CAMP BLAUVELT MUNITIONS RESPONSE SITE

REMEDIAL INVESTIGATION THROUGH RECORD OF DECISION

TPP #1 MEETING

12 February 2025

U.S.ARMY

US Army Corps of Engineers®

ARMY NATIONAL GUARD

AGENDA

- Project Teams
- Goals of the Remedial Investigation
- Camp Blauvelt Munitions Response Site (MRS) Information and Prior Investigations
- Conceptual Site Model (CSM)
- Data Quality Objectives (DQOs)
- Technical Approach – Three Phases
- Reporting
- Schedule
- Open Discussion

ACRONYMS

ApA	Anomalies per Acre
ARNG	Army National Guard
bgs	below ground surface
CSM	Conceptual Site Model
DFW	Definable Feature of Work
DGM	Digital Geophysical Mapping
DMM	Discarded Military Munitions
DQO	Data Quality Objective
DU	Decision Unit
DUA	Data Usability Assessment
ft	feet
FS	Feasibility Study
HD	High Density
HRR	Historical Records Review
HUA	High Use Area
ISM	Incremental Sampling Methodology
ISO	Industry Standard Object
ITS	Instrument Test Strip
IVS	Instrument Verification Strip
LD	Low Density
LUA	Low Use Area
LUC	Land Use Control
MC	Munitions Constituents
MD	Munitions Debris
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern
MPC	Measurement Performance Criteria
MPPEH	Material Potentially Presenting an Explosive Hazard
MR-QAPP	Munitions Response Quality Assurance Project Plan
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
NEU	No Evidence of Use
NFA	No Further Action
NYARNG	New York Army National Guard
NYDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OESS	Ordnance and Explosives Safety Specialist
PM	Project Manager
PSL	Project Screening Limit
QC	Quality Control
RI	Remedial Investigation
ROTC	Reserve Officers Training Corps
SAA	Small Arms Ammunition
SI	Site Inspection
SLAM	Simultaneous Localization and Mapping
SU	Sample Unit
SUXOS	Senior Unexploded Ordnance Supervisor
T&E	Threatened and Endangered
TPP	Technical Project Planning
USACE	U.S. Army Corps of Engineers
UXO	Unexploded Ordnance
UXOQCS/SO	Unexploded Ordnance Quality Control Specialist/Safety Officer
VSP	Visual Sampling Plan
XRF	X-Ray Fluorescence
yd	yard

ARMY PROJECT TEAM

- US Army Corps of Engineers (USACE) Project Manager (PM) – Wayne Davis
- Army National Guard (ARNG) Program Manager – Walt Gee
- ARNG Project Manager – John Haines
- New York Army National Guard (NYARNG) – Greg Austin, James Williamson
- USACE Risk Assessor – Cliff Opdyke
- USACE Geophysicist – David King
- USACE Ordnance and Explosives Safety Specialist (OESS) – Marty Holmes

TETRA TECH PROJECT TEAM

- Program Manager/ Project Manager – Jennifer Harlan
- Deputy Project Manager – Jessie Powers
- Senior Geophysicist – Brian Junck
- QC Geophysicist – Jeff Gamey
- Risk Assessor – Hannah Neeley
- Project Chemist – Keir Craigie
- Director, Munitions Response and Explosives Safety – Tim Idom
- Corporate QC Manager – Eugene Mikell
- Corporate H&S Manager – Jim Streib

ORGANIZATIONAL CHART

US Army Corps of Engineers

Regulators/Stakeholders
NYSDEC PM
Steve Scharf
NYSDOH
TBD
Landowners
Palisades Interstate Parkway Commission
Various Private Parties

USACE PM
Wayne Davis
ARNG PM
Walt Gee, John Haines
NYARNG
Greg Austin
James Williamson

USACE Geophysicist
David King

Tetra Tech PM
Jennifer Harlan
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Jessie Powers

Tetra Tech Quality Manager
Eugene Mikell

Tetra Tech Health & Safety Manager
Jim Streib

Other Project Resources
Chemist
Kier Craigie
Risk Assessor
Hannah Neeley
Biologist
Richard Delahunty
GIS Specialist
JJ Madden

Subcontractor Resources
Laboratory Analysis
Laboratory Data Consultants
Data Validation
Eurofins
NY Licensed Surveyor
TBD

