

**Final
No Further Action Proposed Plan
for
RVAAP-002-R-01 Erie Burning Grounds
Munitions Response Site
Version 1.0**

**Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio**

**Contract No. W912DR-15-D-0016
Delivery Order No. 0001**

Prepared for:



**US Army Corps
of Engineers®**

**U.S. Army Corps of Engineers
Baltimore District
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December 19, 2018

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REPORT DOCUMENTATION PAGE

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14. ABSTRACT The U.S. Department of the Army (U.S. Army) is presenting this No Further Action (NFA) Proposed Plan to involve the public in the remedy selection process for the Ravenna Army Ammunition Plant Erie Burning Grounds Munitions Response Site, RVAAP-002-R-01, in Portage and Trumbull Counties, Ohio. This NFA Proposed Plan presents the U.S. Army's preliminary recommendations for addressing the MRS. Investigations have not found material potentially presenting an explosive hazard (MPPEH) or munitions and explosives of concern (MEC) at the MRS. Therefore, no explosive hazards and no risk to receptors exist from historical activities associated with manufacturing, storing, transporting, testing, training, and/or disposal that occurred at the facility.					
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Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

February 13, 2019

**Re: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859256**

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Subject: Receipt and Review of the "Final No Further Action Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site Version 1.0" Dated December 19, 2018 (Work Activity No. 267000859256)

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final No Further Action Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site Version 1.0" dated December 19, 2018. This document was received by Ohio EPA, NEDO on January 14, 2019, and was prepared by HydroGeoLogic, Inc. as a result of the investigation completed under the military munitions response program.

Based on the information contained in the final proposed plan, other investigation documents and reports, Ohio EPA concurs with the No Further Action (NFA) determination presented. As stated in the proposed plan, the Army will offer a public comment period between March 1 and April 3, 2019, and hold an open house/public meeting on March 6, 2019. This is required prior to the submittal of the Record of Decision (ROD).

If you have any questions or concerns, please do not hesitate to contact Nicholas Roope at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Sferra", is written over a light blue horizontal line.

James Sferra, Chief
Division of Environmental Response and Revitalization

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FEB 13 2019

JS/sc

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CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

HydroGeoLogic, Inc., has completed the *Final No Further Action Proposed Plan for RVAAP-002-R-01 Erie Burning Grounds Munitions Response Site, Version 1.0* at the Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives, technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets customer's needs consistent with law and existing United States Army Corps of Engineers policy.

Reviewed/Approved by:

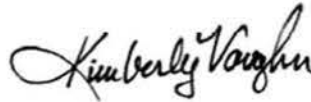
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ARNG – Army National Guard

COR – Contracting Officer’s Representative

IED – Installation and Environment Division

OHARNG – Ohio Army National Guard

RVAAP – Former Ravenna Army Ammunition Plant

USACE – United States Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

ARAR	applicable or relevant and appropriate requirements	NCP	National Oil and Hazardous Substances Pollution Contingency Plan
Army	U.S. Department of the Army	NFA	No Further Action
ARNG	Army National Guard	OHARNG	Ohio Army National Guard
Camp Ravenna	Camp Ravenna Joint Military Training Center	Ohio EPA	Ohio Environmental Protection Agency
CB&I	CB&I Federal Services, LLC	PP	Proposed Plan
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	RI	Remedial Investigation
COC	chemical of concern	ROD	Record of Decision
COPEC	chemical of potential concern	RVAAP	Former Ravenna Army Ammunition Plant
COR	Contracting Officer's Representative	SI	Site Inspection
DA	U.S. Department of the Army	TNT	trinitrotoluene
DMM	discarded military munitions	U.S.	United States
DoD	Department of Defense	USACE	U.S. Army Corps of Engineers
e ² M	Engineering-Environmental Management, Inc.	USP&FO	U.S. Property and Fiscal Officer
Final HRR	<i>Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio</i>	UXO	unexploded ordnance
Final RI Report	<i>Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0</i>		
Final SI Report	<i>Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio</i>		
FS Report	<i>Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 4.0</i>		
FS	Feasibility Study		
HGL	HydroGeoLogic, Inc.		
HRR	Historical Records Review		
IED	Installation and Environment Division		
IRP	Installation Restoration Program		
ISM	Incremental Sampling Methodology		
MC	munitions constituents		
MD	munitions debris		
MEC	munitions and explosives of concern		
mm	millimeter		
MMRP	Military Munitions Response Program		
MRS	munitions response site		
MRSP	MRS Prioritization Protocol		

1.0 INTRODUCTION

The United States (U.S.) Department of the Army (Army or DA) is presenting this No Further Action (NFA) **Proposed Plan*** (PP) to involve the public in the **remedy selection process** for the RVAAP-002-R-01 Erie Burning Grounds **Munitions Response Site (MRS)**. The former Ravenna Army Ammunition Plant (RVAAP) is located in Portage and Trumbull Counties, Ohio, as shown on **Figure 1**. The location of the Erie Burning Grounds MRS in relation to the former RVAAP is shown on **Figure 2**.

The Army, in consultation with the Ohio Environmental Protection Agency (Ohio EPA), is the lead agency for investigating, reporting, making **remedial decisions**, and taking **remedial actions** at the former RVAAP. This NFA PP presents the Army's preliminary recommendations for addressing the Erie Burning Grounds MRS. Investigations indicate that no **U.S. Department of Defense (DoD) military munitions** were confirmed as **munitions and explosives of concern (MEC)** or risks associated with **munitions constituents (MC)**-related contamination exists.

The Army is issuing this NFA PP to address its public participation responsibilities under Section 117(a) of the **Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)**, as amended by the Superfund Amendments and Reauthorization Act of 1986, and Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan (NCP)** (40 Code of Federal Regulations 300). Implementation of the selected remedy at the MRS will comply with the requirements of the *Director's Final Findings and Orders for RVAAP* (Ohio EPA, 2004).

This NFA PP summarizes information contained in the Final Remedial Investigation Report for *RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0* (Final **Remedial Investigation [RI]**) (CB&I Federal Services, LLC [CB&I], 2014) and the *Final Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0* (**Feasibility Study [FS]**) (HydroGeoLogic, Inc.

[HGL], 2018). The Army encourages the public to review these documents to better understand the history of the MRS, activities that have been conducted there, and determinations that have been made for the MRS under the **Military Munitions Response Program (MMRP)**.

The Army, in consultation with the Ohio EPA, will review and consider all comments on this NFA PP received during the 30-day public comment period. The public is encouraged to review and comment on all recommendations presented in this NFA PP.

2.0 FACILITY AND MRS BACKGROUND

This section summarizes the history of the former RVAAP and of the Erie Burning Grounds MRS.

2.1 Facility History

The former RVAAP (Federal Facility ID No. OH213820736), now known as the Camp Ravenna Joint Military Training Center (Camp Ravenna), is located in northeastern Ohio within Portage and Trumbull Counties and is approximately 3 miles east-northeast of the city of Ravenna. The federally owned facility, approximately 11 miles long and 3.5 miles wide, is bounded by a Norfolk Southern railroad line to the north; State Route 5, the Michael J. Kirwan Reservoir, and a CSX railroad line to the south; State Route 534 to the east; and Garret, McCormick, and Berry Roads to the west. The facility is surrounded by the communities of Windham, Garrettsville, Newton Falls, Charlestown, and Wayland.

Administrative control of the 21,683-acre facility has been transferred to the U.S. Property and Fiscal Officer (USP&FO) for Ohio and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a training site, Camp Ravenna. The restoration program for the facility involves the remediation of areas affected by the activities of the former RVAAP.

The former RVAAP was constructed in 1940 and 1941 for assembly/loading and **depot storage** of ammunition. While serving as an ammunition plant, RVAAP was a U.S. Government-owned and contractor-operated industrial facility. The

* Terminology used in this Proposed Plan is defined in the Glossary found at the back of this document.

ammunition plant consisted of 12 munitions assembly facilities, referred to as “load lines.” Load Lines 1 through 4 were used to melt and load 2,4,6-trinitrotoluene (TNT) and Composition B (a mixture of TNT and Research Department Explosive) into **large-caliber shells** and bombs. Operations on the load lines produced explosive dust, spills, and vapors that collected on the floors and walls of each building. Periodically, the floors and walls were cleaned with water and steam. After cleaning, the “pink water” wastewater, which contained TNT and Composition B, was collected in concrete holding tanks, filtered, and pumped into unlined ditches for transport to **earthen settling ponds**. Load Lines 5 through 11 manufactured **fuzes, primers, and boosters**. From 1946 to 1949, Load Line 12 produced ammonium nitrate for explosives and fertilizers; subsequently, it was used as a **weapons demilitarization facility**.

