

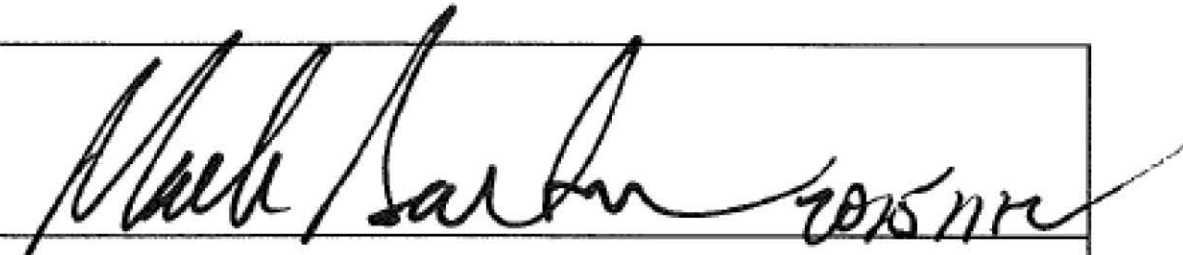
**FY2015**


**RAVENNA ARMY AMMUNITION PLANT**  
**Army Defense Environmental Restoration Program**  
**Installation Action Plan**

# JFHQ OH ARNG

## Army National Guard Cleanup Program<sup>1</sup>

### Installation Action Plan Signatures

	
MARK E. BARTMAN Major General The Adjutant General	Date

	
WILLIAM M. MYER COL, EN Chief, Environmental Programs Division	3/16/10 Date

Installation Action Plan Signatures for the following installations:

JFHQ OH ARNG  
Ravenna Army Ammunition Plant

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## Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear cleanup program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern (AOC), and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions.

In an effort to coordinate planning information between the Army National Guard (ARNG), Directorate, the Ohio Army National Guard (OHARNG), the US Army Corps of Engineers (USACE) - Louisville District, the Ohio Environmental Protection Agency (Ohio EPA), the executing agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and tentative budgets for all major Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

## Acronyms

ACM	Asbestos Containing Material
AEDB-R	Army Environmental Database-Restoration
AOC	Area of Concern
ARNG	Army National Guard Directorate
AST	Aboveground Storage Tank
bgs	below ground surface
bldg	Building
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
COC	Contaminants of Concern
COPC	Contaminants of Potential Concern
CR	Compliance Restoration
CS	Confirmatory Sampling
DD	Decision Document
DERP	Defense Environmental Restoration Program
DFFO	Director's Final Findings and Orders
DLA	Defense Logistics Agency
DQO	Data Quality Objective
EE/CA	Engineering Evaluation/Cost Analysis
ER,A	Environmental Restoration, Army
FRA	Final Remedial Action
FS	Feasibility Study
ft	feet or foot
FWGWMP	Facility-wide Groundwater Monitoring Program
FY	Fiscal Year
GSA	General Services Administration
HMX	Cyclotetramethylenetetranitramine
HRR	Historical Records Review
IAP	Installation Action Plan
ID	Identification
IMP(C)	Implementation (Construction)
INV	Investigation
IR	Installation Restoration
IRA	Interim Remedial Action
IRP	Installation Restoration Program
ISC	Initial Site Characterization
K	thousand
LAP	Load, Assemble, and Pack
LF	Landfill
LTM	Long Term Management
LUC	Land Use Control
MC	Munitions Constituents
MDAS	Material Documented as Safe
MEC	Munitions and Explosives of Concern
mm	millimeter

## Acronyms

MMRP	Military Munitions Response Program
MPPEH	Material Potentially Presenting an Explosive Hazard
MR	Munitions Response
MRS	Munitions Response Site
MRSPP	Munition Response Site Prioritization Protocol
N/A	Not Applicable
NACA	National Advisory Committee on Aeronautics
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OB/OD	Open Burn/Open Detonation
ODA	Open Demolition Area
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbons
PBA	Performance Based Acquisition
PBC	Performance Based Contract
PCB	Polychlorinated Biphenyl
PMP	Project Management Plan
POL	Petroleum, Oil, and Lubricants
PP	Proposed Plan
RA(C)	Remedial Action (Construction)
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	Cyclotrimethylenetrinitramine
RFA	RCRA Facility Assessment
RI/FS	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
RVAAP	Ravenna Army Ammunition Plant
SI	Site Inspection
STP	Sewage Treatment Plant
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TAPP	Technical Assistance for Public Participation
TCRA	Time-Critical Response Action
TD	Transferred
TNT	trinitrotoluene
TRC	Technical Review Committee
USACE	US Army Corps of Engineers
USEPA	US Environmental Protection Agency



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## Acronyms

USP&FO	United States Property and Fiscal Officer
UST	Underground Storage Tank
UXO	Unexploded Ordnance
VOC	Volatile Organic Compounds
WWII	World War II
WWT	Waste Water Treatment

# Installation Information

## Installation Locale

**Installation Size (Acreage):** 21683.28

**City:** Ravenna

**County:** Portage and Trumbull

**State:** Ohio

## Other Locale Information

The facility, consisting of 21,683 acres, is located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 kilometers (3 miles) east/northeast of the City of Ravenna and approximately 1.6 kilometers (1 mile) northwest of the City of Newton Falls. The facility, previously known as the Ravenna Army Ammunition Plant (RVAAP), was formerly used as a load, assemble, and pack facility for munitions production. As of September 2013, administrative accountability for the entire acreage of the facility has been transferred to the United States Property and Fiscal Officer (USP&FO) for Ohio and subsequently licensed to the OHARNG for use as a military training site (Camp Ravenna). References in this document to RVAAP relate to previous activities at the facility as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

Camp Ravenna is approximately 11 miles long and 3.5 miles wide and is 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.

Camp Ravenna is surrounded by several communities. Windham is to the north, Garrettsville is six miles to the northwest, Newton Falls is one mile to the southeast, Charlestown is to the immediate southwest, and Wayland is three miles to the south. When the RVAAP was operational Camp Ravenna did not exist and the entire 21,683 acre parcel was a government owned/contractor-operated industrial facility.

## Installation Mission

The OHARNG mission is to train and maintain combat ready troops and units in support of the National Military Strategy and to protect life and property and to preserve peace, order, and public safety as ordered by the Governor of the state of Ohio.