SUXOS

Senior Project Geophysicist
Brian Junck

QC Geophysicist
Jeff Gamey

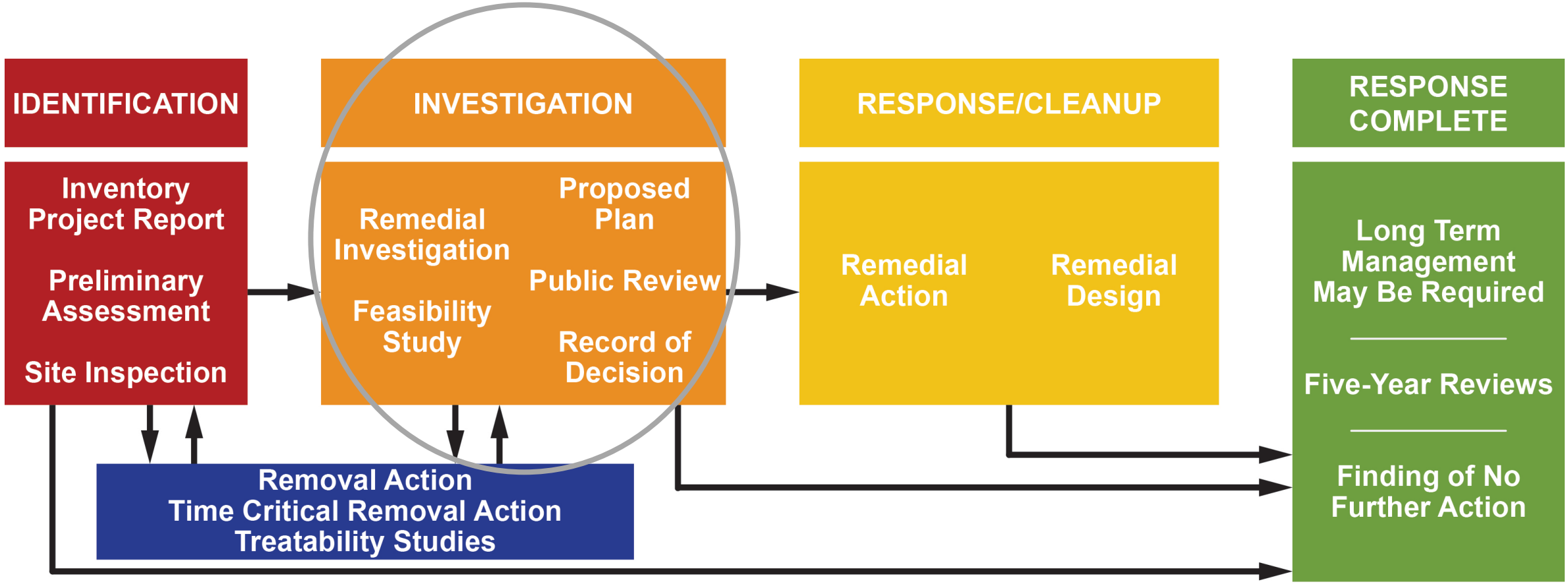
UXOSO/QCS

UXO Technicians

Direct line of communication
Indirect line of communication

CERCLA PROCESS OVERVIEW

Project is currently at this stage



(U.S. Army Corps of Engineers, FUDS Handbook, Supplement to ER 200-3-1, December 2022)

GOALS FOR THE REMEDIAL INVESTIGATION (RI)

Overall Goal:

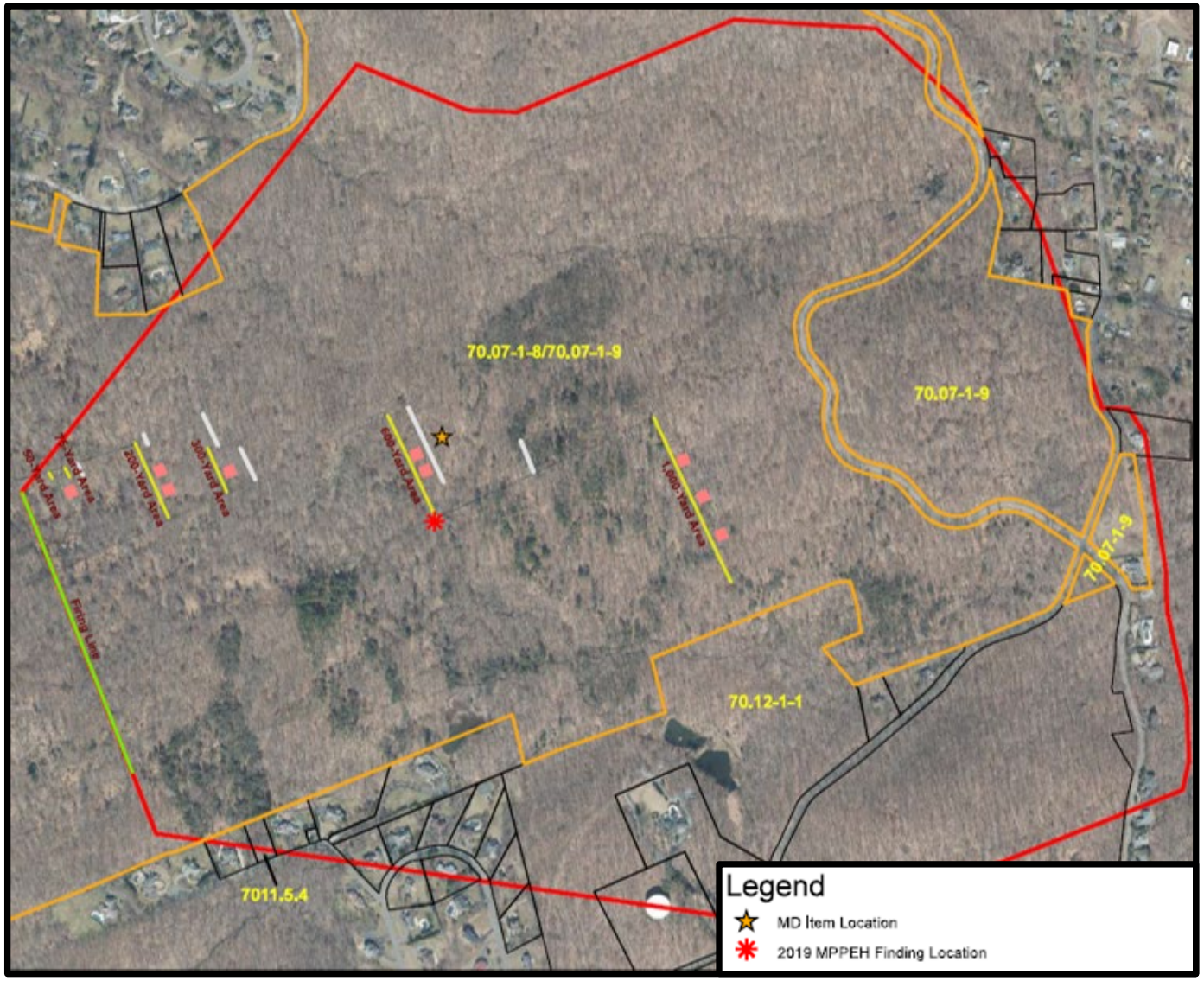
- Gather sufficient information to determine the nature and extent of munitions and explosives of concern (MEC)/munitions constituents (MC) and assess the potential risks/hazards to support the evaluation of a no further action (NFA) or remedial action alternative

RI Objectives:

