MORGAN GENERAL ORDNANCE DEPOT MILITARY MUNITIONS RESPONSE PROGRAM FORMERLY USED DEFENSE SITE - MRS 02 REMEDIAL INVESTIGATION

#### SAYREVILLE, NEW JERSEY

**Systematic Project Planning Meeting #2** 

27 February 2025

**US Army Corps** 

of Engineers.

U.S. ARMY







### **MEETING GOALS**

Part 1

#### Introductions Overview of CERCLA Process and Morgan General Ordnance Depot Review WS#10 (Preliminary CSM) Review WS#11 DQO Steps 1 through 6 Review WS#12 (MPCs)

WS#11 DQO Step 7 WSs #17 (Sample Design and Project Workflow) Develop Sample Design for Preliminary Characterization Identify preliminary High Density Area Characterization Strategy WS#22 (Equipment Testing, Inspection, and QC)

> Stakeholder Involvement Review Project Schedule Action Items

# Part 3

Part 2

### MORGAN GENERAL ORDNANCE DEPOT MRS-02 REMEDIAL INVESTIGATION STRATEGIC PROJECT PLANNING MEETING #2

# Part One Introduction and Overview

### INTRODUCTIONS

## **Executing Agency**





- Todd Beckwith, Contracting Officer's Representative and Technical Manager (CENAB)
- Gina Kaso, Project Manager (CENAE)
- Yixian Zhang, Chemist (CENAE)
- Grace Greenberg, Risk Assessor (CENAE)
- Brent Smith, Geologist (CENAE)
- Marcos Paiva, Archaeologist and Cultural Resources (CENAE)
- Michael Narcisi, Ecological Risk Assessor (CENAE)
- David King, Quality Assurance (QA) Geophysicist (CENAB)
- Marty Holmes, Ordnance and Explosive Safety Specialist (OESS) (CENAB)
- Michael Heck, Real Estate (CENAN)

### Contract Support

Weston Solutions, Inc.



- Layne Young, Project Manager
- Andrew Fedetz, Senior Project Geophysicist
- Brandon Sutter, Project Geophysicist
- Shawn Lucas, Unexploded Ordnance (UXO) Technician

### INTRODUCTIONS

### **Regulatory Agencies**

- New Jersey Department of Environmental Protection (NJDEP)
  - Ralph Rodrigues, Emergency Response Specialist
  - Keith Rivera, UXO Pro Inc. (consultant to NJDEP)
  - Al Crandall, UXO Pro Inc.

### **Stakeholders**

- Cheesequake State Park
  - Jonathan Luk
- Township of Old Bridge
- City of South Amboy
- Borough of Sayreville
  - Glenn Skarzynski





### **CERCLA PROCESS SUMMARY**

PROCESS	OVERALL GOAL		
Identify Release(s)			
Site Inspection		Document the presence/absence of contaminants and whether further investigation is needed.	
Remedial Investigation		Define the nature and extent of contamination and complete a risk assessment.	
Feasibility Study		Screen remedial technologies and develop/evaluate remedial alternatives.	
Proposed Plan		Document and propose the selected remedy for public comment.	
Decision Document		Document and authorize the selected remedy.	

#### Remedial Design

Current Contract Scope

**Remedial Action** 

### **TERMS & ACRONYMS**

AGC – Advanced Geophysical Classification

AOC – Area of Concern

AOI – Area of Interest

- bgs below ground surface
- CENAB USACE, Baltimore District
- CENAE USACE, New England District
- CENAN USACE, New York District
- CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
- COPC Chemicals of Potential Concern
- CSM Conceptual Site Model
- DGM Digital Geophysical Mapping
- DMM Discarded Military Munitions
- DPT Direct Push Technology
- DoD Department of Defense
- DQO Data Quality Objectives
- EE/CA Engineering Evaluation / Cost Analysis
- FS Feasibility Study
- FUDS Formerly Used Defense Site
- HD / LD High Density / Low Density
- HE High Explosive
- HUA / LUA High Use Area / Low Use Area
- ISM Incremental Sampling Methodology
- MC Munitions Constituents

