to Early Jurassic (229 to 175 million years ago) and consist of interbedded shale, sandstone, and siltstone that are typically red, reddish brown, or maroon. Locally sediments may be gray or black and may include conglomerate, black mudstone and some coal (Trapp and Horn, 1997). Magmatism in the Early Jurassic (approximately 201 million years ago) produced voluminous basalt lava flows and the intrusion of diabase, including the Palisades Sill (Yager and Ratcliffe, 2010). The Palisades Sill underlies the Camp Blauvelt MRS and outcrops in prominent cliffs along the west bank of the Hudson River (structure map in Yager and Ratcliffe, 2010). Sedimentary formations that outcrop west of the MRS generally dip westward at approximately 10 degrees. The glaciers that covered most of Canada and the northern United States episodically over the last 1.8 million years extended only a few miles south of the Camp Blauvelt MRS during the most recent glacial advance approximately 22,000 years ago (Skehan, 2008). Glaciers scoured and removed soil and soft weathered surface rocks as they moved. As the ice melted, the sediment load was dropped in place as unsorted till or was redistributed as outwash by the vast amounts of meltwater

Profile Type	MRS Characterization
	released by the glacier. Till is a mixture of silt, gravel, and boulders of various sizes in a clay matrix. The glacial outwash sediments, deposited by streams and rivers of meltwater in front of the receding glaciers (glaciofluvial deposits), tend to be graded from coarse to fine with increasing distance from the glacier. Meltwater could also be impounded in lakes that were dammed either by the ice or by glacial sediments. Lake plains, terraces, and beaches were left in place when the dammed water found a lower outlet (Olcott, 1995). Based on surface geology maps in Heisig (2010) unconsolidated deposits of glacial till, lake deposits and alluvium cover bedrock in the vicinity of the Camp Blauvelt MRS. Within the MRS, unconsolidated material is thin or absent on the igneous bedrock of the Palisades Sill.
	Topography: The Camp Blauvelt MRS is on the westward sloping outcrop of the Palisades Sill. The surface of the MRS is undulating with elevations ranging from approximately 250 to 610 feet above sea level with isolated peaks at 350 feet, 410 feet, and 610 feet. East of the MRS, there is steep slope down to the Hudson River at approximately 10 feet above sea level. To the west of the MRS, there is a steep slope down to approximately 150 feet above sea level (Figure 4-1) (USGS, 1979).
	Soil: The eastern half of the Camp Blauvelt MRS is made up of Holyoke-Rock outcrop complex. The soil in the western portion of the MRS is predominantly Wethersfield gravelly silt loam on undulating to steep slopes. The material is glacial till derived from reddish sandstone, shale and conglomerate with some basalt. A typical soil profile is gravelly silt loam from 0 to 13 inches; gravelly loam from 13 to 22 inches; and gravelly fine sandy loam from 22 to 60 inches (NRCS, 2022).
	Hydrogeology: Although sedimentary rocks are thin or absent over the igneous Palisades Sill within the Camp Blauvelt MRS, Newark Basin sediments outcrop just west of the MRS boundary. The aquifer beds near the MRS consist of sandstone, mudstone, siltstone, and shale. At the western margin of the basin, aquifer beds are coarser consisting of conglomerate, pebbly sandstone, and sandstone. Fractures parallel to the bedding planes are the major water-bearing zones (Heisig, 2010). The Newark Basin aquifer is unconfined where the water table is below the bedrock surface. Where the water table is within the overlying glacial till, the relatively low permeability of till and lake sediments constitute a confining layer (Yager and Ratcliffe, 2010). Approximately 32 percent of the public water supply in Rockland County is obtained from the sedimentary bedrock aquifer identified as the Newark Basin aquifer. Most of the public supply wells are in the coarse-grained sedimentary formations in the Newark Basin lowlands west of the MRS. The Lake DeForest Reservoir, approximately 2.5 miles northwest of the MRS, provides 37 percent of the public water supply (Heisig, 2010). There are no groundwater wells within the Camp Blauvelt MRS as shown on Figure 4-1
	Hydrology: Several small ponds and intermittent streams are located within the MRS. The more prominent surface water bodies are not in the vicinity of the former range. The ponds are located approximately 300 yards north of the southern MRS boundary. The stream flows from southeast to northwest and is located in the northwest corner of the MRS. The stream discharges into a pond approximately 0.5-mile northwest of the MRS (United States Fish and Wildlife Service [USFWS], 2021a). A drainage ditch runs behind the 300-yard target wall on the northeastern side, where an intermittent stream travels north from the concrete tunnels through the drainage ditch to the concrete blocks adjacent to the 300-yard target wall.

Profile Type	MRS Characterization
	Vegetation: The majority of the MRS is heavily wooded with the exception of the southwestern portion that has some residential properties.
	Cultural, Archeological, and Historical Resources: There are no historic or cultural resources at Camp Blauvelt. Additionally, there are no National Historic Landmarks located in Rockland County, NY (National Park Service, 2022a,b.c).
	Wetlands: There are five types of wetlands within the MRS, these include: PUBHh (Palustrine, Unconsolidated Bottom, Permanently Flooded, Dikes/Impounded), R4SBC (Riverine, Intermittent Streambed, Seasonally Flooded), PFO1A (Palustrine, Forested, Broad-Leaved Deciduous, Temporary Flooded), PFO1C (Palustrine, Forested, Broad-Leaved Deciduous, Temporary Flooded) and PFO1E (Palustrine, Broad-Leaved-Deciduous, Seasonally Flooded/Saturated) (USFWS, 2022a). The wetlands are not in the vicinity of the former range.
	Demographics: The total population in Orangetown based on the 2020 census from the U.S. Census Bureau is 48,655. The square mileage of Orangetown is 24.10 miles. The population density of Orangetown (based on square mileage) is 2,019 people per square mile. The 2020 census estimated total population of Rockland County is 338,329. The population density of Rockland County (based on the square mileage of 174 sq. mi.) is 1944 persons per square mile (U.S. Census Bureau, 2020).
Ecological and Cultural Resources Profile	Habitat Type: The area is forested. No critical habitats are present (USFWS 2022b).
	Ecological Receptors: Forested areas, which may provide habitat for ecological receptors, are present within the MRS. There are three federally-listed threatened and endangered species that occur in Rockland County; the Indiana Bat (*Myotis sodalist*), the Northern Long-Eared Bat (*Myotis septentrionalis*), and the Bog Turtle (*Clemmys muhlenbergii*). No federally designated critical habitat is located within the MRS (USFWS, 2022b); however, habitat supporting ecological receptors is present within the MRS. New York State also lists numerous threatened and endangered species with known ranges or locations within the vicinity of the MRS, including species of mollusks, insects, fish, amphibians, reptiles, birds, and mammals (NYSDEC, 2022). For a full list of New York State listed threatened and endangered species with the potential to be found within the vicinity of the MRS, see Chapter 11.
	Degree of Disturbance: Low disturbance of the MRS is present. The MRS is a forested state park and there are a couple of residential properties with the only use of the area being for residential and recreational purposes.
	Cultural and Archeological Resources: Camp Blauvelt MRS is not located within a National Heritage Area (NHA) (National Parks Service [NPS], 2022a) and does not contain a structure on the National Register of Historic Places (NRHP) (NPS, 2022b), National Register of Historic Districts (NRHD) (NPS, 2022a) or a National Historic Landmark (NHL) (NPS, 2022c).
Land Use and Exposure Profile	Current Land Use: Undeveloped and residential land uses are present. Portions of the MRS are a state park.
	Current Potential Receptors: Current receptors include residential, site visitors or recreational users, commercial/industrial users, and ecological receptors.
	Potential Future Land Use: Same as current land use.
	Potential Future Receptors: Same as current receptors.