- Conduct field investigations to characterize the MRS
- Determine the type (nature), density, and distribution (extent) of MEC and munitions debris (MD)
- Determine the concentrations (if any) and extent of MC
- Assess potential risks/hazards to human health, safety, and the environment
- Assess MRS boundaries
- Delineate areas inaccessible to RI field activities based on terrain and/or sensitive habitat

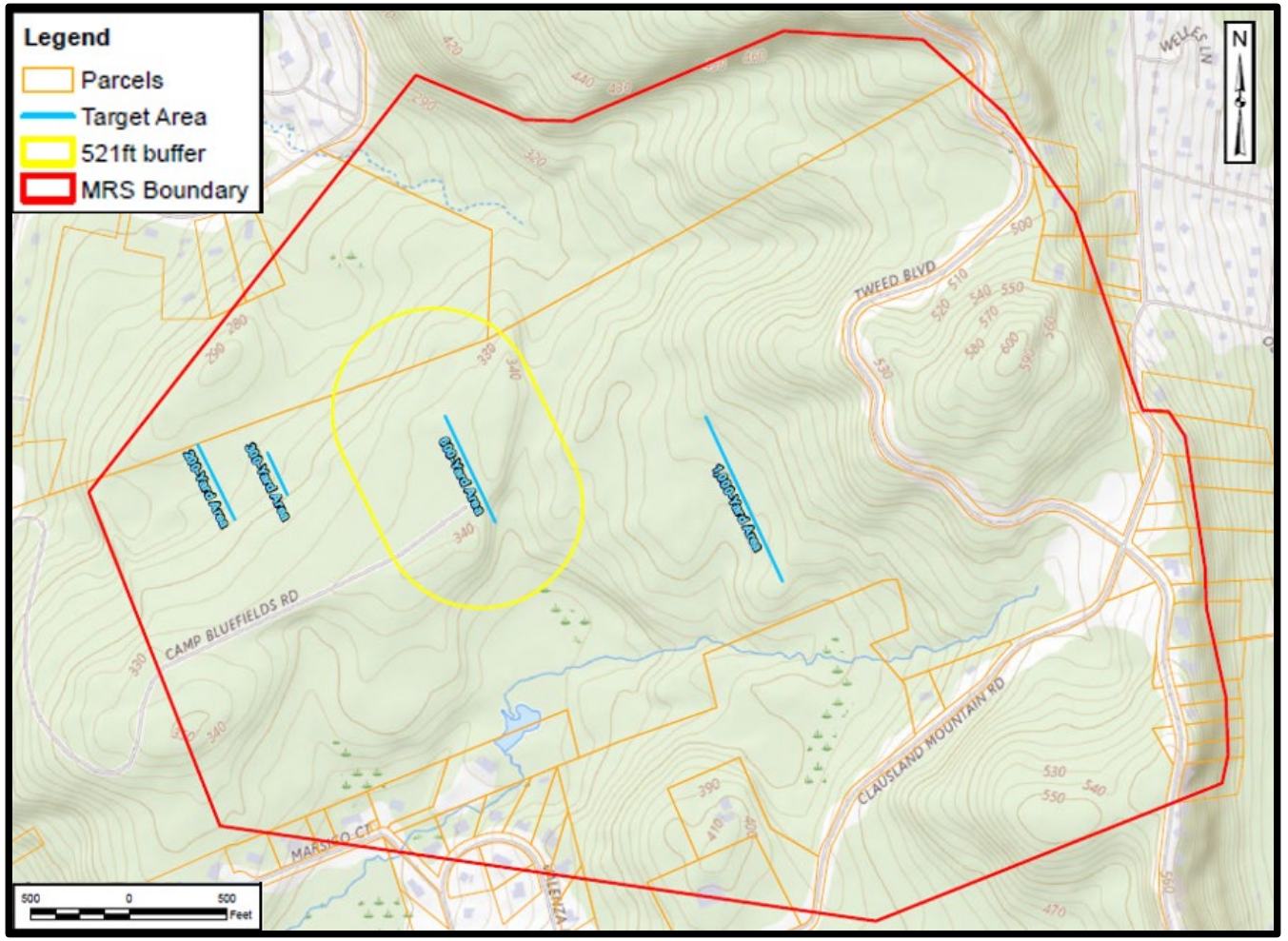
CAMP BLAUVELT MRS SITE INFORMATION

- Camp Blauvelt MRS encompass 447 acres of land in Orangetown, Rockland County, New York.
- The MRS contains a former 50 – 1,000-yard (yd) Known Distance Small Arms Range and Infiltration Course
  - Concrete target walls at 200, 300 and 600 yds and a natural backstop at 1,000 yds from the firing line.
  - Two pistol ranges and shelter structures exist between the firing point and the 200 yd target wall.
  - Range features include concrete bunkers, interconnected tunnels and former observations towers still present at the MRS.



CAMP BLAUVELT MRS SITE INFORMATION

- The majority of the MRS is located in Blauvelt State Park, which is part of the NY State Park system and operated by the Palisades Interstate Park Commission.
  - There are several residential parcels within the MRS boundary, but these parcels are not expected to be affected by RI fieldwork.
- Future land use is anticipated to remain as an active state park with recreational hiking and biking trails.
- There are no fences which restrict entry by the public and there is evidence of illicit dumping and trash pits surrounding the 600-yd Target Wall.
- Several freshwater ponds and shrub wetland areas exists within the MRS; primarily in the vicinity of Antler Creek, which is located south of the 1,000-yd target wall.
- The terrain is primarily undeveloped undulating deciduous hardwood forest.



