

Final
Revised Property Management Plan for the Designated
Areas of Concern and Munitions Response Sites
Version 2.0
Former Ravenna Army Ammunition Plant
Camp Ravenna Joint Military Training Center
Portage and Trumbull Counties, Ohio

Prepared for:

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ACRONYMS & ABBREVIATIONS

AOC	Area of Concern
ARNG	Army National Guard
BGS	Below Ground Surface
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CAMP RAVENNA	Camp Ravenna Joint Military Training Center
C.F.R.	Code of Federal Regulations
CO	Commanding Officer
DERP	Defense Environmental Restoration Program
DFFO	The Director's Final Findings and Orders
DoD	Department of Defense
FWGWMPP	Facility-Wide Ground Water Monitoring Program Plan
FWSAP	Facility-Wide Sampling and Analysis Plan
IAP	Installation Action Plan
IRP	Installation Restoration Program
LUC	Land Use Control
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
NCP	National Contingency Plan
OHARNG	Ohio Army National Guard
OHIO EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
Orders	The Director's Final Findings and Orders

PMP	Property Management Plan
PP	Proposed Plan
RCO	Range Control Officer
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Cyclonite Hexahydro 1,3,5-Trinitro-1,3,5-Triazine
REIMS	Ravenna Environmental Information Management System
RI/FS	Remedial Investigation/ Feasibility Study
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plant
SVOC	Semi-Volatile Organic Compound
TNT	2,4,6-Trinitrotoluene
UCMJ	Uniform Code of Military Justice
U.S.C.	United States Code
USEPA	United States Environmental Protection Agency
WBG	Winklepeck Burning Grounds
WWII	World War II

1.0 INTRODUCTION

1.1 PURPOSE

This Property Management Plan (PMP) identifies Land Use Controls (LUCs) and restrictions for specific Areas of Concern/Munitions Response Sites (AOCs/MRSs) at the former Ravenna Army Ammunition Plant (RVAAP), now known and operated as the Camp Ravenna Joint Military Training Center (Camp Ravenna) by the Ohio Army National Guard (OHARNG). The procedures described herein are intended to comply with the *Department of Defense (DoD) Manual, Defense Environmental Restoration Program (DERP) Management, Number 4715.20, March 9, 2012*, (Department of Defense Office of the Under Secretary of Defense for Acquisition, Technology and Logistics) and Ohio Revised Code (ORC) 5913.10.

Land Use Controls include any physical, legal, or administrative mechanism that places restrictions on the use of, or limits access to, real property to prevent exposure to contaminants at concentrations greater than permissible levels or other safety issues. The intent of using these controls is to protect the integrity of the remedy (if present) and human health and the environment by limiting the activities that may occur at an AOC/MRS. Land Use Controls are part of a remedial decision where there may be potential risks or safety issues associated with contaminants not fully eliminated by remedial actions. When implemented, these LUCs provide protection to individuals by limiting and/or preventing activities which could potentially result in risks to people using and working at the AOC/MRS. The Army is responsible to control land use on active installations such as at Camp Ravenna and can internally restrict the use of such property.

This PMP provides mechanisms to implement and manage LUCs at Camp Ravenna. Land Use Controls and other restrictions that are often used to support remedial decisions reached through the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) [42 U.S.C. §9601, *et seq.*] risk-based decision process, as implemented through the National Contingency Plan (NCP), 40 C.F.R. Part 300. The LUCs are usually necessary to assure the protection of human health and/or the environment is achieved. CERCLA and NCP regulations are followed at RVAAP, and the Ohio Environmental Protection Agency (Ohio EPA) is the lead regulatory agency. The CERCLA NCP process is consistent with the Final Findings and Orders issued by the Director, Ohio EPA, June 10, 2004. These Director's Final Findings and Orders ("Orders") were issued to the United States Department of the Army ("Army" or the "Respondent") pursuant to the authority vested in the Director of Environmental Protection ("Director"), on behalf of the Ohio Environmental Protection Agency ("Ohio EPA"), under Chapters 3734, 3745 and 6111 of the ORC. These Orders are entered into by the Army pursuant to authority vested in the Secretary of the Army by the CERCLA, 42 U.S.C. Section 9601 *et seq.*; the Defense Environmental Restoration Program (DERP), 10 U.S.C. Section 2701 *et seq.*; and the NCP, 40 C.F.R. Part 300. The Orders require the Respondent to develop and implement: a Remedial Investigation/Feasibility Study (RI/FS), a Proposed Plan (PP), a Record of Decision (ROD), or other applicable studies/documentation and a remedy for each AOC/MRS or appropriate group of AOCs/MRSs at RVAAP. The Orders also require the Respondent to implement a Facility-Wide Ground Water Investigation, Monitoring and Remediation Program at RVAAP. All work, plans, and documentation at the RVAAP must be in conformance with

CERCLA, the NCP, and the Orders (including the attached Appendices). The DERP [10 U.S.C. §2701, *et seq.*] is also relevant to the manner in which remediation will proceed, particularly with respect to safety issues unique to munitions and explosives of concern (MEC).

This PMP is required under Army Regulation 210-20, and satisfies requirements of the Orders. Components of the PMP (specifically LUCs) are enforceable under the Orders because the LUCs are part of the remedy and the remedy is a requirement of the Orders. If the Army fails to comply with LUCs or any component of a remedy established to protect human health and the environment at an AOC/MRS as identified through the CERCLA remedial decision process, then the Ohio EPA may take regulatory actions to ensure the failure is corrected.

If residual contamination is left in place after the CERCLA remediation process is complete and the contamination still poses a potential for unacceptable risks or exceeds cleanup standards, then the ROD for the AOC/MRS will require LUCs in accordance with the approved Remedial Design (RD).

Appendix A shall include an individual section for each AOC/MRS with LUCs. The AOCs/MRSs which do not require LUCs will also be included in Appendix A in order to document the final remedial decisions and facilitate overall installation management by the OHARNG. Each AOC/MRS in Appendix A will be tabbed by AOC/MRS number. The level of detail in this PMP varies between the body of the document (which includes general information applicable to Camp Ravenna) and the AOC/MRS-specific sections in Appendix A. This PMP is a dynamic document and will be continually updated/revised/and amended as needed. As the remedial process for an AOC/MRS progresses to the approved RD stage, a new section will be added to Appendix A for that particular AOC/MRS. Each AOC/MRS-specific section in Appendix A includes, as applicable, strategies for implementation of LUCs, maintenance, monitoring, enforcement, and modification or termination of LUCs. The AOC/MRS-specific information in Appendix A is based upon the Final Record of Decision and the approved RD for that specific AOC/MRS.

Current copies of this PMP will be maintained by the Camp Ravenna Range Operations, the Camp Ravenna Environmental Office and the Army National Guard (ARNG) RVAAP Restoration Program Manager. The PMP shall also be referenced in the OHARNG Master Plan. Details regarding LUCs/restrictions will be included in the Master Plan.

1.2 BACKGROUND INFORMATION

The RVAAP Installation Restoration Program (IRP) began in 1989. The property boundary was resurveyed by OHARNG over a 2-year period (2002 and 2003) and the total acreage of the property was found to be 21,683 acres. As of September 2013, administrative accountability of the entire 21,683-acre former RVAAP has been transferred to the United States Property and Fiscal Office for Ohio. The installation has been licensed to the OHARNG for use as a military training site. Once transfer of the whole installation was complete, management of the IRP was transferred from the Army's Base Realignment and Closure Division to the ARNG with support from the OHARNG.

Camp Ravenna is in northeastern Ohio within Portage and Trumbull counties, approximately 3 miles (4.8 km) east-northeast of the City of Ravenna and approximately 1 mile (1.6 km) northwest of the City of Newton Falls. Camp Ravenna is a parcel of property approximately 11 miles (17.7 km) long and 3.5 miles (5.6 km) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry roads on the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (Figures 1 and 2). Camp Ravenna is surrounded by several communities: Windham on the north; Garrettsville 6 miles (9.6 km) to the northwest; Newton Falls 1 mile (1.6 km) to the southeast; Charlestown to the southwest; and Wayland 3 miles (4.8 km) to the south.

When RVAAP was operational, Camp Ravenna did not exist and the entire 21,683-acre parcel was a government-owned, contractor-operated industrial facility. The RVAAP IRP encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. Subsequent references in this document to RVAAP, or the former RVAAP, relate to previous activities at the installation as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

Industrial operations at the former RVAAP 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 into large-caliber shells and bombs. The 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. Following cleaning, the waste water, containing TNT and Composition B, was known as "pink water" for its characteristic color. Scupper systems were used to collect pink water, which was contained in concrete holding tanks, filtered, and pumped into unlined ditches for transport to earthen settling ponds. However, in some instances, "pink water" was swept from doorways, or scupper systems overflowed onto the ground surface. Load Lines 5 through 11 were used to manufacture fuzes, primers, and boosters. Potential contaminants in these load lines include lead compounds, mercury compounds, and explosives. From 1946 to 1949, Load Line 12 was used to produce ammonium nitrate for explosives and fertilizers prior to use as a weapons demilitarization facility.

In 1950, the facility was placed in standby status and operations were limited to renovation, demilitarization, and normal maintenance of equipment, along with storage of munitions. Production activities were resumed from July 1954 to October 1957 and again from May 1968 to August 1972. In addition to production missions, various demilitarization activities were conducted at facilities constructed at Load Lines 1, 2, 3, and 12. Demilitarization activities included disassembly of munitions and explosives melt-out and recovery operations using hot water and steam processes. Periodic demilitarization of various munitions continued through 1992.

In addition to production and demilitarization activities at the load lines, other facilities at RVAAP include AOCs/MRSs that were used for the burning, demolition, and testing of munitions. These burning and demolition grounds consist of large parcels of open space or abandoned quarries. Potential contaminants at these AOCs/MRSs include explosives, propellants, metals, and waste oils. Other types of AOCs/MRSs present at RVAAP include

landfills, an aircraft fuel tank testing facility, and various general industrial support and maintenance facilities.

1.3 IMPLEMENTATION OF THE PROPERTY MANAGEMENT PLAN – ROLES AND RESPONSIBILITIES

It is the responsibility of the ARNG to implement, inspect, maintain and enforce LUCs at the former RVAAP. The OHARNG will assist with enforcement and management of the LUCs and will facilitate on-site operations and maintenance (O&M) associated with the LUCs.

2.0 OBJECTIVES

Per the *Department of Defense (DoD) Manual, Defense Environmental Restoration Program (DERP) Management, Number 4715.20, March 9, 2012*, (Department of Defense Office of the Under Secretary of Defense for Acquisition, Technology and Logistics), LUC implementation and management plans should present general objectives of the LUCs for that particular installation and detailed plans for specific AOCs/MRSs. Each AOC/MRS that requires a LUC on Camp Ravenna has unique site-specific objectives which will be presented in the individual sections in the Appendix A.

The general performance objectives of the LUCs at Camp Ravenna are as follows:

- 1.) Prevent unsafe exposure to surface soils, subsurface soil, wet sediment, dry sediment, surface water, and groundwater that may result in unacceptable risks or adverse health effects, including MEC risks at identified Munitions Response Sites. In addition, although not a general performance Objective associated with a LUC, all military activities executed within Camp Ravenna must be in compliance with OHARNG and DoD safety regulations. If MEC or other hazards are encountered, the OHARNG has specific protective actions and procedures that will be followed. On Camp Ravenna and all operating installations, the Army is responsible for MEC safety through the Department of Defense Explosives Safety Board (DDESB) requirements and Army Regulations.
- 2.) Prevent ingestion of groundwater with concentrations above maximum contaminant levels (MCLs), RVAAP (specific) cleanup goals, or risk-based levels (where standards do not exist).
- 3.) Prevent off-site migration of contaminants to surrounding areas through ground water, surface water, or other impacted media at concentrations greater than MCLs, RVAAP (specific) cleanup goals, or other applicable risk-based levels per CERCLA.

3.0 GENERAL LAND USE CONTROLS

There are various terms used by different Federal Agencies that are related to or define a LUC. Terms such as LUCs, Institutional Controls (ICs), and Engineering Controls (ECs) are often used interchangeably. The DoD defines LUCs to include any type of physical, legal, or administrative mechanism that restricts the use of, or limits access to, real property to prevent exposure to contaminants at concentrations greater than permissible levels. The intent of using these controls is to protect human health, the environment, and the integrity of a remedy by limiting the access/activities that may occur at a particular contaminated site. The three types of LUCs (per DoD) are described below.

- Physical Mechanisms include a variety of engineered remedies to contain or reduce contamination, and/or physical barriers intended to limit access to property such as fences, signs, or landfill covers.
- Legal Mechanisms include restrictive covenants, negative easements, equitable servitudes, and deed notices that are meant to ensure the continued effectiveness of land use restrictions imposed as part of a remedial decision.
- Administrative Mechanisms include notices, adopted local land use plans and ordinances, construction permitting or other existing land use management systems that may be used to ensure compliance with use restrictions.

Certain LUCs are used to mitigate risks associated with exposure to contamination, when it is inappropriate or not feasible to eliminate those risks by removing or treating the contaminated media to unrestricted use levels. Generally, LUCs are used as a component of other remedial actions. In many circumstances LUCs are used when the alternative of leaving contaminants in place proves to be the most favorable risk management decision (e.g., due to technical or economic limitations, concerns regarding worker safety, or to prevent collateral ecological damage).

Land Use Controls for Camp Ravenna were established based on results from remedial investigations and remedial actions where some degree of control was determined to be necessary to prevent unsafe exposure (exposure to concentrations expected to result in unacceptable risks or adverse health effects) to the residual contamination. All receptors and the input parameters used to evaluate their potential exposures were considered when determining potential risks and safe levels from exposure to residual contamination at the AOC/MRS. The specific Land Uses, exposure parameters, and the receptors can be found in the Human Health Risk Assessor's Manual (see RVAAP's *Facility Wide Human Health Risk Assessor Manual Amendment 1, USACE, 1 Dec 2005*) and the RVAAP's Facility-wide Cleanup Goal Report (*Final Facility-Wide Human Health Cleanup Goals for Ravenna Army Ammunition Plant, SAIC, 23 Mar 2010*). After the first version of this PMP was finalized, the Army prepared a "Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the Ravenna Army Ammunition Plant (Risk Assessment Technical Memo) (RVAAP Installation Restoration Program, Portage/Trumbull Counties, Ohio (Army National Guard Directorate, 2014))." The Risk Assessment Technical Memo defined three Categorical Land Uses and Representative Receptors to be considered during the RI phase of the CERCLA process. The Risk Assessment Technical Memo allowed for exceptions to evaluating these three Land Uses, depending upon

their stage of completion in the CERCLA process and the conclusions of the document. These three Land Uses and Representative Receptors are summarized below.

- 1.) Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer)
- 2.) Military Training Land Use – National Guard Trainee
- 3.) Commercial/Industrial Land Use – Industrial Receptor (USEPA Composite Worker).

The Risk Assessment Technical Memo allowed for exceptions to evaluating these three Land Uses, depending upon their stage of completion. Because many of the AOCs had already had the RI completed at the time of the finalization of the Risk Assessment Technical Memorandum, the three Land Uses may not have been evaluated fully. The National Guard Trainee's exposure scenario is not for full time work so does not account for the potential of fulltime personnel on an AOC/MRS. Therefore, when there is a possibility that a full time occupational exposure may occur on an AOC, the Commercial/Industrial Land Use using the Industrial Receptor is to be evaluated. Additionally, the Military Training Land Use requires additionally monitoring to ensure no full-time occupational exposure occurs. The Risk Assessment Technical Memo established that the Commercial/Industrial Land Use using the Industrial Receptor allows for full-time occupational personnel to work freely on the site and would be protective of both full-time occupational personnel and National Guard Trainees who have shorter exposure durations.

Land Use Controls, including O&M requirements associated specifically with any one RVAAP AOC/MRS, are discussed in Appendix A for that particular AOC/MRS. The AOC/MRS-specific narrative in Appendix A will be updated as necessary to support changes to the status of the AOCs/MRSs. Updates are the responsibility of the ARNG. The OHARNG will assist with on-site facilitation of updates.

The LUCs for each AOC/MRS will be reviewed as specifically described for each AOC/MRS in Appendix A. Operational and maintenance requirements and any corrective actions will be noted during reviews and recorded during the AOC/MRS-specific inspections. All reviews will be conducted at the intervals stated in Appendix A and will be documented in an Annual Report that will supplement the required five-year review process under CERCLA's Long Term Management requirements. It is anticipated that the frequency of the reviews and/or Annual Reports may be modified in the future (subsequent to Ohio EPA approval), but will be determined on an AOC/MRS specific-basis.

4.0 LAND USE CONTROL MECHANISMS AND TRAINING

4.1 ENGINEERING CONTROLS

As previously defined, LUCs include any type of physical, legal, or administrative mechanism that restricts the use of, or limits access to, real property to prevent or reduce risk to human health and the environment. Physical mechanisms encompass a variety of engineered remedies to contain or reduce contamination and/or physical barriers to limit access to property, such as fences or signs. Based upon this definition, inspections completed for each AOC/MRS (using forms similar to that in Appendix B) will document all LUCs associated with each AOC/MRS, including any monitoring, maintenance, and reporting required for continued operation and maintenance.

The AOC-specific engineering controls will be documented in the appropriate section for each AOC/MRS in Appendix A. Such controls as fences, warning signs, Seibert stakes, or landfill covers may be part of an AOC/MRS-specific LUC. These requirements will be specified in the individual AOC/MRS sections in Appendix A of this PMP. The AOC-specific LUCs associated with each AOC/MRS, will include monitoring, maintenance, and reporting required for continued operation and maintenance.

4.2 LAND USE CONTROL AWARENESS TRAINING

4.2.1 Standard Awareness Training

LUC awareness training will be provided, as appropriate, to individuals (e.g., personnel, visitors, visiting units) before they are granted access to any area with a restrictive LUC. Individuals will be briefed if there are potential health or safety concerns or if the planned activity could impact an engineering control. For AOCs/MRSs achieving Commercial/Industrial Use or Military Training Use, the need for LUC training will be assessed on a case-by-case basis, depending on how the site is being utilized. The training will be conducted by the Army or OHARNG. The LUC training will provide an overview of this PMP and the procedures for preventing and reporting LUC violations, as well as any AOC/MRS specific restrictions. An annual refresher course will also be provided. Standard in-processing of newly assigned permanent party and contract employees shall include the standard LUC awareness training if the individual will be accessing any area with a LUC.

4.2.2 Training Materials

This PMP shall serve as the basis of all LUC awareness training materials. Appendix A includes the AOC/MRS- specific LUC information.

4.2.3 Training Records

Documentation of training sessions will be kept on record for future reference and to supplement inspections and the CERCLA Five-Year Review for each AOC/MRS. Each training record will annotate the date, time, location, instructor(s), name of audience (e.g., X-Company, Unit, Group, platoon, etc.), title of training, and which AOCs/MRSs are likely to be involved for purposes of awareness during field training activities.