In 1950, the facility was placed on standby status, and operations were limited to **renovation, demilitarization**, normal maintenance of equipment, and munitions storage. **Production** activities resumed from July 1954 to October 1957 and again from May 1968 to August 1972. Demilitarization and production activities were conducted at Load Lines 1, 2, 3, and 12. Demilitarization activities included disassembling munitions and melting out and recovering explosives using hot water and steam processes. These activities continued through 1992.

In addition to production and demilitarization activities at the load lines, other facilities at RVAAP included areas used for the burning, demolition, and testing of munitions. The burning and demolition grounds consisted of large, open areas and abandoned quarries. Other areas of concern at the former RVAAP include landfills, an aircraft fuel tank testing area, and various industrial support and maintenance facilities (CB&I, 2014).

Public Comment Period:

March 1 to April 3, 2019

Public Meeting:

The Army will hold an open house/public meeting to present the NFA PP. Oral and written comments on the document will be accepted at the meeting. The open house/public meeting is scheduled for 6:00 p.m. on March 6, 2019, at the Charlestown Town Hall, 6368 Rock Spring Road, Ravenna, Ohio 44266.

Information Repositories:

Information used in selecting the preferred remedy is available online at www.rvaap.org and at the following locations:

Reed Memorial Library

167 East Main Street
Ravenna, Ohio 44266
(330) 296-2827

Hours of Operation:

9 a.m.–8 p.m., Monday–Thursday
9 a.m.–6 p.m., Friday
9 a.m.–5 p.m., Saturday
1 p.m.–5 p.m., Sunday

Newton Falls Public Library

204 South Canal Street
Newton Falls, Ohio 44444
(330) 872-1282

Hours of Operation:

9 a.m.–8 p.m., Monday–Thursday
9 a.m.–5 p.m., Friday and Saturday

The **Administrative Record** File, which includes the information used to select the preferred remedy, is available for review at the following location:

Camp Ravenna Joint Military Training Center (Camp Ravenna)

Environmental Office
1438 State Route 534
Newton Falls, Ohio 44444
(614) 336-6136

Note: Access to Camp Ravenna is restricted, but an appointment to review the Administrative Record File can be scheduled.

2.2 MRS History

The Erie Burning Grounds MRS is a 33.93-acre parcel in the northeastern portion of the Camp Ravenna within Portage County. The MRS is the location of a former burning ground that operated between 1941 and 1951 adjacent to the intersection of Blackberry Lane and North Patrol Road at Camp Ravenna (**Figure 2**). The Erie Burning Grounds received bulk, obsolete, and off-specification propellants; conventional explosives; rags, and large, explosive-contaminated items (railcars) to be thermally treated (by open burning). Open burn activities occurred in four areas: Burn Area A, Burn Area B, Burn Area C, and Burn Area D. **Bomb flashing** and open burn activities deposited ash that remained at the MRS after use was discontinued (HGL, 2018).

Since use of the burning ground discontinued, the MRS was inundated with water due to sedimentation, vegetation growth, and beaver damming of the small stream that drains the MRS. As a result, the MRS is now occupied by wetland areas with intermittent open water areas ranging from 3 to 5 feet in depth depending on season and precipitation (HGL, 2018).

The MRS boundary and site features for the 33.93-acre Erie Burning Grounds MRS are presented on **Figure 3**. Additional details describing the MRS history are provided in the following sections.

2.3 MRS Historical Investigations

The following investigations and reports have been completed under the MMRP for the Erie Burning Grounds MRS:

- *Final Historical Records Review (HRR)* (Engineering-Environmental Management, Inc. [e²M], 2007);
- *Final Site Inspection Report* (Final Site Inspection [SI] Report) (e²M, 2008);
- *Final Remedial Investigation Report* (Final RI Report) (CB&I, 2014); and
- *Feasibility Study* (Final FS) (HGL, 2018)

2.3.1 Historical Records Review

The 2007 Final HRR was completed to document historical and other known information on select MRSs identified at the former RVAAP, including

the Erie Burning Grounds MRS. The HRR activities included a limited-scope records search to document historical and other known information. The records search identified four former burn areas as well as a former borrow area located in the western portion of the MRS. Partially buried munitions-related items have been observed across the MRS; however, the type, condition, and extent of MEC and MC-related contamination at the Erie Burning Grounds MRS was unknown. The HRR recommended a MEC assessment be performed at the Erie Burning Grounds MRS in an SI (CB&I, 2014).

2.3.2 Site Inspection Summary

In 2007, the Army completed MMRP SI field activities at former RVAAP MRSs including the Erie Burning Grounds MRS.

Metal detector-assisted **unexploded ordnance (UXO)** surveys were performed throughout the accessible, dry areas of the MRS (**Figure 4**). Subsurface anomalies were identified, and locations recorded in the northwest, central, and southwest portions of the MRS. No intrusive investigation was conducted; therefore, the type and depth of subsurface anomalies was not characterized. One possible MEC item was found partially buried northwest of the wooded area. No MC sampling activities were performed since characterization of possible contamination in soil, groundwater, surface water, and dry sediment was being conducted under the **Installation Restoration Program (IRP)**.

Recommendations were made in the Final SI Report to further characterize the entire MRS with respect to MEC and MC (in pond sediment only) under the MMRP (CB&I, 2014).

2.4 Remedial Investigation Results

The Army conducted an RI at the Erie Burning Grounds MRS in 2014 to characterize the nature and extent of any military munitions and MC-related contamination potentially present within the MRS. Field activities included a **digital geophysical mapping** survey of 6.8 acres, intrusive investigation of 350 individual anomalies and 14 exploratory trenches, and sampling for MC-related contamination. The RI

field activity results (**Figure 6a and Figure 6b**) are discussed below:

Digital geophysical surveys identified 2,233 clusters of high **anomaly** density around the shoreline of the northern pond. Two-hundred anomaly clusters were within 3 feet of one another and were merged together to form one target. A total of 266 anomaly clusters and 1,076 individual anomalies were identified outside of the high anomaly density areas. Another 49 anomaly clusters also located outside of the high-density area were found to be related to cultural features (i.e., underground utilities) or nails placed by the field teams for quality control purposes. The transects were placed in parallel lines across the MRS. The coverage exceeded the proposed sampling coverage and was sufficient to identify any munitions use areas that may not have been previously identified. The transect coverage of the MRS is shown in **Figure 5**. Based on the geophysical data collected, two types of intrusive investigation (digging) were completed during the RI field activities: trench investigations and individual anomaly investigation. The RI geophysical data indicates that the anomaly density across the MRS is relatively low, and the areas on either side of the railroad embankment and near Burn Area D are the locations with high anomaly densities. No significant patterns indicating a target area or impact area were located. In the high anomaly density areas trenches were used to investigate anomaly clusters. In low anomaly density areas individual anomalies were selected for intrusive investigation.

Trench Investigation

Intrusive investigation of the high anomaly density areas was conducted using mechanical excavation techniques at 14 trench locations. From the 14 trenches, non-explosively hazardous fragments classified as **munitions debris (MD)** were located in five of the trenches. Thirty-three MD items weighing approximately 910-pounds were removed from trench locations. Fragments recovered from trench locations were various parts associated with an AN-M64A1-series 500-lb General Purpose bomb. The fragments were determined to have no explosive hazard and were classified as MD. The trenches were placed

in biased locations within the areas of the highest concentrations of subsurface metal shown in the geophysical survey data. No explosively hazardous items were found in any of the 14 trenches.

Individual Anomaly Investigation

Outside the high anomaly density areas, in the low anomaly density areas, a total of 1,052 individual anomalies of interest were selected for intrusive investigation by hand digging. From these individual locations, 350 were able to be dug, as the remaining anomalies were buried too deep in the sediment and could not be safely investigated. Intrusive investigation teams must be able to see the items that are being excavated. From the 350 locations investigated, twenty-nine MD items weighing approximately 385-pounds were removed from **point-source target** locations. Fragments recovered from point-source locations were associated with the M48-series 75 millimeter (mm) high explosive projectile and M309-series 75mm projectile. These fragments had no explosive hazards and were classified as MD. No explosively hazardous items were found in any of the 350 locations.