CAMP BLAUVELT MRS SITE INFORMATION

- The Camp Blauvelt Range MRS was used from 1910 to 1913 as a training area for the NYARNG. The range originally included 56 targets with 200, 600 and 1,000-yd firing lines, and 30 targets with a 300-yd firing line.
- The direction of fire of the rifle ranges was to the east/northeast.
- After the NYARNG closed the range in 1913, Camp Blauvelt was transferred to the Palisades Interstate Park Commission and turned over the to the NY State Military Training Commission for use by the Reserve Officers Training Corps (ROTC).
- Camp Blauvelt was used the U.S. Army for training exercises and potentially as an air raid post during WWII.
- The extent of military use at the MRS from 1913-1944 is unknown.
- Potential munitions used at the MRS include:
  - Small Arms Ammunition (SAA)
    - 0.22 caliber
    - 0.30 caliber
    - 0.38 caliber
    - 0.45 caliber
  - MK II Hand Grenades
  - M11 Practice Rifle Grenades
  - Flares

PREVIOUS INVESTIGATIONS

- **Preliminary Assessment – 2009**
  - Documented range features (concrete wall, tunnels, berms) are still present within the MRS.
  - Data gap identified regarding exact dates of historical use.

- **Historical Records Review (HRR)/Site Inspection (SI) – 2011**
  - SAA (0.30 caliber bullets) were identified during visual survey. Other SAA calibers (0.22, 0.30, 0.38 and 0.45) were suspected to have been used during range training.
  - Surface soil samples showed exceedances of screening levels for Lead and Copper.

- **Remedial Investigation (RI) – 2019**
  - The field team encountered an item of material potentially presenting an explosive hazard (MPPEH) while collecting discrete soil samples for X-Ray Fluorescence (XRF) analysis. The item was found at the southern end of the 600-yd target wall.
  - A stop work order was issued in the field, and intrusive RI field activities were ceased.

PREVIOUS INVESTIGATIONS

- **Site Visit – 2019**
  - Visual inspection of former range structures not investigated during the SI including:
    - Firing Line extending further to the south tiered with several elevations that line up with the downrange target walls.
    - Two pistol ranges and shelters between the Firing Line and 200-yd target wall.
    - Concrete blocks remnants of foundation structures for removed metal backstops behind/adjacent to the 200-, 300-, and 600-yd target walls.
    - Drainage ditch behind/adjacent to the 300-yd target wall and stormwater runoff pools behind the 200yd target wall.

- **After Action Report – 2020**
  - MPPEH item discovered during RI confirmed by New York State Police as expended grenade fuze.
  - Cultural debris (i.e., computer monitors, terra cotta tiles, etc.), general trash and ash-like soil show evidence of illicit dumping and burning in the southern end of the 600-yd target wall area. Time period of use as a dumping area is unknown, but likely occurred after ARNG use.

PREVIOUS INVESTIGATIONS

- **HRR/SI Addendum – 2023**
  - Munitions – M11 Practice Grenade (MD) observed in the 600-yd area.
  - Surface soil –Samples exceeded the ambient concentration range and project screening limits (PSL) for Copper and Lead at the concrete block remnants at 200-yd, 300-yd, 600-yd and for Cu at the 1,000-yd natural backstop. Explosives not detected in samples collected. No exceedances outside of these areas of concern.
  - Sediment – Samples exceeded the ambient concentration range and PSL for Aluminum in Antler Creek. No exceedances in Sparkill Creek.
  - Surface Water – Samples exceeded the ambient concentration ranges and PSLs for Aluminum, Copper, Lead and Zinc in Antler Creek. No exceedances in Sparkill Creek.

  - **Recommended for NFA**:
    - Pistol Range Area, Extended Firing Line, remains of concrete shelters directly behind the 600-yard target wall, 600-yard concrete block remains further from the target wall (at approximately 800 yards), southern end of the 600-yard wall trash pit/landfill area for MC, 1,000-yard target wall center concrete structure, Sparkill Creek, and the remainder of the MRS not associated with past training activities.
  - **Recommended for MC RI/FS:**
    - 200-yd concrete block remnants, 300-yd concrete block remnants (both sets), 600-yd concrete block remnants near target wall, 1,000-yd natural backstop, and Antler Creek
  - **Recommended for MEC RI/FS:**
    - 600-yd target area

CONCEPTUAL SITE MODEL – MEC/MC

Site Details	MEC/ MC	Known or Suspected Contamination Source(s)	Potential or Suspected Location and Distribution	Source or Exposure Medium	Current and Future Receptors	Potentially Complete Exposure Pathway
Name: Camp Blauvelt MRS **Acreage:** 447 acres **Suspected Past Activities (release mechanisms):** Small arms training camp use from 1910-1913. **Current and Future Land Use:** The MRS area is recreational and residential. There are no anticipated future changes in land use.	MEC	• SAA: *0.22, 0.30, 0.38 and 0.45 caliber* • MK II hand grenade • M11 practice rifle grenade • Flares	• Potentially present on or beneath ground surface.	• Surface • Subsurface	Current and future • Recreational users/ trespassers: *Hikers, Hunters and Campers* • Residents: *Adult and Child* • Site workers: *State Park and Federal/State Employees* • Biota (MC only)	• In surface and subsurface soil, human receptors' exposure pathways are potentially complete for MEC.
	MC	• Select Metals: Antimony, Copper, Lead and Zinc Aluminum *(surface water/sediment only)* • Propellants • Explosives	• Potentially present on or beneath ground surface. • Potentially present in surface water and sediment (Antler Creek)	• Surface • Subsurface • Surface water		• In surface water, human and ecological receptors' exposure pathways are potentially complete for MC. • In surface and subsurface soil, human and ecological receptors' exposure pathways are potentially complete for MC.

- No federal or state threatened or endangered (T&E) species are known to exist within the MRS.
  - There are two federally-listed T&E species that occur in Rockland County, NY.
- No known historical or cultural resources within the MRS.
  - No known National Historic Landmarks located in Rockland County, NY.