5.0 MONITORING AND REPORTING

Site inspections will be conducted by the Army or OHARNG to confirm if the LUCs remain effective and meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted periodically, as directed by the AOC/MRS-specific RD. At a minimum, a LUC AOC/MRS Inspection Form, similar to the one located in Appendix B of this PMP, will be completed for each periodic inspection. The scheduling and completion of periodic inspections for multiple AOCs/MRSs may be synchronized (subsequent to Ohio EPA approval) in order to increase efficiency and reduce administrative costs, without reducing the frequency of inspections. Results from periodic inspections will be reported in an annual LUC monitoring report, with changes in inspection frequency to be coordinated with and approved by Ohio EPA.

The annual LUC monitoring report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies, including inconsistent land uses, were addressed. The Annual LUC report will summarize all monitoring completed during the calendar year for all the AOCs/MRSs. This Annual LUC report will be submitted to the Ohio EPA for review and approval. The Annual LUC monitoring reports will be used in the preparation of the CERCLA 121(c) Five-Year Review. The Annual LUC monitoring report will include a written certification stating whether or not the LUCs remain in place and are effective.

Inspections will be conducted according to the frequency cited within the RD and Appendix A for the AOCs/MRSs listed in this PMP. A separate AOC/MRS-specific Inspection Form will be developed for each AOC/MRS in coordination with the Ohio EPA using the Template Form provided in Appendix B. The AOC/MRS-specific Inspection Forms will include specific monitoring and maintenance requirements for that particular AOC/MRS. The AOC/MRS-specific Inspection Forms will be completed by the Army or OHARNG (or a designated contractor) for each LUC inspection on an AOC/MRS and submitted to the Ohio EPA. The completed AOC/MRS-specific Inspection Forms will be used to support the preparation of the Annual Report (summarizing current status of land use classification and LUCs) for each AOC/MRS with LUCs covered by this PMP.

6.0 ENFORCEMENT OF LAND USE CONTROLS

All Army and OHARNG/Camp Ravenna personnel and authorized visitors to the installation will be required to comply with the prescribed LUCs. If Army or OHARNG personnel observe a LUC violation, they will immediately take appropriate corrective action (e.g., halt excavation operations, apprehend trespasser(s), take appropriate action to safely remove trespassers from unauthorized areas, etc.). Any observed LUC violations will be reported to Camp Ravenna Range Control within 48 hours, or as soon as practicable. The Camp Ravenna Environmental Office and ARNG Restoration Manager will take action to restore the integrity of the LUC, and will assess whether any additional preventive measure(s) should be considered as a result of the reported incident (e.g., repair fence, post signs, publish further command guidance, prosecute trespassers, etc.).

Administrative corrective measures should be sufficient to resolve most LUC violations (e.g., verbal or written counseling, administrative sanctions against contractors, etc.). However, in the event of a more egregious trespass or a repeat offender, offenders may be subjected to administrative action or punishment under the Uniform Code of Military Justice (UCMJ) for military personnel; or title 18 U.S.C. 1382 and title 50 U.S.C. 797 for civilians. Additionally, the Ohio Code of Military Justice, Ohio Revised Code (ORC) Chapter 5924 [or other state military code, as appropriate], can be applied if a violation is alleged to have been committed by a Soldier or other uniformed personnel subject to the UCMJ or deemed in violation of military law.

Since civilian personnel are not subject to military law, any sanctions imposed against civilians will be based upon applicable federal and state laws and regulations. Criminal sanctions may be considered for, but not limited to, such acts as unauthorized hunting (OAC Chapters 1531 and 1533; ORC sections 1547.69, 2923.16 and 4519.40), trespassing (ORC 2911.21), and attempted theft of scrap (ORC 2913.01 (K)).

If the Army discovers any land use that is inconsistent with LUC objectives or practices, and/or that impairs the effectiveness of remedial actions at an AOC/MRS, the Army will notify Ohio EPA in writing as soon as practicable, but no later than ten (10) calendar days after discovery, with a written description of the inconsistent land use. Within ten (10) calendar days after such notification, the Army will provide Ohio EPA with information regarding what efforts or measures have been or will be taken to address the inconsistent land use.

The LUCs in this PMP are enforceable by the Ohio EPA pursuant to the applicable RODs and RDs, which were prepared in accordance with the Orders for RVAAP.

7.0 CERCLA 121(C) FIVE-YEAR REVIEWS

As part of the CERCLA Section 121(c) Five-Year remedy review process, the Army shall prepare a report evaluating the continued effectiveness of the remedy, including effectiveness of the LUCs and an assessment of whether there is a need to modify the LUCs. The Five-Year Review report will be submitted to the Ohio EPA.

The Army will verify whether the LUCs continue to be properly documented and maintained. Each review of the remedy will evaluate whether conditions have changed due to contaminant attenuation, migration or other factors such as land use. Such changes will be investigated to the extent deemed necessary, depending on the AOC/MRS conditions. If the risk levels have changed since initial LUC implementation, LUC modifications will be considered, which may include a change in monitoring frequency.

8.0 MODIFICATIONS

This PMP shall be binding upon the lead Army Agency, and upon its successors, subject to amendment or termination as set forth herein. Any modifications to this PMP will be provided to all stakeholders for their comment and approval. Any modifications to the PMP must be documented in a manner to demonstrate that all LUCs herein are properly maintained throughout the Installation.

The current lead Army agency will provide notice of modification(s) to the Ohio EPA for review, comment, and approval, prior to implementation of the proposed modification. "Change pages" will be appropriately marked, and will identify the effective date. The most current version of the PMP will be maintained by the Army and available as part of the administrative record and on the Ravenna Environmental Information Management System (REIMS) and/or the current repository.

The modifications to LUCs in this PMP may be amended or terminated by consent of all of the following: the current lead Army agency and the Ohio EPA. Amendment shall mean any changes to the LUCs set forth under the AOC/MRS-specific section in Appendix A. Termination shall mean the elimination of all LUCs set forth herein and all other obligations.

9.0 POINTS OF CONTACT

There are five Points of Contact for Camp Ravenna. These are listed in the following.

<p>Ohio EPA Site Coordinator, RVAAP Restoration Program Division of Environmental Response and Revitalization Ohio EPA, Northeast District Office 2110 East Aurora Road Twinsburg, OH 44087 (330) 963-1200</p>
<p>Camp Ravenna Environmental Office 1438 State Route 534 SW Newton Falls, OH 44444 (614) 336-6136</p>
<p>United States Property and Fiscal Officer for Ohio 2811 W. Dublin-Granville Road Columbus, OH 43235-2788 (614) 336-7201</p>
<p>Camp Ravenna Garrison Commander Ohio Army National Guard Camp Ravenna Joint Military Training Center 1438 State Route 534 SW Newton Falls, OH 44444 (614) 336-6560</p>
<p>Army National Guard Directorate RVAAP Restoration Program Manager, Camp Ravenna 111 S George Mason Drive Arlington, VA 22204</p>

10.0 PMP APPROVALS

APPROVED:



Date: 21 DEC 18

SHAUN T. ROBINSON
MAJ, LG OHARNG
Commanding



Date: 2019.01.03 09:57:09
-05'00'

Date: _____

DAVID M. CONNOLLY
RVAAP Restoration Program Manager
Army National Guard Directorate

FIGURES

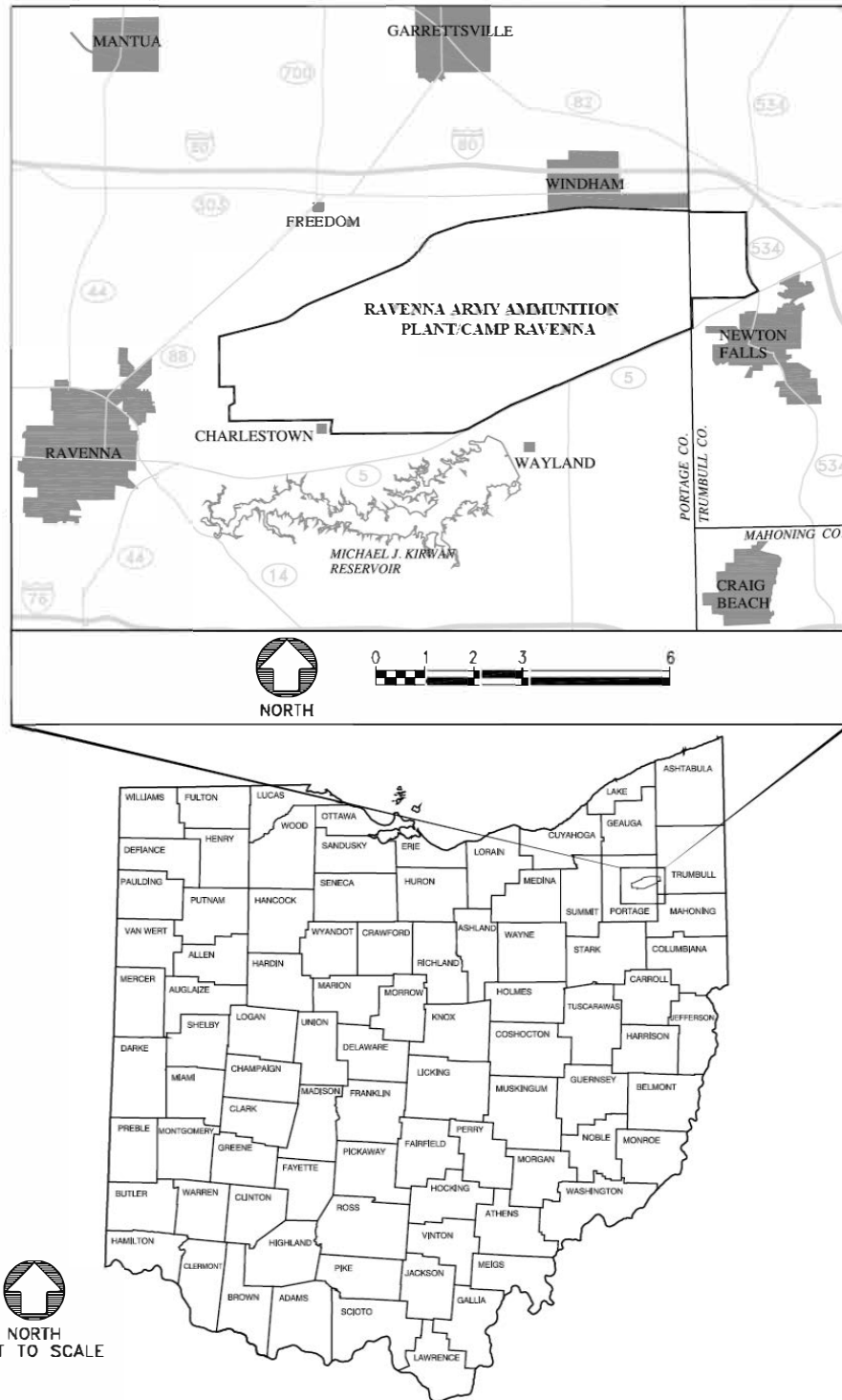
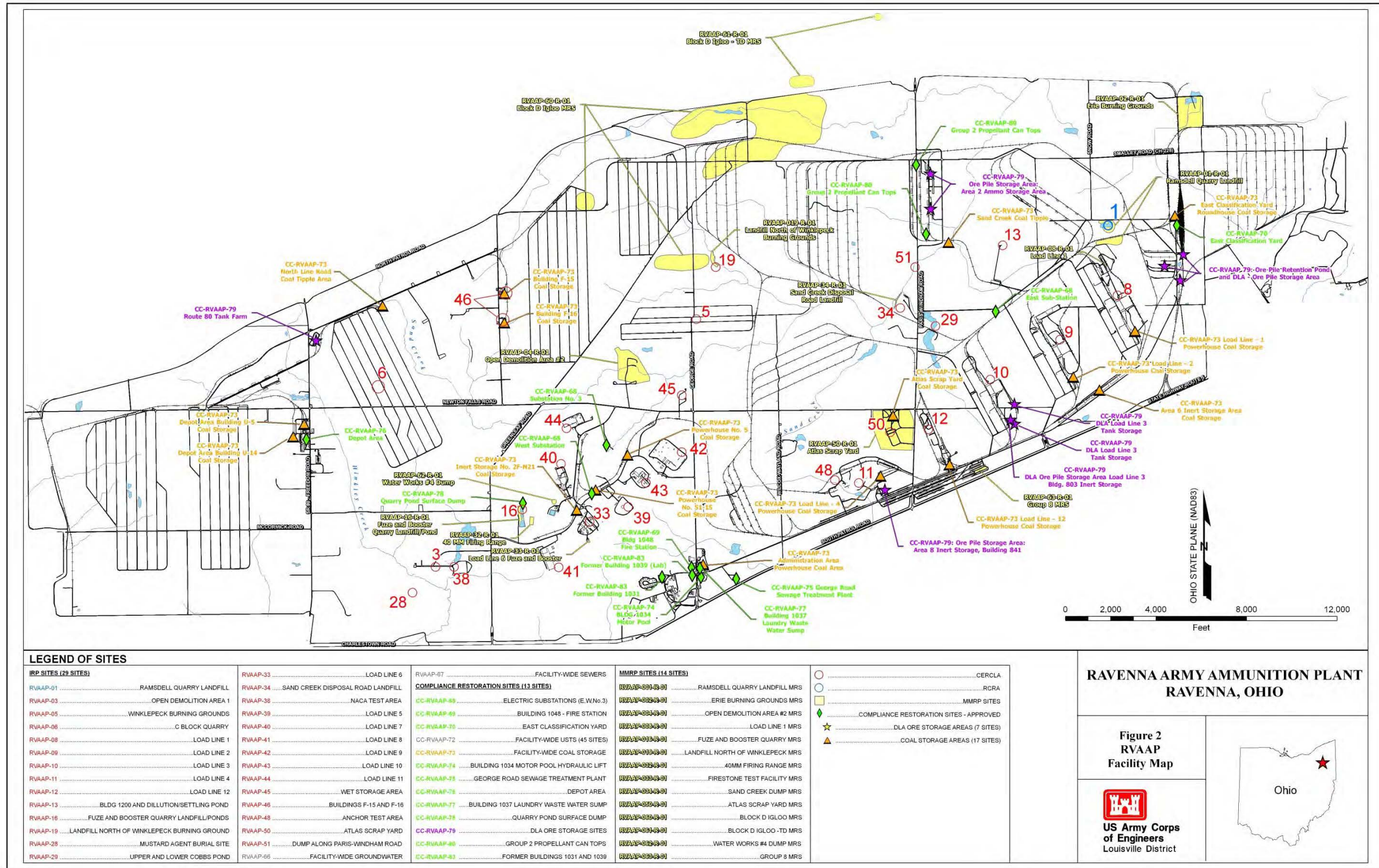


Figure 1. General Location and Orientation of the former RVAAP/Camp Ravenna



**RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO**

**Figure 2
RVAAP
Facility Map**



**APPENDIX A
SUMMARY OF REMEDIAL DECISIONS FOR
EACH AOC/MRS INCLUDING LAND USE AND
ENGINEERING CONTROLS, WHERE
APPLICABLE**

Appendix A, Section A.1 - Contains Sites with LUCs

**Appendix A, Section A.2 - Contains Sites with a Remedial
Decision of No Further Action (NFA) for Soil, Sediment, and
Surface Water**

Appendix A, Section A.1

Sites with LUCs

LIST OF EACH AOC/MRS IN APPENDIX A, SECTION A.1, SPECIFIC LUCS, AND REVISION DATES

AOC/MRS	Appendix Tab	Land Use Controls	Date Section added to the PMP	Revision or Update
RVAAP-01 Ramsdell Quarry Landfill	RVAAP - 01	<p>The LUCs for the RQL AOC are as follows:</p> <ul style="list-style-type: none"> • Maintenance of the 6 ft high chain-link security fence at the northern perimeter of RQL and a five-strand, high tensile wire fence at the eastern, southern, and western perimeters. Maintenance of the closed sanitary landfill. • All activities must be in compliance with established digging restrictions and established exposure limits. <ul style="list-style-type: none"> ○ All digging or excavation within the quarry bottom is prohibited due to the residual asbestos and contamination. ○ Digging and excavation on the landfill cap is regulated by the post-closure care plan and the Ohio solid waste regulations. • Permanent warning signs will be installed and maintained around RQL on the gates and on the chain-link and high tensile wire fence at 300 ft centers to warn of the ACM hazard in the quarry bottom. The signs will meet the requirements of OAC 3745-20-07(B)(1)(b). <p>As no soil disturbing activities are allowed within the quarry bottom, OSHA asbestos awareness training set forth at 29 CFR 1926.1101(k)(9)(vii) is not required. Any personnel entering the quarry bottom will be briefed of the asbestos hazards.</p>	April 9, 2014	
RVAAP-05 Winklepeck Burning Grounds	RVAAP- 05	<p>The LUCs for the WBG AOC are as follows:</p> <ul style="list-style-type: none"> • The AOC cannot be used for Unrestricted (Residential) Land Use unless or until additional evaluation shows that risk levels resulting from residual contamination have been reduced to levels acceptable for Unrestricted (Residential) Land Use and any residual MEC hazards have been removed. • Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following: <ul style="list-style-type: none"> • The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan 		Revised in April 2017 in accordance with approved ESD dated March 2015, but not in effect until Removal Action (RA) was completed and RA Report approved.

AOC/MRS	Appendix Tab	Land Use Controls	Date Section added to the PMP	Revision or Update
		<p>(FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.</p> <ul style="list-style-type: none"> • The modification of existing wells, if necessary, to allow for construction on the range. • The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP and applicable Ohio Administrative Code requirements. 		
RVAAP-08, 09, 10, 11 Load Lines 1, 2, 3, 4	RVAAP-08, 09, 10, and 11	<p>The Final Revised Interim ROD did not contain any formal LUCs. The Land Use was designated as National Guard Mounted Training (no digging). Until the remedial process is completed at these four AOCs, the OHARNG will ensure land use is maintained as Mounted Training – No Digging (tracked and wheeled vehicle use, no digging beyond 4 feet bgs, exposure of 24 hours/day for 39 days/year for 25 years). There are also annual inspections to confirm the land use remains appropriate.</p>		March 2018
RVAAP-12 Load Line 12	RVAAP-12	<p>The LUCs for the LL12 AOC are as follows:</p> <p>Land Use Restrictions:</p> <p>Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence, which shall be a 6-foot chain-link fence topped with a v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.</p> <p>Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management [mowing, brush and weed cutting, controlled burning, and herbicide application]; and compatible natural resources management activities (including but not limited to such activities as flora and fauna surveys, timber management to include timber stand improvement and forest products</p>		March 2018

AOC/MRS	Appendix Tab	Land Use Controls	Date Section added to the PMP	Revision or Update
		<p>harvesting, soil stabilization and erosion control, invasive/non-native species control, nuisance wildlife control, drainage maintenance, wetland delineations, grassland management, and scientific research).</p> <p>Duration of exposure shall be based upon the established National Guard Trainee exposure scenario cited per person at 39 days per year at 24 hour per day for a maximum of 25 years (USACE 2005b). All activities must be in compliance with established digging restrictions and established exposure limits. All other uses of LL12 are prohibited, and the U.S. Army will cause appropriate notice to be posted.</p> <p>Disturbance Restrictions:</p> <p>All digging or excavation on LL12 to depths more than 4 ft BGS is prohibited with the exceptions: ground surface repairs, as required, resulting from maneuver damage; and routine maintenance of the roads, ditches and culverts.</p>		

SECTION A.1, TAB RVAAP-01: RAMSDELL QUARRY LANDFILL

1 BACKGROUND

Ramsdell Quarry Landfill (RQL) was initially a stone quarry that operated until 1941. During operations, the quarry was excavated 30 to 40 ft below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn waste explosives from Load Line 1. Reportedly, 18,000 500-lb (225-kg) incendiary or napalm bombs were burned and liquid residues from annealing operations were disposed of in the quarry.

Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only nonhazardous solid waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately 4 acres of the AOC.

2 PUBLICATIONS

The following publications pertinent to the remedial decision for RQL can be located on www.rvaap.org or in established information repositories:

- Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01. Leidos. 29 November 2017.
- Final Remedial Action Report for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill. Leidos. 30 January 2015.
- Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill. Leidos. 9 April 2014
- Final Record of Decision Amendment for the RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 24 May 2012.
- Revised Final Modified Proposed Plan for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC 2012. 6 June 2012.
- Final Engineering Evaluation for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 2 September 2011.
- Revised Final Remedial Design for RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 17 June 2010.

- Final Record of Decision for the RVAAP-01 Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 24 March 2009.
- Wetlands and Other Waters Delineation Report Remedial Action Areas at Ramsdell Quarry Landfill, Load Line 12, and Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant and Ravenna Training and Logistics Site, Ravenna, Ohio. EnviroScience. 29 December 2008.
- Final Proposed Plan for Soil and Dry Sediment at Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. March 2007
- Revised Final Feasibility Study for Ramsdell Quarry Landfill (RVAAP-01) at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. October 2006.
- Final Sampling and Analysis Plan Addendum No. 2 for the Phase I Remedial Investigation of Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. June 2006
- Final Phase I Remedial Investigation Report for Ramsdell Quarry Landfill at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. September 2005
- Final Project Management Plan Performance-Based Contract for Six Environmental Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. 14 July 2005

3 SITE LOCATION AND DESCRIPTION

RQL encompasses approximately 14 acres in the northeastern portion of Camp Ravenna. RQL includes old-field communities with patches of forests and grasslands. The land surface in a large portion of the AOC slopes into a former quarry, which occupies most of the AOC. The quarry bottom is about 40 feet below the surrounding area. Former quarry operations resulted in the removal of much of the original soil.

Surface water runoff collects in an isolated wetland in the bottom of the former quarry. There is no surface water drainage outlet from the quarry. When water is present in the wetland, the water depth is usually less than 4 feet. The drainage ways and ditch lines outside of the quarry, located along access roads and the former rail line in the southern part of the AOC, only contain water during rain events.

4 LAND USE AND ACTIVITIES

RQL will be managed as restricted access due to residual asbestos and contamination and the closed landfill at the AOC.

5 REMEDY OBJECTIVES

Where applicable, the previously applied remedies at RQL consisted of excavation of contaminated soil and installation of the fence to preclude likely exposure through human contact. Following these remedies, hazardous substances, pollutants, or contaminants remained at levels greater than those that allow unlimited use and unrestricted exposure. Therefore a component of the remedial action includes Land Use Controls (LUCs) (see next section). Because LUCs will be used as part of the remedy, any property owner subsequent to the federal government will be required to enter into an environmental covenant meeting the requirements of ORC Section 5301.82. The remedy applied to soil and dry sediment.

The Final Supplemental Remedial Investigation for Sediment and Surface Water at RVAAP-01, RVAAP-04, RVAAP-16, RVAAP-001-R-01(November 2017) concluded that no further action is needed with regard to surface water or wet sediment at RVAAP-01.

6 LAND USE CONTROLS

The RQL AOC-specific LUCs were designed considering specific parameters developed for Restricted Access. The LUCs for RQL are as follows:

- All activities must be in compliance with established digging restrictions and established exposure limits: 1) All digging or excavation within the quarry bottom is prohibited due to the residual asbestos and contamination and 2) Digging and excavation on the landfill cap will be regulated by the post-closure care plan and the Ohio solid waste regulations.
- Permanent warning signs will be installed and maintained around RQL on the gates and on the chain-link and high tensile wire fence at 300 ft centers to warn of the ACM hazard in the quarry bottom. The signs will meet the requirements of OAC 3745-20-07(B)(1)(b).
- As no soil disturbing activities are allowed within the quarry bottom, OSHA asbestos awareness training set forth at 29 CFR 1926.1101(k)(9)(vii) is not required. Any personnel entering the quarry bottom will be briefed of the asbestos hazards.

7 MONITORING AND REPORTING

Periodic monitoring of LUCs, in the form of site inspections, will be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted on an annual basis. Inspections of the solid waste landfill will be conducted in accordance with State of Ohio solid waste regulations and the Ohio Environmental Protection Agency (Ohio EPA) *Director's Final Findings and Orders* (Ohio EPA 2004).

The Annual RQL-LUC Inspection Reports will be submitted to the Ohio EPA for review and approval as they are completed. The RQL-LUC Inspection Forms for RQL and other AOCs/MRSs will be summarized in an Annual LUC Report for each year. The Annual LUC Report will be submitted to the Ohio EPA for review and approval.

The Annual LUC Report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The Annual LUC Reports will be

used in part for the preparation of the CERCLA 121(c) Five-Year Review. As part of the Annual LUC Report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

Camp Ravenna Joint Military Training Center (Camp Ravenna)/ Former Ravenna Army Ammunition Plant (RVAAP) Land Use Control (LUC) Inspection Form for RVAAP-01 Ramsdell Quarry Landfill Area of Concern (AOC)

In accordance with the Camp Ravenna/former RVAAP Property Management Plan (PMP) Appendix A and the Final Remedial Design for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill (RQL), a LUC inspection of RQL was conducted by _____ on _____.

According to LUCs set forth in the *Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill*, dated 9 April 2014, and memorialized in the PMP, periodic monitoring of LUCs, in the form of site inspections, is required to be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections are required to be conducted on an annual basis and inspections of the solid waste landfill are conducted in accordance with State of Ohio solid waste regulations and the Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (Ohio EPA 2004). Additional LUC inspections may be conducted when landfill inspections are conducted as needed. The required Annual LUC Report is to be submitted to the Ohio EPA for review and approval.

The inspections shall include the following:

- Review of LUC training/inbriefs/maintenance and access logs and other documentation as applicable to RQL.
- Evaluation of activities at RQL to ensure that all activities executed within RQL are in compliance with the established digging restrictions and established exposure limits (Security Guard/Maintenance Worker - one (1) hour/day for 250 days/year for 25 years).
 - All digging or excavation within the quarry bottom is prohibited due to residual asbestos and contamination.
 - Digging and excavation on the landfill cap will be regulated by the post closure care plan and the Ohio solid waste regulations.
 - Due to not meeting the industrial/commercial standard, exposure monitoring for the full-time facility employee must be conducted to ensure and document that exposure at the AOC is not above the established exposure limit set for the Security Guard/Maintenance worker of one (1) hour/day for 250 days/year for 25 years.
- Inspection of warning signs on gates and fencing.
- Inspection of RQL fencing and gates.

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form/report and must also be reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

Activities and Land Use:

- a.) This AOC is to be managed as Restricted Access and is restricted from residential land use. Has residential use occurred? Have other land uses or land use changes occurred?

- b.) What activities have occurred at RQL since the last inspection? Has any maintenance been performed at the AOC?

- c.) Are activities at RQL being conducted in compliance with established digging restrictions and established exposure limits (exposure for full-time employees who access RQL must be tracked)?

- d.) Are the warning signs in place and functional? Please note condition and any deficiencies.

- e.) Is the RQL fencing and gates intact and in good condition? Please note condition and any deficiencies.

Inspections and Reporting:

Inspections are required on an annual basis. Periodic monitoring inspections may be conducted as needed. Are annual inspections being conducted as required? Have any additional inspections been completed?

An Annual Report is required. Has the annual report been completed and submitted to the Ohio EPA?

Training/Inbriefs (as applicable to RQL):

Are RQL LUC training and/or inbriefs (for those who need to access RQL) being conducted as applicable? Describe the training (content/who attended/who provided/documentation of training).

If training was not provided, explain why and what corrective actions were initiated.

Is access to RQL for full-time employees of the facility being logged in order to track exposure? Please review access logs to ensure exposure is within the established exposure limits.

LUC Violations (if any):

Description of any observed/noted LUC violation(s) as identified:

Date of Notification of LUC violations (if applicable) to ARNG/OHARNG:

Description of any corrective actions taken to remedy observed LUC violations or recommended corrective actions:

Additional Notes/Comments:

Original Inspection Completed by:

Signature:

Printed

Name:

Title:

Organization:

RVAAP-01 Ramsdell Quarry Landfill (RQL) – Land Use Control (LUC) Brief for Contractors/Personnel

The Army National Guard (ARNG)/Ohio Army National Guard (OHARNG) are required to conduct Long Term Monitoring (LTM)/LUC monitoring at RVAAP-01 RQL at Camp Ravenna/former Ravenna Army Ammunition Plant (RVAAP). LUCs include any type of physical, legal, or administrative mechanisms that restrict use of or limit access to real property to prevent or reduce risks to human health and the environment. Established LUCs are set forth in the *Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill*, dated 9 April 2014, and formalized in Appendix A of the Property Management Plan (PMP).

The RQL Area of Concern (AOC) consists of approximately 14 acres and was initially a stone quarry that operated until 1941. During operations, the quarry was excavated 30 to 40 feet below existing grade. The excavated sandstone and quartzite pebble conglomerate was used for road and construction ballast. From 1946 to the 1950s, the bottom of the quarry was used to burn explosives from Load Line 1. Between 1941 and 1989, the western and southern sections of the abandoned quarry were used for landfill operations. No information is available regarding landfill disposal activities from 1941 to 1976, and no information is available on other activities at the quarry from the 1950s to 1976. Only nonhazardous solid waste was deposited in RQL from 1976 until it was closed in 1989. In 1978, a portion of the abandoned quarry was permitted as a sanitary landfill by the State of Ohio. The sanitary landfill was closed in 1990 under State of Ohio solid waste regulations. A clay cap was placed on the former permitted landfill area covering approximately four (4) acres of the AOC. RQL is to be managed as Restricted Access due to residual asbestos and contamination and the closed landfill at the AOC.

The following LUCs have been developed for RQL considering specific parameters established for Restricted Access and must be adhered to:

- All activities must be in compliance with established digging restrictions and established exposure limits (Security Guard/Maintenance Worker - one (1) hour/day for 250 days/year for 25 years).
 - All digging or excavation within the quarry bottom is prohibited due to residual asbestos and contamination.
 - Digging and excavation on the landfill cap will be regulated by the post closure care plan and the State of Ohio solid waste regulations.
 - Due to not meeting the industrial/commercial standard, exposure monitoring for the full-time facility employee must be conducted to ensure and document that exposure at the AOC is not above the established exposure limit set for the Security Guard/Maintenance worker of one (1) hour/day for 250 days/year for 25 years.
- Permanent warning signs will be installed and maintained around RQL on the gates and on the chain link and high tensile wire fence at 300 feet centers to warn of the asbestos hazard in the quarry bottom. The signs will meet the requirements of OAC 3745-20-07 (B)(1)(b).
- As no soil disturbing activities are allowed within the quarry bottom, OSHA asbestos awareness training set forth in 29 CFR 1926.1101(k)(9)(vii) is not required. Any personnel entering the quarry bottom will be briefed of the asbestos hazards.
- Periodic monitoring of LUCs, in the form of site inspections, is required to be conducted by the ARNG/OHARNG to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections are required to be conducted on an annual basis and inspections of the solid waste landfill are conducted in accordance with State of Ohio solid waste regulations and the Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (Ohio EPA 2004). The required annual inspection is to be submitted to the Ohio EPA for review and approval.

If a LUC violation is identified, please contact Range Control at (614)336-6041 to report.

I have been briefed and understand the requirements and LUCs/restrictions at Ramsdell Quarry Landfill. I will comply with all requirements. I will complete the access log for RQL when obtaining the key and accessing the AOC.

Printed Name	Signature	Company	Date

Sign In/Out Sheet for Ramsdell Quarry Landfill – Please sign in and out when entering and exiting the Ramsdell Quarry Landfill. Please also note what activities were performed and what areas of the AOC were accessed.

Name/Company	Date	Time In	Time Out	Description of Activities Performed (i.e., mowing, gw sampling, etc)	Areas Accessed (please choose and check)
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap
					<input type="checkbox"/> Quarry bottom <input type="checkbox"/> Groundwater monitoring wells <input type="checkbox"/> Landfill cap

SECTION A.1, TAB RVAAP-05: WINKLEPECK BURNING GROUNDS

1 BACKGROUND

The total burning ground area consists of 211.66 acres and has been in operation since 1941. Prior to 1980, burning was conducted on the bare ground and the ash was abandoned at the site. Wastes treated in the area included RDX, antimony sulfide, Composition B, lead azide, TNT, propellants, black powder, waste oil, sludge from the load lines, domestic wastes and small amounts of laboratory chemicals. From 1980 until 1998, periodic burning of scrap explosives, propellants, and explosive-contaminated waste materials (e.g., wipe rags, paper, and cardboard) was conducted in raised refractory-lined metal trays within a 1.5-acre area. A Part-B permit covering the active portion of the site was withdrawn in 1994. The burn-trays along the 90-day storage unit of Building 1601 were closed in accordance with Ohio EPA guidance in 1998. MEC is present in the AOC.

2 PUBLICATIONS

The following publications relevant to the remedial decision at WBG can be located on www.RVAAP.org or in established information repositories:

- Final Remedial Design for the Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio. US Army Corp of Engineers, Louisville District. August 2015.
- Final Explanation of Significant Differences for Post-ROD Changes to the Remedy at RVAAP-05 Winklepeck Burning Grounds, Former Ravenna Army Ammunition Plant/Camp Ravenna, Portage and Trumbull Counties, Ohio. US Army Corp of Engineers, Louisville District. March 2015.
- Final Remedial Investigation/Feasibility Study Supplement for RVAAP-05 Winklepeck Burning Grounds, Former RVAAP/Camp Ravenna, Portage and Trumbull Counties, Ohio. US Army Corp of Engineers, Louisville District. 19 September 2014.
- Final Remedial Action Completion Report for RVAAP- 05 Winklepeck Burning Grounds Pads 61/61A, 67, and 70 at Ravenna Army Ammunition Plant. MKM Engineers. 19 Nov 2009.
- Final Contractor Quality Control Plan for the Remedial Action at RVAAP- 05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant. MKM Engineers. 17 Nov 2008.
- Final Explosives Safety Submission for the Munitions and Explosives of Concern Survey and Munitions Response of RVAAP- 05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant, Revision 3, Amendment 3. MKM Engineers. 9 Oct 2008.
- Final Project Management Plan for RVAAP-05 Winklepeck Burning Grounds Remedial Design/Remedial Action, Revision 2. MKM Engineers. 4 Sept 2008.

- Final Record of Decision for Soil and Dry Sediment at RVAAP- 05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant. SAIC. Aug 2008.
- Final Remedial Action Work Plan for RVAAP-05 Winklepeck Burning Grounds at Ravenna Army Ammunition Plant. MKM Engineers. 27 July 2008.
- Revised Final Report On The Biological Field-Truthing Effort At Winklepeck Burning Grounds At Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. Aug 2006.
- Final Sampling and Analysis Plan Addendum No. 2 for RVAAP- 05 Winklepeck Burning Grounds Feasibility Study. SAIC. Feb 2006.
- Proposed Plan for the Winklepeck Burning Grounds, Ravenna Army Ammunition Plant, Ravenna, Ohio. SAIC. Dec 2005.
- Final Site Safety and Health Plan for the Phase II MEC Clearance and Munitions Response at RVAAP- 05 Winklepeck Burning Grounds. MKM Engineers. March 2005.
- Final Work Plan for Phase II MEC Clearance and Munitions Response at RVAAP- 05 Winklepeck Burning Grounds. MKM Engineers. March 1, 2005.
- Revised Final Focused Feasibility Study for RVAAP- 05 Winklepeck Burning Grounds. SAIC. March 2005.
- Final Phase I MEC Density Survey After Action Report at RVAAP- 05 Winklepeck Burning Grounds. MKM Engineers. 1 March 2005.
- Final Phase II Remedial Investigation Report for the Winklepeck Burning Grounds at RVAAP. SAIC. April 2001.
- Final Sampling and Analysis Plan and Site Safety and Health Plan Addendum No. 1 for the Winklepeck Burning Grounds Feasibility Study. SAIC. Oct 2000.
- Closure, Completion of Partial Closure of RVAAP-07 Building 1601 Hazardous Waste Storage and RVAAP- 05 Winklepeck Burning Grounds (WBG). Ohio EPA. 5 May 1999.
- Final Resource Conservation and Recovery Act (RCRA) Closure Field Investigation Report for the Deactivation Furnace Area, Open Detonation Area, Building 1601, and Pesticides Building at RVAAP. SAIC. June 1998.
- Final Sampling and Analysis Plan Addendum for the Phase II Remedial Investigation of the Winklepeck Burning Grounds and Determination of Facility-Wide Background at the Ravenna Army Ammunition Plant. SAIC. April 1998.
- Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Final. SAIC. Feb 1998.

- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant. SAIC. Sept 1997.
- Final Phase I Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant. SAIC. July 1996.
- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant. SAIC. July 1996.
- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP. SAIC. June 1996.

3 SITE LOCATION AND DESCRIPTION

Winklepeck Burning Ground (WBG) encompasses 211.66 acres and is located in the central portion of RVAAP as illustrated within Figure 2 of this PMP and Figure 1 of this Appendix Tab (RVAAP-05). The WBG tract of land exists in an open field within a gently rolling plain having a west to east run-off gradient with a network of looping gravel roads traversing past the once used burning pad areas. It is located within the Camp Ravenna range complex and will be utilized as a range.

4 LAND USE AND ACTIVITIES

The WBG will be utilized as a range. This planned Land Use is considered to be Military Training, but the removal action conducted in Fiscal Year 2017 was performed to meet Commercial/Industrial standards. The Department of Army has classified the WBG as an Operational Range at the WBG AOC. During a Supplemental Remedial Investigation/Feasibility Study (RI/FS) (final report dated September 19, 2014), USACE determined that removal of an additional 5250 cubic yards total of soil from five different locations would allow the residual chemical contamination to meet the standards for Commercial/Industrial Land Use. In accordance with the Risk Assessment Technical Memorandum, meeting the Commercial/Industrial Land Use would allow for use by either National Guard Trainees or full-time personnel without monitoring exposure parameters. While there is no plan to have full-time personnel occupy the AOC, the Army desired that flexibility. Therefore, the Army prepared an Explanation of Significant Differences (ESD) for Post-ROD Changes to the Remedy and a Remedial Design (RD) pursuant to the approved ESD. A Remedial Action (RA) was conducted in November 2016 through January 2017 to implement the ESD and RD. Upon completion of the RA, the residual chemical contamination meets the criteria for Commercial/Industrial Land Use. Given that WBG is now an operational small arms range, any residual MEC will be handled in accordance with Army safety regulations governing operational ranges.