Profile Type	MRS Characterization
Munitions/Release Profile	Munitions Type(s): Small arms ammunition (rifles and pistols) including 0.22, 0.30 0.38 and 0.45 caliber. Potential presence of hand grenades, tracer bullets, flares, machine guns, and dynamite.
	Release Mechanisms: Residual munitions released from historical training activities as well as natural processes, such as erosion or frost heave processes. If MEC or MD (bullets, casings, or metal fragments) are present, MC could be released to the soil via corrosion, degradation, or weathering of bullets or casings. Surface water and sediment may be impacted by indirect deposition into streams via overland flow. Release mechanisms that may enable transport of potential MC from soil or surface water / sediment source areas toward off-range receptors are present in the operational range areas at Camp Blauvelt. Surface water pathways were identified behind target walls.
	Maximum Penetration Depth: Based on the list of suspected munitions (**Appendix C**); maximum probable penetration depth is land surface or shallow subsurface (<12”).
	MEC Density: The presence of MEC is possible and the CSM reflects this conservative assumption.
	Munitions Debris: The presence of MD is possible and the CSM reflects this conservative assumption.
	Associated Munitions Constituents: MC of interest include antimony, copper, lead, zinc, aluminum, barium, chromium, and explosives (**Appendix C**). Note: Table C-1, Appendix C lists magnesium, strontium, and tin as MC of possible munitions used at Camp Blauvelt, however, site samples will not be analyzed for magnesium as it is an essential nutrient. Site samples will also not be analyzed for strontium because it is a very uncommon metal requiring a different analytical method. Munitions containing magnesium, strontium, and tin also contain other metals at greater concentrations that will be analyzed. Since the purpose of an SI is to determine if there is evidence of a release of contamination to the environment, that objective can be met without the analysis of magnesium, strontium, or tin.
	Transport Mechanisms/Migration Routes: MC metals and explosives have limited solubility and can adsorb to or form complexes with soil particles or organic matter in soil under natural geochemical conditions. This makes these compounds generally less likely to be transported by water via leaching or runoff. Because explosives are organic compounds, they are also subject to biological or chemical degradation over time, which results in these compounds being less persistent in the environment than MC metals. Based on these properties, while MC compounds potentially are present in surface and subsurface soil, the migration of potential MC compounds to groundwater is not expected at this MRS. The same rationale applies with respect to the migration of MC metals to surface water and sediment. However, if there is evidence of a release of MC to soil, there is the potential for ongoing migration to surface water/sediment. Therefore, evaluation of surface water/sediment will be conducted at the MRS. Based on the limited amount of contaminated surface soil anticipated, contaminated fugitive dust is not expected to migrate off-site.
	Pathway Analysis: While the presence of MC contamination at the additional areas of concern in the MRS has not been confirmed, the historic use of the site may have resulted in the release of MC to site media. Based on the possible presence of MC and other potential contaminants of concern in surface soil, the primary potentially complete exposure pathways for hypothetical future residents; site visitors, recreational users or trespassers; commercial or industrial workers; construction

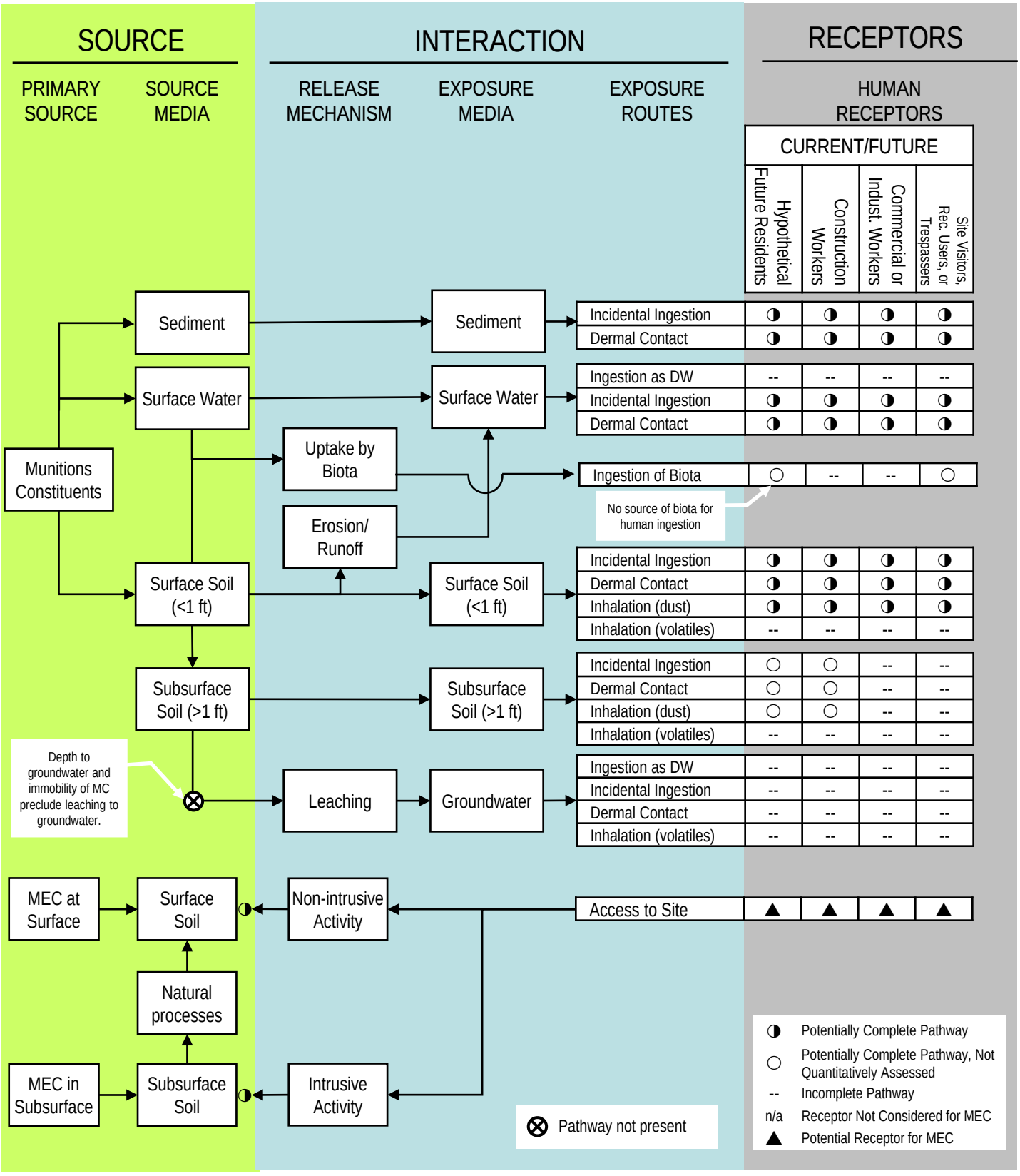
Profile Type	MRS Characterization
	workers; and ecological receptors is through direct contact (i.e., incidental ingestion, dermal contact, and inhalation of resuspended particulates). There is also the potential for exposure to these compounds in subsurface soil for commercial or industrial workers during excavation activities and hypothetical future residents via the redistribution of excavated soil at the ground surface during residential development; however, these pathways are considered to be potentially complete, but not quantitatively assessed, because no sampling of subsurface soil (i.e., deeper than 6 inches) is proposed. These pathways are also considered to be potentially complete, but not quantitatively assessed for ecological receptors. The subsurface soil exposure pathways are incomplete for site visitors and commercial or industrial workers because it is unlikely for these receptors to be exposed to subsurface soil during anticipated non-intrusive activities. There is potential that MC in soil might have migrated to surface water within the MRS via erosion/runoff. Therefore, surface water and sediment exposure pathways (i.e., incidental ingestion and dermal contact) are potentially complete for all receptors within the MRS. The ingestion as drinking water exposure pathway is incomplete because the surface water is not used as a source of drinking water by the human receptors. The groundwater exposure pathways are incomplete for all receptors because migration of MC to groundwater is not expected. The ingestion of biota exposure pathway is incomplete for all receptors at this MRS because there are no sources of biota for human ingestion. Hand grenades, flares, and dynamite were used at Camp Blauvelt; therefore, the pathways for MEC exposure are potentially complete.