DATA QUALITY OBJECTIVES (DQO) SUMMARY

Develop the seven-step DQO process for the RI based on Munitions Response Quality Assurance Project Plan (MR-QAPP) Module 1

Step 1 – State the Problem

Step 2 – Identify the Goals of the Study

Step 3 – Identify Information Inputs

Step 4 – Define the Boundaries of the Study

Step 5 – Develop the Project Data Collection and Analysis Approach

Step 6 – Specify Project-specific Measurement Performance Criteria (MPC) and Performance/Acceptance Criteria

Step 7 – Develop Sampling Design and Project Work Flow

DQO STEP #1 – STATE THE PROBLEM

- SAA were identified and soil samples showed exceedance of screening levels for Copper and Lead during the SI.
- MPPEH and MD have been recovered during the previous investigations.
- The SI Addendum identified concentrations above background and recommended action levels in soil for Copper and/or Lead at the 200-, 300-, and 600- and 1,000-yd target area. Samples also exceeded screening levels for Aluminum, Copper, Lead and Zinc in surface water and Aluminum in sediment in Antler Creek.

- There may be unacceptable risk from potential MEC and/or MC to current and potential future receptors based on current and future land use. The previous RI did not complete all data quality objectives and further investigation is recommended for MEC and MC:
  - An RI is required to determine nature and extent for MEC within the 600-yd target area.
  - An RI is required to determine nature and extent for MC within the 200-, 300-, 600-, and 1,000-yd target areas, and Antler Creek.

DQO STEP #2 – PRINCIPAL STUDY QUESTIONS

1) What site conditions or site access restrictions are present, which limit data collection during the RI and may potentially limit eventual remedial actions?
2) Are there sensitive habitat(s), threatened or endangered species, and/or historical/cultural resources present at the site, which limit or restrict RI data field activities or the field schedule?
3) What is the nature and extent (horizontal and vertical distribution) of MEC and MC, and types of MEC/MD observed within the MRS?
4) What is the achieved depth of detection based on intrusive investigation results, and how do these depths compare to anticipated depths of reliable detection for munitions?
5) What are the boundaries of high-use areas (HUAs), low-use areas (LUAs), and no evidence of use (NEU) areas?
6) How do the background geophysical anomaly density, critical density, and average high-density (HD) area density compare to the expected densities?
7) Has potential MEC/MD provided a source of MC within the MRS?
8) Is the current MRS boundary accurate?

DQO STEP #3 – IDENTIFY INFORMATION INPUTS

The information identified below is needed to answer the study questions.

1) Update the Conceptual Site Model (CSM):

- The type, depths, and quantities of all evidence of munitions found during the RI within the MRS.
- Background, critical, and average HD area geophysical anomaly densities derived during the RI (if different than expected densities).
- The footprint of access restrictions or other obstacles to data collection/MEC removal and whether these restrictions/obstacles create limitations on remedial technologies.
- Evidence if threatened or endangered species and sensitive habitats, and historic or cultural resources are present at the MRS.
- Information for current and future potential receptors, where are they located, and what activities they may perform within the MRS boundary.
- Information regarding changes in expected future land use.
- MC presence and potential risk(s) to receptors.

DQO STEP #3 – IDENTIFY INFORMATION INPUTS

2) RI Fieldwork:

- Study area (i.e., RI footprint) for MEC/MD detection.
- Anticipated depth of detection of digital geophysical mapping (DGM) sensor (EM61) planned for use during the RI for munitions in the CSM.
- Geophysical system Quality Control (QC) test results.
- Instrument Verification Strip (IVS) and Instrument Test Strip (ITS) results, as applicable.
- Data analysis and processing results, including anomaly location accuracy and unique anomaly identification numbers.
- Validation seed and QC seed performance results.
- Dig sheet: unique target identification numbers and locations.
- Excavation results (database) and photos.
- Soil, sediment, and surface water sampling locations for MC analysis.
- Soil, sediment, and surface water screening criteria, including background.

DQO STEP #3 – IDENTIFY INFORMATION INPUTS

4) RI/FS Report:

- Updated MEC and MC CSMs.
- Updated site background and physical profile for the MRS.
- Delineated HUA, LUA, and NEU areas (as applicable) and the geophysical anomaly densities associated with each area.
- Potential risk from MC and potential explosive hazards from MEC due to receptors interacting with exposure media.
- Completed human health and ecological risk assessment, as applicable.
- Data to establish the effectiveness of various alternatives, including anticipated detection technology performance, if required.
- Data to support answering data gaps, and identification of any additional data gaps.
- Data to support costing of various remedial alternatives, if required.
- Updated MRSPP

DQO STEP #4 – DEFINE THE BOUNDARIES OF THE PROJECT

Target Population

- MEC: Any metallic objects detected during site preparation or the geophysical survey above the target selection threshold with characteristics of being unexploded ordnance (UXO) or discarded military munitions (DMM).
- The following munitions are suspected to exist within the site:
  - SAA (no explosive hazard)
  - MK II Hand Grenades
  - M11 Practice Rifle Grenades
  - Flares

- MC: Any concentrations of MC related to delineated range features and munition detonation locations, as applicable.
- The potential MC that may be present within the MRS include the following:
  - Select Metals: Antimony, Copper, Lead, Zinc and Aluminum (*Aluminum is expected in Antler Creek sediment and surface water only*)
  - Propellants/Explosives

DQO STEP #4 – DEFINE THE BOUNDARIES OF THE PROJECT

Horizontal and Vertical Distribution of MEC

- Horizontal boundary for the MEC RI is defined by 600-yd target area buffer. The 521-foot buffer surrounding the 600-yd target wall encompasses approximately 33 acres.
- Vertical boundary is to dig by hand until target anomalies are resolved or until refusal is encountered.
- Vertical distribution is unknown but may be greater than 18 inches.

Horizontal and Vertical Distribution of MC

- Horizontal boundary is defined by Decision Units (DUs) associated with specific range features to include the 200-, 300-, 600- and 1,000-yd target areas, the 1,000-yd natural backstop and other identified SAA features.
- Vertical boundary is to sample up to depths of 36 inches, or until refusal is encountered.