Intrusive Investigation Summary

In the areas of the highest anomaly density (the most concentrated areas of subsurface metal), fourteen trenches were excavated, and no explosively hazardous items were identified. The 350 individual anomalies that were investigated in the low anomaly density areas provided additional characterization data to identify what items are in the subsurface at this MRS. No explosively hazardous items were identified, and the majority of items identified were non-munitions related debris (road base slag, metal rods, hinges, steel rails, cans, scrap metal, rebar, wire, pipes and miscellaneous scrap metal).

No MEC was identified during the RI and the RI Report concluded that the data collected met the required 95-percent confidence level that the potential presence of MEC at the MRS is statistically low. As established in the Feasibility Study, under CERCLA as applied to MMRP, if no explosive hazard is found, there is no basis for a remedial action. As there is no exposure to potential hazards present at the MRS, no remedial

action is necessary to ensure protection of human health.

Munitions Constituents Sampling

Six wet sediment samples were collected using Incremental Sampling Methodology (ISM). Three samples were collected from the North Surface Water basin, two from the South Surface Water Basin, and one from the East Surface Water Basin. Wet sediment ISM sample depths were collected between sediment surface and 0.5-feet below sediment surface. Three surface water samples were also collected, one from each main surface water basin. All samples were analyzed for metals, explosives, nitrocellulose, semi-volatile organic compounds, and pH. Wet sediment samples were also analyzed for polychlorinated biphenyl and total organic carbon. Based on the analytical results, 22 site-related chemicals were identified as potential MC at the Erie Burning Grounds MRS (CB&I, 2014).

No DoD military munitions confirmed to be MEC were found during the intrusive investigation; however, high density areas of MD were encountered. Therefore, additional environmental samples for MC-related contamination were collected from the bottom of two trenches at depths between 3 and 4 feet below ground surface (CB&I, 2014).

The Army completed a **human health risk assessment** and an **ecological risk assessment** to determine if the identified site-related chemicals posed a risk to future **receptors**. Iron was identified as a chemical of concern (COC) for residential receptors in wet sediment; however, evidence suggests that one elevated iron concentration is most likely associated with background conditions and does not pose a hazard. Two chemicals of potential ecological concern (COPECs) were identified in surface water and 10 COPECs were identified in wet sediment for ecological receptors. The ecological risk assessment determined that impacts to ecological receptors are minimal and adverse effects to these **upper-trophic level receptor** populations are not expected. The Human Health and Ecological Risk Assessments concluded that no MC hazards exist at the Erie Burning Grounds MRS (CB&I, 2014).

Based on the results of the RI fieldwork, the project team concluded that the nature and extent of DoD military munitions and MC at the Erie Burning Grounds MRS (**Figures 6a and 6b**) had been adequately characterized. No explosive safety hazards or potential sources of DoD military munitions confirmed as MEC were found within the MRS. The Human Health and Ecological Risk Assessments concluded that the site related chemicals in surface water, wet sediment, and subsurface soil are not present at concentrations great enough to pose risks to human and ecological receptors at the MRS (CB&I, 2014). As there is no unacceptable risk due to MC-related contamination at the MRS, no remedial action is necessary to ensure protection of the environment.

Because no **explosive hazards** were found during the RI no MEC hazard assessment was required. The MRS was assigned a **Munitions Response Site Prioritization Protocol (MRSP)** priority of 7 based on the evaluation of site characteristics in three hazard modules: explosive, materiel, and health hazards. MRSP priority ranking ranges from 1 to 8 (highest to lowest hazard priority, respectively), with alternative ratings of Evaluation Pending, No Known or Suspected Hazard, or No Longer Required.

2.5 Remedial Action Objective

As established in the RI, there are no identifiable hazards from MEC in soil and the MC in soil poses no risk to human or ecological receptors. Therefore, no remedial action objectives were developed for the MRS.

3.0 EVALUATION OF THE NO FURTHER ACTION ALTERNATIVE

Based on further evaluation of the RI results, the Army concluded the Erie Burning Grounds MRS be recommended for NFA. The Army also determined that, because the RI recommended conducting a FS, the FS should be conducted to provide the necessary rationale to support and document the NFA determination. An FS (HGL, 2018) was prepared by the Army to perform a detailed analysis of the NFA alternative for the MRS. The purpose of this detailed analysis was to support NFA at the MRS.

3.1 Detailed Analysis of Alternatives

The detailed analysis presented in the FS consisted of evaluating the NFA alternative using the nine criteria listed in the NCP. The NCP states that the first two criteria, protection of human health and the environment and compliance with **applicable or relevant and appropriate requirements (ARARs)**, are “threshold criteria” that must be met by the selected remedial action unless a waiver is granted under Section 121(d)(4) of CERCLA. The next five criteria are “primary balancing criteria,” and the trade-offs within this group must be balanced. The final two criteria, state and community acceptance, are “modifying criteria” that are evaluated following the comment periods on the FS report and the PP.

Threshold Criteria

Overall Protection of Human Health and the Environment – The selected remedy presented in the **Record of Decision (ROD)** must meet this threshold criterion. The threshold criterion will be met if the risks associated with human exposures are eliminated, reduced, or controlled, and if the remedial action is protective of the environment. No explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS. Therefore, the No Action alternative is protective of human health and the environment and meets this criterion.

Compliance with ARARs – Compliance with ARARs is a threshold criterion that must be met by the remedial action. There are no chemical-specific, location-specific, or action-specific ARARs identified for this alternative. Therefore, the No Action alternative meets this criterion.

Balancing Criteria

Long-Term Effectiveness and Permanence – The level of risk associated with DoD military munitions and MC-related contamination after implementation of the remedial alternative is evaluated by this criterion. No explosive hazard or unacceptable risk due to MC-related contamination is present at this MRS. Therefore, the No Action alternative will be effective in the long term and no residual hazards or risks will remain at the MRS.

Reduction of Toxicity, Mobility, or Volume Through Treatment – The statutory preference for remedial technologies that significantly and permanently reduce the **toxicity, mobility, or volume** of the waste is addressed by this criterion. The No Action alternative includes no treatment because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

Short-Term Effectiveness – Because no active remediation activities are conducted, no additional hazards are posed to current receptors or the future Industrial Receptor as a result of implementing the No Action alternative. The No Action alternative will not result in any adverse short-term effects on the environment.

Implementability – The technical and administrative feasibility of implementing the remedial action is addressed by this criterion. Technical feasibility refers to the ability to construct, reliably operate, and meet technology-specific regulations for process options until a remedial action is complete. Administrative feasibility refers to the ability to obtain approvals from other offices and agencies; the availability of treatment, storage, and disposal services; and the requirements for, and availability of, specific equipment and technical specialists. The No Action alternative does not involve active remediation. Therefore, technical feasibility is not a consideration. No services or equipment are necessary to implement No Action. This alternative will not interfere with any planned remedial action in the future. The No Action alternative is administratively feasible to OHARNG/Camp Ravenna because no explosive hazard or unacceptable risk due to MC-related contamination is present on the MRS. The No Action alternative is expected to receive Ohio EPA concurrence because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

Cost – Capital and long-term management costs are estimated under this criterion. The No Action alternative has no capital or long-term management costs associated with it.

Modifying Criteria

State Acceptance – This criterion will be evaluated during incorporation of regulatory review comments into this PP and future ROD.

Community Acceptance – This criterion will be evaluated when the PP is presented to the public for review and comment.

3.2 Overall Evaluation

The NFA alternative is technically and administratively implementable and there are no costs. The No Action alternative is protective of human health and the environment because no explosive hazard or unacceptable risk due to MC-related contamination is present at the MRS.

The MRSPP tables were updated during the FS in accordance with the MRSPP Primer. The revised FS MRSPP priority is “No Longer Required” (HGL, 2018).

4.0 SCOPE AND ROLE OF RESPONSE ACTION

The results of the RI fieldwork and evaluation in the Final FS for the Erie Burning Grounds MRS support the selection of NFA as the preferred remedy for the MRS. The remedy must be protective of the receptors associated with future land use. The future land use of the MRS is maintenance, natural resources management (beaver dam removal), and environmental sampling. The likely **human receptor** for the future land use is the Industrial Receptor. The Erie Burning Grounds MRS is within a larger area designated for military training; however, the high-quality wetlands present within the MRS will preclude some types of access and military training at the MRS. The NFA determination is protective of other potential future human receptors (such as residential receptors). Though there are no current plans for the MRS to change from an industrial land use to a residential land use, there are no unacceptable risks to a potential future residential receptor from explosive hazards. **Environmental receptors** for the future land use include aquatic biota, muskrat, duck, mink, heron, and **benthic invertebrates** (HGL, 2018).