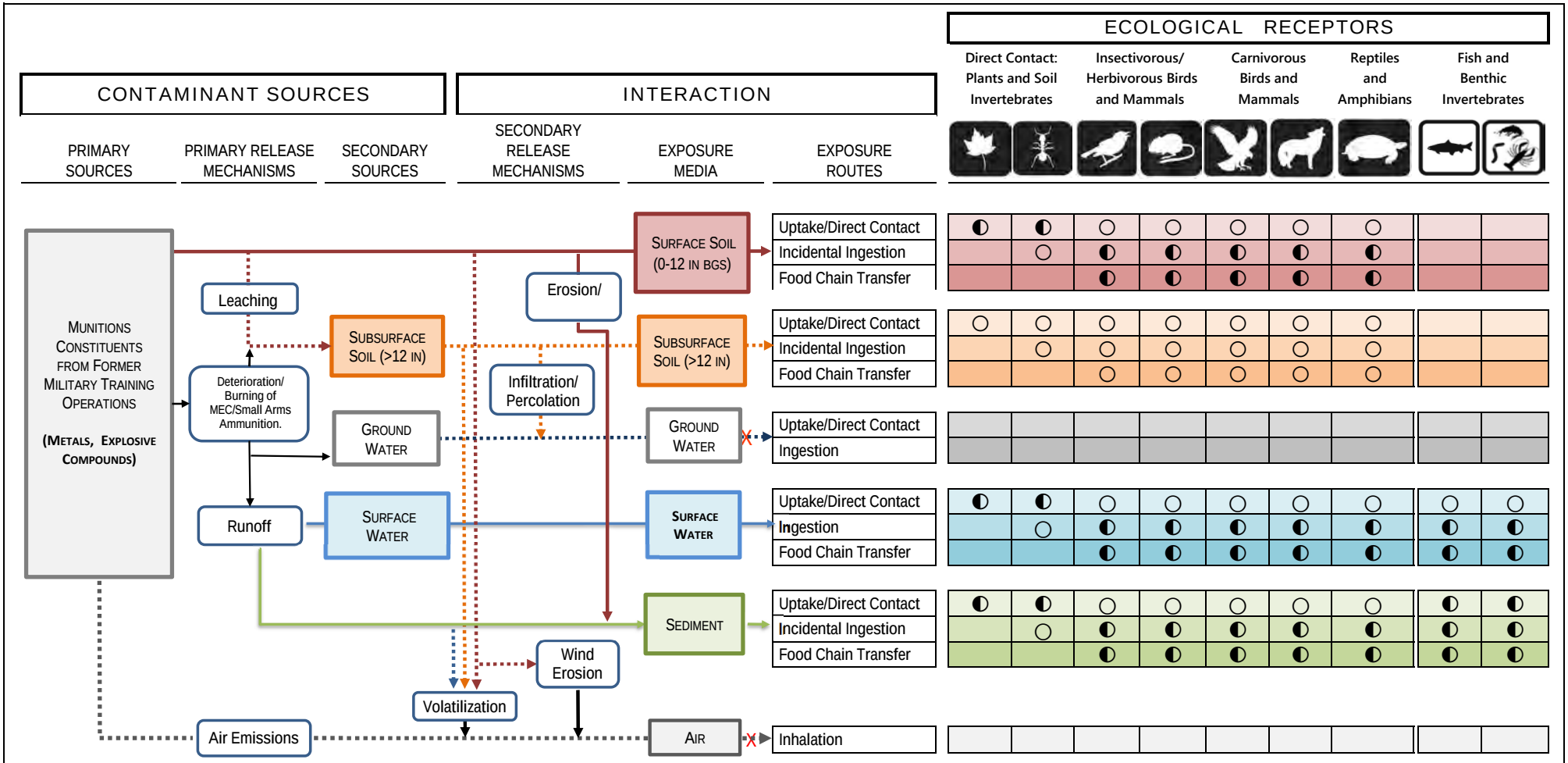
Figure 4-1

CONCEPTUAL SITE MODEL DIAGRAM

Site/MRS Name: Camp Blauvelt MRS, New York

Completed By: Janelle Bartscherer, Parsons ***Date Completed:*** February 4, 2022





Legend

- Potentially complete exposure pathway
- Potentially incomplete exposure pathway
- Incomplete exposure pathway
- ◐ Potentially complete exposure route, quantitatively evaluated
- ○ Potentially complete exposure route, not quantitatively evaluated
- Incomplete exposure route, not evaluated

FIGURE 4-2

Ecological Conceptual Site Model
Camp Blauvelt

Site Inspection Addendum for
Camp Blauvelt
New York

PARSONS

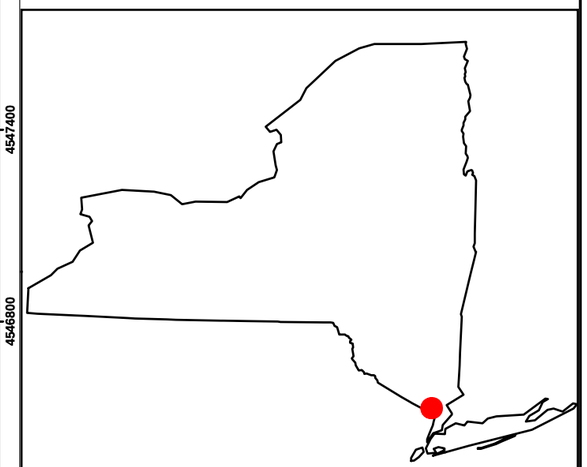
Figure 4-3

Water Wells
Camp Blauvelt
AEDB-R # NYHQ-007-R-01

Rockland County, New York

Legend

- Domestic Water Well
- Irrigation Water Well
- Buffer (1 Mile)
- MRS Boundary



Site Location in New York

N

500 250 0 500 Meters

PARSONS

DESIGNED BY: BT	Water Wells
DRAWN BY: BT	
CHECKED BY: JB	SCALE: As Shown
SUBMITTED BY: DS	DATE: February 2022
	FILE:
	PROJECT NUMBER: 100087.0538.110208.09002
	PAGE NUMBER:

CHAPTER 5
DATA QUALITY OBJECTIVES

5.0 INTRODUCTION

5.0.1 The DQOs for Camp Blauvelt were developed using the USEPA Guidance on Systematic Planning Using the Data Quality Objective Process (USEPA, 2006). This DQO process ensures data are generated during the SI that are of the type, quality, and quantity needed for decision making.

5.0.2 The DQO Process consists of seven iterative steps that define criteria used to establish the final data collection design. The seven steps include:

1. **State the Problem**: The nature of the problem that initiated the study and a conceptual model of the environmental hazard to be investigated.
2. **Identify the Goal of the Study**: State how the data will be used in meeting objectives and solving the problem, identify study questions and the order of priority for resolving them, and define alternative outcomes
3. **Identify Information Inputs**: Identify the data and information needed to answer study questions.
4. **Define the Boundaries of the Study**: The analytic approach or decision rule that defines the logic for how the data will be used to draw conclusions from the study findings. This step should specify the target population and characteristics of interest, spatial and temporal limits, and scale of influence.
5. **Develop Analytical Approach**: Define parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from the findings.
6. **Specify Performance or Acceptance Criteria**: Specify probability limits for false rejection and false acceptance decision errors; develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.
7. **Develop the Plan for Obtaining Data**: Select the resource-effective sampling and analysis plan that meets performance criteria.

5.0.3 The first five steps are focused primarily on identifying qualitative criteria, while the sixth step establishes acceptable quantitative criteria on the quality and quantity of the data to be collected relative to the ultimate use of the data. These criteria are known as performance or acceptance criteria (i.e., DQOs). For decision problems, DQOs are typically expressed as tolerable limits on the probability or chance (risk) of the collected data leading the user to making an erroneous decision. For estimation problems, DQOs are expressed in terms of acceptable uncertainty (e.g., width of an uncertainty band or interval) associated with a point estimate at a desired level of statistical confidence. The seventh step of the DQO Process, a data collection design, is developed to generate data meeting the quantitative and qualitative criteria specified in Step 6. A data collection design specifies the type, number, location, and

physical quantity of samples and data, as well as the Quality Assurance (QA) and Quality Control (QC) activities that will ensure that sampling design and measurement errors are managed sufficiently to meet the performance or acceptance criteria specified in the DQOs. The outputs of the DQO Process are used to develop a QA Project Plan and for performing Data Quality Assessment (USEPA, 2006).

5.0.4 The objective of the DQO Process for this project is to collect an appropriate amount of data for the Camp Blauvelt MRS to determine if the project objectives defined in Section 1.4 of this WP have been met. **Table 5-1** presents the Summary of the DQOs for the Camp Blauvelt MRS; subchapters 5.1 and 5.2 reiterate the MEC and MC DQOs, respectively, and **Table 5-2** presents the MRS-specific sampling and analysis plan that is the end product of Step 7.