## Lead Organization

Headquarters, National Guard Bureau

## Lead Executing Agencies for Installation

USACE, Louisville District

ARNG

## Regulator Participation

<b>Federal</b>	US Environmental Protection Agency (USEPA)
<b>State</b>	Ohio EPA

## National Priorities List (NPL) Status

RAVENNA ARMY AMMUNITION PLANT is not on the NPL

## Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

RAB established 199610

### Installation Program Summaries

#### IRP

**Primary Contaminants of Concern:** Asbestos, Explosives, Metals, Nitrate/Nitrite, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

**Affected Media of Concern:** Groundwater, Sediment, Soil, Surface Water

#### MMRP

**Primary Contaminants of Concern:** Munitions and explosives of concern (MEC), Munitions constituents (MC)

**Affected Media of Concern:** Groundwater, Sediment, Soil, Surface Water

#### CR

**Primary Contaminants of Concern:** Asbestos, Explosives, Herbicides, Metals, Other (Propellants), Other (Solid Waste), Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

**Affected Media of Concern:** Groundwater, Sediment, Soil, Surface Water

## 5-Year / Periodic Review Summary

### 5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Complete	201107	201208	2012
Planned	201607	201708	2017

### Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
Erie Burning Grounds	RVAAP-02
Fuze and Booster Quarry Landfill / Ponds	RVAAP-16
Load Line 1-4	RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-11
Load Line 12	RVAAP-12
Open Demolition Area #2	RVAAP-04
Ramsdell Quarry Landfill	RVAAP-01
Winklepeck Burning Grounds	RVAAP-05

**Results** RVAAP-08, RVAAP-09, RVAAP-11 are considered short and long-term protective. RVAAP-12, RVAAP-010 and RVAAP-05 are considered short term protective. RVAAP-01 is not considered protective because the remedy was not completed.

**Actions** LUCs have not been officially implemented through a PMP. Benzo(a)pyrene, Aroclor-1254, and manganese were detected in soil and dry sediment at RVAAP-10 at concentrations that exceeded the cleanup goals specified in the Interim ROD.

**Plans** Complete facility-wide PMP.

Evaluate Load Line 3 and determine if additional sampling and/or remediation is needed. Re-evaluate remedial alternatives for Ramsdell Quarry Landfill.

#### Recommendations and Implementation Plans:

1. Develop and implement Project Management Plans (PMP) appendices to ensure protectiveness and demonstrate that Land Use Controls (LUCs) have been implemented.
2. Evaluate current environmental data for Load Line 3 to determine if additional sampling and/or remediation is needed at Load Line 3.

## Land Use Control (LUC) Summary

**LUC Title:** LUC Ramsdell Quarry LF

**Site(s):** RVAAP-01

**ROD/DD Title:** Ramsdell Quarry Landfill

**Location of LUC**

Ramsdell Quarry Landfill

**Land Use Restriction:** Landfill restriction - Prohibit activities that would impact the LF cap (or cover system) and drainage system, Landfill restriction - Prohibit excavation on LF cap or cover system, Landfill restriction - Prohibit installation of utility system lines through the site, Landfill restriction - Restrict access to the site, Landfill restriction - Restrict construction of buildings that may interfere with LF cap or cover system, Landfill restriction - Restrict plantings that interfere LF cap or cover system (roots that penetrate the cap or cover system), Landfill restriction - Restrict vehicular traffic, Restrict land use - Mitigation area(s) protection, Restrict land use - No daycare/hospital/school use, Restrict land use - No residential use

**Types of Engineering Controls:** Fences, Signs

**Types of Institutional Controls:** Dig Permits, Education programs, Notations in Master Plan, Restrictions on land use

**Date in Place:** 201503

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Other Army Entity

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** 201208

**LUC Enforcement:** Annual Inspections, 5 Year Reviews

**Contaminants:** INORGANICS

**Additional Information**

N/A

**LUC Title:** Winklepeck Brng Grounds

**Site(s):** RVAAP-05

**ROD/DD Title:** Winklepeck Burning Grounds

**Location of LUC**

Winklepeck Burning Grounds

**Land Use Restriction:** Media specific restriction - prohibit use of groundwater for consumption or domestic purposes, Restrict land use - No daycare/hospital/school use, Restrict land use - No residential use

**Types of Engineering Controls:** Markers, Signs

**Types of Institutional Controls:** Restrictions on Groundwater Withdrawal, Restrictions on land use

**Date in Place:** 200808

**Modification Date:** N/A

**Date Terminated:** N/A

**Inspecting Organization:** Other Army Entity

**Record of LUC:** Master Plan or Equivalent

**Documentation Date:** N/A

**LUC Enforcement:** Annual Inspections, 5 Year Reviews, Other

**Contaminants:** METALS, NITROAROMATICS, ORGANICS, PAH, PCBs, Unexploded Ordnance(UXO), VOC

**Additional Information**

N/A

# Cleanup Program Summary

## Installation Historic Activity

In August 1940 the US government purchased approximately 25,000 acres in the northeastern part of Ohio in Portage and Trumbull counties and in September 1940 construction of the load, assemble, and pack (LAP) facility started. In August 1941, munitions production started. The primary missions of the facility included loading, assembling and packaging of large caliber ammunition and depot storage. The facility changed names several times during its history before being designated the RVAAP in 1961.

From September 1940 until the end of World War II (WWII), when plant operations were turned over to the ordnance department, the Atlas Powder Company operated the facility. From 1946 to 1949, the ammonium nitrate line was operated by the Silas Mason Company for the production of ammonium nitrate fertilizer. In 1950 the facility was placed in standby status and was reactivated during the Korean War for loading and packing large caliber projectiles and components. In August 1957 all production ended. In October 1957, the installation was again placed in a standby condition.

From January 1961 to July 1961, Load Line 12 was used to melt-out and recover explosives from bombs; it was the first operation of this type in the ammunition industry. In May 1968 the RVAAP was once again reactivated to produce munitions on three load lines and two component lines in support of the Vietnam War. These facilities were subsequently deactivated in August 1972. A mission for the demilitarization of various munitions continued on a periodic basis through 1992.

In 1980 RVAAP received a Resource Conservation and Recovery Act (RCRA) Part A permit for the storage and treatment of off-specification munitions and munitions-related waste. In 1992, RVAAP submitted a RCRA Part B permit application for the installation's open burning/open detonation (OB/OD) grounds and a hazardous waste storage building. This application was withdrawn by the installation. It was determined that there was no longer a need for active demolition work. Open Demolition Area (ODA) No. 2 (RVAAP-04) is now the only active RCRA unit at the RVAAP. All others have been closed. In 1992 RVAAP was declared excess to the Army's needs.