DoD military munitions confirmed to be MEC were not identified, only non-explosively

hazardous MD are present at the MRS. The MC-related contamination identified at the MRS does not pose a risk to human or ecological receptors. Therefore, there is no source material or impacted environmental media resulting from historical DoD munitions-related activities at the MRS.

Several site-related chemicals were identified and determined to be COCs during the human health and ecological risk assessments. However, since the COCs are present in low concentrations it was determined that the COCs do not pose a threat to human or ecological receptors.

Although not anticipated, if any additional hazards are identified at the MRS, they would be addressed under the MMRP as a separate response action. No other investigations are ongoing at the MRS under the MMRP.

5.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS

Under the MMRP, a recommendation of NFA must be protective of the human and environmental receptors at the MRS. The Security Guard/Maintenance Worker, Hunter/Trapper and Fire/Dust Suppression Worker were evaluated as potential receptors at the MRS. The evaluation of COCs for these receptors in conjunction with the evaluation of the Resident Receptor (Adult and Child) for the Unrestricted Land Use form the basis for identifying COCs in the RI. The Industrial Receptor, which is representative of the site-specific receptors above, was evaluated during the FS (HGL, 2018). The likely environmental receptors include terrestrial invertebrates (earthworms), voles, shrews, robins, foxes, barn owls, hawks, muskrat, mink, mallards, great blue heron, benthic invertebrates, and aquatic biota (CB&I, 2014).

No DoD military munitions and no MC-related contamination are present at the Erie Burning Grounds MRS. Therefore, no explosive safety hazards or risks associated with MC-related contamination exist for the likely receptors at the Erie Burning Grounds MRS.

6.0 PREFERRED ALTERNATIVE

The results of the RI fieldwork and the evaluation conducted in the FS for the Erie Burning Grounds

MRS support the determination that no hazards associated with exposure to DoD military munitions and no potential for MC-related risk to human or environmental receptors exists at the MRS. The Army, in consultation with the Ohio EPA, is recommending NFA as the preferred remedy under the MMRP for the Erie Burning Grounds MRS.

As no risks have been identified at the MRS, the overall recommendation of NFA under the MMRP is protective of receptors that may be present at the MRS. This recommendation is not a final decision. The Army, in consultation with the Ohio EPA, will select the remedy for the MRS after reviewing and considering all comments submitted during the 30-day public comment period.

6.1 Summary Statement

Based on the information currently available, the Army believes that NFA meets the threshold criteria and provides the best overall protection of the public. The Army expects NFA to satisfy the following statutory requirements of CERCLA Section 121(b): (1) be protective of human health and the environment; (2) comply with ARARs (or justify a waiver); (3) be cost effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principle element, or explain why the preference for treatment will not be met.

7.0 COMMUNITY PARTICIPATION

Public participation is an important component of the remedy selection process. The Army, in coordination with the Ohio EPA, is soliciting input from the community on the preferred remedy. The comment period extends from March 1 to April 3, 2019. This period includes a public meeting at which the Army will present this NFA PP. The Army will accept oral and written comments at this meeting.

7.1 Public Comment Period

The 30-day comment period extends from March 1 to April 3, 2019 and provides an opportunity for public involvement in the decision-making process for the proposed action. The public is

encouraged to review and comment on this NFA PP. The Army and Ohio EPA will consider all public comments before selecting a remedy. During the comment period, the public is also encouraged to review documents pertinent to the Erie Burning Grounds MRS. This information is available at the Information Repositories and online at www.rvaap.org. To obtain further information, contact the Camp Ravenna Environmental Office.

7.2 Public Meeting

The Army will hold an open house/public meeting on this NFA PP on March 6, 2019, at the Charlestown Town Hall, 6368 Rock Spring Road, Ravenna, Ohio 44266. This meeting will provide an opportunity for the public to comment on the preferred remedy. Comments made at the meeting will be transcribed.

7.3 Written Comments

If the public would like to provide comments, questions, or suggestions on this NFA PP or other relevant issues in writing, they should be delivered to the Army at the public meeting or mailed (postmarked no later than April 3, 2019). The public can also submit comments, questions, or suggestions via email before the end of the comment period to the Camp Ravenna Environmental Office using the following email address: kathryn.s.tait.nfg@mail.mil.

POINT OF CONTACT FOR WRITTEN COMMENTS

Ms. Kathryn Tait
Camp Ravenna Environmental Office
1438 State Route 534 SW
Newton Falls, Ohio 44444

7.4 Army Review of Public Comments

The Army will review all public comments before selecting the most appropriate action for the MRS. A **Responsiveness Summary**, a document that summarizes the Army's responses to comments received during the public comment period, will be included in the ROD. The Army's final choice of action will be documented in the ROD. The ROD will be added to the RVAAP Administrative Record and Information Repositories.

GLOSSARY OF TERMS

Administrative Control: Direction or exercise of authority over subordinate or other organizations in respect to administration and support, including organization of Service forces, control of resources and equipment, personnel management, unit logistics, individual and unit training, readiness, mobilization, demobilization, discipline, and other matters not included in the operational missions of the subordinate or other organizations.

Administrative Record: A collection of documents, typically reports and correspondence, generated during site investigation and remedial activities. Information in the Administrative Record is used to select the preferred remedy. It is available for public review at the Camp Ravenna Environmental Office; call (330) 872-8003 for an appointment.

Anomaly: An item seen as a subsurface irregularity (i.e., deviates from expected subsurface items such as pipes, utility lines, etc.) after geophysical investigation.

Applicable or Relevant and Appropriate Requirements (ARARs): The federal and state requirements that a selected alternative will attain. These requirements may vary among sites and alternatives.

Benthic Invertebrates: Organisms that live on the bottom of a water body (or in the sediment) that have no backbone.

Bomb Flashing: Exposing an item to a fire or flame to ensure any residual explosives are burned away.

Booster: A sensitive explosive charge that acts as a bridge between a (relatively weak) conventional detonator and a low-sensitivity (but typically high-energy) explosive such as TNT. By itself, the initiating detonator would not deliver sufficient energy to set off the low-sensitivity charge. However, it detonates the primary charge (the booster), which then delivers an explosive shockwave sufficient to detonate the secondary, main, high-energy charge.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA): This federal law was passed in 1980 and is commonly referred to as the Superfund Program. It provides for liability, compensation, cleanup, and emergency response in connection with the cleanup of inactive hazardous waste release sites that endanger public health or the environment.

Demilitarization: The reduction of one or more types of weapons or weapons systems.

Depot Storage: A designated location for the storage of military supplies.

Digital Geophysical Mapping: The process by which geological features are observed, analyzed, and recorded in the field and displayed in real-time on a computer or personal digital assistant.

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 **unexploded ordnance**, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of in a manner consistent with applicable environmental laws and regulations.

Department of Defense (DoD) Military Munitions: A munition or explosive deposited by DoD activities that may pose an explosive safety risk because it either did not function as designed, was discharged and/or abandoned, or is an explosive constituent. The term includes unexploded ordnance (UXO), DMM, and MC.

Earthen Settling Pond: An earthen structure that uses sedimentation to remove settleable matter and turbidity from wastewater.

Ecological Risk Assessment: The process for evaluating how likely it is that the environment may be impacted as a result of exposure to one or more environmental stressors such as chemicals, land change, disease, invasive species and climate change.

GLOSSARY OF TERMS

Environmental Receptor: Any living organisms other than humans, the habitat that supports such organisms, or natural resources that could be adversely affected by environmental contaminations resulting from a release at or migration from a site.

Explosive Hazard: Any hazard containing an explosive component. Explosive hazards include unexploded explosive ordnance (including land mines), booby traps, improvised explosive devices, and bulk explosives.

Feasibility Study (FS): A study undertaken by the lead agency to develop and evaluate options for remedial action. The RI data are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives. The term also refers to a report that describes the results of the study.

Fuze: A device that detonates a munition's explosive material under specified conditions. In addition, a fuze has safety and arming mechanisms that protect users from premature or accidental detonation.

Human Health Risk Assessment: The process used to estimate the nature and probability of adverse health effects in humans who may be exposed to hazards in contaminated environmental media, now or in the future.

Human Receptor: Any human individual or population that is presently or will potentially be exposed to, and adversely affected by, the release or migration of contaminants.