Table 5-1: Data Quality Objectives Summary

DQO Process Steps	DQO Decision Statements
Step 1. State the Problem	During RI field activities at Camp Blauvelt, a grenade fuze was found and prompted an investigation of training activities at Camp Blauvelt for new areas of potential interest. Historical training activities within the MRS could have resulted in the presence of MEC, MC and MC contamination of the surface soil, surface water, and sediment at the MRS at additional areas of interest. Based on historical records, additional areas of interest were identified in the rifle range, including former backstops behind the 200-, 300-, 600-yard target walls, pistol ranges at 25 and 50 yards and areas of ponding and intermittent streams behind the 200-yard and 300-yard target walls. Additionally, former training at Camp Blauvelt included a grenade course and infiltration course. An SI Addendum is needed at the MRS to determine if MEC/MD or MC contamination are present and, if so, to evaluate whether they are creating a potential explosive hazard (MEC) or unacceptable risk/hazard to human health and the environment (MC/fuel contamination), as determined by comparison to project screening levels (PSLs).
Step 2. Identify Goal of the Study	Does the magnetometer-assisted qualitative reconnaissance (QR) data and inspection observations indicate the presence and/or the potential presence of MEC at the MRS? If evidence of MEC potential is confirmed, then evaluate the need for an interim removal/remedial action or RI/FS. If evidence of MEC potential (or indicators of MEC such as craters, targets, etc.) is not confirmed, then a recommendation of NFA for MEC is viable.
Step 3. Identify Information Inputs	The following information is needed to make the decisions specified above: • Additional historical information for the types of munitions that may have been used at the MRS and locations of munitions use; • Locations, types, and depths of MEC and/or MD observed; • Results from VS transects conducted for the SI Addendum; • Analytical results from MC samples collected during the SI Addendum.
Step 4. Define the Study Boundaries	The study area boundaries include the areas within the MRS boundary and Camp Blauvelt is generally accessible. Magnetometer-assisted QR is

DQO Process Steps	DQO Decision Statements
	focused through the majority of the MRS, at the small arms range (SAR) and all land operated by the Palisades Interstate Park Commission
Step 5. Develop Analytical Approach	If MEC or evidence of MEC use is located, the item will be photographed, and its position recorded using a GPS. In the event MEC is located, field operations will temporarily cease pending direction and following notification of the Parsons PM and in turn the USACE, ARNG G9, and NYARNG project team. If evidence of MEC potential is confirmed, degree of hazard and exposure will be evaluated and an RI for MEC will be recommended. If evidence of MEC potential is not confirmed than an NFA for MEC will be considered. A weight-of-evidence approach will be applied to determine the final recommendation. If MC exists in surface soil above agreed to background values (represented by site-specific ambient data) and screening criteria, and if MEC or MD are present, then the additional area of interest will be recommended for inclusion in the RI/FS and a more robust MC analysis of these areas in the RI/FS is warranted. If MC exists in surface soil above the agreed to ambient values and screening criteria, and MEC or MD are not present, then MC concentrations will be further evaluated to determine whether the MC is related to the former NYARNG training activities. If the source of the MC is not site-related, an NFA will likely be recommended for the additional areas of interest. If MC are not detected in surface soil above the agreed to ambient values and screening criteria, then NFA will be recommended for the additional areas of interest.
Step 6. Specify Performance or Acceptance Criteria	Data quality evaluation procedures and determination of usability are defined in UFP-QAPP (**Appendix E**). Results of Quality Assurance/Quality Control (QA/QC) efforts during sample collection and analysis, in combination with professional judgment, will be used to evaluate the usability of chemical data for making decisions. Acceptable limits for the MC sampling include analytical method reporting and/or detection limits that are sufficiently low to meet applicable human and ecological screening criteria. Analytical method detection limits, reporting limits, and QC acceptance criteria are specified in the UFP-QAPP (**Appendix E**).
Step 7. Develop Plan for Obtaining Data	The overall field data collection plan is presented in Sections 5.1 and 5.2, and the MRS-specific data collection plan is presented in **Table 5-2** and is based on the information presented in the preceding six steps, and evaluation of existing data. Initial field observations will be assessed to optimize sample location selection if MEC and/or MD are present at the MRS. The stakeholder team will have opportunities to provide input through regular project updates during data collection activities, analysis of data, and preparation of reports.

Table 5-2: Summary of Munitions Response Data Collection Plan

Munitions Response Site Sub-Area	Data Requirements						Sampling and Analysis Methods	
	Data User Perspective(s)	**Contaminant or Characteristic of Interest Identified**	**Media of Interest Identified**	**Required Visual Surveys, Sampling Areas or Locations and Depths Identified**	**Visual Survey Lengths, Amount of Sampling/Number of Samples Required**	**Reference Concentration(s) or Other Performance Criteria**	**Sampling Method Identified**	**Analytical Method Identified**
Camp Blauvelt – Small Arms Ranges	Potential for MEC within infiltration course or grenade course.	Hand Grenades, Flares, and Dynamite	Ground surface based on visual observation.	Biased visual survey transects to focus on the firing line, area between firing line and target, surrounding the target area, and between target and natural backstop.	20 miles of magnetometer-assisted visual survey transects.	If evidence of MEC potential is confirmed, degree of hazard and exposure will be evaluated and an RI for MEC will be recommended. If evidence of MEC potential is not confirmed than an NFA for MEC will be considered.	Visual survey transects in biased locations. Magnetometer-assisted survey will include GPS to record geospatial findings, confirm transect alignments and MC sample locations and photographs will be taken of MRS features and sample locations.	Not Applicable.
	Potential for MC within former small arms ranges, grenade course, and infiltration course.	MC (antimony, copper, lead, zinc, aluminum, barium, and chromium and explosives).	Surface soil (sample depth of 0- 6 inches). Surface water/sediment Approach will be modified to consider range-related debris, if detected.	Biased surface soil samples to be collected at additional areas of concern. Locations will be adjusted if conditions exist that warrant additional bias of locations (stained soil, MD, etc.).	15 biased surface soil samples collected at the former firing lines, target areas, and other areas of interest. Two ambient surface soil samples in an area not impacted by former use. Six biased co-located surface water/sediment samples. One ambient co-located surface water/sediment samples.	If MC is detected below screening levels, then the additional areas of interest of the MRS will be recommended for NFA for MC.	Incremental Sampling Methodology (ISM) surface soil samples collected. Discrete co-located surface water/sediment samples collected.	6020B for metals (antimony, copper, lead, zinc, aluminum, barium, and chromium) and 8330B for explosives.

5.1 DATA QUALITY OBJECTIVES FOR MUNITIONS AND EXPLOSIVES OF CONCERN

5.1.1 The Camp Blauvelt MRS additional areas of interest will be evaluated to determine if use of military munitions resulted in the potential for MEC and/or MC contamination. Visual surveys will be conducted to determine the presence/absence of MEC on the land surface. An approximate visual survey length is based on the size of the site and historical use. At the small arms ranges visual surveys will focus on firing lines, target areas, backstops, and the floor between. At possible infiltration course or grenade course locations, visual surveys will focus on evidence of past training courses. Additional transects are planned beyond the known impact areas, over the entire portion of the MRS for which ROE was obtained, to look for evidence of former use.

5.1.2 If MEC is identified, the MRS will be recommended for further investigation. A weight-of-evidence approach will be applied as noted in **Table 5-1** to determine the final recommendation.

5.1.3 The visual survey acres for the Camp Blauvelt MRS are listed in **Table 5-2** and depicted in figures included in **Appendix D** (Field Sampling Plan).

5.2 DATA QUALITY OBJECTIVES FOR MUNITIONS CONSTITUENTS

5.2.1 The Camp Blauvelt MRS additional areas of concern will be evaluated to determine if they have been impacted by former training resulting in the potential for contamination by MC.

5.2.2 Biased samples of surface soil and surface water/sediment will be collected from within the MRS to evaluate for the presence of MC. Ambient samples will also be collected. The number of samples to be collected is listed in **Table 5-1** and Tables D-2 and D-3 of the FSP in **Appendix D**. Collection of samples is based on the presence of military munitions (MEC or MD) and the location of known areas of interest such as target areas, firing lines, and where there is evidence of military activity. Samples will be collected based on the criteria and procedures outlined in Section 3.1 of the FSP. Samples will be analyzed for analytes defined in Table D-1 and D-2 of the FSP.

5.2.3 Constituent concentrations that exceed the detected concentrations in the ambient samples and human health screening criteria based on the decision rules established during the TPP process and documented in this HRR Addendum/WP (see Worksheet 15 of the UFP-QAPP in **Appendix E**) may warrant a recommendation for further investigation of MC. A weight-of-evidence approach will be applied as noted in **Table 5-1** to determine the final recommendation.