In May 1999 the Operations Support Command transferred control and operation of 16,164 acres to the USP&FO. In March 2002 an agreement was signed to transfer an additional 3,774 uncontaminated acres to USP&FO for Ohio with the remaining acreage to be transferred as restoration of the sites is completed.

In June 2004, the Army and the Ohio EPA signed the Director's Final Findings and Orders (DFFO) to authorize continued use of ODA No. 2 to support environmental restoration activities (blow in place and emergency demolition actions are authorized without the need to obtain emergency permits). The orders also authorized the investigation of deactivation furnace soils under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and groundwater monitoring at RVAAP-01 and RVAAP-04. The facility will close the ODA No. 2 RCRA unit under the DFFOs when it is no longer needed to support restoration.

Bulk explosives were stored at the facility until 2004.

As of September 2013, administrative accountability for all the acreage has been transferred to the USP&FO for Ohio and licensed to the OHARNG as a military training site, Camp Ravenna.

Completion of the Installation Restoration Program (IRP), the Military Munitions Response Program (MMRP), and the Compliance Restoration (CR) program, is expected by Fiscal Year (FY)2020.

RVAAP is not on the USEPA NPL, although it is in the USEPA Comprehensive Environmental Response, Compensation, and Liability Information System database. Management of the Defense Environmental Restoration Program (DERP) sites follows CERCLA requirements.

## Installation Program Cleanup Progress

### IRP

**Prior Year Progress:** Remedial Actions for RVAAP-01, RVAAP-13 and RVAAP-48 will be completed. Completion of the Remedial Investigation/Feasibility Study (RI/FS) at RVAAP-43 and surface water. Remedial Design (RD) at RVAAP-05 will be completed. RVAAP-08, 09, 10, 11 and 12 RI/FS supplemental investigation will continue.

**Future Plan of Action:** RVAAP-05 Remedial Action will be completed. RI work plan and background study for RVAAP-66

## Cleanup Program Summary

will be completed. A final Record of Decision (ROD) will be completed at RVAAP-51. RODs will be completed at several sites.

### MMRP

**Prior Year Progress:** RIs will be completed for all 14 sites.

**Future Plan of Action:** A No Further Action (NFA) ROD will be completed for 7 sites. An FS will begin at 6 sites.

### CR

**Prior Year Progress:** NFA at CC RVAAP-71, CC RVAAP-77 & CC RVAAP-83 will be achieved.

An RI will be completed at CC RVAAP-68, 69, 70, 72, 73, 75, 78, & 79.

**Future Plan of Action:** Interim Remedial Action (IRA) will be completed at CC RVAAP-73, 78 & 79.

**RAVENNA ARMY AMMUNITION PLANT**  
**Army Defense Environmental Restoration Program**  
**Installation Restoration Program**



# IRP Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 54/24

## Installation Site Types with Future and/or Underway Phases

1	Burn Area (RVAAP-05)
1	Chemical Disposal (RVAAP-28)
7	Contaminated Buildings (RVAAP-33, RVAAP-39, RVAAP-40, RVAAP-41, RVAAP-42, RVAAP-43, RVAAP-44)
1	Contaminated Ground Water (RVAAP-66)
1	Contaminated Soil Piles (RVAAP-48)
1	Explosive Ordnance Disposal Area (RVAAP-03)
7	Industrial Discharge (RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-11, RVAAP-12, RVAAP-13, RVAAP-46)
3	Landfill (RVAAP-01, RVAAP-19, RVAAP-34)
1	Spill Site Area (PBC at Ravenna)
2	Storage Area (RVAAP-45, RVAAP-50)
3	Surface Disposal Area (RVAAP-06, RVAAP-38, RVAAP-51)
1	Surface Impoundment/Lagoon (RVAAP-29)
1	Waste Lines (RVAAP-67)

## Most Widespread Contaminants of Concern

Asbestos, Explosives, Metals, Nitrate/Nitrite, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

## Media of Concern

Groundwater, Sediment, Soil, Surface Water

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
RVAAP-23	UNIT TRAINING EQUIPMENT SITE UST	FRA	WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS	1990
RVAAP-47	BUILDING T-5301	FRA	REMOVAL	2001
RVAAP-03	OPEN DEMOLITION AREA #1	IRA	EX SITU SOIL TREATMENT	2003
RVAAP-34	SAND CREEK DISPOSAL ROAD LANDFILL	IRA	WASTE REMOVAL - SOLIDS (NON-SOILS)	2004
RVAAP-51	DUMP ALONG PARIS-WINDHAM ROAD	IRA	WASTE REMOVAL - SOILS	2004
RVAAP-08	LOAD LINE 1	IRA	WASTE REMOVAL - SOILS	2008
RVAAP-09	LOAD LINE 2	IRA	REMOVAL	2008
RVAAP-10	LOAD LINE 3	IRA	REMOVAL	2008
RVAAP-11	LOAD LINE 4	IRA	REMOVAL	2008
RVAAP-49	CENTRAL BURN PITS	IRA	WASTE REMOVAL - SOILS	2009
RVAAP-05	WINKLEPECK BURNING GROUNDS	IRA	REMOVAL	2010

## IRP Summary

### Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
RVAAP-16	FUZE&BOOSTER QUARRY LANDFILL/PONDS	FRA	REMOVAL	2010
RVAAP-12	LOAD LINE 12	IRA	REMOVAL	2011
PBC at Ravenna	PBA 2008	FRA	OTHER	2015
RVAAP-01	RAMSDELL QUARRY LANDFILL	FRA	WASTE REMOVAL - SOILS	2015
RVAAP-13	BLDG 1200- DILUTION\SETTLING POND	FRA	REMOVAL	2015
RVAAP-48	ANCHOR TEST AREA	FRA	WASTE REMOVAL - SOILS	2015

### Duration of IRP

**Date of IRP Inception:** 198802

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 203106/203106

**Date of IRP completion including Long Term Management (LTM):** 204802

# IRP Contamination Assessment

## Contamination Assessment Overview

The contamination at RVAAP originated from past industrial activities associated with the assembly and demilitarization of large caliber projectiles, general-purpose bombs, and parts for these munitions. RVAAP produced munitions during WWII, and the Korean and Vietnam Wars. The industrial operations at RVAAP consisted of 12 production areas known as load lines. Load Lines 1 through 4 (melt-pour lines) were the primary sources of secondary explosives contamination such as trinitrotoluene (TNT), Cyclotetramethylenetetranitramine (HMX), and Cyclotrimethylenetrinitramine (RDX), which were melted and poured into projectiles and bombs. Load Line 1 and 12 were used for demilitarization of projectiles. Load Line 1 was used to produce and recondition anti-tank mines. Workers would periodically use steam and hot water to hose down equipment, plus the floors and walls of buildings contaminated with explosive dust, spills, and vapors. The explosive-contaminated water from the cleaning, known as pink water, then drained out doorways and through floor drains onto the soils surrounding the buildings or was discharged into open ditches or ponds after being filtered through sawdust to remove suspended explosives. Waste explosives from the melt pour lines were routinely disposed of by OB/OD at other sites on the installation.