Information Repository: A collection of documents relating to a facility with investigations and response actions under CERCLA and/or a site's permitting activity or corrective action. It includes documents and information about site activities as well as general information about environmental regulations and CERCLA. The purpose of an Information Repository is to (1) ensure open and convenient public access to site-related documents and (2) better inform the public of the restoration process.

Installation Restoration Program (IRP): A comprehensive program to identify, investigate, and clean up contamination at active/operating Army installations. Eligible sites include those contaminated by past defense activities that require response under CERCLA, as amended by the Superfund Amendments and Reauthorization Act, and certain corrective actions required by the Resource Conservation and Recovery Act. The objective of the IRP is to clean up contaminated environmental impacts from past Army activities with the following goals: (1) reduce risk to acceptable levels to protect the health and safety of installation personnel and the public and (2) restore the quality of the environment. The IRP also complies with state, regional, and local requirements applicable to the cleanup of hazardous materials contamination, as well as related site safety. Community involvement activities are an integral part of the Army's IRP. Installation commanders seek community involvement early and throughout the cleanup process.

Large-Caliber Shell: A projectile or shell is a missile fired from the muzzle of a gun; it is always the projectile, whether issuing from the muzzle of a breech-loading rifle, using separate ammunition, or from the muzzle of a rapid-fire gun, using fixed, cartridge-case ammunition. Projectiles for guns of and above 7 inches in caliber are considered large-caliber.

Military Munitions Response Program (MMRP): A U.S. Department of Defense program consisting of actions necessary to ensure protection of human health, welfare, and the environment from the hazards associated with DoD military munitions and MC-related contamination at locations impacted by historical military activities.

Munitions Constituents (MC): Any material originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

GLOSSARY OF TERMS

Munitions Debris (MD): Remnants of military munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

Munitions and Explosives of Concern (MEC): A munition or explosive that may pose an explosive safety risk because it either did not function as designed, was discharged and/or abandoned, or is an explosive constituent. MEC includes unexploded ordnance, discarded military munitions, and explosive constituents of munitions present in high enough concentrations to pose an explosive hazard.

Munitions Response Site (MRS): Any area on a defense site that is known or suspected to contain DMM or MC-related contamination.

Munitions Response Site Prioritization Protocol (MRSPP): The methodology developed by the Army for prioritizing MRSs for response actions under the MMRP.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The National Oil and Hazardous Substances Pollution Contingency Plan is a collection of CERCLA regulations that provide the U.S. Government the authority to respond to the problems of abandoned or uncontrolled hazardous waste disposal sites as well as to certain incidents involving hazardous wastes (e.g., spills).

Point-Source Target: A target identified from digital geophysical mapping surveys for intrusive investigation that is the results of a single subsurface item.

Primer: A primer, also known as a blasting cap, is a small, sensitive, primary explosive device generally used to detonate a larger, more powerful and less-sensitive secondary explosive such as TNT, dynamite, or plastic explosive. Primers come in a variety of types, including nonelectric caps, electric caps, and fuse caps.

Production: The action of making or manufacturing from components or raw

materials, or the process of being so manufactured.

Proposed Plan (PP): This CERCLA document provides the public with information necessary to participate in the selection of a remedy. It is designed to solicit public comment on a preferred remedy before a ROD is established.

Receptor: See human or ecological receptor.

Record of Decision (ROD): A legal record signed by the Army following coordination and concurrence with the Ohio EPA as per a June 10, 2004, agreement between the two parties. It describes the cleanup action or remedy selected for a site, the basis for selecting that remedy, public comments, responses to comments, and the estimated cost of the remedy.

Remedial Action: The actual construction or implementation phase of a CERCLA site cleanup that follows Remedial Design.

Remedial Decision: A formal, written communication from the regulating authority that approves a site investigation, identifies the preferred remedy, and approves the remedial action, if any, at a site.

Remedial Investigation (RI): A CERCLA investigation that involves sampling environmental media, such as air, soil, and water, to determine the nature and extent of contamination and to calculate human health and environmental risks that result from the contamination.

Remedy Selection Process: A part of the CERCLA process, typically from the PP through the ROD, that involves public participation in identifying the preferred remedy. The final selection of the preferred remedy is made in the ROD after taking into consideration the recommendations in the PP and any comments received from the public during the 30-day comment period.

Renovation: The process of improving a broken, damaged, or outdated structure or piece of equipment.

Responsiveness Summary: A section of the ROD where the Army documents and responds

GLOSSARY OF TERMS

to written and oral comments received from the public about the PP.

Toxicity, Mobility, or Volume: Term that refers to the degree which potential explosive hazards or munitions constituents can cause damage, move within environmental media without human interference (freeze-thaw cycling), or the volume of the explosively hazardous items or munitions constituents that remain on an MRS.

Unexploded Ordnance (UXO): Military munitions that: (a) Have been primed, fuzed, armed, or otherwise prepared for actions; (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 whether by malfunction, design, or any other cause.

Upper-Trophic Level Receptors: Receptors whose hierarchical position on the food chain is higher than the other ecological receptors identified for the site.

Weapons Demilitarization Facility: A facility or installation involved in the reduction of a nation's army, weapons, weapons systems, or military vehicles to an agreed upon minimum.

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e²M, 2008. *Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio, Military Munitions Response Sites,* May.

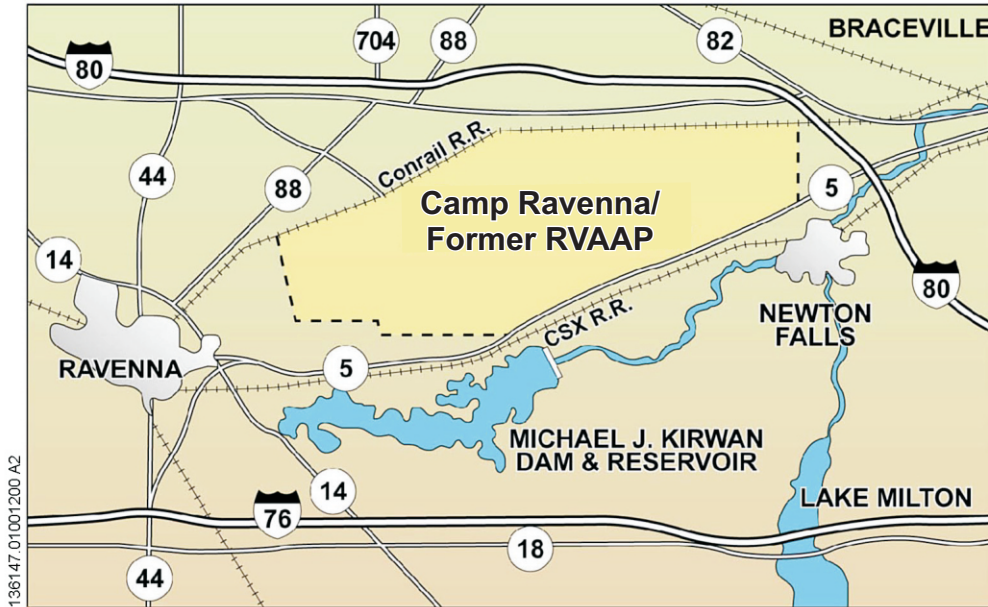
HydroGeoLogic, Inc. (HGL), 2018. *Final Feasibility Study for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio.* September.

Ohio Environmental Protection Agency (Ohio EPA), 2004. *Director's Final Findings and Orders for RVAAP,* Division of Emergency and Remedial Response, June 10.