### **TERMS & ACRONYMS**

- MEC Munitions and Explosives of Concern
- MMRP Military Munitions Response Program
- MPC Measurement Performance Criteria
- MPV Man Portable Vector
- MRS Munitions Response Site
- NEU No Evidence of Use
- NJDEP New Jersey Department of Environmental Protections
- **OESS Ordnance and Explosive Safety Specialist**
- QA Quality Assurance
- QAPP Quality Assurance Project Plan
- **RI** Remedial Investigation
- ROE Rights-of-Entry
- SLAM Simultaneous Localization and Mapping
- SPP Systematic Project Planning
- SSS Side Scan Sonar
- TCRA Time Critical Removal Action
- TOI Target of Interest
- UFP–QAPP Uniform Federal Policy Quality Assurance Project Plan
- USACE U.S. Army Corps of Engineers
- USEPA U.S. Environmental Protection Agency
- UXO Unexploded Ordnance



### SITE HISTORY



### **MR-QAPP WORKSHEET #10 - PRELIMINARY CSM**

Site Details	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: Morgan General Ordnance Depot, Sayreville, NJ Acreage: 3,156 Suspected Past DoD Activities: Load, assemble, and packing of munitions. Morgan had a series of explosions in 1918 that lasted for 3 days, resulting in kickout and scattering of munitions.	MEC <sup>1</sup>	75mm projectiles 155mm projectiles 3-inch Stokes mortars 4.7-inch projectiles <sup>2</sup> 6-inch projectiles 8-inch projectiles 9.2-inch projectiles 240mm trench mortar Adapter Booster Mk-3 Fuze Cartridge Case Bare HE Burster/Adapter Mk-6 Booster Pipe Bomb	Confirmed presence in subsurface. Site is heavily developed, so while the potential for MEC on the surface is low, it is possible to be on the surface in undeveloped areas and could also migrate through erosion or construction activities. It is currently noted as very unlikely for surface.	Surface Below Ground Surface	Residents Industrial/commercial workers Recreational visitors/ trespassers Construction workers	In surface and subsurface soil, human receptors' exposure pathways are potentially complete.
Current and Future Land Use: Heavily developed, with industrial, commercial, and residential land. Cheesequake State Park is also within MRS-02. Land use not expected to substantially change in the future.	MC	Explosives <sup>3</sup>	Within MRS-02 where survey results and investigations identify areas where MEC existed or currently exists and/or a potential MEC release could have occurred.	Soil Groundwater Surface Water Sediment	Residents Industrial/commercial workers Recreational visitors/ trespassers Construction workers Biota	In surface and subsurface soils, the presence of explosives could result in potentially complete exposure pathways and potential risks for humans and biota. In groundwater, if the exposure pathway is complete, the presence of explosives could result in potential risks for humans. In surface water, if the exposure pathway is complete, the presence of explosives, could result in potential risks for humans In sediment, the presence of explosives could result in potentially complete exposure pathways and potential risks for humans and biota.

<sup>1</sup> It is expected that munitions present at Morgan at the time of the explosions would not have been fuzed. Records indicate all munitions found at the site have been unfuzed.

<sup>2</sup> Records indicate the 4.7-inch and 6-inch projectile production lines were never in production.

<sup>3</sup> All munitions were filled with various ratios of amatol (a mixture of TNT and ammonium nitrate), except for the 3-inch Stokes mortars, which were filled with nitrostarch.

### **PREVIOUS ACTIVITIES**

Year	Туре	Findings			
1993	Preliminary Assessment	75mm, 155mm, and 8-inch projectiles were identified			
		Project identified and forwarded to USACE for further evaluation			
1994	Archives Search Report	Site was segmented into six areas:			
		<ul> <li>Areas A, B, C, and D – presence of MEC confirmed</li> </ul>			
		<ul> <li>Areas E and F – presence of MEC unconfirmed, but the potential exists</li> </ul>			
		A total of 15 MEC items were confirmed during the ASR			
1994	TCRA	<ul> <li>75 Acre TCRA – Analog Removal Survey to 2 ft bgs         <ul> <li>15-acre Eisenhower School property – 19 MEC items removed</li> <li>60 acres south of Ernston Road and Eisenhower School, between Nathan Blvd. and the Garden State Parkway – 2,625 MEC items removed</li> </ul> </li> </ul>			
1995	Construction Support	<ul> <li>Construction support for housing development within the 60-acre former TCRA parcel – 41 MEC items were removed</li> </ul>			
1997	EE/CA Removal Action	<ul> <li>Pre-development removal action conducted at the 60-acre TCRA area to a depth of 4 ft bgs</li> <li>2,392 MEC items and 30,022 pounds of ordnance and explosives scrap were removed</li> </ul>			
1997	Construction Support	Construction of a sewer line in 60-acre housing development – 10 MEC items were removed			
1994 - 2000	Site-Wide EE/CA Action Memorandum	<ul> <li>Geophysical surveys were performed on 57 sample plots</li> <li>Partial intrusive investigations conducted, including investigation of over 100 ordnance fragments and removal of one adapter booster</li> </ul>			
2007	Construction Support	<ul> <li>One MEC item was identified during construction of a playground on the grounds of Samsel Upper Elementary School prompting the MEC construction support.</li> <li>No additional MEC items were identified</li> </ul>			