Load Lines 5 through 11 (fuze and booster) were used to assemble fuzes, primers, and boosters while Load Line 12 housed the ammonium nitrate plant. Potential contaminants in Lines 5 through 11 include lead azide, mercury fulminate, lead styphnate, black powder, heavy metals, TNT, and Composition B. The amount of explosives used at the fuze and booster lines was much less than that used at the melt-pour lines because of the types of small munitions components made there. Also, the operations did not create as much waste and were cleaner due to the special handling procedures needed when working with the shock and heat sensitive primary explosives. Load Line 12 recrystallized ammonium nitrate for explosives, fertilizers, and aluminum chloride. It also was periodically used for demilitarization projects involving the melt-out of TNT and other secondary explosives from the bombs and projectiles. As in the other melt pour lines, these activities resulted in pink water being released to the soils, ditches, and ponds in and around the line. Other types of contaminated sites associated with past industrial activities at RVAAP include landfills, testing facilities, dumps, munitions burial sites, a pistol range, storage facilities, a scrap yard, and decontamination buildings. Although not present at every one of these sites, the contaminants of potential concern (COPC) include primary and secondary explosives, propellants, heavy metals, VOCs and SVOCs, PAHs, and asbestos. Industrial activities ceased in 1992 when RVAAP was declared excess.

A Phase I RI examined 11 high priority sites identified as RVAAP-03, RVAAP-04, RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-11, RVAAP-12, RVAAP-13, RVAAP-18, RVAAP-19, and RVAAP-29. A final RI report was issued in 1997. The study concluded that Load Lines 1 through 4 and 12 appeared to be the most contaminated, and contaminants were probably not migrating far from the sources in significant concentrations. The report recommended further study.

For the most part, results from more recent studies have confirmed that explosives and heavy metals are the most common contaminants and are generally located immediately around buildings in the load lines and in the ditches and ponds draining the sites. Installation monitoring wells located to the southeast of Load Line 2 near the perimeter have shown trace amounts of explosives.

## Cleanup Exit Strategy

RI/FS's will be completed to determine the nature and extent of the contaminants. LTM will be performed on both a facility-wide and a site-by-site basis. The appropriate remedy at all of the sites will be achieved as required to ensure adequate risk mitigation for the proposed future use by the OHARNG. See individual sites for specific strategies.

## IRP Previous Studies

Year	Title	Author	Date
1978	Installation Assessment of Ravenna Army Ammunition Plant. Report No. 132	United States Army Toxic and Hazardous Materials Agency	NOV-1978
1989	Hazardous Waste Management Study No. 37-26-0442-84: Phase 2 of AMC Open Burning/Open Detonation Groundwater Evaluation	United States Army Environmental Hygiene Agency	OCT-1989
	Ravenna Army Ammunition Plant RCRA Facility Assessment Draft RR/VS1 Report	Jacobs Engineering Group, Inc	OCT-1989
1996	Preliminary Assessment for the Ravenna Army Ammunition Plant	SAIC	FEB-1996
	Facility-Wide Safety and Health Plan	SAIC	FEB-1996
	Preliminary Assessment for the Characterization of Areas of Contamination	SAIC	FEB-1996
	Action Plan for the Ravenna Army Ammunition Plant	SAIC	MAR-1996
	Facility-Wide Sampling and Analysis Plan for the Ravenna Army Ammunition Plant	SAIC	APR-1996
	Phase 1 Remedial Investigation Site Safety and Health Plan Addendum for High Priority Areas of Concern for RVAAP	SAIC	JUL-1996
	Phase 1 Remedial Investigation Sampling and Analysis Plan Addendum for High Priority Areas of Concern for RVAAP	SAIC	JUL-1996
	Final Facility-Wide Sampling and Analysis Plan, SAIC	SAIC	AUG-1996
	Interim Measures Plan for the Open Detonation (OD) Grounds Hazardous Waste Treatment Unit	SAIC	AUG-1996
	Installation Restoration Program Management Plan	US Army Environmental Command	DEC-1996
1997	Public Meeting Briefing - Phase I RI of High Priority Sites at the RVAAP	USACE	SEP-1997
1998	Quality Control Plan for the Phase II RI for Winklepeck Burning Grounds at RVAAP	USACE	JAN-1998
	Sampling and Analysis Plan Addendum for the Phase II Remedial Investigation of the Winklepeck Burning Grounds (AOC-05) and Determination of Facility-Wide Background at RVAAP	SAIC	APR-1998
	Sampling and Analysis Plan Addendum for the Phase II Remedial Investigation of the Winklepeck Burning Grounds (AOC-05) and Determination of Facility-Wide Background at RVAAP	SAIC	APR-1998
	Site Safety and Health Plan Addendum for the Phase II Remedial Investigation of the Winklepeck Burning Grounds (AOC-05) and Determination of Facility -Wide Background at RVAAP	SAIC	APR-1998
	Sampling and Analysis Plan Addendum for the Groundwater Investigation of the Former Ramsdell Quarry Landfill (AOC-01)	SAIC	JUN-1998
	Site Safety and Health Plan Addendum for the	SAIC	JUN-1998

