

# REMEDIAL ACTIONS FOR MUNITIONS RESPONSE SITES

## GROUP 8 MRS BLOCK D IGLOO MRS

***Presented by:***

**HydroGeoLogic, Inc.**

**April 20, 2022**

*"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."*



**US Army Corps  
of Engineers®**



# Presentation Agenda

- Summary of Military Munitions Response Program
- Block D Igloo Remedial Action Overview
- Group 8 Remedial Action Overview
- Questions



US Army Corps  
of Engineers



# Acronyms

<b>ARNG</b>	Army National Guard	<b>MEC</b>	Munitions and Explosives of Concern
<b>ASR</b>	Archives Search Report	<b>MPPEH</b>	Material Potentially Presenting an Explosive Hazard
<b>CENAB</b>	Corps of Engineers, Baltimore District	<b>MRS</b>	Munitions Response Site
<b>CJAG</b>	Camp James A. Garfield	<b>OHARNG</b>	Ohio Army National Guard
<b>COR</b>	Contracting Officer's Representative	<b>PM</b>	Project Manager
<b>CSM</b>	Conceptual Site Model	<b>PWS</b>	Performance Work Statement
<b>DGM</b>	Digital Geophysical Mapping	<b>QAPP</b>	Quality Assurance Project Plan
<b>EPA</b>	Environmental Protection Agency	<b>QC</b>	Quality Control
<b>FS</b>	Feasibility Study	<b>RAO</b>	Remedial Action Objective
<b>HGL</b>	Hydrogeologic, Inc.	<b>RI</b>	Remedial Investigation
<b>MC</b>	Munitions Constituents	<b>SI</b>	Site Inspection
<b>MD</b>	Munitions Debris	<b>TPP</b>	Technical Project Planning
		<b>UFP</b>	Uniform Federal Policy



US Army Corps  
of Engineers.



# Understanding the MMRP

- The Military Munitions Response Program (MMRP) is a Department of Defense program.
  - Follows the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or Superfund, process to address sites.
  - The munitions response site (MRS) is suspected to contain munitions and explosives of concern (MEC) and/or munitions constituents (MC).
- MEC may remain on an MRS due to former munitions-related activities.
- MC may be generated by munitions-related activities.