5 REMEDY OBJECTIVES

Where applicable, the previously applied remedy consisted of excavation of contaminated soil to preclude likely exposure through human contact at the WBG AOC. A portion of that remedy resulted in hazardous substances, pollutants, or contaminants remaining greater than levels that allow unlimited use and unrestricted exposure. Therefore a component of the remedial action

includes Land Use Controls (LUCs) (see next section). Because LUCs will be used as part of the remedy, any property owner subsequent to the federal government will be required to enter into an environmental covenant meeting the requirements of ORC Section 5301.82.

6 LAND USE CONTROLS

The WBG AOC-specific LUCs were designed for exposure associated with the Commercial/Industrial Land Use. This exposure scenario is based on full-time occupational exposure using the USEPA Regional Screening Levels (RSLs) for full-time workers which were in effect at the time the Supplemental RI/FS was prepared (i.e., May 2013 RSLs).

The LUCs for the WBG AOC are as follows:

- The AOC cannot be used for Unrestricted (Residential) Land Use unless or until additional evaluation shows that risk levels resulting from residual contamination have been reduced to levels acceptable for Residential Land Use and any residual MEC hazards have been removed.
- Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following:
 - The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan (FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.
 - The modification of existing wells, if necessary, to allow for construction on the range.
 - The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP, and applicable Ohio Administrative Code requirements.

7 MONITORING AND REPORTING

Periodic monitoring of LUCs in the form of site inspections will be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted on an annual basis.

The Annual WBG-LUC Inspection Reports will be submitted to the Ohio EPA for review and approval as they are completed. The WBG-LUC Inspection Forms for WBG and other AOCs/MRSs will be summarized in an Annual LUC Report for the installation each year. The Annual LUC Report will be submitted to the Ohio EPA for review and approval.

The Annual LUC Report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The Annual LUC Reports will be used in part for the preparation of the CERCLA 121(c) Five-Year Review. As part of the Annual

LUC Report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

FIGURE 1. WINKLEPECK BURNING GROUNDS MAP WITH METES AND BOUNDS.



Note: The red line represents the boundary of Winklepeck Burning Grounds and the blue lines represent the range fan of the Mark-19 Firing Range as it existed in 2012.

Camp Ravenna Joint Military Training Center (Camp Ravenna)/Former Ravenna Army Ammunition Plant (RVAAP)
RVAAP-05 Winklepeck Burning Grounds – Inspection Form

In accordance with the Camp Ravenna/former RVAAP Property Management Plan (PMP), an inspection of RVAAP-05 Winklepeck Burning Grounds (WBG) was conducted by _____ on _____.

The annual inspection required by the PMP includes the following:

- Review of LUC training and documentation as applicable to WBG.
- Evaluation of activities at WBG to ensure that residential use and groundwater use is not occurring.

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form and properly reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

1. Activities and Land Use

a.) This AOC is restricted from residential land use. Has residential use occurred?

b.) Groundwater use or extraction of groundwater located at or underlying the WBG AOC or any portion thereof is prohibited, except for the following:

- The installation, development, purging, and sampling of new or existing monitoring wells in accordance with the most recent Facility-Wide Sampling and Analysis Plan (FWSAP) as part of the AOC-specific IRP, the Facility-Wide Ground Water Monitoring Program Plan (FGWMPP), or the Facility-Wide Groundwater Remedial Investigation.
- The modification of existing wells, if necessary, to allow for construction on the range.
- The abandonment and replacement of monitoring wells damaged by activities or removed for construction, and abandonment of wells no longer utilized as part of IRP or FGWMPP activities, in accordance with Ohio EPA guidance, the most recent FWSAP, and applicable Ohio Administrative Code requirements.

Have any groundwater activities been conducted and, if yes, are they within the established control parameters?

2. Inspections and Reporting

a.) Inspections are required on an annual basis. Are annual inspections being completed?

b.) An annual report is required. Has the annual report been completed and submitted?

3. Training (as applicable to WBG)

a.) Was LUC training (specific to WBG) being conducted as applicable? Describe the training (content/who attended/who provided/documentation of training).

b.) If training was not provided, explain why and what corrective actions were initiated?

4. Description of any observed/noted LUC violation(s):
5. Date of Notification of LUC violation (if applicable):
6. Description of any corrective actions taken to remedy observed LUC violation(s) or recommended corrective actions:
7. Additional Notes/Comments:

Original Inspection Completed by:

Signature:	
Printed Name:	
Title:	Organization:
Date:	

SECTION A.1, TAB RVAAP-08, 09, 10, AND 11: LOAD LINES 1, 2, 3, AND 4

1 BACKGROUND

RVAAP-08, 09, 10 and 11 are the designated numbers for four Areas of Concern (AOCs), known as Load Lines 1 through 4 (LLs 1-4). While these are unique, individual AOCs, they have historically been studied and treated together, so they are addressed together in this section of Appendix A. RVAAP-08, 09, 10, and 11 collectively cover approximately 800 acres on the former Ravenna Army Ammunition Plant (RVAAP), now known as Camp Ravenna Joint Military Training Center (Camp Ravenna).

Industrial operations at RVAAP primarily consisted of 12 munitions assembly facilities referred to as “load lines.” LLs 1 - 4 were used between 1941 and 1971 to melt and load trinitrotoluene (TNT) and Composition B (a mixture of TNT and cyclotrimethylenetrinitramine (RDX)) into large-caliber shells. The operation of the load lines produced explosive dust, spills, and vapors that collected on the floors and walls of each building. Periodically the floors and walls would be cleaned with water and steam. The liquid, containing TNT and Composition B, was known as “pink water” for its characteristic color and was collected in sumps or settling ponds and in some instances would washout onto the surrounding ground. Various industrial operations associated with the munitions loading process and munitions rehabilitation activities were also conducted during the operation of LLs 1 - 4. As a result of these operational activities, soils were contaminated with explosives, metals, SVOCs, and PCBs.

A Remedial Action for soil and dry sediment was completed in 2008. At first, building demolition ended with floor slabs of the main production buildings remaining in place. Therefore, the Final Revised Interim Record of Decision (ROD) for Remediation of Soils specified that the at-grade slabs would be inspected and maintained until removed as they acted as covers over potentially explosives-contaminated soils that may have remained under the slabs.

After the Interim ROD was approved, the Army obtained funding to demolish the floor slabs and, with oversight and approval of the Ohio EPA, removed the at-grade slabs to make the site more accessible for future OHARNG training activities. Subsequent to demolition of the floor slabs, additional soil investigation and removal activities were conducted. The results of site investigations and summaries of removal actions for LLs 1 - 4 are described in numerous documents, which are listed in Section 2, below. Currently, concrete elevated walkways remain within the Load Lines (which will be demolished by the OHARNG when the site is developed for training).

In 2013 and 2014, the Army developed the *Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program* (hereafter referred to as the Technical Memorandum) (ARNG 2014), which identified three Categorical Land Uses and Representative Receptors to be considered during the CERCLA process. These three Land Uses and Representative Receptors are:

1. Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer),

2. Military Training Land Use – National Guard Trainee, and
3. Commercial/Industrial Land Use – Industrial Receptor (U.S. Environmental Protection Agency [USEPA] Composite Worker).

The Technical Memorandum established, with concurrence from the Ohio EPA, that sites which meet the cleanup standards for the Commercial/Industrial Land Use are also suitable for Military Training (National Guard Trainee) including use by a full-time worker.

Recently, the Final Feasibility Study (FS) Addendum for Soil, Sediment, and Surface Water at Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2 (June 2017) found that only limited areas of surface and subsurface soil at each load line pose unacceptable risk to the Industrial Receptor. The FS Addendum recommended Alternative 3 (Commercial/Industrial Land Use – Ex-situ Thermal Treatment of Soil and Administrative LUCs) to address residual contamination and unacceptable risk. Implementation of Alternative 3 would include excavation and ex-situ thermal treatment of approximately 5,700 cubic yards of soil and excavation and off-site disposal of approximately 160 cubic yards of lead-contaminated soil from Load Lines 1 through 4 and 12. The areas estimated for removal from LLs 1 through 4 are 0.3 acres from LL 1, 0.01 acres from LL 2, 0.6 acres from LL 3, and 0.14 acres from LL 4, or approximately 1.05 acres total from LLs 1 through 4. Alternative 3 is protective of the likely future land user (Industrial Receptor) and is a green and highly sustainable alternative. The Army plans to proceed with the CERCLA process for LLs 1 through 4 and 12 by preparing a Proposed Plan for the alternative recommended in the FS Addendum.

2 PUBLICATIONS

The following publications related to Load Lines 1 through 4 can be located on <www.RVAAP.org> or in established RVAAP information repositories:

- Final Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2, June 2017.
- Final Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, March 2017.
- Final PBA13 Remedial Investigation Sample and Analysis Plan Addendum for Load Line 1, 2, 3, 4, and 12, April 2016.
- Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program, February 2014.
- Final Characterization Sampling Report of Surface and Subsurface Incremental Sampling Methodology at RVAAP-08, 09, 10, 11, and 12 Load Lines 1, 2, 3, 4, and 12, March 2013.
- Final Sampling Report of Surface and Subsurface Incremental Sampling Methodology at Load Lines 1, 2, 3, and 4 (RVAAP-08, 09, 10, and 11), Volumes 1 & 2, March 2011.

- Final Remediation Completion Report Sub-Slab Soils at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-12 Load Line 4, December 2010.
- Final Sampling and Analysis of Soils Below Floor Slabs at RVAAP-08 Load Line 1 and Other Building Locations, September 2010.
- Final Work Plan for Sampling and Closure of Load Lines 1 - 4, 12 (RVAAP- 08, 09, 10, 11, 12) and other Areas of Concern, July 2010.
- Final Stormwater Pollution Prevention Plan for Remediation of Sub-Slab Soils at RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, March 2010.
- Final Multi-Increment Sampling and Analysis of Soils Below Floor Slabs at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, December 2009.
- Final of the Sampling and Screening Analysis of Soils Below Floor Slabs at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, September 2009
- Final Work Plan Addendum 1 for the Sampling of Soils Below Floor Slabs and Remediation at RVAAP-08 Load Line 1 and Other Building Locations, August 2009.
- Final Remedial Action Completion Report for the Remediation of Soils and Dry Sediments at RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, June 2008.
- Final Work Plan for the Sampling of Soils Below Floor Slabs at Load Lines 2-4 and Excavation and Transportation of Contaminated Soils to Load Line 4 (Buildings G-1, G-1A, and G-3), May 2008.
- Final Project Coordination Plan for the Sampling of Soils Below Floor Slabs at RVAAP-09, 10, and 11 Load Lines 2, 3, and 4 and Excavation and Transportation of Contaminated Soils to RVAAP-11 Load Line 4 (Buildings G-1, G-1A and G-3), March 2008.
- Final Letter Report Work Plan for the Sampling of Soils Below Floor Slabs at RVAAP-09, 10, and 11 Load Lines 2, 3, and 4 and Excavation and Transportation of Contaminated Soils to RVAAP-11 Load Line 4 (Buildings G-1, G-1A and G-3), February 2008.
- Final Stormwater Pollution Prevention Plan for Remediation of Soils at RVAAP-08, 09, 10, and 11 Load lines 1 – 4, July 2007.
- Final Remedial Action Work Plan for Remediation of Soils at Load lines 1 – 4 (RVAAP-08, 09, 10, and 11), April 2007.
- Final Revised Interim Record of Decision for the Remediation of Soils at RVAAP-08, 09, 10, and 11 Load lines 1 – 4, January 2007.

- Final Construction Field Plans for the Remediation of Soils at RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4 at Ravenna Army Ammunition Plant, November 2006.
- Final Project Plans of the Structural Analysis and MEC Support for RVAAP-08, 09, 10 and 11 Load Lines 1 - 4, at Ravenna Army Ammunition Plant, November 2006.
- Final Proposed Plan for the Remediation of Soils at Load Lines 1 through 4 at the Ravenna Army Ammunition Plant Ravenna, Ohio, July 2005.
- Final Focused Feasibility Study for the Remediation of Soils at LLS 1-4, RVAAP, May 2005.
- Final Proposed Remedial Goal Options for Soil at RVAAP-08, 09, 10, and 11 Load Lines 1-4, September 2004.
- Final Phase II Remedial Investigation Report for Load Line 4 at RVAAP, September 2004.
- Final Geotechnical Laboratory Results for the Phase II Remedial Investigations for RVAAP-09, 10, and 11 Load Lines 2, 3, and 4 at Ravenna Army Ammunition Plant, April 2003.
- Final Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Lines 2, 3, and 4 at RVAAP, July 2001.
- Final Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.
- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.
- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.

3 SITE LOCATION AND DESCRIPTION

The LLS 1 through 4 AOCs are located in the southeastern portion of the former RVAAP installation, as shown in Figure 2 of this Property Management Plan (PMP), with LL 1 being the easternmost.

Site elevations for LL 1 vary from approximately 12.2 m (40 ft) across LL 1, from 309.6 m (1,016 ft) amsl relative to the North American Vertical Datum of 1988 (NAVD88) near the main entrance to 297.2 m (975 ft) amsl near the east perimeter fence. Inside the production area, the ground surface is hummocky as a result of the extensive excavation of bedrock to accommodate the load lines buildings and infrastructure. Outside the production area and to the southeast, the terrain slopes more uniformly southeastward, with elevations ranging from 298.7 m (980 ft) amsl at the railroad track to 285.9 m (938 ft) amsl at the perimeter fence. This smoother topography reflects

the presence of glacial sedimentary cover that has been relatively undisturbed throughout RVAAP's active life.

Elevations within the bounds of LL 2 vary from approximately 301 to 307 m (990 to 1,010 ft) amsl. However, topography drops sharply to the south of the AOC, in the direction of Kelly's Pond. In general, the land surface slopes from the center of the load line in all directions. There is a high point (1,020 ft) to the north of the AOC, and surface elevation decreases to 930 ft to the south within the bounds of the former RVAAP. Kelly's Pond is located just south of the fenced boundary of LL 2 and a group of four ponds (identified as the Load Line 2 ponds) are located northeast of the AOC perimeter fence.

LL 3 is characterized by sloping topography on a reworked sandstone bedrock surface. Elevations within the bounds of the AOC vary from approximately 299 to 311 m (980 to 1,020 ft) amsl. Topographic elevations across most of the AOC generally decrease from east to the west and north towards Cobbs Pond and the stream entering Cobbs Pond. Along the southern most portion of the AOC, land surface elevations gently decrease to the south toward South Service Road.

The topography within LL 4 is subdued on a glacial till surface. Elevations within the bounds of the AOC vary from approximately 299 to 305 m (980 to 1,000 ft) amsl. The overall topography slopes very gently from north to south within the AOC with localized steeper slopes cut along the main stream and southwestern edge of the settling pond.

4 LAND USE AND ACTIVITIES

Administrative accountability for Camp Ravenna, including LLs 1 – 4, has been transferred to the USP&FO for Ohio and licensed to the Ohio Army National Guard (OHARNG) for use as a military training site. Due to ongoing restoration activities, LLs 1 - 4 are not currently used for military training purposes although future land use will include military training activities. The Final Revised Interim Record of Decision for the Remediation of Soils at RVAAP-08, 09, 10, and 11 Load lines 1 – 4 specified that the planned future use of these four AOCs is National Guard Mounted Training (No Digging). Mounted Training refers to training on vehicles only with vehicle disturbance up to a depth of four (4) feet; however, National Guard Trainees would be restricted from manual digging in these areas.

When the CERCLA process is completed, pursuant to the 2017 FS Addendum, the Army anticipates that LLs 1 – 4 will be suitable for Commercial/Industrial use.

5 REMEDY OBJECTIVES

The selected remedy for soil and dry sediment at the LLs 1 - 4 AOCs, as documented in the Final Revised Interim ROD for the Remediation of Soils (2007), was to excavate contaminated surface and subsurface soils and dry sediment from discrete contaminated areas. The remedial action objective (RAO) was to allow for land use by the National Guard Trainee by achieving cleanup goals for National Guard Trainee, which was considered the most representative receptor. Following excavation of the contaminated surface and subsurface soils and dry sediment and confirmatory soil sampling indicating that material with concentrations of COCs exceeding clean-

up goals had been removed, clean backfill was placed in excavated areas, and the AOCs were restored.

The implemented remedy also included the following components:

- Groundwater monitoring to ensure the remedy did not impact groundwater;
- Maintenance of building slabs and foundations; and
- Five year reviews in accordance with CERCLA 121(c) and 300.430(f)(4)(ii).

The Interim ROD stated that as part of the selected remedy, groundwater monitoring will be performed for five years at select existing wells in LLs 1-4 to monitor for potential impacts to groundwater from remedy implementation. This groundwater monitoring data would supplement data from the Facility-Wide Groundwater Monitoring Program. The Interim ROD also stated that the concrete slabs and building foundations that remain in place after remediation will be inspected periodically (until removed) to ensure their integrity has not been compromised allowing infiltration to potentially contaminated soils underneath. The remedial action will be subjected to five-year reviews as part of the CERCLA process to assure that human health and the environment are being protected.

6 LAND USE CONTROLS

According to the Final Interim ROD, the need for and type of land use controls will be determined in future RODs for the site; thus, land use controls are not a component of the chosen Alternative as presented in the Interim ROD. It also stated that no O&M activities are required under the chosen Alternative (Alternative SDS3). It stated that the concrete slabs and building foundations that remain in place will be inspected periodically to assess their integrity, and maintained and repaired as necessary, until removed. It also stated that groundwater monitoring would be required for 5 years to ensure the selected remedy does not impact groundwater. Five year reviews would also be required until such a time as LLs 1-4 allow for unrestricted access. The Interim ROD also specified that the Land Use would be National Guard Mounted Training (No Digging).

As described Section 1, the Army has removed the building slabs and contaminated soil under the slabs and conducted additional investigation of the AOCs achieving the requirement to inspect and maintain the slabs until removal. Groundwater samples have been collected for soil COCs from monitoring wells identified in the Interim ROD since the completion of the Remedial Action therefore achieving the requirement to monitoring groundwater. Groundwater at Camp Ravenna is managed under the Facility-Wide Groundwater Monitoring Program, which is a component of the *Director's Final Findings and Orders* which includes semi-annual groundwater monitoring at chosen wells throughout the facility including wells within LLs 1-4. A separate RI/FS will be completed for facility-wide groundwater. These activities are being performed outside of the Interim ROD requirements.

The Army plans to proceed with the CERCLA process for LLs 1 – 4 and 12 by preparing a Proposed Plan for the alternative recommended in the FS Addendum (June 2017) to meet Commercial/Industrial use. Once the process is complete, the only LUC anticipated for soil, wet sediment and surface water is that the AOCs will not be used for Residential Land Use.

Until the remedial process is completed at these four AOCs, the OHARNG will ensure land use is maintained as Mounted Training – No Digging (tracked and wheeled vehicle use, no manual digging by the Trainee, and exposure of 24 hours/day for 39 days/year for 25 years).