## IRP Previous Studies

Year	Title	Author	Date
1998	Groundwater Investigation of the Former Ramsdell Quarry Landfill (AOC-01) at RVAAP		
1999	Sampling and Analysis Plan Addendum No. 1 for the Phase I Remedial Investigation of the Erie Burning Grounds (AOC-02) at RVAAP	SAIC	JUL-1999
	Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Line 1 (AOC-08) at the Ravenna Army Ammunition Plant	SAIC	AUG-1999
	Site Safety and Health Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Line 1 (AOC-08) at the Ravenna Army Ammunition Plant	SAIC	AUG-1999
	Environmental Information Management Needs Assessment at RVAAP	SAIC	SEP-1999
	Sampling and Analysis Plan Addendum No. 1 for the Phase I Remedial Investigation of Demolition Area 1 (RVAAP-03)	SAIC	OCT-1999
	Site Safety and Health Plan Addendum No. 1 for the Phase I Remedial Investigation of Demolition Area #1 (AOC-03) at RVAAP	SAIC	OCT-1999
	Sampling and Analysis Plan Addendum No. 1 for the Phase 1 Remedial Investigation of the NACA Test Area (AOC-38) at the Ravenna Army Ammunition Plant	SAIC	OCT-1999
	Site Safety and Health Plan Addendum No. 1 for the Phase I Remedial Investigation of the NACA Test Area (AOC-38) at the Ravenna Army Ammunition Plant	SAIC	OCT-1999
	Scope of Work for the Interim Removal Action and Decontamination & Demolition of Building T-5301 (RVAAP-47)	MKM Engineers, Inc.	DEC-1999
2000	Final Report on the Groundwater Investigation of the Ramsdell Quarry Landfill (AOC-01) at RVAAP	SAIC	AUG-2000
	Site Safety and Health Plan Addendum No. 1 for the Phase II Remedial Investigation of Load Line 1 (AOC-08) at the Ravenna Army Ammunition Plant	SAIC	AUG-2000
	Sampling and Analysis Plan Addendum No. 2 for the Phase II Remedial Investigation of Load Line 1 (AOC-08) at the Ravenna Army Ammunition Plant	SAIC	SEP-2000
	Sampling and Analysis Plan Addendum No. 1 for the Winklepeck Burning Grounds (AOC-05) Feasibility Study at RVAAP	SAIC	OCT-2000
	Site Safety and Health Plan Addendum No. 1 for the Winklepeck Burning Grounds (AOC-05) Feasibility Study at RVAAP	SAIC	OCT-2000
2001	Sampling and Analysis Plan Addendum for the Remedial Investigation of Load Line 11 (RVAAP-44)	MKM Engineers, Inc.	JAN-2001
	Facility-Wide Sampling and Analysis Plan for Environmental Investigations	SAIC	MAR-2001
	Technical Memorandum Human Health and Ecological Risk Assessment Approach for the Load Line 1 (AOC-08) and Load Line 12 (AOC-12) Phase II Remedial Investigations at RVAAP	SAIC	MAR-2001

## IRP Previous Studies

2001

Title	Author	Date
Summary and Technical Assumptions for Area, Volume, and Cost Estimations for the Winklepeck Burning Grounds (AOC-05) Strategic Plan Ravenna Army Ammunition Plant	SAIC	MAR-2001
Phase II Remedial Investigation Report for the Winklepeck Burning Ground (AOC-05) at RVAAP	SAIC	APR-2001
Final Sampling & Analysis Plan Addendum for the Remedial Landfill Design/Removal Action at the Sand Creek Disposal Road Landfill (AOC-34)	MKM Engineers, Inc.	APR-2001
Final Site-specific Safety and Health Plan for the Remedial Design/Removal Action at the Sand Creek Disposal Road Landfill (AOC-34)	MKM Engineers, Inc.	APR-2001
Final Workplan for the Remedial Design/Removal Action at Sand Creek Disposal Road Landfill (AOC-34)	MKM Engineers, Inc.	APR-2001
Final Sampling & Analysis Plan Addendum for the Remedial Design/Removal Action at the Paris-Windham Road Dump (AOC-51)	MKM Engineers, Inc.	APR-2001
Final Site-Specific Safety and Health Plan for the Remedial Design/Removal Action at the Paris Windham Road Dump (AOC-51)	MKM Engineers, Inc.	APR-2001
Final Work Plan for the Remedial Design/Removal Action at the Paris-Windham Road Dump (AOC-51)	MKM Engineers, Inc.	APR-2001
Final Work Plan for the Phase II Remedial Investigation at the Upper and Lower Cobbs Pond (AOC 29)	MKM Engineers, Inc.	JUN-2001
Final Sampling and Analysis Plan Addendum for the Phase II Remedial Investigation at the Upper and Lower Cobbs Pond (AOC-29)	MKM Engineers, Inc.	JUL-2001
Final Site-Specific Safety and Health Plan for the Phase II Remedial Investigation at the Upper and Lower Cobbs Pond (AOC-29)	MKM Engineers, Inc.	JUL-2001
Final Site-Specific Safety and Health Plan for the Remedial Investigation at Central Burn Pits (AOC-49) at the Ravenna	MKM Engineers, Inc.	AUG-2001
Final Work Plan for the Remedial Investigation at Central Burn Pits (AOC-49) at the Ravenna Army Ammunition Plant	MKM Engineers, Inc.	AUG-2001
Groundwater Assessment Plan for the Ramsdell Quarry Landfill (AOC-01)	MKM Engineers, Inc.	SEP-2001
Geophysical Survey Results Suspected Mustard Agent Burial Site RVAAP	SAIC	OCT-2001
Phase I Remedial Investigation Report for the Erie Burning Grounds (AOC-02) at RVAAP	SAIC	DEC-2001
Phase I Remedial Investigation Report for the Demolition Area #1 (AOC-03) at RVAAP	SAIC	DEC-2001
Final Work Plan for the Remedial Design/Removal Action at the Sand Creek Disposal Road Landfill (AOC-34)	SAIC	DEC-2001
Phase 1 Remedial Investigation Report for NACA Test Area (AOC-38) at the Ravenna Army Ammunition Plant	SAIC	DEC-2001

2002

Sampling and Analysis Plan Addendum No. 3 for the Biological Measurements at Winklepeck Burning Grounds (AOC-05) at the Ravenna Army Ammunition Plant	SAIC	MAY-2002
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## IRP Previous Studies