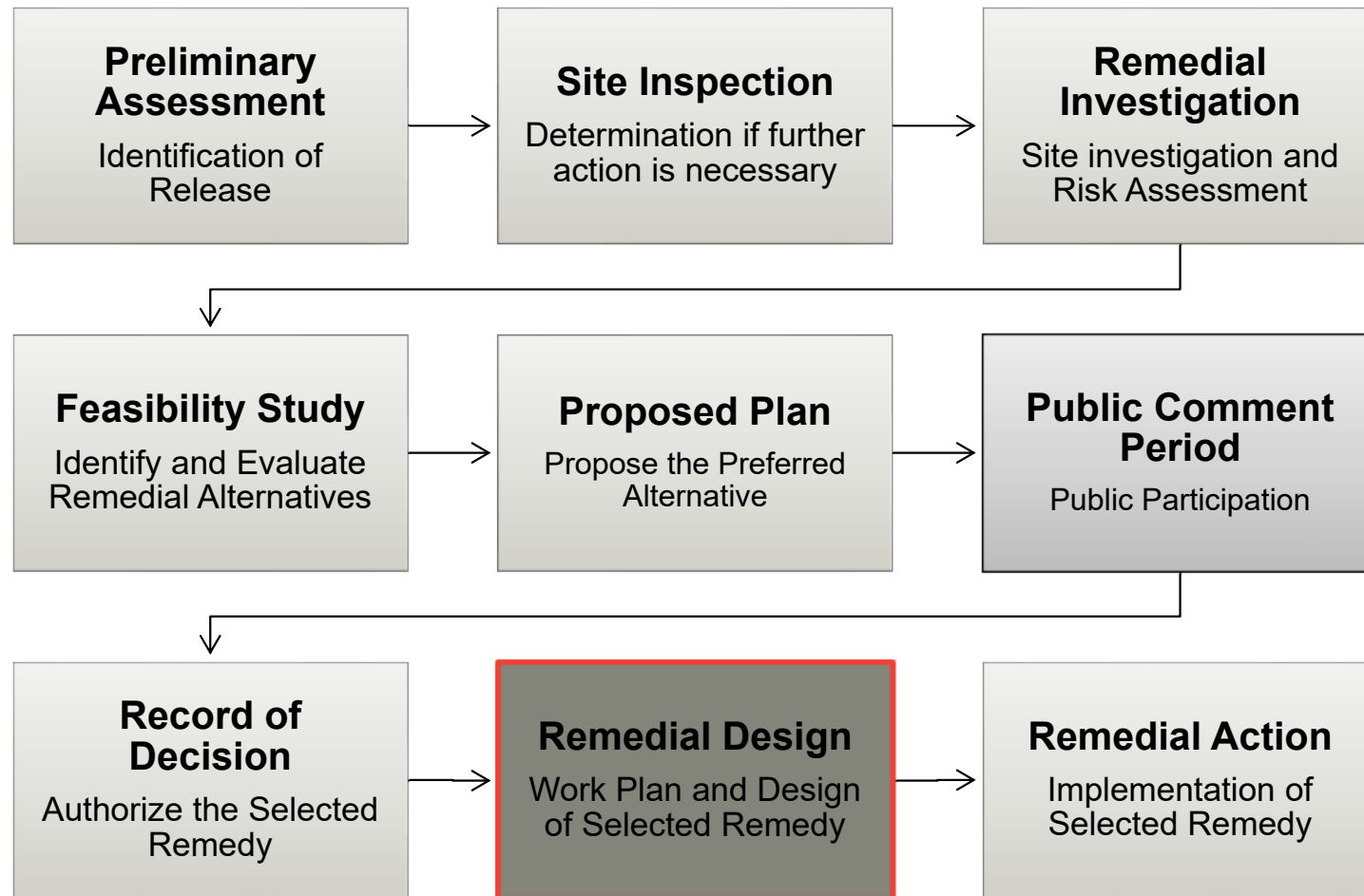


US Army Corps  
of Engineers.



# The Stages of an MMRP Project

5

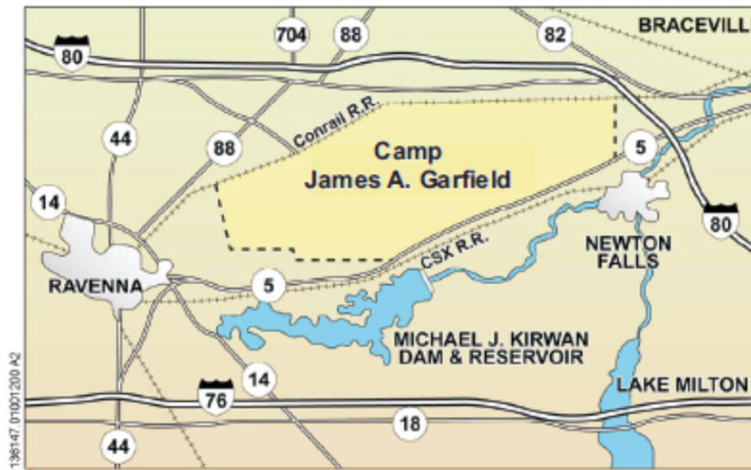


US Army Corps  
of Engineers.



# Former Ravenna Army Ammunition Plant Location

6



**Camp James A. Garfield/  
Former RVAAP  
Portage and Trumbull  
Counties, Ohio**



## Legend



Camp James A. Garfield



US Army Corps  
of Engineers.