### MR-QAPP WORKSHEET #11 – DQO STEPS 1 - 6

AOIs:

- 1. Apache Lake Suspected disposal location at Apache Lake
- 2. Cheesequake Creek Suspected disposal area in Cheesequake Creek

Preliminary HUA:

- 1. Production Area Historical footprint of depot buildings and transportation routes
- EE/CA Sector 4 and 7 Documented MEC finds outside the Production Area within Sector 7 and Sector 4's proximity to area of high-MEC density (i.e. Eisenhower School TCRA)
- 3. Crater Historical crater footprints with surrounding 200-foot buffer to account for uncertainty in crater locations

1000-ft Buffer:

1. 1000 ft buffer beyond the Preliminary HUA boundary to account for uncertainty prior to RI data collection. Areas within the 1000 ft buffer will be included in an HUA or LUA at the conclusion of the RI.

Preliminary LUA:

1. Remainder of MRS-02 outside the AOIs and preliminary HUA, often referred to as kickout, where various MEC was dispersed as a result of the 1918 explosion.

### MR-QAPP WORKSHEET #11 – DQO STEPS 1 - 6

Human receptors may encounter MEC; therefore, explosive safety hazards exist. The extent of MC within MRS-02 is undefined.

Based on the possible presence of MEC and/or MC, further investigation is needed to accomplish the following:

- 1. Identify areas within MRS-02 where MEC from the 1918 explosions is likely to have remained and not been disturbed by development.
- 2. Confirm the MRS-02 boundary. Within this boundary, identify the following:
  - a. Developed areas where potential MEC are inaccessible to receptors.
  - b. Developed areas where potential MEC are accessible to receptors.
  - c. Undeveloped areas where potential MEC are accessible to receptors.
  - d. Boundaries of HUAs and LUAs.
  - e. The type, nature, and distribution of munitions related material within MRS-02.
  - f. The nature and extent of MC contamination.
  - g. Human health risk associated with MEC.
  - h. Human health risk and ecological risk associated with MC.
  - i. Data to support a feasibility study (FS), if necessary.
- 3. Depending on the types and distribution of remaining MEC at MRS-02, remedial action may be required to mitigate risks to current or reasonably anticipated future receptors. Results of the investigation will be used to assess baseline risks, identify remediation goals, estimate cleanup costs, and support a remedial action decision.



### MR-QAPP WORKSHEET #12A -MC MEASUREMENT PERFORMANCE CRITERIA

The MPC for MC are further refined within Worksheet #12A to highlight specific criteria for:

- ISM Field Replicates/Triplicates
- ISM Lab Replicates
- Equipment Rinsate Blanks
- Temperature Blanks
- Field Duplicates
- Analytical Method Blank and Grinding Blank

- Laboratory Control Sample
- Surrogate Spikes
- Internal Standards
- Explosives by Liquid Chromatography-Mass Spectrometry
- Total Organic Carbon in Soil/Sediment
- pH in Soil/Sediment

### MR-QAPP WORKSHEET #12B -MEC MEASUREMENT PERFORMANCE CRITERIA

- 1. Site Preparation
- 2. Validation Seeding, Quality Control Seeding, and Instrument Verification Strip
- 3. Assemble and Verify Correct Operation of Geophysical Sensors
- 4. Detection Surveys
- 5. Data Processing and Anomaly Selection
- 6. Assemble and Test Advanced Geophysical Sensor at IVS for Cued Surveys
- 7. Cued Data Collection
- 8. AGC Data Processing, Classification of Anomalies, and Dig/No-Dig Decisions
- 9. Excavation of Subsurface Anomalies
- 10. MPPEH/MEC and MDAS Handling, Certification, and Disposal
- 11. Verification of Recovered Non-TOIs