2002	Title	Author	Date
	Work Plan and Sampling and Analysis Plan Addenda for the Phase II Remedial Investigation of Demolition Area 2	SpecPro	JUN-2002
	Work Plan and Sampling and Analysis Plan Addenda for the Phase II Remedial Investigation of Demolition Area 2	SpecPro	JUN-2002
	Investigation-Derived Waste Characterization and Disposal Plan	SpecPro	NOV-2002
	Phase II Remedial Investigation Report for the Load Line 1 (RVAAP-08) at RVAAP	SAIC	DEC-2002
	Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site (RVAAP-28)	SpecPro	DEC-2002
2003			
	Final Compliance Monitoring Program for the Open Demolition Area #2 (RVAAP-04)	MKM Engineers, Inc.	JAN-2003
	Report on the Biological Field-Truthing Effort at Winklepeck Burning Grounds (AOC-05)	SAIC	MAR-2003
	RVAAP Applied Dried Paints at Load Lines 6 (AOC-33) and 9 (AOC-42) GCMS PCB Results	MKM Engineers, Inc.	APR-2003
	RVAAP Facility Wide Ecological Risk Work Plan	USACE	APR-2003
	Phase II Remedial Investigation Report for the Load Line 1(RVAAP-08) at RVAAP	SAIC	APR-2003
	Phase II Remedial Investigation Report for the Load Line 1 (RVAAP-08) at RVAAP	SAIC	JUN-2003
	Phase II Remedial Investigation Report for the Load Line 1 (RVAAP-08) at RVAAP	SAIC	JUN-2003
	Safety and Health Plan for the Remedial Investigation of Load Lines 6 (RVAAP-33) and 9 (RVAAP-42)	MKM Engineers, Inc.	JUL-2003
	Community Relations Plan	USACE	SEP-2003
	Safety and Health Plan for the Remedial Investigation of Load Lines 6 (RVAAP-33) and 9 (RVAAP-42)	MKM Engineers, Inc.	SEP-2003
	Sampling and Analysis Plan Addendum for the Remedial Investigation of Load Line #6 (RVAAP-33)	MKM Engineers, Inc.	SEP-2003
	Sampling and Analysis Plan Addendum for the Remedial Investigation of Load Line #9 (RVAAP-42)	MKM Engineers, Inc.	SEP-2003
	Sampling and Analysis Plan Addendum No. 1 for the Phase I Remedial Investigation of Ramsdell Quarry Landfill (AOC-01) at RVAAP	SAIC	OCT-2003
	Site Safety and Health Plan Addendum No. 1 for the Phase I Remedial Investigation of Ramsdell Quarry Landfill	SAIC	OCT-2003
	Sampling and Analysis Plan Addendum No 1 for the Phase II Remedial Investigation of the Erie Burning Grounds (RVAAP-02)	SAIC	OCT-2003
	Sampling and Analysis Plan Addendum No. 1 for the Phase II Remedial Investigation of the Erie Burning Grounds (AOC-02) at RVAAP	SAIC	OCT-2003
	Final Work Plan and Sampling and Analysis Plan Addenda for the Phase I/Phase II Remedial Investigation of the Fuze and Booster Quarry Landfill/Ponds at RVAAP	SpecPro	OCT-2003
	Sand Creek Dump (AOC-34) Cleanup Project Weekly	MKM Engineers, Inc.	OCT-2003



## IRP Previous Studies

2003	Title	Author	Date
	Reports August - October 2003		
	Paris-Windham Dump (AOC-51) Clean Up Project Weekly Reports, Photos, Misc Data April-October 2003	MKM Engineers, Inc.	OCT-2003
	Decon-Demo Load Lines 6 (AOC-33) and 9 (AOC-42) Misc Corres, Reports, Photos at RVAAP	Unknown	DEC-2003
2004	OE/UXO Removal & Interim Removal Action Report For The Open Demolition Area #1 (RVAAP-03)	MKM Engineers, Inc.	MAR-2004
	Remedial Design/Removal Action Plan for Sand Creek Dump (AOC-34)	MKM Engineers, Inc.	MAR-2004
	Final Report Interim Removal Action at Load Line 11 (AOC-44)	MKM Engineers, Inc.	MAR-2004
	Interim Removal Action Report for Load Line #11 (AOC-44) Vol 1 Main Text - Appendices A-G	MKM Engineers, Inc.	MAR-2004
	Interim Removal Action Report for Load Line #11 (AOC-44) Vol 2 Appendices H-I	MKM Engineers, Inc.	MAR-2004
	Final Report for Remedial Design/Removal Action at Paris-Windham Road Dump (AOC-51) at Ravenna Army Ammunition Plant	MKM Engineers, Inc.	MAR-2004
	Facility-Wide Biological and Water Quality Study 2003	USACE	JUN-2004
	Supplemental Baseline Human Health Risk Assessment	Shaw/SAIC	JUL-2004
	Phase II Remedial Investigation Report for the Load Line 2 (AOC-09) at the Ravenna Army Ammunition Plant, Volume 1 - Main Text	Shaw/SAIC	JUL-2004
	Phase II Remedial Investigation Report for Load Line 3 (AOC-10) at the Ravenna Army Ammunition Plant Volume 1 - Main Text	Shaw/SAIC	JUL-2004
	Phase II Remedial Investigation Report for Load Line 3 (AOC-10) at the Ravenna Army Ammunition Plant Volume 2 - Appendices A-S	Shaw/SAIC	JUL-2004
	Work Plan for the Phase I MEC Density Survey of Winklepeck Burning Grounds (AOC-05)	US Army Technical Center for Explosives Safety	AUG-2004
	Phase II Remedial Investigation Report for Load Line 4 (AOC-11) at the Ravenna Army Ammunition Plant Volume 1 - Main Text	Shaw/SAIC	SEP-2004
	Phase II Remedial Investigation Report for Load Line 4 (AOC-11) at the Ravenna Army Ammunition Plant Volume 2 - Appendices A-S	Shaw/SAIC	SEP-2004
	Facility-Wide Groundwater Monitoring Program Plan, Portage	Shaw	SEP-2004
	Proposed Remedial Goal Options for Soil at Load Lines 1 (AOC-08), 2 (AOC-09), 3 (AOC-10), and 4 (AOC-11) at RVAAP	Shaw	SEP-2004
	Sampling and Analysis Plan for the Data Gap Analysis and Additional Sampling and Security, Emergency Response and Contingency Plan and Safety, Health and Emergency Response Plan for the Remediation of Soils at Load Lines 1 (AOC-08), 2 (AOC-09), 3 (AOC-10), and 4 (AOC-11) at RVAAP	Shaw	OCT-2004
	Final Sampling and Analysis Plan Addendum for the Characterization of 14 RVAAP AOCs at RVAAP	MKM Engineers, Inc.	OCT-2004
	Sampling and Analysis Plan for the Data Gap Analysis and Additional Sampling in Support of the Remediation	Shaw	OCT-2004