# **BLOCK D IGLOO MRS (RVAAP-060-R-01)**

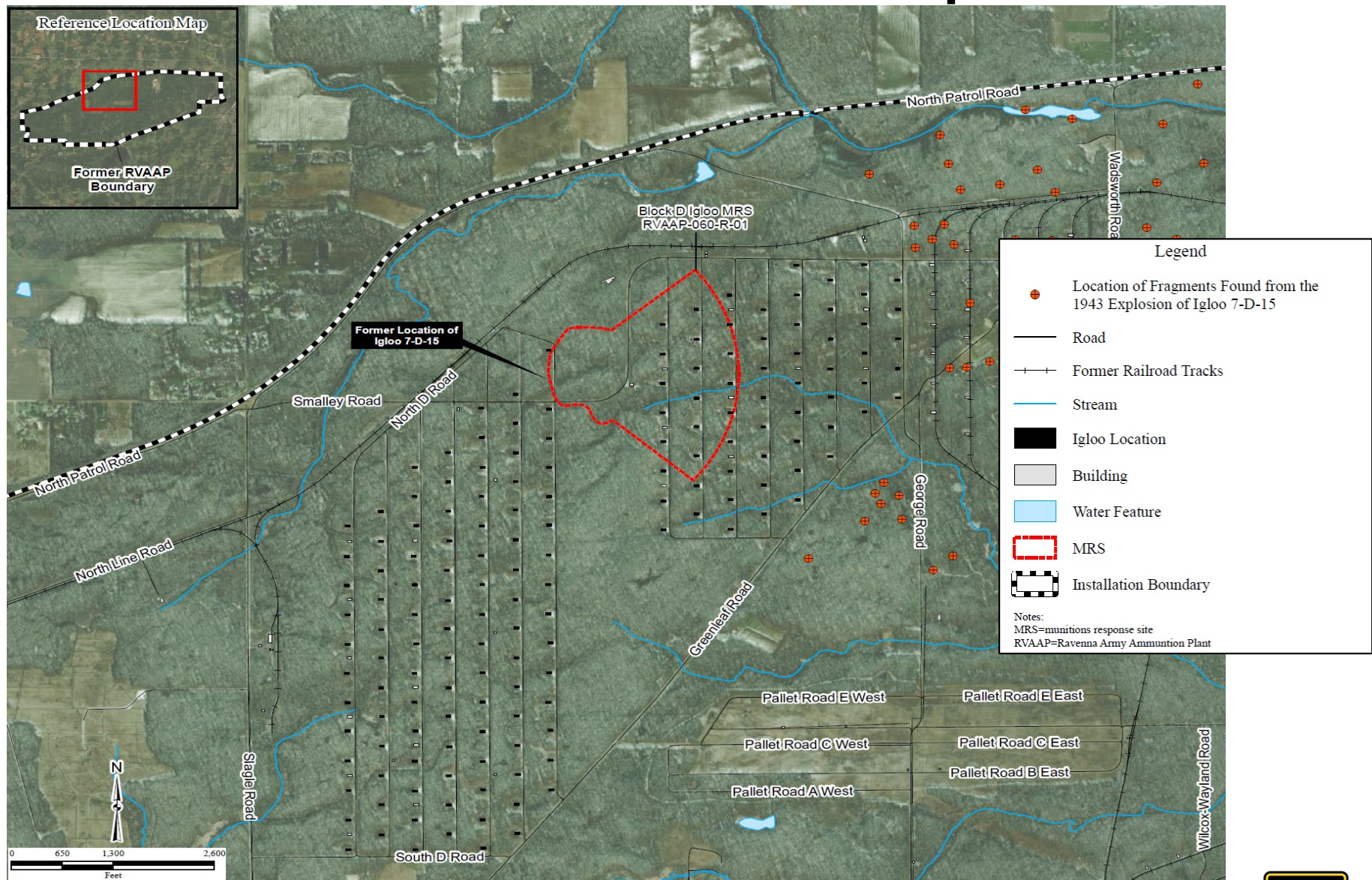


US Army Corps  
of Engineers®





# MRS Location Map



US Army Corps  
of Engineers





# Historical Background

- Block D Igloo MRS is 101.6 acres and located in the northeast-central portion of the facility.
  - March 24, 1943 - 2,516 clusters of M-41 20-pound fragment bombs exploded.
  - The explosion was reported to have been caused by rough handling and faulty design of a fuze.
- The MRS is mostly heavily wooded with thick vegetation and ground cover.
- Roads, fields, and wetlands are also located within the boundary.