### MORGAN GENERAL ORDNANCE DEPOT MRS-02 REMEDIAL INVESTIGATION STRATEGIC PROJECT PLANNING MEETING #2

Part Two RI Approach

Spring 2025 – Winter 2026							
Detailed Characterization Phase							
DFW 1 Mobilization/Site Preparation (Planning Documents, Training, Utility Clearance, Right of Entries, Land Survey, Anomaly Avoidance, Vegetation Reduction, Surface Sweep) • Includes Site Preparation Technical Memorandum	DFW 3 Assemble and Verify Correct Operation of Geophysical Sensors for Dynamic Surveys	DFW 6 Assemble and Verify Correct Operation of Geophysical Sensors for Cued Surveys	DFW 10 MEC/MPPEH and MDAS Handling and Disposal (Disposal activities if required during DFW 9)	DFW 12 MC Sampling (Soil sampling associated with breached munitions, MEC disposal, HUA; Surface water and sediment sampling downgradient of HUA )	DFW 13 As-Needed Site Restoration		
	DFW 4 Dynamic Detection Surveys	DFW 7 Cued Data Collection			DFW 14 Final Data Usability Assessment		
DFW 2 Validation Seeding, QC Seeding, and IVS Construction • Includes IVS Technical Memorandum • In accordance with Blind Seeding Plan	DFW 5 Dynamic Data Processing	DFW 8 AGC Data Processing	DFW 11 Verification of Recovered Non-TOIs		DFW 15 Risk Assessment, Reporting, and Data Submittal (Document investigation results, update CSM, prepare screening level risk assessment)		
		DFW 9 Excavation of Subsurface Anomalies					

### **SAMPLE DESIGN - PRELIMINARY CHARACTERIZATION**

#### Traditional Preliminary Characterization not feasible for this site

- MEC release mechanism was atypical (i.e., the 1918 explosion)
- Explosion resulted in unfuzed and unfired munitions and munitions components being randomly dispersed throughout MRS-02

#### Sample Design

- Preliminary characterization and delineation of HD and LD areas will not be completed. Highly
  developed and heterogeneous nature of site means background anomaly density cannot be
  adequately determined to further classify what is HD or LD
- All parts of MRS-02 will be preliminarily categorized as either part of a preliminary HUA/LUA or AOI
  associated with distinct CSM MEC hazards
- NEU categorization is not expected to be defensible based on the current CSM

### **IDENTIFY PRELIMINARY CHARACTERIZATION STRATEGY**

The Preliminary HUA is based on the locations of historical explosion craters and clusters of MEC and single MEC finds in the vicinity of the crater locations. Single MEC finds further from the explosions are associated with explosion kickout and not included in the Preliminary HUA. A 1000 ft buffer was established around the Preliminary HUA to account for uncertainties.



### **IDENTIFY DETAILED CHARACTERIZATION STRATEGY**

- Dynamic and Cued AGC data will be collected in accessible areas (i.e., open grass yard) of developed properties throughout the Preliminary HUA and the 1000 ft buffer.
- Up to ten 100-by-100-foot investigatory (i.e., step-outs and focused investigations) grids will be established based on input during project planning sessions and results of completed RI field work
- AGC dynamic and cued surveys, followed by intrusive investigations of TOI, will be conducted within these properties/grids to further refine HUA/LUA boundaries.





Left – MPV Dynamic AGC Survey Right – MPV Cued AGC Survey utilizing Robotic Total Station Positioning **MEC Remedial Action** Spring Valley FUDS, Washington, D.C.





utilizing Real-Time Kinematic Positioning MEC Remedial Action Camp Maxey FUDS, Paris, Texas

### **IDENTIFY DETAILED CHARACTERIZATION STRATEGY**

Land-based and water-based DGM transect data will be collected over Cheesequake Creek and Apache Lake, and selected TOI will be intrusively investigated to determine the source of the electromagnetic anomalies in these potential disposal areas.





Above – Land-based EM61 using SLAM positioning for DGM data collection.





Left and Above – UXO Diver using SharkMarine® for positioning and data recording during underwater intrusive investigations.





#### MC SAMPLING DESIGN AND PROJECT WORKFLOW

- The RI characterization strategy is designed around the currently understood CSM (Worksheet #10) to achieve the primary objectives and project DQOs, including identifying and delineating boundaries of known or suspected MEC and MC impacted areas using a phased approach to characterize the nature and extent of MC contamination attributable to DoD.
- Sampling during Phase 1 will consist of surface soil sampling focused on properties where past geophysical and intrusive investigations have found numerous MEC or where the current investigation identifies MEC or significant MD indicative of MEC identified as a potential MC release.
- In Sampling Phase 2, subsurface soil borings will be advanced in AOCs where MEC is encountered deeper and in areas where damaged MEC is encountered based on intrusive investigations or where surface soil samples indicate potential leaching of COPCs deeper than 2 feet bgs. Sediment and surface water samples will be collected during Phase 2 at or adjacent to parcels where this medium is believed to be impacted by MEC or MD associated with MRS 02.
- Based on soil sampling results from Sampling Phases 1 and 2, monitoring wells will be installed at targeted locations identified as having significant potential for groundwater contamination. Monitoring wells will also be installed if groundwater is considered a potential exposure pathway or to delineate the extent of an identified groundwater contaminant plume, as needed.