## IRP Previous Studies

2004	Title	Author	Date
	of Soils at Load Lines 1 (AOC-08), 2 (AOC-09), 3 (AOC-10), and 4 (AOC-11) at RVAAP		
	Final Site Safety and Health Plan Addendum for the Characterization of 14 RVAAP AOCs	MKM Engineers, Inc.	OCT-2004
2005			
	Final November 2004 Sampling Completion Report for Load Lines 1 - 4	Shaw	FEB-2005
	Focused Feasibility Study for the Winklepeck Burning Grounds (AOC-05) at RVAAP	SAIC	FEB-2005
	Phase I MEC Density Survey After Action Report At Winklepeck Burning Grounds (AOC-05)	MKM Engineers, Inc.	MAR-2005
	Phase III Remedial Investigation Report for the Winklepeck Burning Grounds (AOC-05) at RVAAP	SAIC	MAR-2005
	Phase III Remedial Investigation Report for the Winklepeck Burning Grounds (AOC-05) at RVAAP	USACE	MAR-2005
	Final Work Plan for Phase II MEC Clearance and Munitions Response at Winklepeck Burning Grounds (AOC-05)	MKM Engineers, Inc.	MAR-2005
	Final Site Safety and Health Plan for the Phase II MEC Clearance and Munitions Response at Winklepeck Burning Grounds (AOC-05)	MKM Engineers, Inc.	MAR-2005
	Winklepeck Burning Grounds AutoCAD Figures for Phase I After Action Report	MKM Engineers, Inc.	MAR-2005
	Focused Feasibility Study for the Remediation of Soils at Load Lines 1 through 4 (AOC-08) (AOC-09) (AOC-10) (AOC-11) at the RVAAP	Shaw	MAY-2005
	Final Focused Feasibility Study for the Remediation of Soils at LLs 1-4, RVAAP	Shaw	MAY-2005
	Focused Feasibility Study for the Remediation of Soils at Load Lines 1 through 4 (AOC-08) (AOC-09) (AOC-10) (AOC-11) at the RVAAP	Shaw	MAY-2005
	Phase I Remedial Investigation December 2004 Follow-On Groundwater Sampling at the Ramsdell Quarry Landfill (AOC-01)	SAIC	JUN-2005
	Final Report on the Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site (RVAAP AOC-28) - Main Report and Appendices A-H	SpecPro	JUL-2005
	Final Report on the Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site (RVAAP AOC-28)	SpecPro	JUL-2005
	Report on the Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site (RVAAP AOC-28)	SpecPro	JUL-2005
	Final Proposed Plan for the Remediation of Soils at LL1-4 (RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-11)	Shaw	JUL-2005
	Proposed Plan for the Remediation of Soils at LL1-4 (RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-11)	Shaw	JUL-2005
	Final Report on the Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site (RVAAP AOC-28)	SpecPro	JUL-2005
	RVAAP/Ohio EPA Cooperative Agreement Work Plans	Various	AUG-2005

## IRP Previous Studies

2005

Title	Author	Date
Final Report Facility Wide Groundwater Monitoring Program April 2005 Sampling Event Report - Main Report and Appendices A-D	SpecPro	AUG-2005
Final Report Facility Wide Groundwater Monitoring Program Sampling Event Report - Main Report and Appendices A-D	SpecPro	AUG-2005
Site Safety and Health Plan for the Phase I MEC Density Survey of Winklepeck Burning Grounds (AOC-05)	MKM Engineers, Inc.	AUG-2005
Final Facility Wide Groundwater Monitoring Program Report on the July 2005 Sampling Event -Vol 1- Main Report	SpecPro Inc.	AUG-2005
Final Facility Wide Groundwater Monitoring Program Report on the July 2005 Sampling Event-Vol 2- Appendices A-C	SpecPro Inc.	AUG-2005
Final Work Plan Containing Addendums(Sampling and Analysis Plan, Quality Assurance Project Plan, Site Safety and Health Plan ,UXO) for Groundwater Monitoring Well Installation and Groundwater Sampling at the Suspected Mustard Agent Burial Site (AOC-28)	SpecPro, Inc.	SEP-2005
Final Remedial Investigation Report Central Burn Pits (RVAAP-49)	SAIC/MKM	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44)	MKM Engineers, Inc.	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44) VOL 2	MKM Engineers, Inc.	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44) VOL 3	MKM Engineers, Inc.	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44) VOL 4	MKM Engineers, Inc.	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44) VOL 5	MKM Engineers, Inc.	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44) VOL 1	MKM Engineers, Inc.	SEP-2005
Final for the Remedial Investigation at Load Line 11 (AOC-44) VOL 2	MKM Engineers, Inc.	SEP-2005
Phase I Remedial Investigation Report for the Ramsdell Quarry Landfill at RVAAP	SAIC	SEP-2005
Phase I Remedial Investigation Report for the Ramsdell Quarry Landfill (AOC-01) at RVAAP	SAIC	SEP-2005
Final for the Phase II Remedial Investigation at the Upper and Lower Cobbs Pond (AOC 29) Vol 1	MKM Engineers, Inc.	SEP-2005
Final for the Phase II Remedial Investigation at the Upper and Lower Cobbs Pond (AOC 29) Vol 2	MKM Engineers, Inc.	SEP-2005
Final for the Phase II Remedial Investigation at the Upper and Lower Cobbs Pond (AOC 29) Vol 3	MKM Engineers, Inc.	SEP-2005
Final Phase II Remedial Investigation Report for the Erie Burning Grounds (AOC-02) at RVAAP	SAIC	SEP-2005
Final Phase II Remedial Investigation Report for the Open Demolition Area #2 (AOC-4) Vol 2	SpecPro/SAIC	SEP-2005
Final Proposed Plan for the Winklepeck Burning Grounds	SAIC	OCT-2005
Facility-Wide Biological and Water Quality Study 2003, Part 1-Streams, Part 2-Ponds	USACE	NOV-2005