US Army Corps  
of Engineers



# Previous Investigations

- **2004 Archives Search Report (ASR)**: The ASR indicated that the area surrounding former Igloo 7-D-15 potentially contained MEC and recommended further investigation.
- **2007 Historical Records Review**: The Review summarized the investigation following the accidental explosion of Igloo 7-D-15 (“D” Block) on March 24, 1943.
- **2008 Site Inspection (SI)**: The SI did not identify any MEC or MD. Further investigation was recommended to address potential munitions constituents (MC) contamination.
- **2011 Remedial Investigation (RI)**: The RI investigation team investigated 3,140 subsurface anomalies and recovered five MEC items and 3,135 inert MD items. MC contamination was not found to pose a risk to human health or the environment.
- **2015 Feasibility Study (FS)**: The FS determined that removing MEC from the surface and subsurface would result in the greatest reduction of risk. The selected alternative was based on historical munitions use and would achieve Unlimited Use/Unrestricted Exposure.
- **2018 Proposed Plan (PP) and 2019 Record of Decision (ROD)**: Presented the alternatives for public comment, documented the preferred alternative, finalized the selected remedy and established the remedial action objectives (RAO).
- **2020 Surface Clearance**: USACE personnel completed a surface clearance for MEC/MPPEH at the Block D Igloo MRS. A total of 101.6 acres were cleared in 2020. Recoveries included 407 pounds of material documented as safe (MDAS), 23 pounds of cultural debris, and approximately 40 cubic yards of reinforced concrete. No MEC/MPPEH was identified or recovered.



US Army Corps  
of Engineers.



# Remedial Action Objectives (RAO)

As summarized in the 2019 Record of Decision, the RAOs for the Block D Igloos MRS are to:

- Reduce the unacceptable potential hazard of military munitions on the ground surface and in sediment at the saturated and surface water areas within the MRS, to address the likelihood of exposure to Industrial Receptors via direct contact, to ensure that the likelihood of encounter is negligible.
- Reduce the unacceptable potential hazard of military munitions to a depth of 4 feet below ground surface within the MRS, to address the likelihood of exposure to Industrial Receptors via direct contact, to ensure that the likelihood of encounter is negligible.

*Note there is no munitions constituents (MC) remediation at this MRS.*



US Army Corps  
of Engineers.



# Remedial Action Approach – Site Preparation and Special Considerations

- **Wetlands/Streams** – Wetlands and streams are known to be present at the MRS. *Delineation of wetlands and streams will occur prior to the remedial action. Erosion control devices will be installed.*
- **Trees** – Approximately 85 acres of vegetation removal. *In preparation for the remedial action selective timber harvesting was conducted.*
- **Existing Igloos within the MRS** – Approximately 1 acre of anomalies investigation.
- **Concrete Debris from Former Igloo 7-D-15** – Removal of concrete debris and anomalies investigation (unless it can be determined that they are an intact piece of the original floor slab, and therefore, no munitions would be underneath).



US Army Corps  
of Engineers



# Remedial Action Approach – Geophysical Surveys

- **Survey** – Digital geophysical mapping (DGM)
- **Instrumentation** – Geonics EM61-MK2
- **Set-up** – Towed-array platform with up to three height-adjustable EM61 coils
- **Rough Terrain** – Hand-operated EM61
- **Inaccessible Areas** – Handheld Schonstedt GA-52x (or equivalent)



US Army Corps  
of Engineers.





# Remedial Action Approach – Removal Action

- **Flagging**
  - Identification of anomalies on Grid Dig List.
- **Intrusive Investigation**
  - Performed by Unexploded Ordnance (UXO) personnel at each anomaly location using hand digging beside and laterally to each anomaly.
  - Wetlands and streams will be avoided as much as possible. If anomaly investigation is necessary within a water feature, hand digging will be used to minimize disturbance.
  - Road surfaces repaired after anomaly investigation (~1,850 feet of roadway)
- **MEC/MPPEH Disposal**
  - Disposed through detonation at the Buried Explosion Module if not free of explosives hazards.
  - Blown-in-place if unacceptable to move.



US Army Corps  
of Engineers.



# Remedial Action Approach – Site Restoration

- At the conclusion of MEC removal activities, HGL will restore the site including repairing roadways and repairing delineated wetlands/streams, as needed.
- HGL anticipates re-establishing drainage and restoring vegetation with a CJAG-approved wetlands seed mix, as needed.
- HGL will seed areas of the MRS that are not wetlands with a CJAG-approved native seed mix to re-establish vegetation to prairie/grassland.
- HGL will monitor site restoration activities to ensure vegetation re-establishes.



US Army Corps  
of Engineers.