5.3 DATA QUALITY OBJECTIVES FOR MUNITIONS RESPONSE SITE PRIORITIZATION PROTOCOL

Specific input data will be collected and the MRSPP modules populated as part of the SI Addendum. These data will be collected from existing document sources and SI Addendum field work data. Source documents will include the PA, 2011 HRR, 2012 SI, RI After Action Report, and HRR Addendum Report. Data gaps will be filled via sampling, reviewing local and state agencies' records, interviews, internet searches, and other database searches.

5.4 MUNITIONS RESPONSE SITE-SPECIFIC DATA QUALITY OBJECTIVES

The qualitative and quantitative statements summarized above were refined to clarify study objectives, define the type of data needed, and specify the potential decision errors for Camp

Blauvelt. The resulting Field Data Collection Plan (Step 7 of the DQO process) is presented in **Table 5-2**.

CHAPTER 6
SAMPLING AND ANALYSIS PLAN

6.0 INTRODUCTION

6.1 A Field Sampling Plan (FSP) was developed to describe Parsons' specific activities and procedures for conducting VS and sample collection during the SI Addendum field activities at the Camp Blauvelt MRS. The FSP is provided as **Appendix D** to this HRR Addendum/WP.

6.2 Information on definitions and generic goals for data quantity and minimum requirements for Quality Assurance/Quality Control (QA/QC) samples are included in the FSP (**Appendix D**) as well as the UFP-QAPP (**Appendix E**). The procedures address sampling and decontamination protocols, visual survey, field documentation, sample handling, custody and shipping, instrument calibration and maintenance, field and laboratory auditing, data reduction, validation, reporting, corrective action requirements, and QA reporting.

6.3 **Table 6-1** provides a summary of the SI Addendum field work that will be conducted at the Camp Blauvelt MRS. Exact sample locations and frequencies will be determined in the field based on the locations of the target areas, firing lines, and any range features of interest identified during the magnetometer-assisted QR and VS and be collected in accordance with the FSP (**Appendix D**) and UFP-QAPP (**Appendix E**).

Table 6-1: Summary of Camp Blauvelt SI Addendum Field Plan

Type	AEDB-R #	Range Size (Acres)	Visual Survey (Line Miles)	Field Sampling Plan[(1)]
Camp Blauvelt	NYHQ-0007-R-01	447-acres	20	Soil
				17
				Sediment
				7
				Surface Water
				7

(1) – Sample count does not include duplicates, replicates, triplicates, MS, or MSD.

CHAPTER 7
ACCIDENT PREVENTION PLAN

7.0 INTRODUCTION

An APP, including Activity Hazard Analyses (AHA), is included as **Appendix F** to this HRR Addendum/WP. The APP provides specific details relating to the procedures that will be used during the SI Addendum to ensure worker safety throughout the process. This plan addresses exposure to the elements, wildlife, vehicle safety, explosive hazards, and chemical hazards.

CHAPTER 8
ANOMALY AVOIDANCE

8.0 INTRODUCTION

8.0.1 An MEC Support WP is included as **Appendix H** to this HRR Addendum/WP. The MEC Support WP identifies specific details regarding the approach, methods, and operational procedures to be used to perform UXO support during the SI Addendum activities in addition to the avoidance procedures described here.

8.0.2 Anomaly avoidance refers to techniques used by personnel at sites with known or suspected MEC. The purpose of anomaly avoidance is to avoid any potential surface MEC and subsurface anomalies during sampling activities. SI Addendum activities with the potential for encountering MEC include visual surveys and sampling. Intrusive anomaly investigation is not permitted during anomaly avoidance operations. For anomaly avoidance during SI Addendum field activities, compliance with anomaly avoidance procedures will be the responsibility of the field UXO Technician III/Site Safety and Health Officer (SSHO). In addition, an Installation Communication Protocol and Ordnance Contact Form (**Appendix G**) will be followed. The SSHO will be responsible for conducting safety briefings for all site personnel and visitors.

8.1 ANOMALY AVOIDANCE PLAN

8.1.1 Prior to initiation of SI Addendum field activities, the SSHO will provide the field teams with information to aid in the recognition of items that may be anticipated at each MRS. The SSHO will emphasize that although the potential for certain MEC items may exist at an MRS, the field teams must be prepared to recognize all potential MEC.

8.1.2 The Site Visit Team (SVT) conducting SI Addendum field activities will consist of a minimum of two members. One of these team members will be the SSHO. The other required member of the team will consist of the Field Team Leader (FTL). Other team members, such as a sampling technician, will be used as needed. The SSHO is responsible for providing MEC recognition, location, and safety functions during VS and MC sampling. The SSHO will escort team members and site visitors at all times. Hand-held magnetometers will be used to enhance visual sweep procedures and identify potential MEC items to ensure worker safety. The VS will be tracked using a hand-held Global Positioning System (GPS) instrument. If GPS initialization is lost or horizontal error exceeds acceptable accuracy due to lack of satellites or poor satellite geometry, the VS will be hand recorded on maps or aerial photographs.

8.1.3 All MEC and significant munitions-related debris as well as range related debris (RRD) encountered during the field effort will be marked as GPS waypoints and recorded in a field log. Digital photographs of representative findings will be documented. Parsons will not conduct UXO/MEC detonations or removal as part of this SI Addendum. Characteristics and

preliminary identification (if possible) will be documented by the SSHO and reported to the Parsons PM who will notify the appropriate contacts in accordance with the Installation Communication Protocol (**Appendix G**).

8.1.4 In summary, if suspect UXO/MEC is identified within an MRS, the property owner will be notified first (unless absentee owner) followed by the local law enforcement agency second (if the property owner is not available), and the NYARNG designated POCs, ARNG G9 PM, and USACE PM, third. In addition, the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) may be notified by the USACE PM if UXO/DMM is identified. Information regarding MEC identified during SI Addendum field activities will be documented on an Ordnance Contact Form, also included in **Appendix G**. Information on the form will assist in relocating and identifying the MEC item for future mitigation or disposal by other parties. If MEC items are identified, the survey will be halted and the SSHO will review safety risks and may select an alternate VS route around the item.

8.1.5 Prior to MC sampling, the SSHO will visually survey the proposed sampling location for indication of MEC. In addition, the area will be swept with the handheld electromagnetic device to confirm the absence of subsurface anomalies (potential MEC). If anomalies are detected within the proposed sampling location, an alternate location will be selected. Once the intended sample site has been determined to be clear of anomalies, the sample will be collected from the cleared point(s).

CHAPTER 9
RIGHTS OF ENTRY/SITE ACCESS

9.0 INTRODUCTION

9.0.1 The USACE Baltimore District requested an ROE to allow access and completion of SI Addendum activities at the MRS. Copies of the ROE and ROE Amendment are included in **Appendix J**.