7 MONITORING AND REPORTING

Periodic monitoring of the land use and other conditions of the Interim ROD, in the form of site inspections, will be conducted by the Army to confirm that the Interim ROD conditions are being met. Site inspections will be conducted annually and will be documented using an inspection form like the one that follows this section. Monitoring results will be reported in an annual LUC report which will be submitted to the Ohio EPA. The annual LUC monitoring reports will be used in part for the preparation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 121(c) Five-Year Review.

**Camp Ravenna Joint Military Training Center (Camp Ravenna)/ Former Ravenna Army
Ammunition Plant (RVAAP) Inspection Form for
RVAAP-08 Load Line 1, RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load
Line 4 Areas of Concern (AOC)**

This inspection of Load Line 1, Load Line 2, Load Line 3 and Load Line 4 (LL1-4) was conducted by _____
on _____.

According to the *Final Interim Record of Decisions (ROD) for the Remediation of Soils at Load Lines 1 through 4 at the Ravenna Army Ammunition Plant*, dated January 2007, the selected remedy included soil excavation and the following components:

- Groundwater monitoring to ensure the remedy did not impact groundwater;
- Maintenance of building slabs and foundations; and
- Five year reviews in accordance with CERCLA 121(c) and 300.430(f)(4)(ii).

The 2007 Interim ROD further indicated that “for the selected remedy, groundwater monitoring will be performed for five years at select existing wells in LLS 1-4 to monitor for potential impacts to groundwater from remedy implementation. Groundwater monitoring data will supplement data from the Facility-Wide Groundwater Monitoring Program. Groundwater samples will be collected semi-annually for the first two years after remedy implementation. The sampling frequency thereafter will be based on the laboratory results. Groundwater samples will be submitted to an environmental chemistry laboratory for analysis of the full suite of constituents (i.e., VOCs, SVOCs, PCBs, pesticides, explosives, propellants and TAL metals). Findings will be evaluated in the context of the facility-wide groundwater monitoring program and any action will be determined by the Army, with approval by Ohio EPA. In addition, the concrete slabs and building foundations that remain in place after remediation will be inspected periodically to ensure their integrity has not been compromised allowing infiltration to potentially contaminated soils underneath. The remedial action will be subjected to five-year reviews as part of the CERCLA process to assure that human health and the environment are being protected.” According to the Interim ROD, the intended future use of the AOCs is Mounted Training – No Digging.

Based on the 2007 Interim ROD, the U.S. Army will conduct the following to ensure the components of the selected remedy are met:

- Ensure that groundwater monitoring was conducted for five years after the remedial action was completed in 2007/2008;
- Ensure that building slabs and foundations were maintained and inspected periodically if in place;
- Ensure land use is maintained as Mounted Training – No Digging (tracked and wheeled vehicle use, no digging beyond 4 feet bgs, exposure of 24 hours/day for 39 days/year for 25 years); and
- Conduct five-year reviews as necessary.

Verification of the compliance with these components will be documented on an inspection form for Load Lines 1-4 similar to the one on the following page.

Inspection Form for Load Lines 1, 2, 3, and 4

<p>1. Activities and Land Use:</p> <p>a. This AOC is to be managed as Mounted Training – No Digging. What activities have occurred at LL1-4 within the last year? Are the activities within the established use for the AOC?</p> <p>b. Are the activities being conducted at LL1-4 in compliance with established digging restrictions and exposure parameters?</p>
<p>2. Inspections and Reporting:</p> <p>a. Has a 5-Year Review been completed for this AOC as required?</p>
<p>3. Groundwater Monitoring:</p> <p>a. Was groundwater monitoring conducted for 5 years after the remedial action in accordance with the Interim ROD?</p>
<p>4. Concrete Slabs and Building Foundations:</p> <p>a. Were the concrete slabs and building foundations inspected periodically to ensure their integrity was not been compromised allowing infiltration to potentially contaminated soils underneath? Not Applicable. Slabs and building foundations have been removed.</p>
<p>Additional Notes/Comments:</p>
<p>Inspection Completed by:</p> <p>Signature</p> <p>Printed Name:</p> <p>Title:</p> <p>Organization:</p> <p>Date:</p>

SECTION A.1, TAB RVAAP-12: LOAD LINE 12

1 BACKGROUND

The Load Line 12 (LL12) Area of Concern (AOC), RVAAP-12, is comprised of approximately 80 acres on the former Ravenna Army Ammunition Plant (RVAAP), now known as Camp Ravenna Joint Military Training Center (Camp Ravenna). It was originally known as the Ammonium Nitrate Plant which started operations in November 1941. Several structures related to the production of ammonium nitrate, as well as support operations, existed on the LL12 AOC. The western half of the AOC contained former production areas; the eastern half of the AOC did not contain any known production facilities. In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private contractor leased LL12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a private contractor leased the Neutral Liquor Building (Building FF-19) for the production of aluminum chloride. The Army terminated the lease early due to environmental concerns related to air emissions and wastewater discharges to Upper and Lower Cobbs Ponds. In June 1944, three evaporation/crystallization units (Buildings 900, 904, and 905) were converted for demilitarization of munitions. Rinsate from demilitarization operations was initially allowed to flow out of the buildings and directly onto the ground or to drainage ditches. In 1981, the LL12 Pink Water Treatment Plant was built to treat the demilitarization effluent prior to discharge. After the termination of demilitarization operations, the treatment plant was used under a National Pollutant Discharge Elimination System (NPDES) permit to treat explosives-tainted storm water from LL12 and other RVAAP locations. Currently, there are no above-grade structures remaining at the AOC; all buildings were demolished between 1973 and 2000.

A Remedial Action including excavation and off-site disposal to address arsenic-contaminated dry sediment was completed in 2010.

In 2013 and 2014, the Army developed the Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program (hereafter referred to as the Technical Memorandum) (ARNG 2014), which identified three Categorical Land Uses and Representative Receptors to be considered during the CERCLA process. These three Land Uses and Representative Receptors are:

1. Unrestricted (Residential) Land Use – Resident Receptor (Adult and Child) (formerly called Resident Farmer),
2. Military Training Land Use – National Guard Trainee, and
3. Commercial/Industrial Land Use – Industrial Receptor (U.S. Environmental Protection Agency [USEPA] Composite Worker).

The Technical Memorandum established, with concurrence from the Ohio EPA, that sites which meet the cleanup standards for the Commercial/Industrial Land Use are also suitable for Military Training (National Guard Trainee) including use by a full-time worker.

Recently, the Final Feasibility Study (FS) Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2 (June 2017) found that removal of an additional 372 cubic yards of soil over an area of only 0.06 acres would allow LL 12 to attain Commercial/Industrial Land Use, providing the Army more flexibility in the future. The FS Addendum recommended Alternative 3 (Commercial/Industrial Land Use – Ex-situ Thermal Treatment of Soil and Administrative LUCs) to address residual contamination and unacceptable risk. Implementation of Alternative 3 would include excavation and ex-situ thermal treatment of soil. Alternative 3 is protective of the likely future land user (Industrial Receptor) and is a green and highly sustainable alternative. The Army plans to proceed with the CERCLA process for LLs 1 – 4 and 12 by preparing a Proposed Plan for the alternative recommended in the FS Addendum.

2 PUBLICATIONS

The following publications related to LL12 can be located on <www.RVAAP.org> or in established RVAAP information repositories:

- Final Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12, Volumes 1 & 2, June 21, 2017.
- Final Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, February 16, 2017.
- Final PBA13 Remedial Investigation Sample and Analysis Plan Addendum for Load Line 1, 2, 3, 4, and 12, April 8, 2016.
- Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP Installation Restoration Program, February 2014.
- Final Characterization Sampling Report of Surface and Subsurface Incremental Sampling Methodology at RVAAP-08, 09, 10, 11, and 12 Load Lines 1, 2, 3, 4, and 12, March 29, 2013.
- Final Remedial Action Report for the RVAAP-12 Load Line 12, August 2010.
- Final Work Plan for Sampling and Closure of Load Lines 1 - 4, 12 (RVAAP- 08, 09, 10, 11, 12) and other Areas of Concern, July 2010.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Design for RVAAP-12 Load Line 12 at Ravenna Army Ammunition Plant, October 2009.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.

- Final Sampling and Analysis Plan for Groundwater Sampling at RVAAP-12 Load Line 12 at Ravenna Army Ammunition Plant, Addendum 1, April 2009.
- Final Record of Decision for Soil and Dry Sediment for RVAAP-12 Load Line 12 at Ravenna Army Ammunition Plant, March 2009.
- Wetlands and Other Waters Delineation Report Remedial Action Areas at Ramsdell Quarry Landfill, Load Line 12, and Fuze and Booster Quarry Landfill/Ponds at the Ravenna Army Ammunition Plant and Ravenna Training and Logistics Site, Ravenna, Ohio, December 2008.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.
- Final Proposed Plan for Soil and Dry Sediment at Load Line 12 (RVAAP-12) Ravenna Army Ammunition Plant, Ravenna, Ohio, March 2007.
- Final Feasibility Study for Load Line 12 (RVAAP-12) Ravenna Army Ammunition Plant Ravenna, Ohio, July 2006.
- Final Phase II Remedial Investigation Supplemental Report for Load Line 12 (RVAAP-12) at the Ravenna Army Ammunition Plant, Ravenna, Ohio, November 2005.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs at RVAAP, October 2004.
- Final Phase II Remedial Investigation Report for Load Line 12 at the Ravenna Army Ammunition Plant, Ravenna, Ohio, DACA62-00-D-0001, DO CY06, March 2004.
- Final Revised Final Technical Memorandum Human Health and Ecological Risk Assessment Approach for the Load Line 1 and Load Line 12 Phase II Remedial Investigations at RVAAP, August 2002.
- Final Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Line 12 at Ravenna Army Ammunition Plant, September 2000.
- Final Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.
- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.
- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.

3 SITE LOCATION AND DESCRIPTION

The LL12 AOC is approximately 80 acres and is located in the southeastern portion of the former RVAAP facility (see Figure 2 of this Property Management Plan). Ground surface elevations across LL12 range from approximately 970 to 987 feet above mean sea level (AMSL). The majority of LL12 was re-graded and soil was distributed during demolition activities that occurred between 1998 and 2000. At LL12, the Main Ditch that bisects the central part of the AOC flows into drainage ditches located north of the AOC. A stream traverses LL12 from west to east and intercepts the Main Ditch near the northern boundary of the AOC. Ultimately, the drainage flows into the Cobbs Pond complex (Upper and Lower Cobbs Ponds) several hundred yards to the north of LL12.

4 LAND USE AND ACTIVITIES

Administrative accountability for Camp Ravenna, including the LL12 AOC, has been transferred to the USP&FO for Ohio and licensed to the Ohio Army National Guard (OHARNG) for use as a military training site. Due to ongoing restoration activities, LL12 is not currently used for military training purposes although future land use will include military training activities. The Final Record of Decision for Soil and Dry Sediment at RVAAP-12 Load Line 12 indicated that the intended future land use for LL12 is for National Guard training. Specifically, this area will be used for mounted training. Maneuver damage may occur up to four (4) feet bgs.

When the CERCLA process is completed, pursuant to the 2017 FS Addendum, the Army anticipates that LL12 will be suitable for both Commercial/Industrial and Military Training Land Uses; however the planned future land use remains Military Training.

5 REMEDY OBJECTIVES

The selected remedy for soil and dry sediment at the LL12 AOC, as documented in the *Record of Decision for Soil and Dry Sediment for the RVAAP-12 Load Line 12* (USACE 2009a), was to excavate contaminated dry sediment within the Main Ditch aggregate to achieve a cleanup of arsenic for the most representative receptor (National Guard Trainee). The remedial action, as documented in the *Final Remedial Action Report for the RVAAP-12 Load Line 12* (USACE, 2010), was to attain the remedial action objective (RAO) for the Chemical of Concern (COC), arsenic, as established in the LL12 Record of Decision (ROD) to allow for land use by the National Guard Trainee. A portion of the remedy resulted in concentrations of hazardous substances, pollutants, or contaminants remaining at levels that would not allow unlimited use and unrestricted exposure. Therefore, a component of the remedial action included Land Use Controls (LUCs) (see next section).

The Final Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 (February 16, 2017) documented that no additional remedial actions are needed for wet sediment and surface water.

When the CERCLA process is advanced, pursuant to the 2017 FS Addendum, the Army anticipates that the RAO for the planned remedial action at LL12 will be to remove soil such that LL12 will achieve Commercial/Industrial Land Use.

6 LAND USE CONTROLS

The LL12 AOC-specific LUCs were designed considering certain parameters developed for exposure established for the National Guard Trainee Land Use exposure scenario.

According to the Final Remedial Design for RVAAP-12 Load Line 12, the LUCs for the LL12 AOC are as follows:

- **Land Restrictions**

Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence, which shall be a 6-foot chain-link fence topped with a v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.

Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management [mowing, brush and weed cutting, controlled burning, and herbicide application]; and compatible natural resources management activities (including but not limited to such activities as flora and fauna surveys, timber management to include timber stand improvement and forest products harvesting, soil stabilization and erosion control, invasive/non-native species control, nuisance wildlife control, drainage maintenance, wetland delineations, grassland management, and scientific research).

Duration of exposure shall be based upon the established National Guard Trainee exposure scenario cited per person at 39 days per year at 24 hour per day for a maximum of 25 years (USACE 2005b). All activities must be in compliance with established digging restrictions and established exposure limits. All other uses of LL12 are prohibited, and the U.S. Army will cause appropriate notice to be posted.

- **Disturbance Restrictions**

All digging or excavation on LL12 to depths more than 4 ft BGS is prohibited with the exceptions:

- Ground surface repairs, as required, resulting from maneuver damage; and
- Routine maintenance of the roads, ditches and culverts.

When the CERCLA process is advanced, pursuant to the 2017 FS Addendum, the Army anticipates that the RAO for the planned remedial action at LL12 will be to remove soil such that LL12 will achieve Commercial/Industrial Land Use. The only LUC anticipated after that removal action would be to prohibit residential use.

7 MONITORING AND REPORTING

Periodic monitoring of LUCs in the form of site inspections will be conducted by the Army to confirm whether the LUCs remain effective and meet LUC objectives for continued remedy protectiveness. Site inspections will be conducted at least once per year and will be documented

using a form like the one that immediately follows this section. Monitoring results will be reported in an annual LUC monitoring report which will be submitted to the Ohio EPA.

The annual LUC monitoring report will evaluate the status and effectiveness of LUCs with a description of how any LUC deficiencies or inconsistent uses were addressed. The annual LUC monitoring reports will be used in part for the preparation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 121(c) Five-Year Review. As part of the LUC monitoring report, a written certification will be submitted stating whether or not the LUCs remain in place and are effective.

**Camp Ravenna Joint Military Training Center (Camp Ravenna)/ Former Ravenna Army
Ammunition Plant (RVAAP) Land Use Control (LUC) Inspection Form for
RVAAP-12 Load Line 12 Area of Concern (AOC)**

In accordance with the Camp Ravenna/former RVAAP Property Management Plan (PMP) and the Final Remedial Design for Soil and Dry Sediment at RVAAP-12 Load Line 12 (LL12), a LUC inspection of LL12 was conducted by _____ on _____.

According to LUCs set forth in the *Final Remedial Design for the RVAAP-12 Load Line 12*, dated 1 October 2009, and memorialized in the PMP, periodic monitoring of LUCs, in the form of site inspections, is required to be conducted by the Army to confirm that the LUCs remain effective and still meet LUC objectives for continued remedy protectiveness. Site inspections are required to be conducted as necessary but not less than once per year. The required Annual LUC Report is to be submitted to the Ohio EPA for review and approval.

Based on the 2009 Remedial Design document, the U.S. Army will implement LUCs to achieve the performance objectives listed below for LL12:

- Maintain the Camp Ravenna perimeter fence – Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence which shall be of 6-foot, chain-link fence topped with v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.
- Restrict future land use to National Guard mounted training – Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management, and compatible natural resources management activities;
- Maintain a LUC training program;
- Limit activities to tracked and wheeled operations that are consistent with the National Guard mounted training scenario and other essential security, safety, and natural resources management activities (National Guard Trainee – Mounted Training - 24 hours/day for 39 days/year for 25 years); and
- Prohibit digging beyond four (4) feet below ground surface (bgs) except for routine maintenance of roads, ditches and culverts, and ground surface repairs resulting from maneuver damage.

Therefore, the annual LUC inspection shall include the following (at a minimum):

- Inspection of the Camp Ravenna perimeter fence;
- Review of activities at LL12 including exposure timeframes, signage/markers, types of activities performed, and any disturbance/digging activities;
- Review of LUC training program as applicable to LL12;

LUC deficiencies or inconsistent land uses that are identified must be reported and identified on the inspection form/report and must also be reported to the Army National Guard (ARNG)/Ohio Army National Guard (OHARNG).

Review of LUCs – Management/Effectiveness/Corrective Action

1. Activities and Land Use:

- a. This AOC is to be managed as National Guard Trainee - Mounted Training. What activities have occurred at LL12 within the last year? Are the activities within the established limitations of use for the AOC?
- b. Are the activities being conducted at LL12 in compliance with established digging restrictions and exposure parameters? How is this being tracked and managed?
- c. Are signage/markers in place to identify areas where the LUCs apply? Are they being maintained?
- d. Is the Camp Ravenna perimeter fence and associated gates being maintained in order to be an effective and protective control and deter trespassers?

2. Inspections and Reporting:

- a. Inspections are required on an annual basis. Are annual inspections being conducted as required?
- b. An Annual Report is required. Has the annual report been completed and submitted to the Ohio EPA? Did the annual report provide a written certification stating whether or not the LUCs remain in place and effective?
- c. Are the LUCs for LL12 incorporated into the Property Management Plan (PMP) (i.e., map indicating the location and dimensions of the AOC with the LUC location, environmental overlay and appropriate Ohio EPA notice procedures)?
- d. Has a 5-Year Review been completed for this AOC as required?

3. Training/Inbriefs (as applicable to LL12):

- a. Is a LUC training program in place and being conducted as applicable to LL12? Describe the training (content/who attended/who provided/documentation of training).
- b. If training was not provided, explain why and what corrective actions were initiated.

4. LUC Evaluation and Reporting of Violations (if any):

- a. Are LUCs in place and being effectively managed at LL12?
- b. Were any LUC violations or deficiencies noted?
Provide a description of any observed/noted LUC violation(s) as identified and a date of notification of LUC violations (if applicable) to ARNG/OHARNG. Also provide a description of any corrective actions taken to remedy observed LUC violations or recommended corrective actions.

Additional Notes/Comments:

Inspection Completed by

Signature:

Printed Name:

Title:

Organization:

Date:

RVAAP-12 Load Line 12 (LL12) – Land Use Control (LUC) Brief for Contractors/Personnel

The Army National Guard (ARNG)/Ohio Army National Guard (OHARNG) are required to conduct Long Term Monitoring (LTM)/LUC monitoring at RVAAP-12 Load Line 12 (LL12) at Camp Ravenna/former Ravenna Army Ammunition Plant (RVAAP). LUCs include any type of physical, legal, or administrative mechanisms that restrict use of or limit access to real property to prevent or reduce risks to human health and the environment. Established LUCs for LL12 are set forth in the *Final Remedial Design for RVAAP-12 Load Line 12*, dated 1 October 2009.