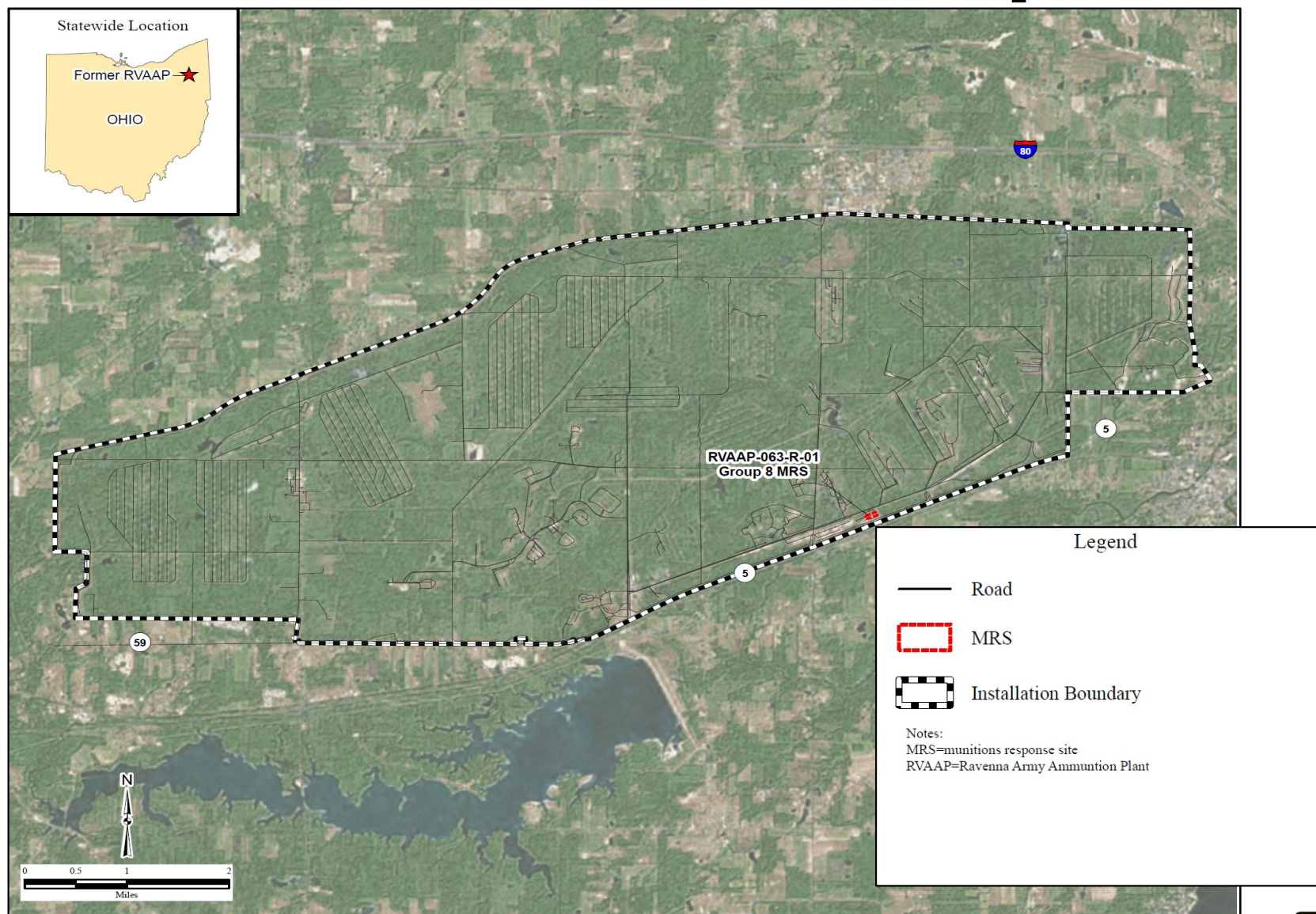
# **GROUP 8 MRS (RVAAP-063-R-01)**



US Army Corps  
of Engineers®



# MRS Location Map



US Army Corps  
of Engineers.



# Historical Background

- Group 8 MRS is 2.65 acres and located between Buildings 846 and 849, just north of the southern facility boundary.
  - Used to burn debris/rubbish for an unknown time;
  - Used as a staging area for military vehicles; and
  - No documentation of prior disposal of munitions, but munitions were found previously.
- The MRS is unimproved grassy land with gravel and dirt roads that pass through the MRS.
- A drainage ditch flows along the southern border of the MRS.