Maximum predicted extent of future disturbances

- No changes in land use are anticipated, and therefore there is no maximum predicted extent for future disturbances.

Temporal Boundaries

- Temporal boundaries include the project duration, field work schedule, weather, time of year constraints, and stakeholder constraints.

DQO STEP #5: DEVELOP THE PROJECT DATA COLLECTION AND ANALYSIS APPROACH

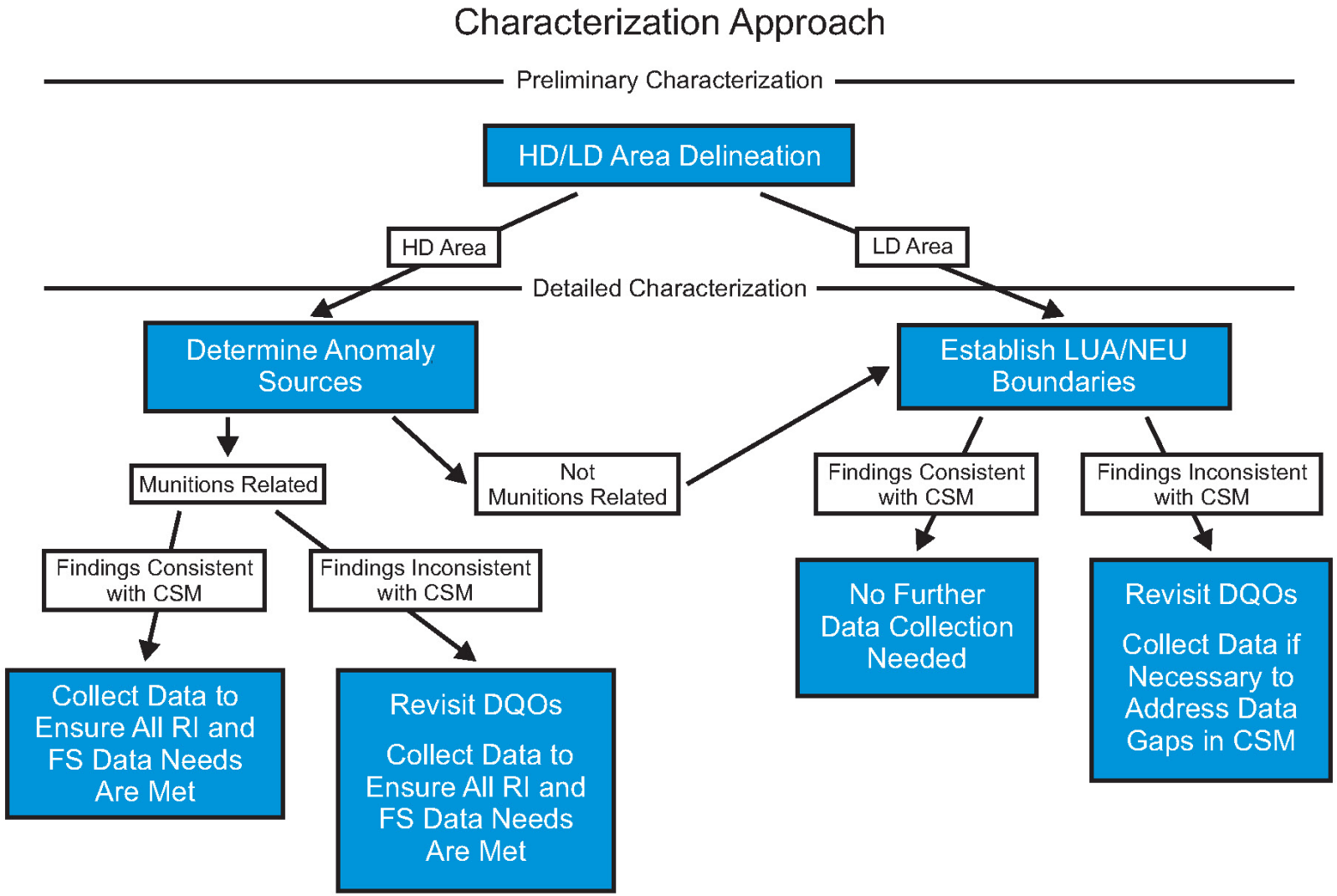
MEC: The data collection and analysis approach for the RI generally involves three work phases to meet the goals of the project:

- Phase 1: Preliminary MRS Characterization
- Phase 2: HD/Low Density (LD) Characterization
- Phase 3: Intrusive Investigation

MC: Sampling locations will be based on the results of the geophysical survey results, intrusive investigation findings, and SI Addendum recommendations:

- Conducted after intrusive investigation in Phase 3
- Soil sampling will be conducted in areas with high MEC and/or MD density within the 600-yd target area that warrant impacts to soil (defined HUAs) and range features associated with the 200-, 300-, 600- and 1,000-yd target areas and natural backstop identified in the SI Addendum
- Sediment and surface water sampling will be conducted in Antler Creek as close to the 1,000-yd target backstop as possible
- Background sample for soil, surface water, and sediment will be conducted

MR-QAPP PHASED RI APPROACH



DQO STEP #6: SPECIFY PROJECT-SPECIFIC MPCS AND PERFORMANCE/ACCEPTANCE CRITERIA

- MPCs are documented on UFP-QAPP Worksheets #12A and #12B.

- MEC Data Quality Indicators include completeness, sensitivity, precision, bias, accuracy, comparability, and representativeness.
  - MPCs will be developed for Site Preparation, Sampling Design, Data Acquisition, Anomaly Resolution, and NEU Confirmation.

- MC Data Quality Indicators include precision (field and laboratory), accuracy (laboratory), representativeness (field and laboratory), completeness (field and laboratory), comparability (field and laboratory), and sensitivity (laboratory).