Brief History of LL12

LL12 is approximately 80 acres in the southeastern portion of the facility. LL12 was originally known as the Ammonium Nitrate Plant and started operations in 1941. The western half of LL12 contained former production areas and the eastern half was previously cleared, but did not contain any known production facilities. The investigations also identified an area immediately north of LL12 (informally termed the Team Track Area) that was used for the offloading and staging of materials. In May 1943, production of ammonium nitrate was terminated. From 1946 to 1950, a private contractor leased LL12 to produce fertilizer-grade ammonium nitrate. From 1965 to 1967, a private contractor leased Building FF-19 for the production of aluminum chloride. The U.S. Army terminated this lease early due to environmental concerns related to air emissions and wastewater discharges to Cobbs Ponds. In June 1944, Buildings 900, 904, and 905 were converted for demilitarization of munitions. Rinsate from demilitarization operations was initially allowed to flow out of the buildings and directly onto the ground or to drainage ditches. In 1981, the LL12 Pink Water Treatment Plant was built to treat the demilitarization effluent prior to discharge. After the termination of demilitarization operations, the treatment plant was used under an NPDES permit to treat explosives-tainted storm water from LL12 and other RVAAP locations. Currently, there are no above-grade structures remaining at the LL12. LL12 is to be managed as Mounted Training – No Digging due to residual contamination at the AOC above cleanup goals for Commercial/Industrial and Residential Use.

Summary of Land Use Controls at LL12

The following LUCs have been developed for LL12 considering specific parameters established for Mounted Training – No Digging and must be adhered to:

- Maintain the Camp Ravenna perimeter fence – Land use of LL12 shall be limited by the maintenance of the existing Camp Ravenna perimeter fence which shall be of 6-foot, chain-link fence topped with v-shaped bracket slanting inward and outward with a three-strand barbed wire bracket.
- Restrict future land use to National Guard mounted training – Land use shall be limited to use of LL12 for National Guard mounted training operations. Activities at LL12 shall be limited to the following: tracked and wheeled vehicle operations and associated training activities along with training area development and maintenance, maintaining the integrity of monitoring wells, road and culvert repair, routine ditch maintenance, vegetation management, and compatible natural resources management activities;
- Maintain a LUC training program;
- Limit activities to tracked and wheeled operations that are consistent with the National Guard mounted training scenario and other essential security, safety, and natural resources management activities (National Guard Trainee – Mounted Training - 24 hours/day for 39 days/year for 25 years); and
- Prohibit digging beyond four (4) feet below ground surface (bgs) except for routine maintenance of roads, ditches and culverts, and ground surface repairs resulting from maneuver damage.

If a LUC violation is identified, please contact Range Control at (614)336-6041 to report.

I have been briefed and understand the requirements and LUCs/restrictions at Load Line 12. I will comply with all requirements. I will complete the access log for LL12 when obtaining the key and accessing the AOC. Please sign and submit to Camp Ravenna ENV Office (Katie Tait).

Printed Name	Signature	Company	Date

Appendix A, Section A.2
No Further Action (NFA) Sites

AOC/MRS SITES THAT HAVE ACHIEVED NO FURTHER ACTION (NFA) STATUS

The AOCs and MRSs listed in this Appendix are those sites that have achieved No Further Action (NFA) as part of the RVAAP Restoration Program. This Appendix will be updated annually to include additional AOCs/MRSs that have achieved NFA.

AOC/MRS	Appendix Tab	No Further Action Details	Date Section Added to the PMP	Revision or Update
RVAAP-02 Erie Burning Grounds	RVAAP-02	Record of Decision for soil and dry sediment approved in 2007.	August 2018	
RVAAP-04 Open Demolion Area #2	RVAAP-04	Record of Decision for soil and dry sediment approved in 2007.	August 2018	
RVAAP-08-R Load Line 1A MRS	RVAAP-008-R-01	Record of Decision approved in 2015.	August 2018	
RVAAP-13 Building 1200	RVAAP-13	Record of Decision approved in 2014.	August 2018	
RVAAP-33-R-01 Firestone Test Facility MRS	RVAAP-033-R-01	Record of Decision approved in 2015.	August 2018	
RVAAP-34-R-01 Sand Creek Dump MRS	RVAAP-34-R-01	Record of Decision approved in 2015.	August 2018	
RVAAP-48 Anchor Test Area	RVAAP-48	Record of Decision approved in 2014.	August 2018	
RVAAP-49 Central Burn Pits	RVAAP-49	Record of Decision for soil and dry sediment approved in 2009.	August 2018	
RVAAP-62-R-01 Water Works No. 4 MRS	RVAAP-062-R-01	Record of Decision approved in 2015.	August 2018	

Appendix A.2-02: Erie Burning Grounds (RVAAP-02) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-02.1 Background, Site Location and Description

Erie Burning Grounds (EBG), designated as RVAAP-02, covers approximately 35 acres in the northeastern corner of the facility. The EBG area may have been used for brick manufacturing prior to its acquisition by the US Army in 1940. From 1941 to 1951, the Area of Concern (AOC) was used to perform open burning of propellants, bulk explosives, and explosives-contaminated materials, such as rags, paper, and sawdust. Metal items contaminated with explosives were also burned to make them safe for salvaging or recycling. Once burned, the metal items were recovered and processed as scrap. Ash residues were not removed. A wooden chute at the east end of Track 49 was used to move material to a burn area immediately north of the rail spur. A burning area, enclosed by water-filled ditches for fire control, was constructed south of Track 49. This area is informally called the T-Area. A borrow area between Tracks 49 and 10 may have also been used for open burning.

In the 1990s, the area became inundated due to sedimentation, vegetation growth, and beaver activity, which plugged some drainage culverts and small streams that drained EBG. The resulting wetlands now cover approximately 60% of the AOC. The eastern end of the Track 49 embankment, the former burn area, the northern part of the gravel access road, and the T-Area are where most burning activities are known or suspected to have occurred.

A.2-02.2 Publications

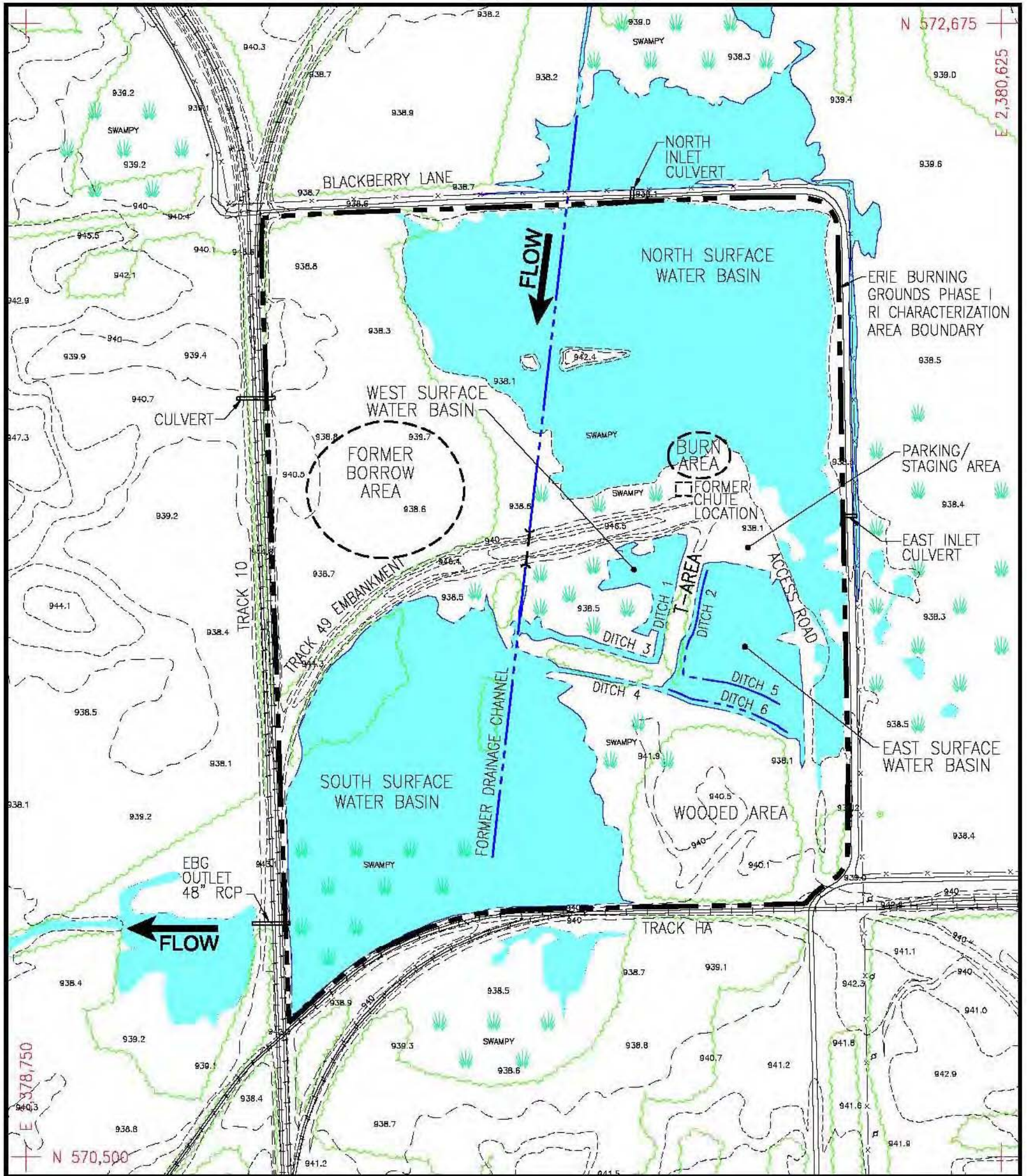
The following publications relevant to the Record of Decision (ROD) for EBG can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase II Remedial Investigation Report for RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 26 September 2005.
- Final Addendum to the Phase II Remedial Investigation Report for RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 25 September 2006.
- Final Proposed Plan for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 22 February 2007.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 02 Erie Burning Grounds at Ravenna Army Ammunition Plant. SAIC. 19 September 2007b.

A.2-02.3 No Further Action Required

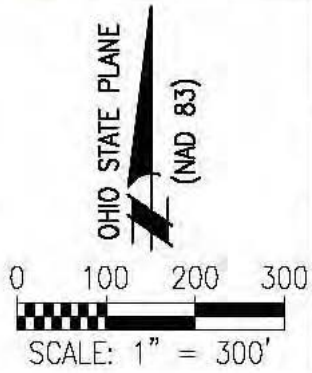
No Further Action (NFA) under CERCLA is necessary for soil and dry sediment at EBG. Groundwater and surface water at EBG will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision as no contaminants of concern (COCs) were identified in soil and dry sediment for the representative receptor (Hunter/Trapper and Fire/Dust Suppression Worker) and Resident Subsistence Farmer.

NFA for soil and dry sediment is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because contamination in soil and dry sediment at EBG does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2007b).



LEGEND:

- GRAVEL ROAD
- RAILROAD TRACKS
- GROUND CONTOUR (10-FT INTERVAL)
- GROUND CONTOUR (2-FT INTERVAL)
- SPOT ELEVATION
- TRIBUTARY
- STREAM
- TREELINE
- EBG PHASE I RI CHARACTERIZATION AREA BOUNDARY
- RCP.....REINFORCED CONCRETE PIPE



US Army Corps
of Engineers
Louisville District

**U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
LOUISVILLE, KENTUCKY**

**ERIE BURNING GROUNDS
RVAAP - RAVENNA, OHIO**

DRAWN BY: R. BEELER	REV. NO./DATE: REV. 0 / 12-08-03	CAD FILE: /03025/DWGS/S80SITE1
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Appendix A.2-04: Open Demolition Area #2 (ODA2) (RVAAP-04) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-04.1 Background, Site Location and Description

ODA2, designated as RVAAP-04, is situated in the central portion of the facility and is 25 acres. Starting in 1948, the US Army used ODA2 as a location to detonate bombs, various caliber munitions, and off-specification bulk explosives that could not be destroyed through any other means due to their condition at the RVAAP. Materials to be destroyed by open detonation were typically placed in pits excavated to depths of at least 4 ft, then covered with 2 ft of soil, and detonated. Following detonation, the Area of Concern (AOC) was searched for scrap metal, shrapnel, or Munitions and Explosives of Concern (MEC). MEC has been found several thousand feet from the detonation site and throughout ODA2. Other operations at this AOC included the burial of MEC and a munitions firing area. Known historical areas of operation within ODA2 include:

- Open Detonation Areas [including the Resource Conservation and Recovery Act (RCRA)-permitted unit]: Following detonation and the removal of metal pieces, the pits were backfilled, mulched, and seeded.
- Open Burning Area: From 1981 to 1986, the US Army used this area within the RCRA unit to thermally destroy explosives-contaminated sludges and residues from other RVAAP production areas.
- 40-mm Projectile Prototype Testing Range: The US Army fired projectiles into targets in this area.
- Three explosive storage bunkers: Buildings 1501, 1502, and 1503.
- Burial Sites 1 and 2: Burial Site 1 is located approximately 200 ft northeast of Building 1501 and is approximately 2 acres in size. Burial Site 2 is located approximately 100 ft north of Building 1503 and is approximately 1 acre in size. MEC was likely buried at both areas.
- A MEC disposal area located along a 70-ft embankment northeast of Building 1503 overlooking Sand Creek. MEC exists at the ground surface in this part of the AOC.

Elevations across ODA2 range from approximately 1,017 to 1,071 ft above mean sea level. ODA2 is characterized by gently to steeply sloping topography. The AOC is bisected by Sand Creek. Structures at ODA2 include three above-ground explosive storage bunkers and gravel access and paved roads. Access to ODA2 is restricted by a locked gate on the main access road that enters the AOC from the south.

A.2-04.2 Publications

The following publications relevant to the Record of Decision (ROD) for ODA2 can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Phase II Remedial Investigation Report for RVAAP- 04 Open Demolition Area #2 at Ravenna Army Ammunition Plant, Volumes 1 & 2. SpecPro. 27 September 2005.
- Final Addendum to the Phase II Remedial Investigation Report for RVAAP-04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 12 September 2006.
- Final Proposed Plan for Soil and Dry Sediment at RVAAP-04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 23 February 2007.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 04 Open Demolition Area #2 at Ravenna Army Ammunition Plant. SAIC. 19 September 2007b.

A.2-04.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediments at ODA2. Groundwater and surface water at ODA2 will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision because chemicals in soil and dry sediment do not exceed cleanup goals for the intended land use. Land use is currently restricted at ODA2 because of the documented presence of MEC. ODA2 will be maintained as restricted access under intended future land use. The Army will address land use controls for ODA2 under the Military Munitions Response Program (MMRP), as part of future response actions for MEC. The Army will maintain current interim use restrictions at ODA2 until such time that final actions are completed under the MMRP.

NFA for soil and sediment is protective of human health under the intended future land use and is protective of the environment. NFA meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. The Army will address requirements for periodic reviews under the MMRP, as part of future response actions for MEC (SAIC, 2007b).



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Legend

- Road
- Vegetation
- Water
- 2 Ft. Contour
- 10 Ft. Contour
- x— Fence Line
- Sand Creek Flow Direction
- RCRA Unit
- Rocket Ridge
- 40-m Prototype Test Range
- Burial Site 2
- Burial Site 1
- 1501, 1502, 1503: Explosive Storage Bunkers

ODA2 AOC Map
Drawn By: HRA
CAD FILES: R51718/R51617/R41415/R41516
Date: 2006/DEC/11

Appendix A.2-008-R-01: Load Line 1A Munitions Response Site (MRS) (RVAAP-008-R-01) No Further Action (NFA) Status

A.2-008.1 Background, Site Location and Description

The Load Line #1A MRS is located at the north end of the former Load Line #1, which is situated at the eastern portion of Camp Ravenna. The former Load Line #1 is approximately 164 acres in area and was used to melt and load TNT and Composition B explosives into large-caliber shells during World War II and the Korean War. Activities initially conducted near the MRS included packing and shipping. After munitions manufacturing ceased at Load Line #1, the later activities near the MRS included the demilitarization of primers containing propellants at a former popping furnace.

The MRS was originally referred to as "Load Line #1 MRS" during the previous investigations and activities that occurred at the MRS under the Military Munitions Response Program (MMRP) and prior to the Remedial Investigation (RI) field work. In coordination with the Ohio EPA and the Army National Guard (ARNG), the designation for the current MRS area was revised to "Load Line #1A MRS" following the RI field work due to propellants that have since been observed outside the current MRS boundary.

A.2-008.2 Publication

The following publications relevant to the Record of Decision (ROD) for Load Line 1A MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Military Munitions Response Sites. Environmental and Engineering Management, LLC (e2M). 13 May 2008.
- Final Work Plan for Military Munitions Response Program Remedial Investigation, Ravenna Army Ammunition Plant Ravenna, Ohio, Shaw Environmental & Infrastructure, Inc., (Shaw) March 2011.
- Final Remedial Investigation Report for RVAAP-008-R-01 Load Line #1A MRS Version 2.0. CB&I Federal Services. LLC, 28 August 2014.
- Final No Further Action Proposed Plan for RVAAP-008-R-01 Load Line #1A Munitions Response Site Version 1.0. CB&I Federal Services, LLC, 06 May 2015.
- Final No Further Action Record of Decision for RVAAP-008-R-01 Load Line #1A Munitions Response Site Version 1.0. CB&I Federal Services, LLC, 14 August 2015b.

A.2-008.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Load Line #1A MRS under the MMRP. No evidence of munitions and explosives of concern (MEC) was found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) at locations specified in the Final Work Plan for Military Munitions Response Program Remedial Investigation Environmental Services (Shaw, 2011), and no chemicals of concern (COCs) or chemicals of potential ecological concern (COPECs) that presented potential risks to human or environmental receptors, respectively, were found. The MRS is collocated with a designated Installation Response Program (IRP) Area of Concern (AOC), RVAAP-08 Load Line #1. COCs identified in the environmental media at the collocated AOC, if any, have either already been addressed or will continue to be addressed under future CERCLA decisions to be carried out under the IRP.

No MEC were encountered at the Load Line #1A MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015b).



RVAAP-008-R-01
Load Line 1A MRS



Former Building CA-14
Elevated Slab

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

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 MRS Boundary



**U.S. ARMY
CORPS OF ENGINEERS
BALTIMORE DISTRICT**

MILITARY MUNITIONS RESPONSE PROGRAM

LOAD LINE #1A MRS
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO

0 50 100 Feet
Projection : NAD_1983_UTM_Zone_17N



CB&I Federal Services LLC
150 Royall Street
Canton, MA 02021

Appendix A.2-13: Building 1200 – (RVAAP-13) – No Further Action (NFA) STATUS for Soil, Sediment, and Surface Water

A.2-13.1 Background

The Building 1200 Area of Concern (AOC) was designated as the Ammunition Sectioning Area. From 1941 to 1971, three buildings served as a quality assurance (QA) inspection station that encompassed disassembly of production line munitions items, including explosive melt-pour operations. The primary operations building was Building 1200, which was a 30 by 20 ft combined reinforced concrete and transite panel frame structure. The steam melt-out process generated explosives-contaminated wastewater (pink water), which discharged from the building via a pipe, through a crushed slag gravel bed, and into a ditch connected to a 0.5-acre, unlined settling pond (located approximately 415 ft northeast of Building 1200). The depth of the settling pond is less than 3 ft. Overflow from the settling pond discharged directly to the ground surface southeast of the pond; there is no documented evidence of a discharge drainage ditch exiting the settling pond and flowing to a surface water body.