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FIGURES

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 (01)Location_Map.cdr
 3/16/2018 JAR
 Source: CB&I

Legend

Camp Ravenna/Former RVAAP

Note:
 RVAAP=Ravenna Army Ammunition Plant

Figure 1
Location Map
Camp Ravenna/
Former RVAAP
Portage and Trumbull
Counties, Ohio





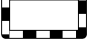
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Statewide Location

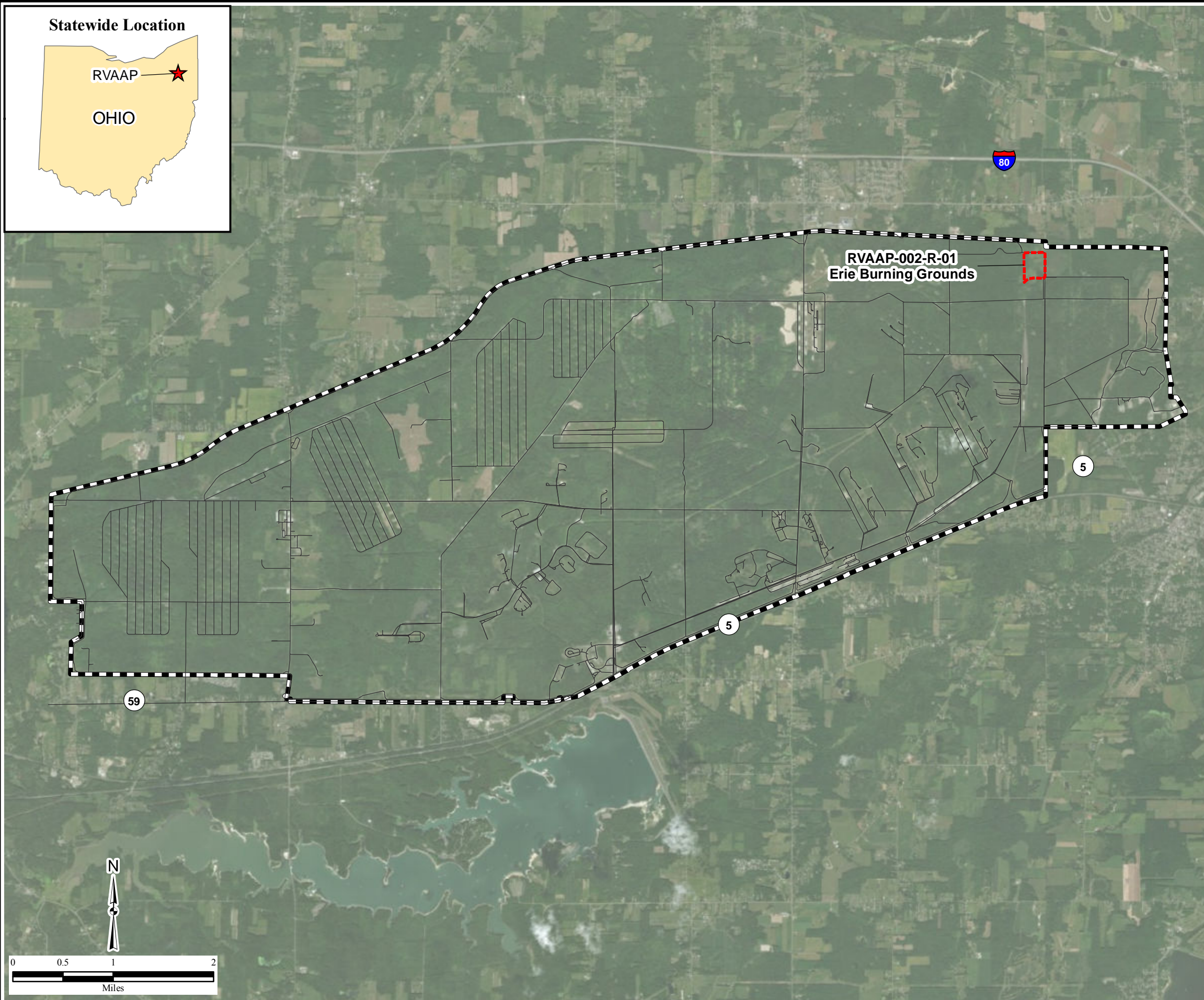


Figure 2
MRS Location
Erie Burning Grounds
Former RVAAP
Portage and Trumbull Counties, Ohio

Legend

-  Road
-  MRS
-  Installation Boundary

Notes:
MRS=munitions response site
RVAAP=Ravenna Army Ammunition Plant

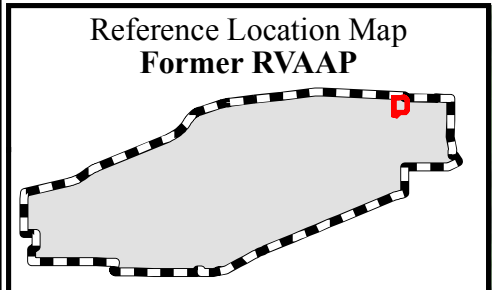
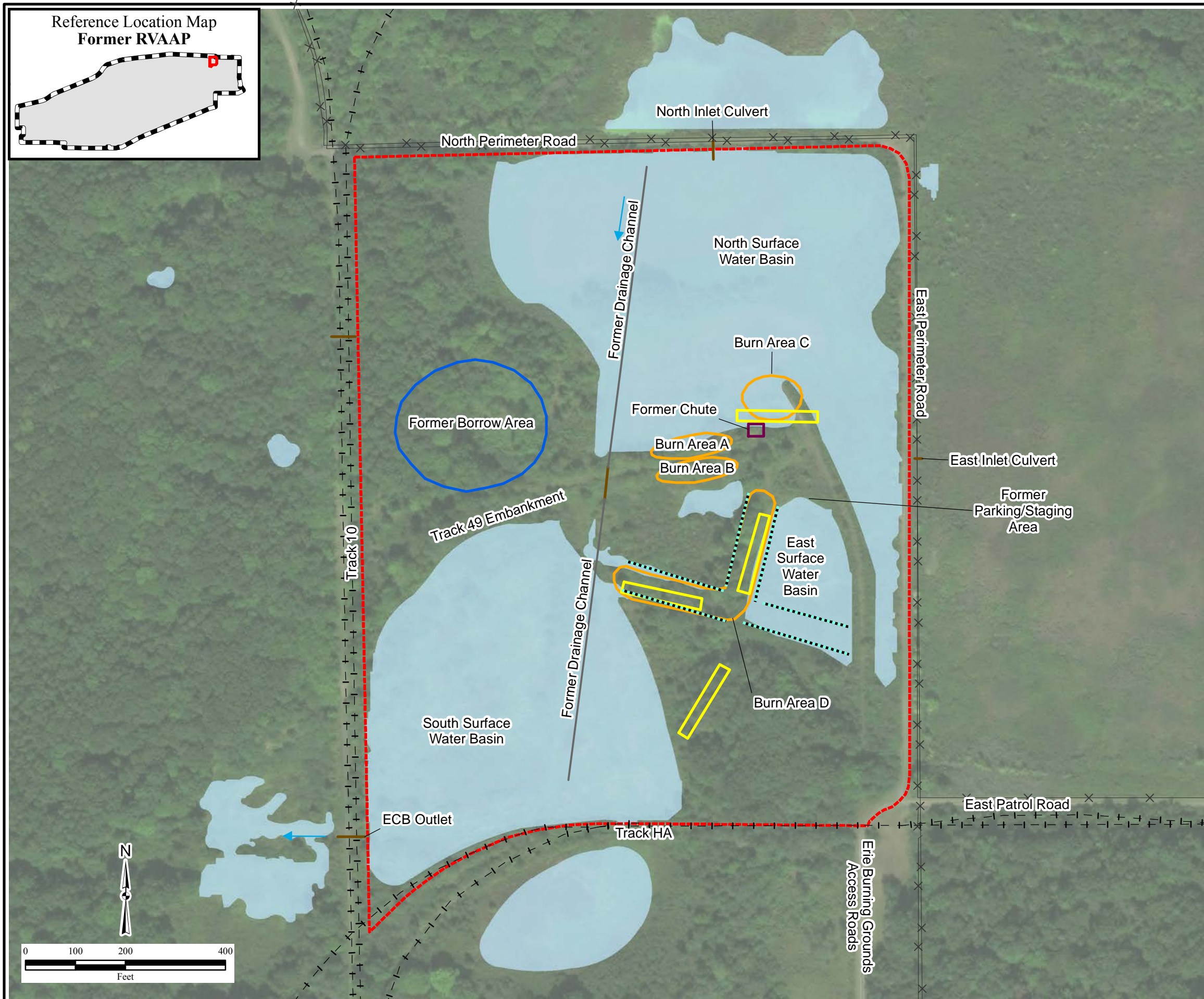


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(02)EBG_MRSLoc.mxd
3/16/2018 CNL
Source: HGL,CB&I, USACE, eM
ArcGIS Online Imagery



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Figure 3
Site Features
Erie Burning Grounds MRS
Former RVAAP Portage
and Trumbull Counties, Ohio

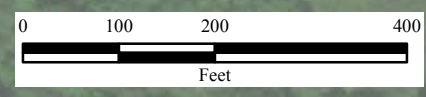


Legend

- Culvert/Outlet
- Ditch
- Drainage Flow Direction
- Former Drainage Channel
- Fence
- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- Surface Water (OHARNG, 2014)
- MRS
- Installation Boundary