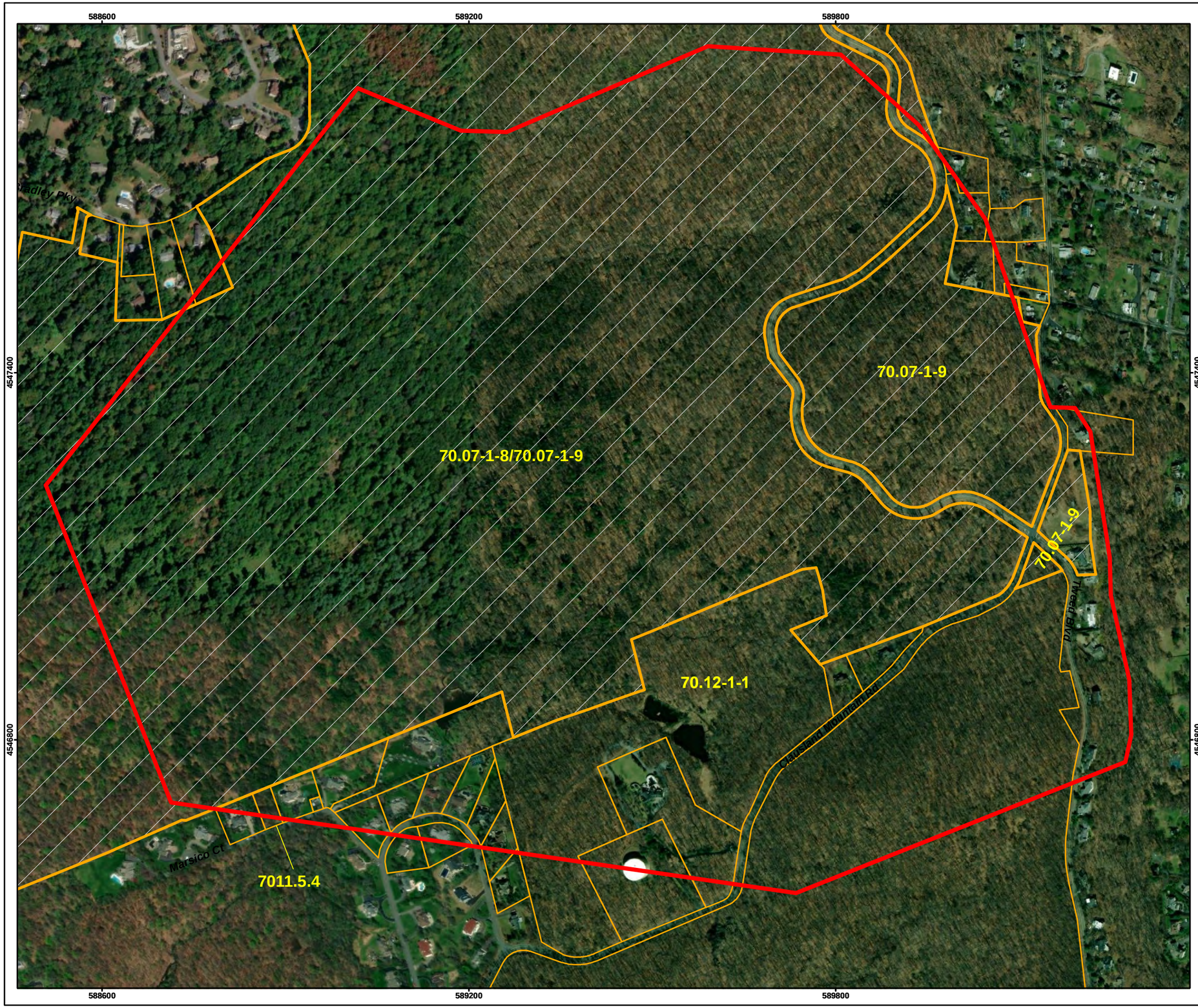
9.0.2 **Table 9-1** summarizes ownership information for the parcels for which the ROE has been requested for the Camp Blauvelt MRS. The property information is based on the best available knowledge at the time of plan preparation. The parcel boundaries in relation to the MRS boundaries are depicted in **Figure 9-1**.

Table 9-1: Property Ownership Information for Camp Blauvelt MRS

MRS Name	Property Owner	Parcel Number	Significance of Parcel	Status
Camp Blauvelt	State; operated by Palisades Interstate Park Commission	70.07-1-8/ 70.07-1-9	Primary	Obtained
	Town of Orangetown - 37%; County of Rockland - 37%; Palisades Interstate Park Commission - 26%	70.12-1-1	Secondary	Pending

Figure 9-1
Land Ownership Boundary
Camp Blauvelt
AEDB-R # NYHQ-007-R-01

Rockland County, New York



Legend

- MRS Boundary
- Parcels owned by the Palisades Interstate Park Commission
- Other Parcel

N

150 75 0 150 Meters

PARSONS	U.S. ARMY CORPS OF ENGINEERS HUNTSVILLE CENTER

DESIGNED BY: BT	Land Ownership Boundary	
DRAWN BY: BT		
CHECKED BY: AK	SCALE: As Shown	PROJECT NUMBER: 100087.0538.110208.09002
SUBMITTED BY: DS	DATE: February 2022	PAGE NUMBER:
	FILE:	

CHAPTER 10
COMMUNICATION

10.0 INTRODUCTION

10.1 The primary means of on-site communication will be cellular phones. The SVT will remain together throughout all aspects of the field activities. Communications will be checked at the start of each workday and after breaks when work resumes. Regular communication checks will be conducted throughout the day by the SSHO.

10.2 Additional communication protocols are discussed in the Accident Prevention Plan (**Appendix F**) and the MEC Support Work Plan (**Appendix H**).

CHAPTER 11
ENVIRONMENTAL PROTECTION PLAN

11.0 INTRODUCTION

11.0.1 The intent of this Environmental Protection Plan (EPP) is to establish guidelines to ensure performance of the SI Addendum field activities at the Camp Blauvelt MRS will be conducted in a manner that protects environmentally sensitive resources.

11.0.2 Specifically, the plan is intended to provide adequate procedures to safeguard the environmental condition of land and water in and around the MRS and to mitigate and/or minimize the environmental impact from MRS operations. A summary of the sensitive environments and special state species is located in **Table 11-1** on the next page.

11.0.3 For the purposes of this plan, the definitions of "Environmental Protection" and "Environmental Impact" are as follows:

- *Environmental Protection*: Preservation of the environment in its natural state to the greatest extent possible.
- *Environmental Impact*: Disturbance, damage, and/or contamination of the soil, air, water, and/or natural resources, including wildlife and wildlife habitat.

11.0.4 The following are the environmental goals of the SI:

- Perform inspection in a manner that minimizes the disturbances of land resources such as animals, plants, cultural resources, and land features.
- Perform inspection in a manner that minimizes the disturbance of sediment, and other wetland or surface water resources.
- Perform inspection in a manner to avoid impact to State- and Federal-listed Threatened or Endangered Species and/or their habitats.
- Leave the inspection footprint areas in as near a natural condition as operationally possible.
- Implement the procedures designed to protect the environment as agreed to during coordination with MRS stakeholders and regulators.

11.0.5 To accomplish these goals, Parsons will implement procedures to:

- Avoid impacts to listed/protected species,
- Avoid or minimize impacts to sensitive and critical terrestrial and wetland habitat,
- Reduce physical disturbances and air and/or noise pollution,
- Manage site wastes, and
- Control any potential pollution throughout the MRSs, focusing on preventing contaminants from leaving the source, from entering potential contaminant transport pathways, and from reaching receptors.

Table 11-1: Environmental Protection Plan Summary of Sensitive Environments and Special State Species

Site	Wetlands	Federally Designated T&E species	Critical Habitat	Cultural Resources	State Listed T&E Species	Parks (State or City)	Sensitive Resources	County
Camp Blauvelt MRS	Yes	No	No	No	No	Yes	No	Rockland County

11.0.6 The following sources were consulted for identifying biological and cultural resources the Camp Blauvelt MRS:

- U.S. Fish and Wildlife Service, 2022a. National Wetlands Inventory: Wetlands Mapper. http://www.fws.gov/wetlands/Data/mapper.html
- U.S. Fish and Wildlife Service, 2022b. U.S. Fish & Wildlife Service ECOS Environmental Conservation Online System, Information for Planning and Consultation (IPaC) tool. Ecos.fws.gov/ipac/
- New York Department of Fish and Game (NYDFG), 2022. New York Department of Fish and Game: State of New York Special Status Species. https://www.dec.ny.gov/regs/2494.html
- National Park Service, 2022a. National Heritage Areas: https://www.nps.gov/subjects/heritageareas/index.htm
- National Park Service, 2022b. National Register of Historic Places: https://www.nps.gov/subjects/nationalregister/index.htm
- National Park Service, 2022c. National Historic Landmarks Program: https://www.nps.gov/subjects/nationalhistoriclandmarks/list-of-nhls-by-state.htm

11.1 THREATENED AND ENDANGERED SPECIES

11.1.1 Forested areas, which may provide habitat for ecological receptors, are present within the MRS. There are three federally-listed threatened and endangered species that occur in Rockland County; the Indiana Bat (Myotis sodalist), the Northern Long-Eared Bat (*Myotis septentrionalis*), and the Bog Turtle (*Clemmys muhlenbergii*). There are no known threatened species present within the area of the MRS (USFWS, 2022b). Twenty-three migratory birds were identified to potentially be present within the MRS. Certain birds are protected under the Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act of 1940. A complete list of the migratory birds is provided within **Table 11-2** as well as guidance on when to implement minimization measures to reduce impacts to migratory birds. The SVT will be provided a copy of this EPP to review the information provided in **Table 11-2**. Management will ensure that the SI Addendum team is versed in identifying and avoiding these species and if any are observed, care will be taken to not disturb them or their immediate habitat. Species awareness training will be included in the daily tailgate safety meetings.