US Army Corps  
of Engineers.





# Previous Investigations

- **2004 Archives Search Report (ASR)**: The ASR indicated that Group 8 potentially contained MEC and recommended further investigation.
- **2007 Historical Records Review**: The HRR was completed to perform a records search on MRSs identified at the facility, to supplement the U.S. Army Closed, Transferring, and Transferred Range/Site Inventory. The HRR documented MEC and MD was found in the MRS.
- **2008 Site Inspection (SI)**: The SI identified munitions potentially presenting an explosive hazard (MPPEH). Further investigation was recommended to address potential munitions constituents (MC) contamination.
- **2011 Remedial Investigation (RI)**: The RI investigation team investigated anomalies. All MPPEH items were documented as safe and determined to be MD. Approximately 1,180 pounds (lbs) (277 individual MD items) of MD items were recovered from 9 trenches and 1,281 lbs of “Other Debris” were identified within all 14 trenches. Since all items identified were MD, no unacceptable MEC risk was identified. MC contamination was found to pose a risk to human health or the environment.
- **2015 Feasibility Study (FS)**: The FS determined that removing MC in soil to a maximum depth of 0.5 ft bgs would result in the greatest reduction of risk. The selected alternative was based on historical munitions use and would achieve Unlimited Use/Unrestricted Exposure.
- **2020 Proposed Plan (PP) and 2020 Record of Decision (ROD)**: Presented the alternatives for public comment, documented the preferred alternative, finalized the selected remedy and established the remedial action objectives (RAO).



US Army Corps  
of Engineers.



# Remedial Action Objectives

According to the 2020 Record of Decision, the RAOs for the Group 8 MRS are to:

- Prevent exposure of a Resident Receptor (Child and Adult) to lead and cadmium present in surface soil (0 to 0.5 feet bgs) at GR8SS-004M; and
- Prevent exposure of a Resident Receptor (Child and Adult) to lead present in surface soil (0 to 0.5 feet bgs) at GR8SS-001M, GR8SS-003M and GR8SS-004M.

*Note there is no explosive hazard anticipated at this MRS.*



US Army Corps  
of Engineers.



# Remedial Action Approach – Site Preparation

- Minimal vegetation removal is expected at the Group 8 MRS.
- If needed, mowing and removal of trees with a diameter of less than 3 inches will be conducted.
- Erosion control devices will be installed.
- High visibility fencing will be used to protect the 2 utility poles on site.