Notes:
 ECB=erosion control blankets
 MRS=munitions response site
 RVAAP=Ravenna Army Ammunition Plant

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 5/1/2018 JAR
 Source: HGL, CB&I, USACE, eM, Ohio Army National Guard (OHARNG), 2014.
 Integrated Natural Resources Management Plan (INRMP) at the Camp Ravenna
 Joint Military Training Center, Portage and Trumbull Counties, Ohio. December.
 ArcGIS Online Imagery



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Figure 4
Site Inspection Results
Erie Burning Grounds MRS
Former RVAAP Portage
and Trumbull Counties, Ohio



Legend

- Suspected MEC
- - - > Meandering Path Survey Transect
- ×— Fence
- |-|- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- Surface Water (OHARNG, 2014)
- MRS
- Installation Boundary

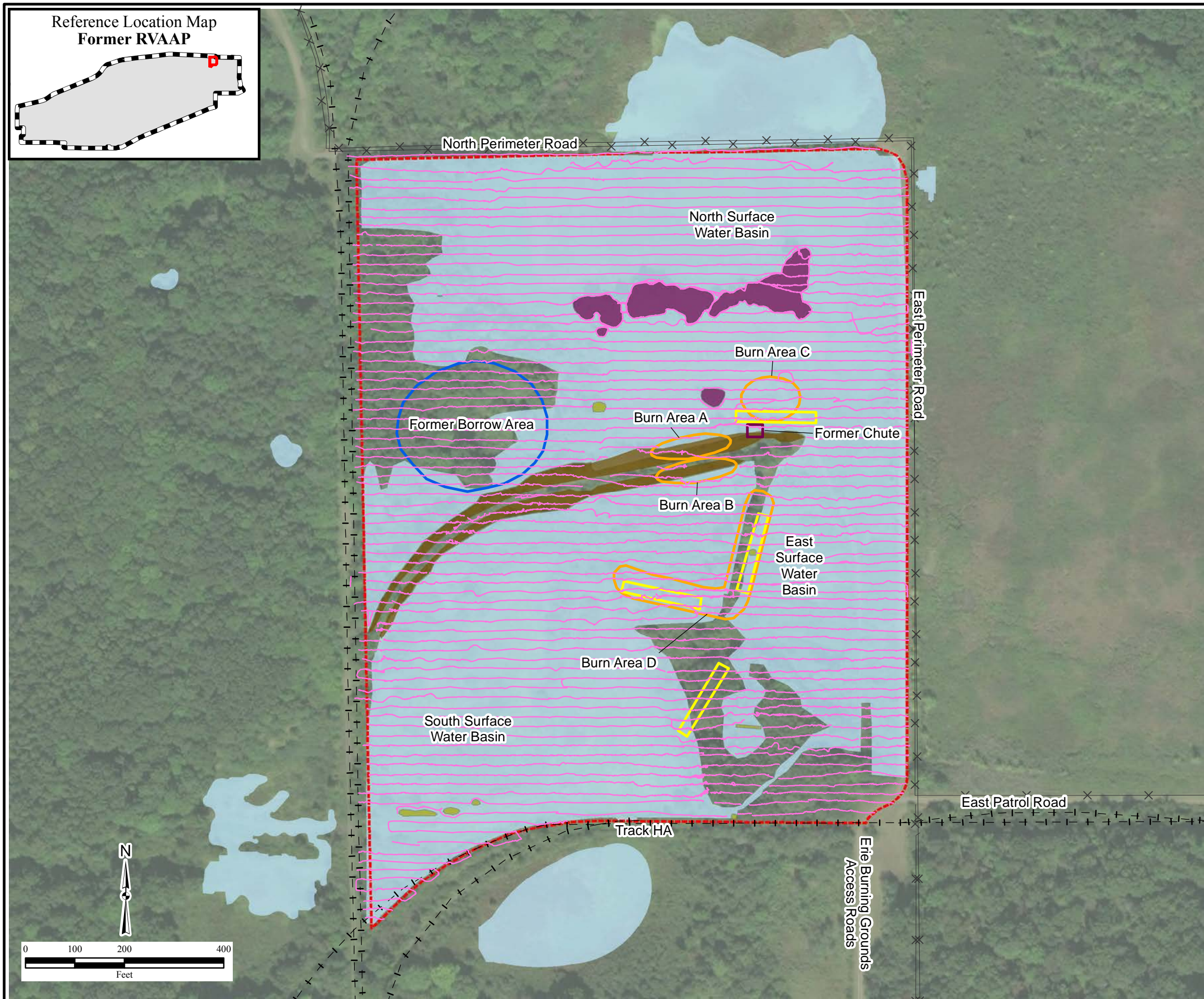
Notes:
 MEC=munitions and explosives of concern
 MRS=munitions response site
 RVAAP=Ravenna Army Ammunition Plant

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 5/1/2018 JAR
 Source: HGL, CB&I, USACE, eM, Ohio Army National Guard (OHARNG), 2014. Integrated Natural Resources Management Plan (INRMP) at the Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio. December. ArcGIS Online Imagery



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Figure 5
2014 Remedial Investigation
Digital Geophysical Mapping
Transect Coverage

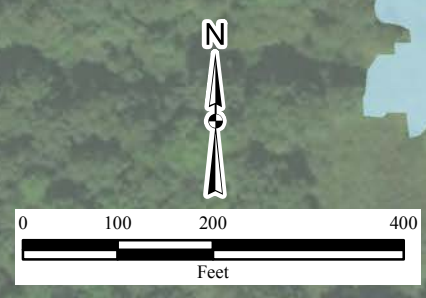


Legend

- DGM Transect
- Fence
- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- Vegetation Area
- Island
- Steep Slope
- Surface Water (CB& I, 2014)
- MRS
- Installation Boundary

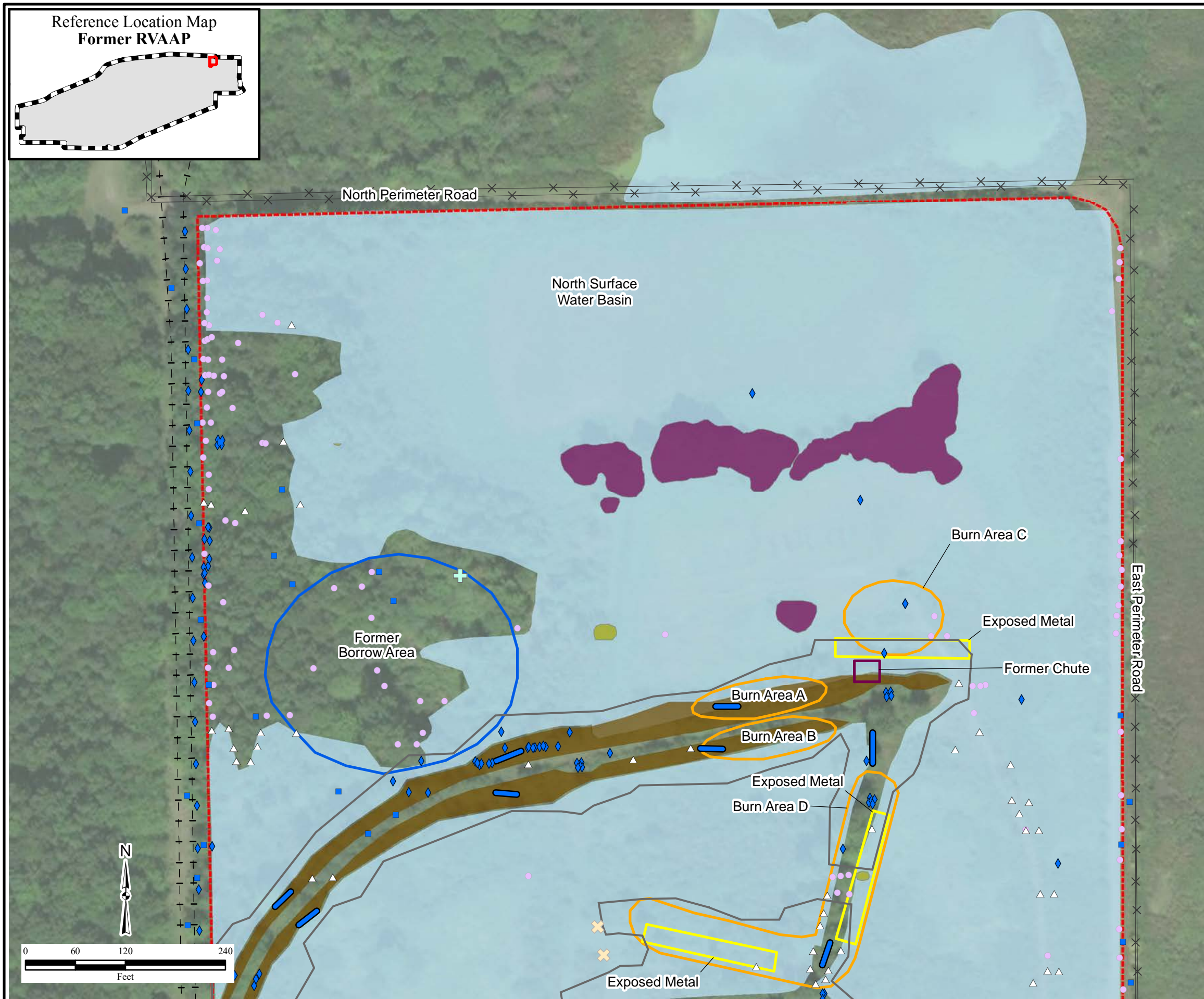
Notes:
 DGM=digital geophysical mapping
 MRS=munitions response site
 RVAAP=Ravenna Army Ammunition Plant