11.1.2 New York State lists numerous threatened and endangered species with known ranges or locations within the vicinity of the MRS, including species of mollusks, insects, fish, amphibians, reptiles, birds, and mammals (NYSDEC, 2022). For a full list of New York State listed threatened and endangered species with the potential to be found within the vicinity of the MRS, see **Figure 11-1**.

11.1.3 No federally designated critical habitats exist at Camp Blauvelt (USFWS, 2022b).

Table 11-2: Migratory Birds

Species Name Level of Concern Breeding Season	Species Name Level of Concern Breeding Season	Species Name Level of Concern Breeding Season
Bald Eagle Haliaeetus leucocephalus Non-BCC Vulnerable Breeds Oct 15 to Aug 31	**Cerulean Warbler** Dendroica cerulea BCC Rangewide (CON) Breeds Apr 29 to Jul 20	**Lesser Yellowlegs** Tringa flavipes BCC Rangewide (CON) Breeds elsewhere
Black Skimmer Rynchops niger BCC Rangewide (CON) Breeds May 20 to Sep 15	**Dunlin** Calidris alpina arcticola BCC - BCR Breeds elsewhere	**Long-eared Owl** asio otus BCC Rangewide (CON) Breeds elsewhere
Black-billed Cuckoo Coccyzus erythropthalmus BCC Rangewide (CON) Breeds May 15 to Oct 10	**Evening Grosbeak** Coccothraustes vespertinus BCC Rangewide (CON) Breeds elsewhere	**Prairie Warbler** Dendroica discolor BCC Rangewide (CON) Breeds May 1 to Jul 31
Bobolink Dolichonyx oryzivorus BCC Rangewide (CON) Breeds May 20 to Jul 31	**Hudsonian Godwit** Limosa haemastica BCC Rangewide (CON) Breeds elsewhere	**Red-headed Woodpecker** Melanerpes erythrocephalus BCC Rangewide (CON) Breeds May 10 to Sep 10
Canada Warbler Cardellina canadensis BCC Rangewide (CON) Breeds May 20 to Aug 10	**Least Tern** Sterna antillarum BCC - BCR Breeds Apr 20 to Sep 10	**Red-throated Loon** Gavia stellata BCC Rangewide (CON) Breeds elsewhere
Ruddy Turnstone Arenaria interpres morinella BCC – BCR Breeds elsewhere	**Short-billed Dowitcher** Limnodromus griseus BCC Rangewide (CON) Breeds elsewhere	**Willet** Tringa semipalmata BCC Rangewide (CON) Breeds Apr 20 to Aug 5

Species Name Level of Concern Breeding Season	Species Name Level of Concern Breeding Season	Species Name Level of Concern Breeding Season
Rusty Blackbird Euphagus carolinus BCC Rangewide (CON) Breeds elsewhere **Semipalmated Sandpiper** Calidris pusilla BCC Rangewide (CON) Breeds elsewhere	**Snowy Owl** Bubo scandiacus BCC Rangewide (CON) Breeds elsewhere **Whimbrel** Numenius phaeopus BCC Rangewide (CON) Breeds elsewhere	**Wood Thrush** Hylocichla mustelina BCC Rangewide (CON) Breeds May 10 to Aug 31

11.2 WETLANDS

11.2.1 The USFWS Wetlands Mapper, through the National Wetlands Inventory, was used to identify wetlands within the MRS. Wetlands are land areas that are transitional between terrestrial and deep-water habitats in which the water table usually is at or near the surface or in which the land is covered by shallow water.

11.2.2 There are five types of wetlands within the MRS (USFWS, 2022a), these include:

- PUBHh: (Palustrine, Unconsolidated Bottom, Permanently Flooded, Dikes/Impounded); and
- R4SBC: (Riverine, Intermittent Streambed, Seasonally Flooded); and
- PFO1A: (Palustrine, Forested, Broad-Leaved Deciduous, Temporary Flooded); and
- PFO1C: (Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded); and
- PFO1E (Palustrine, Broad-Leaved-Deciduous, Seasonally Flooded/Saturated).

It should be noted the wetlands are not in the vicinity of the former range.

11.2.4 The Wetlands Mapper is used primarily for planning and does not accurately indicate jurisdictional limits of wetlands that are Waters of the United States. Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than in this inventory. There is no attempt, in either the design or product of this inventory, to define the limits of proprietary jurisdiction of any federal, state, or local government or to establish the geographic scope of the regulatory programs of government agencies. A formal wetland delineation will not be performed by the SVT. Other wetlands not identified in the Wetland Online Mapper may be on the site. If additional wetlands are within the SI Addendum area, they will be avoided if possible.

Figure 11-1

6 CRR-NY 182.5
NY-CRR

OFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK
TITLE 6. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAPTER I. FISH AND WILDLIFE
SUBCHAPTER J. MISCELLANEOUS REGULATIONS
PART 182. ENDANGERED AND THREATENED SPECIES OF FISH AND WILDLIFE; SPECIES OF SPECIAL CONCERN; INCIDENTAL TAKE PERMITS

6 CRR-NY 182.5
6 CRR-NY 182.5

182.5 Endangered species, threatened species and species of special concern.

(a) Endangered species.

Those endangered species that merit listing as endangered either based on the criteria for listing in sections 182.3(b) and (c) of this Part or because they are species listed as endangered by the United States Department of the Interior in the 50 *Code of Federal Regulations* part 17 (see section 182.1 of this Part) and are native to New York State include:

Common Name	Scientific Name
(1) Molluscs:	
(i) Dwarf wedgemussel	*Alasmidonta heterodon*
(ii) Pink mucket	*Lampsilies abrupta*
(iii) Clubshell	*Pleurobema clava*
(iv) Fat pocketbook	*Potamilus capax*
(v) Rayed bean	*Villosa fabalis*
(vi) Chittenango ovate amber snail	*Novisuccinea chittenangoensis*
(2) Insects:	
(i) Tomah mayfly	*Siphlonisca aerodromia*
(ii) American burying beetle	*Nicrophorus americanus*
(iii) Hessel's hairstreak	*Callophrys hesseli*
(iv) Karner blue	*Lycaeides melissa samuelis*
(v) Regal fritillary	*Speyeria idalia*
(vi) Persius duskywing	*Erynnis persius*
(vii) Grizzled skipper	*Pyrgus centaureae wyandot*
(viii) Arogos skipper	*Atrytone arogos arogos*
(ix) Bog buckmoth	*Hemileuca* species 1
(x) Pine pinion moth	*Lithophane lepida lepida*
(3) Fishes:	
(i) Shortnose sturgeon	*Acipenser brevirostrum*
(ii) Silver chub	*Macrhybopsis storeriana*
(iii) Pugnose shiner	*Notropis anogenus*
(iv) Round whitefish	*Prosopium cylindraceum*
(v) Bluebreast darter	*Etheostoma camurum*
(vi) Gilt darter	*Percina evides*
(vii) Spoonhead sculpin	*Cottus ricei*
(viii) Deepwater sculpin	*Myoxocephalus thompsoni*
(4) Amphibians:	
(i) Tiger salamander	*Ambystoma tigrinum*
(ii) Northern cricket frog	*Acris crepitans*
(5) Reptiles:	
(i) Mud turtle	*Kinosternon subrubrum*
(ii) Bog turtle	*Clemmys muhlenbergii*
(iii) Hawksbill sea turtle	*Eretmochelys imbricata*
(iv) Atlantic ridley sea turtle	*Lepidochelys kempii*
(v) Leatherback sea turtle	*Dermochelys coriacea*
(vi) Queen snake	*Regina septemvittata*

(vii) Massasauga	*Sistrurus catenatus*
(6) Birds:	
(i) Golden eagle	*Aquila chrysaetos*
(ii) Peregrine falcon	*Falco peregrinus*
(iii) Spruce grouse	*Falcipennis canadensis*
(iv) Black rail	*Laterallus jamaicensis*
(v) Pipping plover	*Charadrius melodus*
(vi) Eskimo curlew	*Numenius borealis*
(vii) Roseate tern	*Sterna dougallii dougallii*
(viii) Black tern	*Chlidonias niger*
(ix) Short-eared owl	*Asio flammeus*
(x) Loggerhead shrike	*Lanius ludovicianus*
(7) Mammals:	
(i) Indiana bat	*Myotis sodalis*
(ii) Allegheny woodrat	*Neotoma magister*
(iii) Sperm whale	*Physeter catodon*
(iv) Sei whale	*Balaenoptera borealis*
(v) Blue whale	*Balaenoptera musculus*
(vi) Finback whale	*Balaenoptera physalus*
(vii) Humpback whale	*Megaptera novaeangliae*
(viii) Right whale	*Eubalaena glacialis*
(ix) Gray wolf	*Canis lupus*
(x) Cougar	*Felis concolor*

(b) Threatened species.