Building demolition activities took place between November 2004 and August 2005, and no buildings or structures remain at the AOC. The remaining surface features include the access road, drainage ditch from the former operations area to the former settling pond, and the former settling pond and associated discharge area.

A.2-13.2 Publications

The following publications can be located on <www.RVAAP.org> or in established RVAAP information repositories:

- Final Quality Control Plan for the Phase I Remedial Investigation for High Areas of Concern at RVAAP, June 1996.
- Final Phase I Remedial Investigation Sampling and Analysis Plan Addendum for High Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Phase I Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for the Ravenna Army Ammunition Plant, July 1996.
- Final Public Meeting Briefing Phase I Remedial Investigation of High Priority Areas of Concern at the Ravenna Army Ammunition Plant, September 1997.
- Phase I Remedial Investigation Report for High Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio, February 1998.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs at RVAAP, October 2004.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.

- Final Quality Assurance Surveillance Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation at Ravenna Army Ammunition Plant, September 2008.
- Final Project Management Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation, September 2008.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, March 2012.
- Final Proposed Plan for Soil, Sediment and Surface Water at RVAAP-13 Building 1200, April 2013.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, March 2014.
- Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, August 2014.
- Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200, May 2015.

A.2-13.3 Site Location and Description

The Building 1200 AOC is a former operational facility designated as RVAAP-13. The AOC is approximately 7.7 acres and is situated in the eastern portion of Camp Ravenna. Building demolition activities took place between November 2004 and August 2005, and no buildings or structures remain at the AOC. The remaining surface features include the access road, drainage ditch from the former operations area to the former settling pond, and the former settling pond and associated discharge area.

The topography at the Building 1200 AOC gently slopes radially from a high point just southwest of the former operations buildings. Ground elevations at the AOC range from 990 to 1004 ft above mean sea level (amsl). Intermittent surface water flows in the drainage ditch from the former operations area east to the former settling pond during precipitation events and periods of snow melt. The ditch tends to hold water for extended periods of time due to the low permeability of soil. Surface water discharge from the former settling pond occurs via an outlet channel to the southeast. Discharge flow is diffuse and enters into a heavily wooded area to the south of the pond. The nearest defined surface water conveyance (large ditch line or tributary flowing southwest to Sand Creek) that receives surface water flow lies approximately 1,000 ft to the southeast of the settling pond discharge area.

The Building 1200 AOC is on a local bedrock high. The AOC is underlain by a thin unconsolidated interval generally less than 3 ft thick. The underlying bedrock formation observed at the AOC is the Pennsylvanian age Pottsville Formation, Sharon Sandstone Member. The sandstone unit of the Sharon member (informally referred to as the Sharon Conglomerate) is a highly porous, loosely

cemented, permeable, cross-bedded, frequently fractured and weathered orthoquartzite sandstone, which is locally conglomeritic. The Sharon Conglomerate exhibits locally occurring thin shale lenses in the upper portion of the unit. Upper members of the Pottsville Formation are not present at the AOC.

A.2-13.4 Land Use and Activities

The AOC will be used for Military Training. The selected and implemented remedy for soil, sediment, and surface water allows for Unrestricted (Residential) Land Use, which also allows for Military Training Land Use.

A.2-13.5 Remedy Objectives

The *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2014) documented that no further action (NFA) was required for sediment and surface water at the AOC. Manganese in soil was identified as a chemical of concern (COC) requiring remediation to attain Unrestricted (Residential) Land Use. Remedial activities were conducted in December 2014 and January 2015 and were summarized in the *Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200* (USACE 2015). A total of 376 tons of contaminated soil was excavated from two contaminated areas within the AOC and transported and disposed at a local landfill. Confirmation sampling results and concurrence from the Ohio Environmental Protection Agency (EPA) concluded that the AOC met the criteria for Unrestricted (Residential) Land Use after implementation of the remedial action.

A.2-13.6 Land Use Controls

Land use controls (LUCs) are not required for soil, sediment, and surface water at the Building 1200 AOC. The remedial action achieved the remedial action objective (RAO) for manganese in soil to attain Unrestricted (Residential) Land Use, and NFA was required for sediment and surface water. Other media (i.e., groundwater) will be addressed as part of future actions.

A.2-13.7 Monitoring and Reporting

Five-year reviews are not required for soil, sediment, and surface water at the Building 1200 AOC, which is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c).

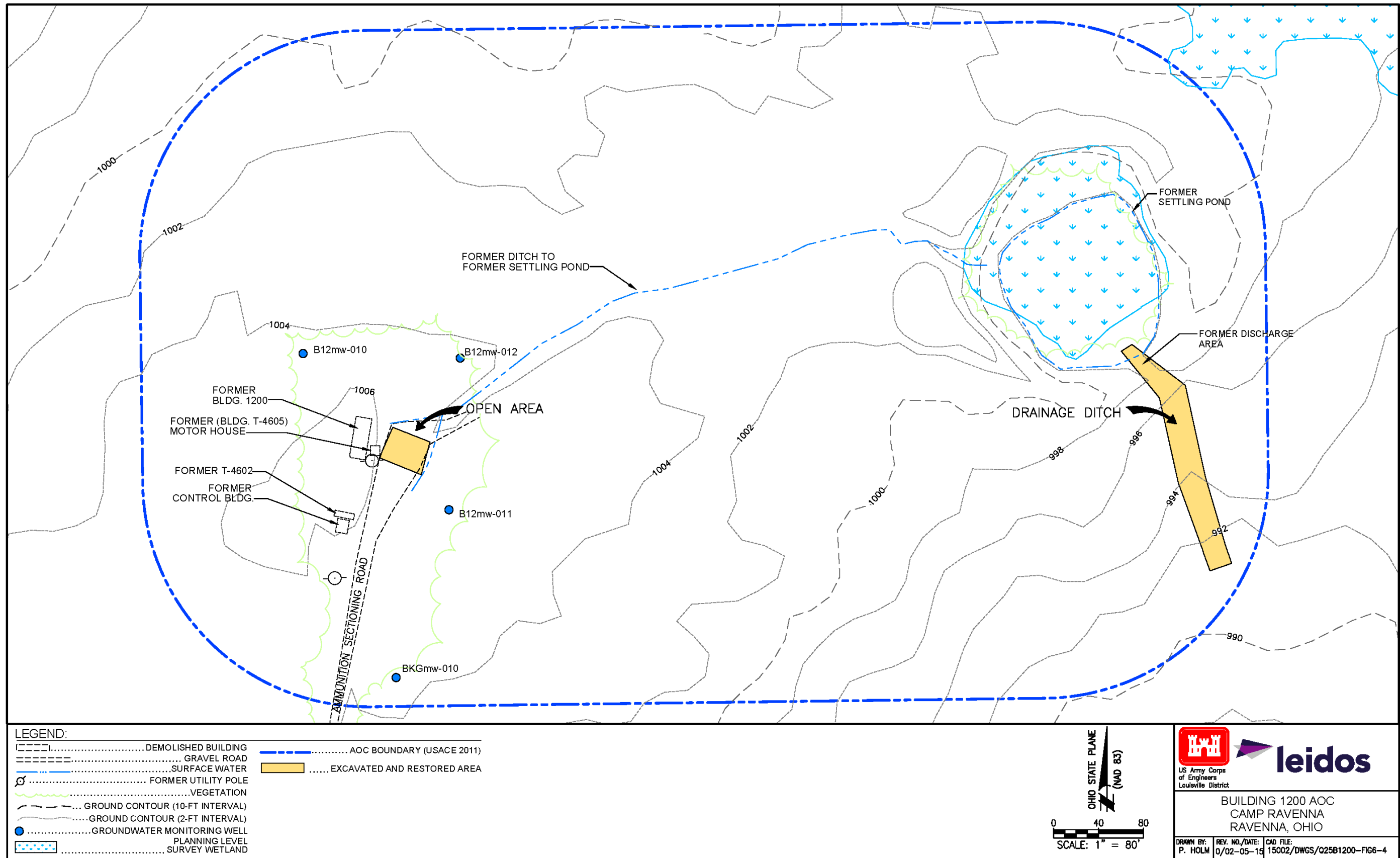


Figure A.13-1. Features of the Building 1200 AOC

Appendix A.2-033-R-01: Firestone Test Facility Munitions Response Site (MRS) (RVAAP-033-R-01) – No Further Action (NFA) Status

A.2-033.1 Background, Site Location and Description

The Firestone Test Facility was originally an approximately 1-acre area that consisted of three buildings, a test pond, and a suspected test range. Two of the buildings were used as a test chamber for tube-launched, optically-tracked, wire-guided missiles and Dragon missiles, while shaped charges were tested under water at the test pond. Due to the classified nature of the research that was conducted at the Firestone Test Facility, there is little available information regarding the activities that occurred or how the tests were conducted (SAIC, 1996). The tests that were conducted were reportedly contained, which limited any release of Munitions and Explosives of Concern (MEC) (engineering-environmental Management, Inc. [e2M], 2007). A third, smaller building was located adjacent to the former test pond that was used for testing shaped charges. The building, which measured 10 feet high and 10 feet square, was constructed of reinforced concrete and fitted with steel plates and was surrounded by a barricade constructed of railroad ties. All three buildings have been removed, and the areas have been cleared of surface construction debris. Some buried construction debris is evident in the area around the former test pond due to mounded areas with rebar protruding through the ground surface. The MRS is currently 0.41 acres and is the location of the former building and area around the former test pond. The MRS is currently undeveloped, vacant land with no improvements.

A.2-033.2 Publications

The following publications relevant to the Firestone Test Facility MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. Environmental and Engineering Management, LLC (e2M). May 2008.
- Final Remedial Investigation Report for RVAAP-033-R-01 Firestone Test Facility MRS, Version 1.0. CB&I Federal Services, LLC, 26 August 2014.
- Final No Further Action Proposed Plan for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site, Version 1.0. CB&I Federal Services, LLC, 06 May 2015.
- Final No Further Action Record of Decision for RVAAP-033-R-01 Firestone Test Facility Munitions Response Site. CB&I Federal Services, LLC, 14 August 2015.

A.2-033.3 No Further Action Required




No Further Action (NFA) under CERCLA is necessary for the Firestone Test Facility MRS under the Military Munitions Response Program (MMRP). No evidence of MEC was found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP. The MRS was further evaluated for munitions constituents (MC) at locations specified in the Final Work Plan for Military Munitions Response Program Remedial Investigation Environmental Services (Work Plan; Shaw Environmental & Infrastructure, Inc. [Shaw], 2011), and no chemicals of concern (COCs) or chemicals of potential ecological concern (COPECs) that presented potential risks to human or environmental receptors, respectively, were found.

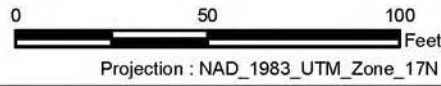
No MEC were encountered at the Firestone Test Facility MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, LLC., 2015).

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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

-  MRS Boundary
-  Fence Line
-  Direction of Drainage Channel Flow



	U.S. ARMY CORPS OF ENGINEERS BALTIMORE DISTRICT
	MILITARY MUNITIONS RESPONSE PROGRAM

FIRESTONE TEST FACILITY MRS
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO

	CB&I Federal Services LLC 150 Royall Street Canton, MA 02021
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Appendix A.2-034-R-01: Sand Creek Dump Munitions Response Site (MRS) (RVAAP-034-R-01) – No Further Action (NFA) Status

A.2-034.1 Background, Site Location and Description

The Sand Creek Dump MRS is collocated with an Installation Restoration Program (IRP) Area of Concern (AOC) known as the Sand Creek Disposal Road, or RVAAP-34. The site is a former open dump area that operated from 1950 to 1960. In general, it is assumed that the construction- and debris-type materials were delivered and dumped over an embankment located immediately adjacent to Sand Creek. The dump site extended along the embankment for approximately 1,200 feet and varied in width from 20 to 40 feet from the top of the bank to the bottom. The bank slopes from east to west towards Sand Creek at 40 to 60 degrees from horizontal (CB&I, 2015b).

Two demilitarized 75mm projectiles were found following the 2003 Removal Action (RA) at the collocated AOC and were considered munitions debris (MD). Evaluation of the Sand Creek Dump as an MRS was initiated under the Military Munitions Response Program (MMRP) following the MD findings during the RA. A 105mm projectile was observed in Sand Creek during the 2008 Site Investigation (SI) field work; however, it is not known from where the projectile originated. The projectile appeared to be empty, but it was not inspected to determine the explosive safety status as either “safe” or “hazardous.” The projectile was not observed in the creek during the RI field work, and the disposition of this projectile is unknown. The 2015 Remedial Investigation (RI) field work confirmed the results of previous investigations at and outside the MRS where no munitions and explosives of concern (MEC) have ever been found; therefore, an explosive safety hazard is not present at the Sand Creek Dump MRS. Based on the results of MEC investigation, it was determined that no potential source of munitions constituents (MC) was present at the Sand Creek Dump MRS.

A.2-034.2 Publications

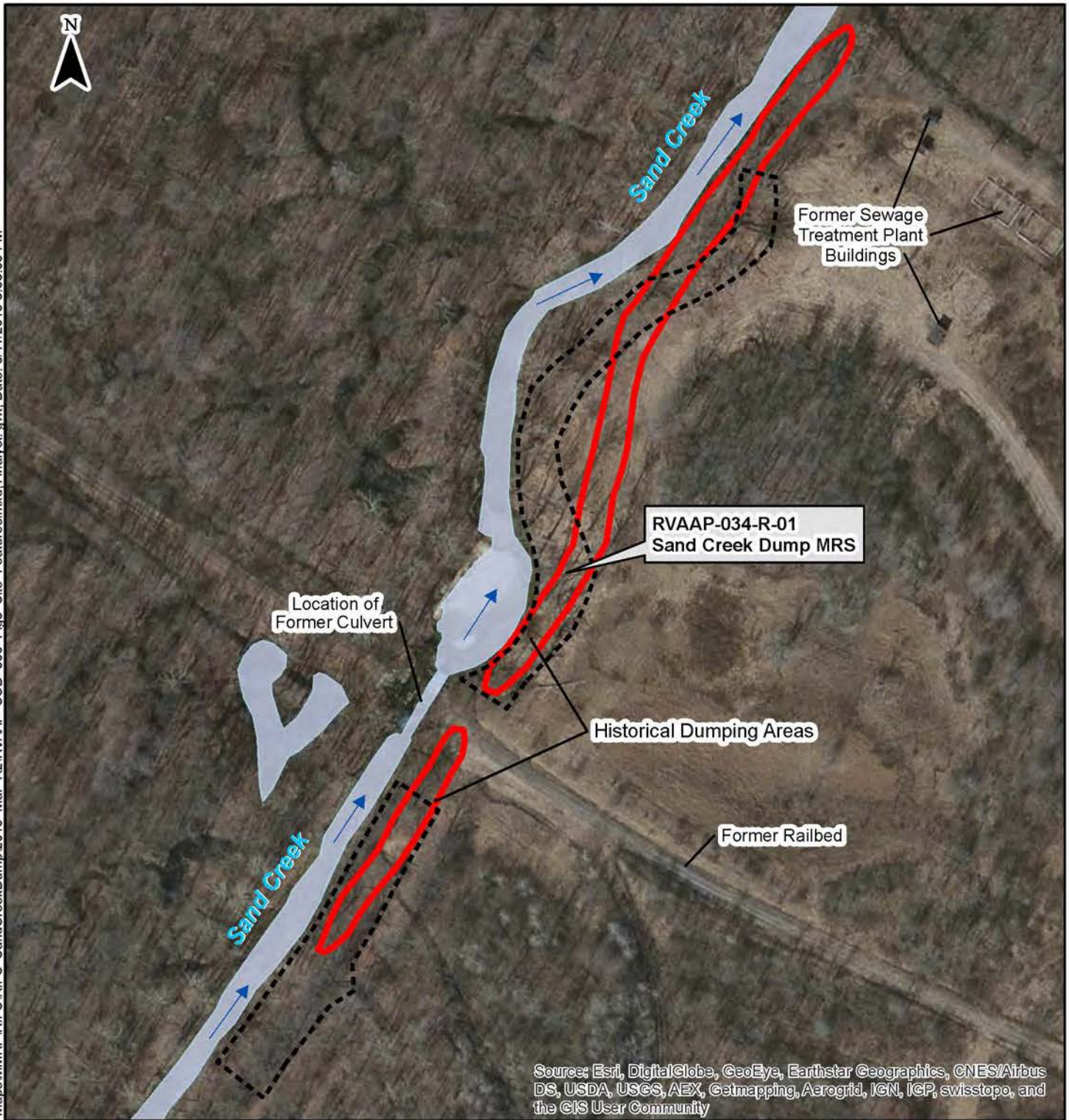
The following publications relevant to the Record of Decision (ROD) for the Sand Creek Dump MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Design/Removal Action Plan for RVAAP- 34 Sand Creek Disposal Road Landfill at Ravenna Army Ammunition Plant. MKM Engineers, Inc. 01 March 2004.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. environmental-engineering management, Inc. (e2M). May 2008.
- Final Remedial Investigation Report for RVAAP-034-R-01 Sand Creek Dump MRS. CB&I Federal Services, LLC. 25 March 2015a.
- Final No Further Action Proposed Plan for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 28 May 2015b.
- Final No Further Action Record of Decision for RVAAP-034-R-01 Sand Creek Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 29 September 2015.


A.2-034.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Sand Creek Dump MRS under the Military Munitions Response Program (MMRP). No evidence of munitions and explosives of concern (MEC) or a source of munitions constituents (MC) from MEC or munitions-related activities were found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP.

No MEC were encountered at the Sand Creek Dump MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the MMRP is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015).



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

-  MRS Boundary
-  AOC Boundary
-  Stream
-  Direction of Flow



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MILITARY MUNITIONS RESPONSE PROGRAM

SAND CREEK DUMP MRS
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO



CB&I Federal Services LLC
150 Royall Street
Canton, MA 02021



Projection : NAD_1983_UTM_Zone_17N

Appendix A.2-48: Anchor Test Area – (RVAAP-48) – No Further Action (NFA) STATUS for Soil, Sediment, and Surface Water

A.2-48.1 Background

Although operational information is relatively limited about this former research and development area used by the Firestone Tire and Rubber Company Defense Research Division, it is believed that Anchor Test Area was used for testing explosives-driven soil anchoring devices. These devices typically consisted of metal rods driven into the ground and attached via a cable to stabilize structures or anchor them to the ground. The dates this Area of Concern (AOC) was used are unknown; however, a 1961 drawing shows the final design for the AOC; therefore, it is likely it was not active until after the early 1960s. Aerial photographs from 1966 confirm the construction of AOC features, but it is unknown whether Anchor Test Area was active at the time of the photographs.