DQO STEP #7 – DEVELOP THE SAMPLING DESIGN AND PROJECT WORK FLOW

- Definable Features of Work (DFWs) are documented on UFP-QAPP Worksheet #17.
- Visual Sample Plan (VSP) used for transect design for DGM transect investigations.
- Workflow including activities (MEC and MC characterizations) and decision points.
- Contingencies if field conditions are different than expected and require re-evaluation of sampling design (additional planning sessions, if needed).
- Points in process at which USACE/ARNG and stakeholders will interface for decision making (e.g., concurrence on target dig sheets).

TECHNICAL APPROACH – PHASE 1

Site Preparations:

- Establish staging area, perform equipment and material receipt inspections, and meet with local points of contact to coordinate logistics, as necessary
- Conduct site specific training
- Coordinate utility locates with New York One Call (811)
- Construct analog ITS
- Reduce vegetation along DGM transects with mechanized equipment (i.e., skid steer) and hand tools, as needed.
- Professional Land Surveyor establishes site controls

DGM Transect Survey:

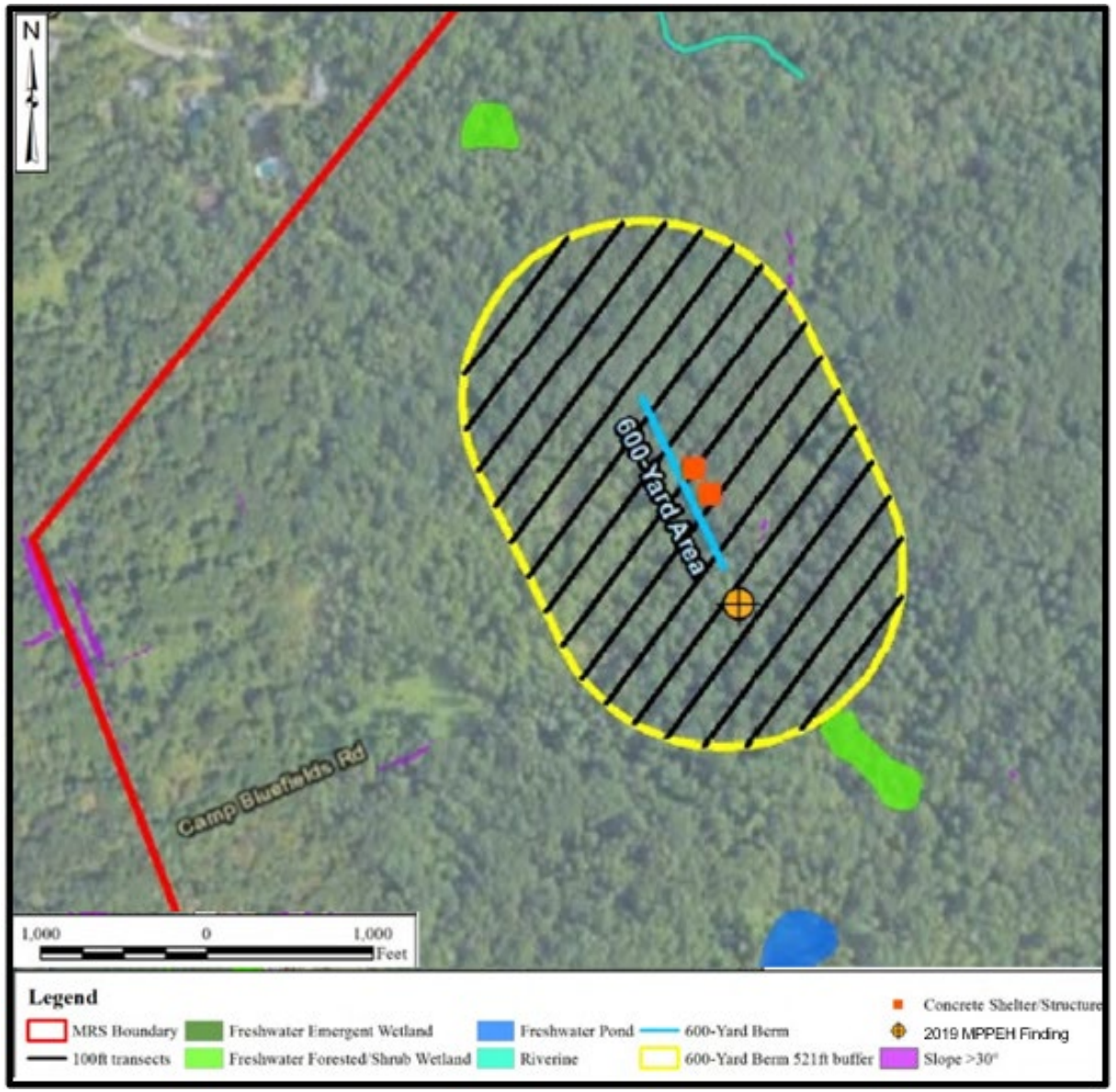
- Construct IVS
- Collect EM61-MK2 data along transects using line and fiducial positioning
- Collect EM31-MK2 data along transects using line and fiducial positioning
- Total transect length is approximately 2.7 miles (both sensors collect the same transects)

Output: Preliminary Characterization Memorandum with Data Usability Assessment (DUA)

TECHNICAL APPROACH – TRANSECT DESIGN

- Transects spaced 100 feet (ft) apart.
- The northeast/southwest transect orientation is designed to maximize the number of times the transects bisect the berm area.
- The conservative transect spacing will support delineation of the dump area footprint and account for inaccuracy in grenade throwing during training activities.