### MORGAN GENERAL ORDNANCE DEPOT MRS-02 REMEDIAL INVESTIGATION STRATEGIC PROJECT PLANNING MEETING #2

Part Three Stakeholder Involvement & Next Steps

### **STAKEHOLDER INVOLVEMENT**

### Regulatory Agency - NJDEP

- Review project documents (30 business days).
- Oversight of fieldwork to ensure regulatory compliance.
- Thoughts on access considerations and scope of the fieldwork.

### Cheesequake State Park

- Keep informed of project progress.
- Respond to recreational user inquiries.
- Coordinate park accessibility and any closures, as necessary.
- Participate in stakeholder surveys and interviews.

### STAKEHOLDER INVOLVEMENT

### Local Leaders & Representatives

- Keep informed of project progress.
- Respond to public comment in support of ROE process.
- Participate in stakeholder surveys and interviews.
- Provide thoughts on access considerations and scope of the fieldwork.

### Local Community

- Participate in stakeholder surveys and interviews.
- Property owners within areas that may contain MEC and MC may be asked to approve ROE for RI field work.

### **RIGHT OF ENTRY REQUESTS**

#### As of 2/19/2025

- 228 Parcels requested
- 158 Total Property Owners = 158 ROEs requested

# 158 Parcels requested from 152 private landowners

- 10 ROEs executed
- 17 request denied
- 125 ROEs outstanding (no response) for 131 total Parcels

70 Parcels requested from 4 public landowners (6 ROEs requested)

- 5 ROEs executed for 68 parcels (from Borough of Sayreville, Sayreville Board of Education, and New Jersey Turnpike Authority)
- 1 ROE outstanding (City of South Amboy) for 2 parcels



### **STAKEHOLDER COMMUNICATIONS**

- In-Person Meetings
- Web Postings
  - Local Municipalities
    - Sayreville
    - South Amboy
    - Old Bridge
  - USACE

https://www.nae.usace.army.mil/Missions/Projects-Topics/Morgan-General-Ordnance-Depot/

### **PROJECT SCHEDULE**

- Spring/Summer 2025
  - Public Meeting/Site Visit (Pre-field work, April-May 2025)
  - DFW 1: Mobilization and Preparation (April May 2025)
  - DFW 2: Validation Seeding, QC Seeding, and IVS Construction (April May 2025)
  - DFW 3: Assemble and Verify Correct Operation of Geophysical Sensors for Dynamic Surveys (April -May 2025)
  - DFW 4: Dynamic Detection Surveys (May July 2025)
  - DFW 5: Dynamic Data Processing (May July 2025)
  - DFW 6: Assemble and Verify Correct Operation of Geophysical Sensors for Cued Surveys (April May 2025)
  - DFW 7: Cued Data Collection (August September 2025)
  - DFW 8: AGC data Processing (August September 2025)
- Fall/Winter of 2025;
  - DFW 9: Excavation of Subsurface Anomalies
  - DFW 10: MEC/MPPEH and MDAS Handling and Disposal
  - DFW 11: Verification of Recovered Non-TOIs
  - DFW 12: MC Sampling
  - DFW 13: As-needed Site Restoration
- Reporting upon completion of all above DFWs near the end of the RI;
  - DFW 14: Final Data Usability Assessment
  - DFW 15: Risk Assessment, Reporting, and Data Submittal

### **SCHEDULE & ACTION ITEMS**

Action Item Review

Upcoming Schedule

Upcoming Documents

### **Upcoming Meetings**

Public Meeting – Anticipated May 2025 SPP Meeting #3 - Anticipated December 2025

### **ADDITIONAL INFORMATION**

USACE Project Web Page: Morgan General Ordnance Depot

### 3Rs Explosive Safety: <u>3Rs Explosives Safety Education Program</u>

HOW can I be safe? Follow the 3Rs of Explosives Safety.



—when you may have encountered a munition and that mu<mark>nitions are dang</mark>erous.

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

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