A.2-48.2 Publications

The following publications can be located on <www.RVAAP.org> or in established Ravenna Army Ammunition Plant (RVAAP) information repositories:

- Hazardous and Medical Waste Study No. 37-EF-5360-99 Relative Risk Site Evaluation for Newly Added Sites, October 1998.
- Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs, October 2004.
- Final Characterization of 14 AOCs at Ravenna Army Ammunition Plant, March 2007.
- Final Quality Assurance Surveillance Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation at Ravenna Army Ammunition Plant, September 2008.
- Final Project Management Plan for the 2008 Performance-Based Acquisition of Environmental Investigation and Remediation, December 2008.
- Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services, September 2009.
- Final PBA 2008 Supplemental Investigation Sampling and Analysis Plan Addendum No. 1 at Ravenna Army Ammunition Plant, December 2009.
- Final Remedial Investigation/Feasibility Study Report for Soil, Sediment, and Surface Water at the RVAAP-48 Anchor Test Area, Ravenna Army Ammunition Plant, Ravenna, Ohio, January 2012.
- Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, May 2013.
- Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, March 2014.
- Final Remedial Design for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200 and RVAAP-48 Anchor Test Area, August 2014.

- Final Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area, April 2015.

A.2-48.3 Site Location and Description

Anchor Test Area is approximately 0.5 acres and is located approximately 50-75 ft west of Wilcox-Wayland Road and 2,500 ft south of Newton Falls Road (Figures 2-2 and 2-3). The distinct surface features of the AOC are the former earthen blast wall (dirt mounds) and a nearby 12 by 36 ft sandpit. The anchor tests were likely performed within the sandpit. The adjacent dirt mounds functioned as blast walls. One mound is approximately 8-10 ft high while the others are only 1-2 ft high. The dirt mounds are still observable, although the mounds are overgrown with vegetation and small trees. The sandpit is no longer visually distinct due to vegetative growth. Metal debris is visible in the area, and a section of concrete culvert can be seen in one of the dirt mounds.

The immediate vicinity is heavily forested with the exception of the large wetland approximately 500 ft to the south. No perennial surface water or drainage conveyance features are present at the AOC. Sediment and surface water are not considered media of concern at Anchor Test Area. Surface water occurs only intermittently as overland storm water runoff associated with heavy rainfall events and generally flows towards the wetland located 500 ft to the south. The wetland is drained to the south by an unnamed stream which enters the west branch of the Mahoning River.

Anchor Test Area is located on the southern edge of a small topographic high isolated from other former operational areas at an elevation of approximately 1004 ft above mean sea level (amsl). From this topographic high, the elevation gently slopes downward towards the south and west to approximately 998 ft amsl.

A.2-48.4 Land Use and Activities

The AOC will be used for Military Training. The selected and implemented remedy for soil allows for Unrestricted (Residential) Land Use, which also allows for Military Training Land Use.

A.2-48.5 Remedy Objectives

The *Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2014) documented that sediment and surface water are not present at the AOC. Arsenic in soil was identified as a chemical of concern (COC) requiring remediation to attain Unrestricted (Residential) Land Use. Remedial activities were conducted in November 2014 and were summarized in the *Remedial Action Report for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area* (USACE 2015). A total of 45 tons of contaminated soil was excavated from within the AOC and transported and disposed at a local landfill. Confirmation sampling results and concurrence from the Ohio Environmental Protection Agency (Ohio EPA) concluded that the AOC met the criteria for Unrestricted (Residential) Land Use after implementing the remedial action.

A.2-48.6 Land Use Controls

Land use controls (LUCs) are not required for soil, sediment, or surface water. The remedial action achieved the remedial action objective (RAO) for arsenic in soil to attain Unrestricted (Residential) Land Use. Sediment and surface water are not present at Anchor Test Area. Other media (i.e., groundwater) will be addressed as part of future actions.

A.2-48.7 Monitoring and Reporting

Five-year reviews are not required for soil, sediment, and surface water at Anchor Test Area, which is compliant with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121(c).

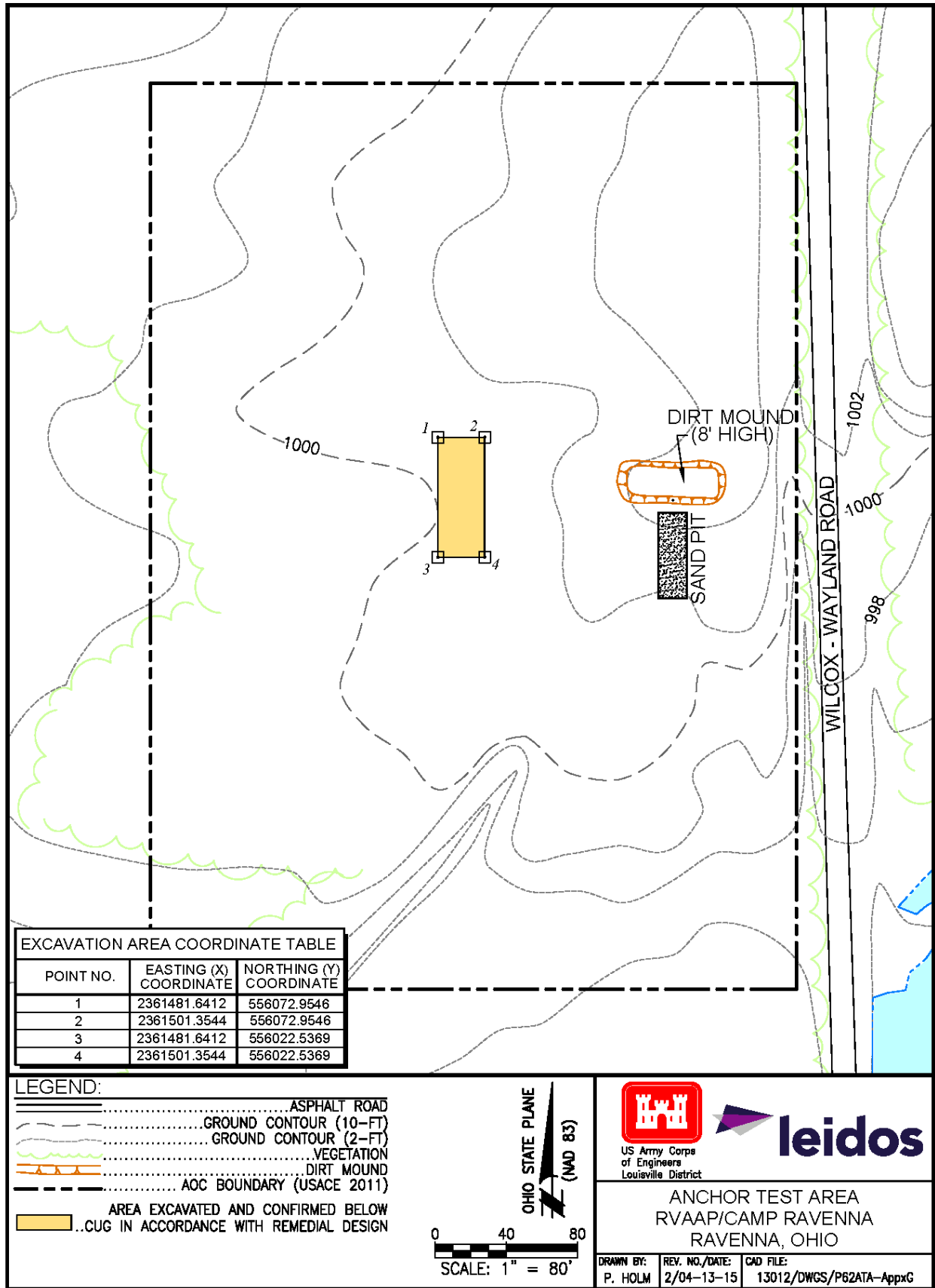


Figure A.48-1. Features of Anchor Test Area

Appendix A.2-49: Central Burn Pits (RVAAP-49) – No Further Action (NFA) Status for Soil and Dry Sediment

A.2-49.1 Background, Site Location and Description

The Central Burn Pits (CBP) is in the east-central area at the intersection of Paris-Windham Road and Lumber Yard Road and is approximately 20 acres in size. The Area of Concern (AOC) is bordered by former railroad tracks to the north (Track 39) and south (Track 33), and Sand Creek to the west-northwest. The topography across the majority of CBP is relatively flat due to historical grading and fill activities. Undisturbed topography is characterized by gently undulating contours.

CBP, designated as AOC RVAAP-49, was originally used as a lumber and building materials storage area. CBP was later used for open burning of non-explosive wastes, electrical components, wooden boxes and other combustible scrap. Operation of the burn pits is believed to have started shortly after RVAAP began operations and continued until the mid 1970s, although actual dates are unknown. In addition, disposal of non-hazardous waste material (e.g., concrete, metal, excess fill dirt and gravel) occurred at CBP; these materials were placed in various piles and elongated berms throughout the AOC.

A.2-49.2 Publications

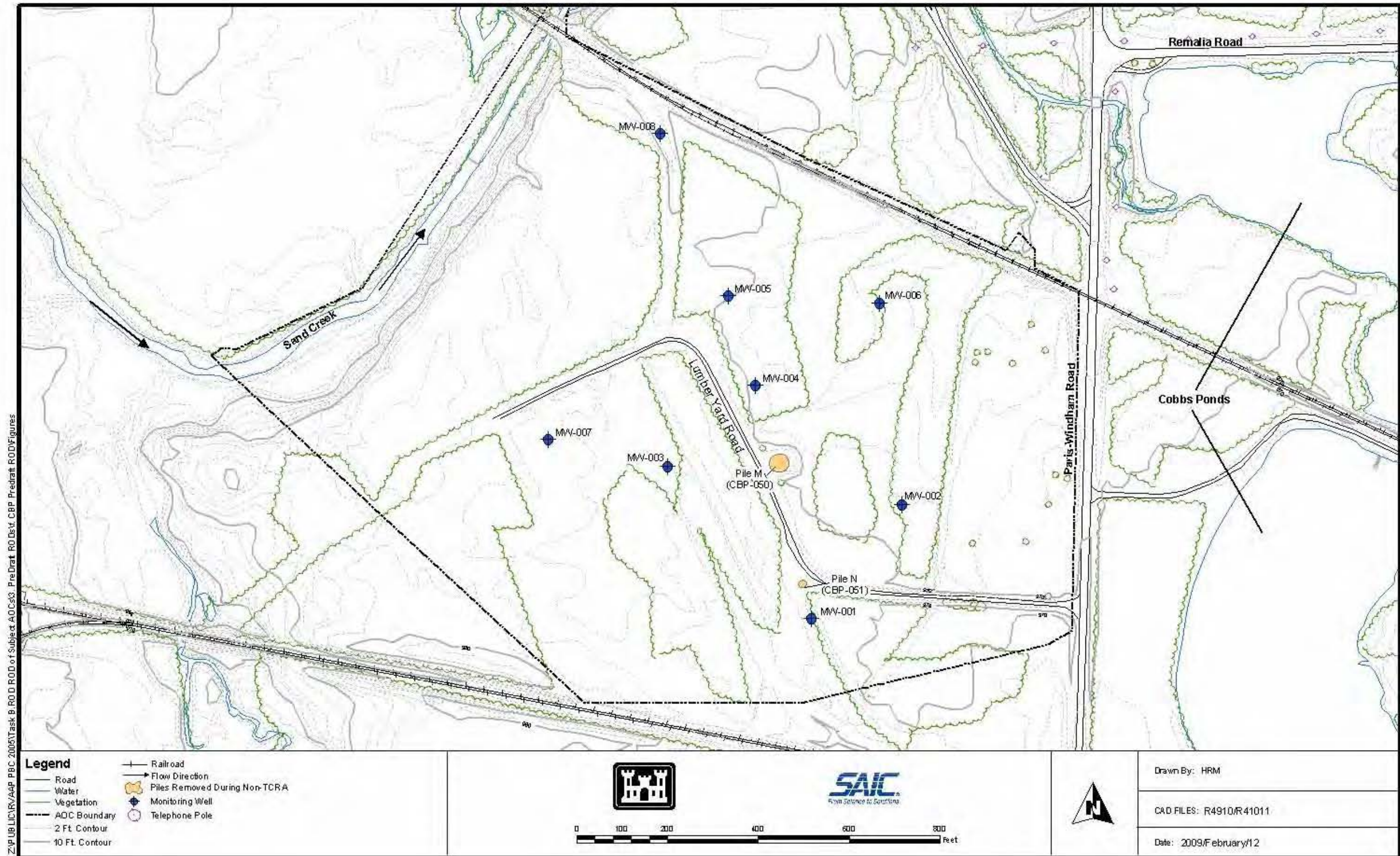
The following publications relevant to the Record of Decision (ROD) for the CBP can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Remedial Investigation Report for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. MKM Engineers, Inc./SAIC. 20 September 2005.
- Final Engineering Evaluation/Cost Analysis for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 24 January 2007.
- Final Action Memorandum for RVAAP-49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 20 June 2007.
- Final Remedial Investigation Report Addendum No. 1 for the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 27 June 2008b.
- Final Proposed Plan for Soil and Dry Sediment at the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 24 October 2008.
- Final Removal Action Report for the RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 05 December 2008.
- Final Record of Decision for Soil and Dry Sediment at RVAAP- 49 Central Burn Pits at Ravenna Army Ammunition Plant. SAIC. 21 April 2009.

A.2-49.3 No Further Action required

No Further Action (NFA) under CERCLA is necessary for soil and dry sediment at CBP. Groundwater and surface water at CBP will be addressed under future CERCLA decisions. Land use controls will not be implemented as part of this decision. No chemicals of concern (COCs) were above cleanup goals [as established in the Remedial Investigation Report Addendum No. 1 for RVAAP-49 Central Burn Pits (SAIC, 2008b)] in soil and dry sediment for the most likely foreseeable future land use (National Guard Trainee) and the residential land use (Resident Subsistence Farmer).

NFA for soil and dry sediment is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA. Because no contaminants of concern in soil and dry sediment at CBP exceeded cleanup goals for the most likely foreseeable future land use and the residential land use, and exposure does not pose a potential risk to human health or the environment, five-year reviews will not be required for soil and dry sediment (SAIC, 2009).



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Figure 3. Central Burn Pits Area of Concern Map

Appendix A.2-062-R-01: Water Works No. 4 Dump Munitions Response Site (MRS) (RVAAP-062-R-01) – No Further Action (NFA) Status

A.2-062.1 Background, Site Location and Description

The Water Works #4 Dump MRS is 0.77 acres in size and is located in the south-central portion of Camp Ravenna. The MRS consists of an open cleared area that is currently undeveloped vacant land with no improvements. The Water Works #4 Dump MRS was presumably used for the intentional dumping of nonexplosive metal parts of large caliber ordnance rounds. These dumping activities reportedly occurred from 1941 to 1949. Large-caliber casings were previously found scattered lying on the ground surface and partially buried throughout the wooded area north of the clearing, as were metal parts identified as ogives from World War I-era 155-millimeter (mm) Mk I shrapnel projectiles (engineering-environmental Management, Inc. [e2 M], 2007).

A.2-062.2 Publications

The following publications relevant to the Record of Decision (ROD) for the Water Works No. 4 Dump MRS can be located on www.RVAAP.org or in established RVAAP information repositories:

- Final Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio. engineering-environmental Management, Inc. (e2 M). January 2007.
- Final Site Inspection Report, Ravenna Army Ammunition Plant, Ohio. engineering-environmental Management, Inc. (e2 M). May 2008.
- Final Remedial Investigation Report for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site. CB&I Federal Services, LLC. 10 March 2015.
- Final No Further Action Proposed Plan for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 28 May 2015.
- Final No Further Action Record of Decision for RVAAP-062-R-01 Water Works #4 Dump Munitions Response Site, Version 1.0. CB&I Federal Services, LLC. 29 September 2015b.

A.2-062.3 No Further Action Required

No Further Action (NFA) under CERCLA is necessary for the Water Works #4 Dump MRS under the MMRP. No evidence of munitions and explosives of concern (MEC) or a source of munitions constituents (MC) from MEC or munitions-related activities were found at the MRS during the Remedial Investigation (RI) field work that was conducted under the MMRP.

No MEC were encountered at the Water Works #4 Dump MRS, and there are no explosive hazards or sources for MC. The recommendation of NFA at the MRS under the Military Munitions Response Program (MMRP) is protective of human health and the environment and meets the statutory requirements for cleanup standards established in Section 121 of CERCLA (CB&I Federal Services, 2015b).





**RVAAP-062-R-01
Water Works #4 Dump**

Open Field Area

Water Works #4 Buildings

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, ICP, swisstopo, and the GIS User Community

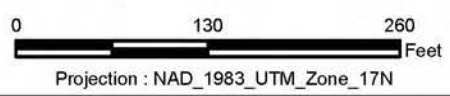
-  MRS Boundary
-  Site Investigation MRS Boundary and Remedial Investigation Expanded Investigation Area



 **U.S. ARMY
CORPS OF ENGINEERS
BALTIMORE DISTRICT**

MILITARY MUNITIONS RESPONSE PROGRAM

WATER WORKS #4 DUMP MRS
FORMER RVAAP/CAMP RAVENNA
PORTAGE AND TRUMBULL COUNTIES, OHIO



CB&I Federal Services LLC
150 Royall Street
Canton, MA 02021

H:\MAMRS\Ravenna\GIS_Documents\Project_Maps\MMR\RIFS\RIFS_WW4_006_Fig3_MRS_Features_2.mxd; Analyst: gwt; Date: 3/9/2015 2:58:22 PM

**APPENDIX B
AOC/MRS SITE INSPECTION FORM
TEMPLATE**

**Camp Ravenna Joint Military Training Center (Camp Ravenna) /
Ravenna Army Ammunition Plant (RVAAP)
LUC AOC/MRS Inspection Form Template**

In accordance with the Camp Ravenna Joint Military Training Center/Ravenna Army Ammunition Plant Property Management Plan (PMP) dated _____ and Appendix A-____ an inspection of AOC /MRS _____ was conducted by _____ [*indicate Army or its approved representative*] on _____ *date*.

Description of any observed Land Use Control (LUC) violation(s)

Date(s) of Notifications: _____

Description of any corrective actions taken to remedy observed LUC violation(s)

Status of LUC Procedures

- **AOC/MRS Map** – Is the AOC/MRS map current with respect to AOC/MRS boundaries, land activities and prescribed LUCs?

- **Signs and Other Markers**–Are the required Seibert stakes, signage and/or other required markers in place and functional? If not, when and what corrective actions will be undertaken? If not required for this AOC, note as “Not required.”

- **Training** – Was the LUC Awareness training consistently conducted over the past year? If not, why not? What corrective actions were initiated? Who provided training?

- **Required Monitoring** – Did the Army or the designated representative conduct required monitoring over the past year? If not, why not. Provide dates of inspection.

Date: _____

Name/Title: _____

Organization: _____

Signature: _____