Those species that merit listing as threatened either based on the criteria for listing in sections 182.3(b) and (c) of this Part or because they are species listed as threatened by the United States Department of the Interior in 50 *Code of Federal Regulations* part 17 (see section 182.1 of this Part) and are native to New York State include:

(1) Molluscs:	
(i) Brook floater	*Alasmidonta Varicosa*
(ii) Wavy-rayed lampmussel	*Lampsilis fasciola*
(iii) Green floater	*Lasmigona subviridis*
(2) Insects:	
(i) Pine barrens bluet	*Enallagma recurvatum*
(ii) Scarlet bluet	*Enallagma pictum*
(iii) Little bluet	*Enallagma minisculum*
(iv) Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*
(v) Frosted elfin	*Callophrys irus*
(3) Fishes:	
(i) Lake sturgeon	*Acipenser fulvescens*
(ii) Mooneye	*Hiodon tergisus*
(iii) Lake chubsucker	*Erimyzon sucetta*
(iv) Gravel chub	*Erimystax x-punctata*
(v) Mud sunfish	*Acantharchus pomotis*
(vi) Banded sunfish	*Enneacanthus obesus*
(vii) Longear sunfish	*Lepomis megalotis*
(viii) Eastern sand darter	*Ammocrypta pellucida*
(ix) Swamp darter	*Etheostoma fusiforme*
(x) Spotted darter	*Etheostoma maculatum*
(xi) Longhead darter	*Percina macrocephala*
(4) Amphibians:	
None	
(5) Reptiles:	
(i) Blanding's turtle	*Emydoidea blandingii*
(ii) Green sea turtle	*Chelonia mydas*
(iii) Loggerhead sea turtle	*Caretta caretta*
(iv) Fence lizard	*Sceloporus undulatus*
(v) Timber rattlesnake	*Crotalus horridus*
(6) Birds:	
(i) Pied-billed grebe	*Podilymbus podiceps*
(ii) Least bittern	*Ixobrychus exilis*
(iii) Bald eagle	*Haliaeetus leucocephalus*
(iv) Northern harrier	*Circus cyaneus*
(v) King rail	*Rallus elegans*

(vi) Upland sandpiper	*Bartramia longicauda*
(vii) Common tern	*Sterna hirundo*
(viii) Least tern	*Sterna antillarum*
(ix) Sedge wern	*Cistothorus platenis*
(x) Henslow's sparrow	*Ammodramus henslowii*
(7) Mammals:	
None	

END OF DOCUMENT

11.3 CULTURAL AND ARCHAEOLOGICAL RESOURCES

11.3.1 Camp Blauvelt MRS is not located within a National Heritage Area (NHA) (National Parks Service [NPS], 2022a) and does not contain a structure on the National Register of Historic Places (NRHP) (NPS, 2022b), National Register of Historic Districts (NRHD) (NPS, 2022a) or a National Historic Landmark (NHL) (NPS, 2022c).

11.4 EROSION AND SEDIMENT CONTROL PLAN

11.4.1 Overall Approach

This plan is not necessary as activities will be limited to the collection of soil, surface water, and sediment samples.

11.4.2 Dust and Emission Control

11.4.2.1 Dust levels are expected to be minimal during sample collection; therefore, dust control measures are not anticipated to be required during these activities.

11.4.2.2 Field staff will travel and move supplies and equipment on foot, while driving only on existing roadways whenever possible, and when permission is granted from the landowner. When driving on gravel or dirt roads, all vehicles will be operated at low speeds to reduce the amount of dust generated. To reduce auto emissions, vehicles will be turned off when not in operation.

11.4.3 Minimization of Sound Intrusions

Noise controls are not necessary during this operation. No loud noises are generated from the visual survey and sample collection activities

11.4.4 Control of Water Run-On and Runoff

Soil disturbances associated with sampling activities are localized and impact a very small area. Therefore, there will be no significant erosion or sediment control concerns.

11.4.5 Minimization of Disturbed Area

To minimize the impacts of vehicles and other equipment within the site, vehicles will remain on existing roads to the extent practicable. Trail width will be kept to a necessary minimum.

11.4.6 Tree and Shrub Removal and Protection

Brush clearing by Parsons is not anticipated at this site. If necessary, and after landowner concurrence, minimal clearing will be accomplished using hand tools such as string trimmers to clear underbrush. No trees or shrubs will be removed during the field activities. Trail surface may be cleared of timber, brush, stumps, and snags. Removal of brush, slash, and immature trees will be accomplished by any of the following two methods:

- Spreading and scattering in the adjacent brush area without damaging other trees, and
- Chipping and scattering in such a way as to preclude their being washed into any watercourse.

11.5 OTHER MITIGATION MEASURES

11.5.1 Waste Management

The Waste Management Plan is provided in Chapter 12. There are no existing waste disposal sites in the MRS and no hazardous waste or contaminated wastewater is anticipated to be generated by project activities. Minimal wastewater (water and non-phosphate detergent) may be generated when decontaminating sampling equipment (e.g., incremental sampling tools and hand augers) during sampling activities. If generated, decontamination water will be disposed in the immediate vicinity of the related sampling location.

11.5.2 Training

Environmental protection/pollution control training will be held for all field personnel prior to commencing project activities. Additional training will be conducted for new personnel and when site conditions change. The training will include relevant aspects of this EPP that are not already addressed in the daily safety and occupational health briefings.

11.5.3 Spill Control and Prevention

Gasoline refueling of vehicles will be conducted off-site. Emergency response plans for spills and leaks are discussed in the Emergency Response and Contingency Plan (SOP H&S-03) located in the UFP-QAPP, **Appendix E**.

11.5.4 Air Monitoring Plan

No air monitoring will be required during project operations.

11.5.5 Storage Areas and Temporary Facilities

No storage areas or temporary facilities will be set up as part of this project.

11.5.6 Access Routes

No access roads will be constructed during the field effort. No landing areas or trails will be closed, nor will any access to state land or public water be restricted by the field team.

11.5.7 Post-Activity Cleanup

Following completion of field work, all debris created during the project will be removed. No significant disturbance is anticipated during this project; therefore, no reseeding, grading, or contouring is planned during this phase.

11.6 GREEN AND SUSTAINABLE EFFORTS

The initiatives below will be implemented by the project team to support the Army's goal of preserving natural resources, minimize energy use, minimize carbon dioxide emissions, maximize recycling and reuse of materials, and minimize the Army's environmental footprint.

- Use equipment, supplies, and materials that are locally available and are reusable and/or recyclable;
- Identify sensitive areas prior to field work (e.g., wetlands, sensitive habitats and species, historic properties, cultural resources, etc.) and plan field work to avoid or mitigate impacts;
- Plan travel to and from the site to minimize the number of trips and vehicles used;
- Inspect and maintain vehicles and equipment to ensure optimal fuel efficiency and to minimize emissions;

- Use phosphate-free detergents instead of organic solvents or acids to decontaminate sampling equipment; and
- Make use of reusable Personal Protective Equipment wherever practical.

CHAPTER 12
NON-MUNITIONS RELATED WASTE

12.0 INTRODUCTION

12.0.1 During SI Addendum field activities, if non-munitions related waste (e.g., drums, batteries) is encountered and/or evidence of hazardous substance or oil discharges are observed, the location (GPS coordinates) and relevant photographs will be recorded in the field logbook or Daily Field Report by the FTL or their designee. In addition, the following procedures will be followed if a release of hazardous substance or oil is witnessed, or evidence of a historical spill is observed within or during access to the MRS:

- The PM or representative will notify the USACE PM.
- The NYSDEC project team representative will be notified by NYARNG.

12.0.2 The ARNG G9 will complete all appropriate Army notifications and follow-up with NYSDEC as required regarding reportable spills/discharges. Parsons will continue to provide assistance and documentation support to the USACE, ARNG G9, and NYARNG as needed.

CHAPTER 13
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