US Army Corps  
of Engineers



# Remedial Action Approach – In Situ Waste Characterization Sampling

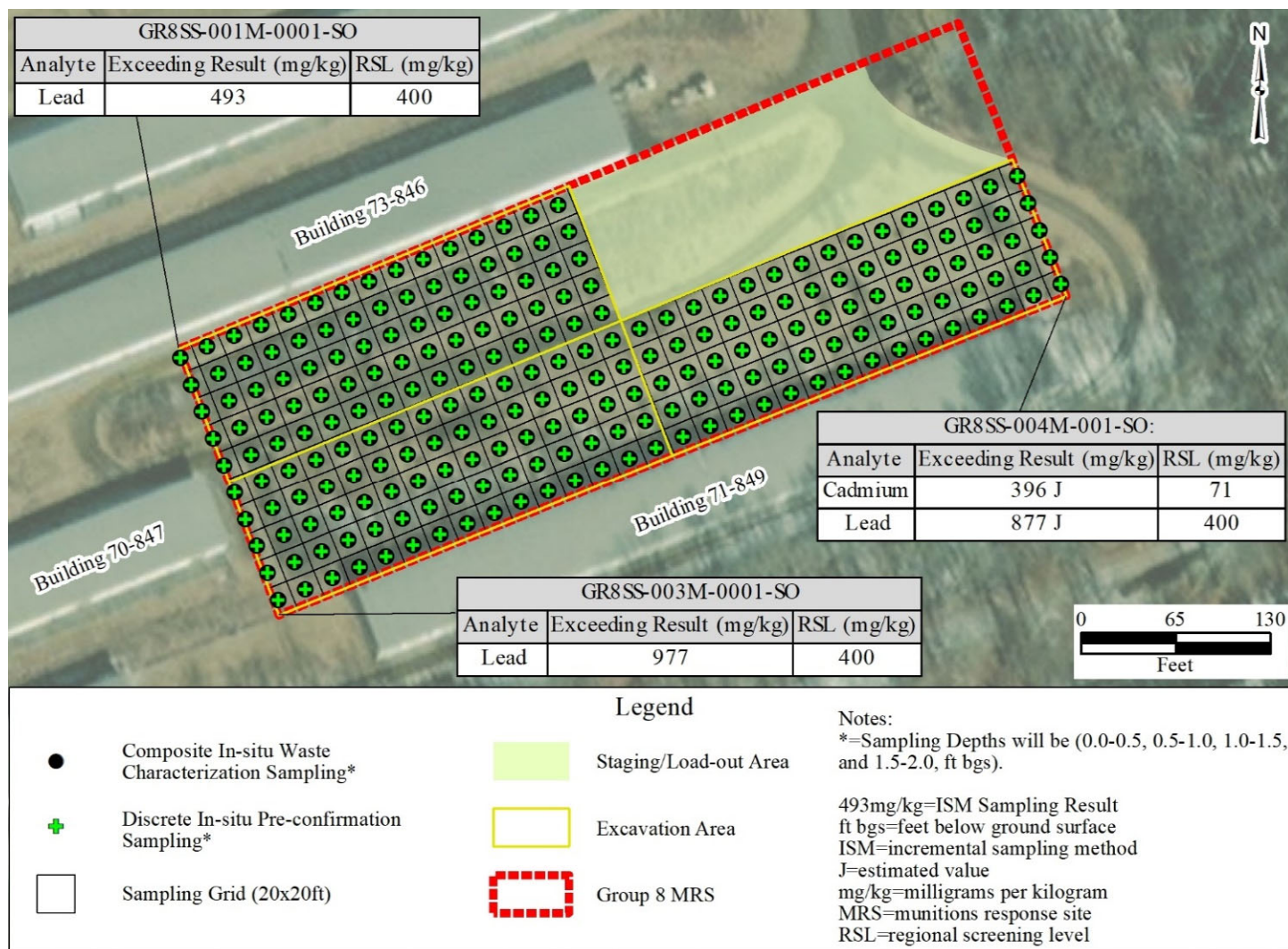
- The pre-excavation confirmation sampling will define the horizontal and lateral extent of the excavation.
- Based on this information, samples will be collected and analyzed to determine if the soil meets the definition of characteristic hazardous waste, pursuant to 40 CFR Part 261 using the Toxicity Characteristic Leaching Procedure for disposal.
- Multiple samples from across the represented area will be composited and submitted to the laboratory for analysis and subsequent waste profiling.



US Army Corps  
of Engineers.



# MC Sampling Contamination



US Army Corps  
of Engineers





# Remedial Action Approach – Construction Support

- No explosive hazard is present for this MRS
- HGL will provide construction support during contaminated soil excavation
- The UXO qualified personnel will inspect and observe all activities for the presence of MPPEH
- Any MPPEH discovered will be inspected and managed by UXO-qualified personnel (though no explosive hazards are anticipated)



US Army Corps  
of Engineers.



# Remedial Action Approach – Excavation Of Contaminated Soil

- UXO construction support will be used, and the area will be screened prior to excavation.
- Contaminated soil will be removed from each grid to the specified depth based on the pre-excavation sampling results.
- Hazardous soil will be segregated from nonhazardous soils for proper off-site disposal.
- Soil will be loaded by HGL either into trucks or roll-off containers for transport and disposal as nonhazardous or hazardous waste.



US Army Corps  
of Engineers.



# Remedial Action Approach – Site Restoration

- At the conclusion of soil removal activities, HGL will restore the site including the following activities:
  - Backfilling with clean fill;
  - Re-establishing drainage pathways; and
  - Repairing the gravel road, as needed.
- HGL will seed areas of the MRS with a CJAG-approved native seed mix to re-establish vegetation.
- HGL will monitor site restoration activities to ensure vegetation re-establishes.



US Army Corps  
of Engineers.



# Questions or Comments?



US Army Corps  
of Engineers.