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 11/8/2018 JAR
 Source: HGL, CB&I, USACE, eM, CB&I, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August. ArcGIS Online Imagery



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Figure 6a
2014 Remedial Investigation
Intrusive Investigation Results
North Section
Erie Burning Grounds
Former RVAAP
Portage and Trumbull
Counties, Ohio



Legend

- MD (no explosive hazard) Identified
- + Fragments of 500lb GP, AN-M64A1¹
- Visual Survey MD (no explosive hazard) Identified
- x Fragments of 500lb GP, AN-M64A1¹
- Non Munitions Related Items
- Other Debris Identified
- △ Cultural Feature
- ◆ Metal Feature
- Quality Control Position (Nail)
- ▬ Trench (No MEC or Munitions Debris)
- x—x Fence
- |-|- Former Railroad
- Former Burn Area
- Exposed Metal (Historical)
- Former Borrow Area
- Former Chute
- High Anomaly Density Area
- Vegetation Area
- Island
- Steep Slope
- Surface Water (CB& I, 2014)
- MRS
- Installation Boundary

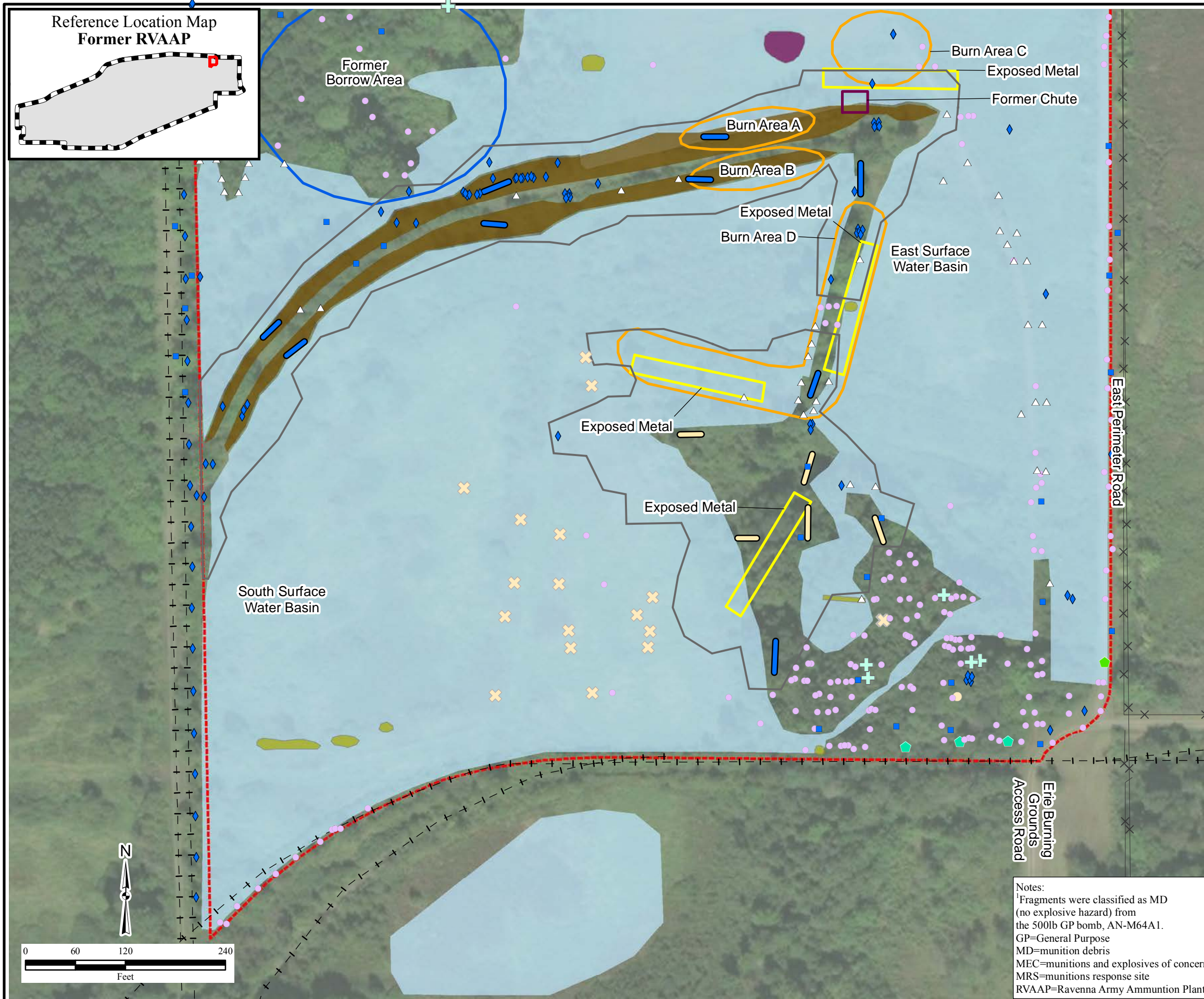
Notes:
¹Fragments were classified as MD (no explosive hazard) from the 500lb GP bomb, AN-M64A1.
 GP=General Purpose
 MD=munition debris
 MEC=munitions and explosives of concern
 MRS=munitions response site
 RVAAP=Ravenna Army Ammunition Plant

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 11/20/2018 JAR
 Source: HGL, CB&I, USACE, e2M, CB&I, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August. ArcGIS Online Imagery



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Figure 6b
2014 Remedial Investigation
Intrusive Investigation Results
South Section
Erie Burning Grounds
Former RVAAP
Portage and Trumbull
Counties, Ohio



Legend

- MD (no explosive hazard) Identified**
 - + Fragments of 500lb GP, AN-M64A1¹
 - ◆ Fragments from a Projectile, 75mm, HE, M309
 - ◆ Fragments from a Projectile, 75mm, HE, M48
- Visual Survey MD (no explosive hazard) Identified**
 - Ordnance Components
 - × Fragments of 500lb GP, AN-M64A1¹
- Non Munitions Related Items**
 - Other Debris Identified
 - △ Cultural Feature
 - ◆ Metal Feature
 - Quality Control Position (Nail)
 - Trench (Munitions Debris Identified)
 - Trench (No MEC or Munitions Debris)
 - × Fence
 - Former Railroad
 - Former Burn Area
 - Exposed Metal (Historical)
 - Former Borrow Area
 - Former Chute
 - High Anomaly Density Area
 - Vegetation Area
 - Island
 - Steep Slope
 - Surface Water (CB&I, 2014)
 - MRS
 - Installation Boundary

Notes:
¹Fragments were classified as MD (no explosive hazard) from the 500lb GP bomb, AN-M64A1.
 GP=General Purpose
 MD=munition debris
 MEC=munitions and explosives of concern
 MRS=munitions response site
 RVAAP=Ravenna Army Ammunition Plant

\\Gst-srv-01\HGLGIS\Ravenna_AAP\ErieBG\PP\06b\EBG_Intrusive_South.mxd
 11/20/2018 JAR
 Source: HGL, CB&I, USACE, eM, CB&I, 2014. Final Remedial Investigation Report for RVAAP-002-R-01 Erie Burning Grounds MRS, Version 1.0. Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. August. ArcGIS Online Imagery



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