VSP Input	Camp Blauvelt MRS
Munition	MkII Hand Grenade HE (2.26-inch diameter)
VSP-derived Target Area Radius and Pattern	362 feet, circular
Background Anomaly Density	25 ApA
Average Target Area Density (above background)	75 ApA
Average Target Area Density (above background) input determined at:	Outer edge of target
Target Distribution	Bivariate normal density
Probability of Traversing and Detecting Target Area	100%
Transect Width	3.3 feet
Transect Pattern	Parallel
Orientation	Northeast/Southwest



TECHNICAL APPROACH – PHASE 2

Site Preparations:

- Conduct site specific training, as needed
- Stake grid corners of 6 non-contiguous grids (each 0.23 acres), totaling approximately 1.4 acres
- Reduce vegetation within grids with mechanized equipment and hand tools
- Analog assisted surface sweep – remove all metal greater than 2 inches in any dimension

Quality Control (QC) Seeding:

- Conduct QC seeding of grids

Validation Seeding:

- Conducted by USACE

Seed Type	Percentage of Total	Orientation	Depth Range
Small ISO40	10%	Vertical	3 to 15 inches[1]
Small ISO40	60%	Horizontal	3 to 15 inches[1]
Medium ISO40	30%	Horizontal	10 to 24 inches

[1] *Maximum small ISO seed depth range corresponds to detection performance requirement in PWS.*

Grid Survey:

- Collect digital point clouds for each grid using Stencil-2 Simultaneous Localization and Mapping (SLAM) positioning system
- Dynamic survey of grids using EM61-MK2 sensor using SLAM positioning

Output: Detailed MRS Characterization Memorandum with DUA and Dig List

TECHNICAL APPROACH – PHASE 3

Intrusive Investigation:

- Conduct site specific training, as needed.
- Reacquire target locations. No targets will be selected from EM31 survey for intrusive investigation.
- Conduct evacuations, road closures and implement engineering controls, as needed.
- Intrusively investigate each target and 2.5-foot radius around flag location.
- Recovered anomaly sources will be photo documented on a white board.
- Process material potentially presenting an explosive hazard (MPPEH)/MD in accordance with the approved Explosives Site Plan and regulations.
- Use on-call explosives; guard MEC until detonated.
- Inspect and document material documented as safe (MDAS).
- Site restoration.

Output: Final DUA

Example Whiteboard Photograph

TECHNICAL APPROACH – PHASE 3

MC Sampling:

- Technical memorandum will be submitted prior to sampling detailing number of DUs, Sample Units (SUs) and RI soil sample locations for the 600-yd target area based on results of prior phases.
- All soil samples will be collected as incremental samples.
  - Range Features – 200-yd, 300-yd, 600-yd and 1,000-yd target areas, natural backstop, and SAA features
    - Surface (0-1 foot) soil sampling
    - Upper Subsurface (1-2 feet) soil sampling
    - Lower Subsurface (2-3 feet) soil sampling
  - Background
    - 3 SUs collected in triplicate
    - Location TBD based on field efforts and ROEs
    - Same sampling intervals as HUA samples

TECHNICAL APPROACH – PHASE 3

MC Sampling:

- All surface water/sediment samples will be collected as discrete grab samples.
  - Antler Creek
    - Collect surface water sample via direct fill if sufficient water; otherwise, utilize hand-held scoop
    - Sediment samples collected from 0-3 inches below creek bottom surface
    - Background samples will also be collected upstream of the sampling area

- Analytes
  - Explosives/Propellants
  - Select Metals: Copper, Antimony, Lead, Zinc and Aluminum (*Aluminum is a select metal in Antler Creek sediment and surface water only*)

REPORTING

- **RI/Feasibility Study (FS) Report**
  - Updated CSM
  - DUAs (geophysical and chemistry)
  - Human health and ecological risk assessments, if warranted
  - MEC hazard assessment in accordance with Risk Management Methodology guidance
  - Includes FS if an unacceptable risk is identified
    - Develop Remedial Action Objectives
    - Develop and screen remedial alternatives
    - Detailed cost analysis using Remedial Action Cost Engineering Requirement (RACER®)

- **Proposed Plan**
  - 30-day public review and comment period
  - Public meeting

- **Record of Decision**

SCHEDULE

- ✓ October 17, 2023: Contract Kickoff Meeting
- ✓ May 24, 2024: Restoration Advisory Board (RAB) Solicitation
- ✓ February 12, 2025: TPP #1 Meeting
- March 2025: Draft Community Relations Plan, Army review
- March 2025: Draft MR-QAPP, Army review
- March 2025: Draft Explosives Site Plan (ESP) review by USACE
- May 2025: Draft Final MR-QAPP Review, Stakeholder review
- July 2025: TPP #2 Meeting
- August 2025: Final MR-QAPP
- August 2025: Final ESP
- August 2025 – March 2026: RI fieldwork (3 separate phases)
- May 2026 – December 2026: RI/FS Report
- November 2026 – June 2027: Proposed Plan
- June 2027 – January 2028: Record of Decision

SAFETY REMINDER

Follow the 3Rs of Explosives Safety:

Recognize:

When you may have encountered a munition and that munitions are dangerous.

Retreat:

Do not approach, touch, move or disturb it, but carefully leave the area.

Report:

Call 911 and advise the police of what you saw and where you saw it.

Questions/Open Discussion

DEFINITIONS

Geophysical:

- High density (HD) area: Area within a munitions response site (MRS) where the anomaly density has been determined to be ≥ critical density. HD areas will be presumed to result from munitions use unless and until it can be demonstrated otherwise.
- High use area (HUA): HD area where munitions use has been confirmed. Unexploded ordnance (UXO) and/or discarded military munitions (DMM) are anticipated to be present in HUAs.
- Low density (LD) area: Area(s) within an MRS where the anomaly density has been determined to be < critical density. LD areas can include both low use areas (LUA) and no-evidence-of-use areas (NEU).
- Low use area (LUA): LD area where the potential presence of munitions cannot be ruled out. Examples of LUA include buffer zones and maneuver areas.
- No-evidence-of-use (NEU) area: 1) LD area for which the Conceptual Site Model (CSM) contains no evidence munitions were used in the area, or 2) HD area determined to be not related to munitions use. All available and relevant lines of evidence supporting this delineation (e.g., historical records review, historical photo interpretation, visual observations, and interviews) must be considered.