## IRP Previous Studies

**2005**

Title	Author	Date
Final Phase II Remedial Investigation Supplemental Report for Load Line 12 (AOC-12)	SAIC	NOV-2005
Final Phase II Remedial Investigation Supplemental Report for Load Line 12 at RVAAP	SAIC	NOV-2005
Final Sampling and Analysis Plan Addendum No. 1 Supplemental Phase II Remedial Investigations (RVAAP-04) ODA#2, (RVAAP-16) F&BQL/P, and (RVAAP-49) CBPs	SAIC	NOV-2005
Final Report Phase I/II Remedial Investigation of the Fuze & Booster Quarry Landfill/Ponds (RVAAP-16) Volume One - Main Report	SpecPro/SAIC	NOV-2005
Final Report Phase I/II Remedial Investigation of the Fuze & Booster Quarry Landfill/Ponds (RVAAP-16) Volume Two - Appendices A-K	SpecPro/SAIC	NOV-2005
Final Facility Wide Groundwater Monitoring Program Report on the July 2005 Sampling Event-Main Report and Appendices A-C	SpecPro	NOV-2005
Final Proposed Plan for the Winklepeck Burning Grounds	SAIC	DEC-2005
Phase II MEC Clearance and Munitions Response at Winklepeck Burning Grounds (AOC-05)	MKM Engineers, Inc.	DEC-2005
Phase II MEC Clearance and Munitions Response at Winklepeck Burning Grounds (AOC-05)	MKM Engineers, Inc.	DEC-2005

**2006**

Sampling and Analysis Plan Addendum No. 2 for the Winklepeck Burning Grounds Feasibility Study at RVAAP	SAIC	FEB-2006
Final FS for Ramsdell Quarry Landfill	SAIC	JUL-2006
Final FS for Load Line 12	SAIC	JUL-2006
Final FS for Fuze-Booster Quarry Pond Landfill	SAIC	JUL-2006
Facility-Wide Ground Water Sampling Event #1	SpecPro	AUG-2006
Revised Eco Field Truthing Report	SAIC	SEP-2006
Final RI Addendum for ODA#2	SAIC	SEP-2006
Final RI Addendum for Erie Burning Grounds	SAIC	SEP-2006
Final P&A After Action Report for Ramsdell Quarry Landfill	SAIC	SEP-2006
Facility-Wide Ground Water Sampling Event #2	SpecPro	OCT-2006

**2007**

Final Engineering Evaluation/Cost Analysis for Central Burn Pits	SAIC	JAN-2007
Final Structural Analysis Report for Load Lines 1 through 4	Shaw	JAN-2007
Final Proposed Plan for Soil and Dry Sediment at RVAAP--2 Erie Burning Grounds	SAIC	FEB-2007
Facility-Wide Ground Water Sampling Event #3	SpecPro	MAR-2007
Final Report of the Characterization of 14 Areas of Concern	MKM Engineers, Inc.	MAR-2007
Final Proposed Plan for Soil and Dry Sediment at	SAIC	MAR-2007

## IRP Previous Studies

2007

Title	Author	Date
RVAAP-12 Load Line 12		
Final Proposed Plan for Soil and Dry Sediment at RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	SAIC	MAR-2007
Final Proposed Plan for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill	SAIC	MAR-2007
Final Facility Wide Groundwater Monitoring Program Report on the October 2006 Sample Event	SpecPro, Inc.	MAR-2007
Final Facility Wide Groundwater Monitoring Program Report on the July 2006 Sampling Event No. 3	SpecPro, Inc.	MAR-2007
Final Remedial Action Work Plan Remediation of Soils at RVAAP- 08, 09, 10, and 11 Load Lines 1- 4	Shaw Environmental	APR-2007
Final Work Plan for the DLA Storage Area Reclamation-Route 80 Tank Farm and East Ore Yard Culvert Replacement	SpecPro, Inc.	APR-2007
Final Facility Wide Groundwater Monitoring Program Annual Report for 2006	SpecPro, Inc.	MAY-2007
Final Interim Record of Decision for Load Lines 1-4	Shaw	JUN-2007
Final Action Memorandum for RVAAP-49 Central Burn Pits	SAIC	JUN-2007
Final Facility-Wide Groundwater Monitoring Program Report on the January 2007 Sampling Event (#1)	SpecPro, Inc.	JUL-2007
Final Stormwater Pollution Prevention Plan for the Remediation of Soils at RVAAP- 08, 09, 10, and 11 Load Lines 1- 4	Shaw Environmental	JUL-2007
Final Sampling and Analysis Plan and the Site Safety and Health Plan for the Exposed Soil Sampling and Characterization After Slab and Foundation Removals at RVAAP-39 Load Line 5, RVAAP-40 Load Line 7, RVAAP-41 Load Line 8, and RVAAP-43 Load Line 10	United States Army Corps of Engineers	AUG-2007
Final Construction Completion Report on the Munitions Response for the Demolition of RVAAP-41 and RVAAP-43, Load Lines 8 and 10	PIKA International, Inc.	AUG-2007
Final Report for the Phase I Remedial Investigation of RVAAP-33 Load Line 6	MKM Engineers, Inc.	AUG-2007
Final Removal Action Work Plan for RVAAP-49 Central Burn Pits	SAIC	AUG-2007
Final Record of Decision for Soil and Dry Sediment at the RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	SAIC	SEP-2007
Final Record of Decision for Soil and Dry Sediment at the RVAAP-02 Erie Burning Grounds	SAIC	SEP-2007
Final Record of Decision for Soil and Dry Sediment at the RVAAP-02 Open Demolition Area #2	SAIC	SEP-2007
Final Report for the Phase I Remedial Investigation at RVAAP-42 Load Line 9, Volume 1	MKM Engineers, Inc.	OCT-2007
Final Report on the Disposal of MEC, Discarded Military Munitions and MC	PIKA International, Inc.	NOV-2007
Final Work Plan for the Geophysical Investigation of the Suspected RVAAP-28 Mustard Agent Burial Site	Environmental Quality Management/John M. Miller, John Vanderlaan	NOV-2007
Final Facility-Wide Groundwater Monitoring Program April 2007 Sampling Event	Environmental Quality Management, Inc.	NOV-2007
Final Project Completion Report for the Munitions Response for Demolition of Load Lines 5, 7, Building 1039, and Transite Removal at Building T-1604	Lakeshore Engineering Services, Inc.	DEC-2007

## IRP Previous Studies

2008	Title	Author	Date
	Final Propellant Removal Summary Report for MEC Support for RVAAP- 08 Load Line 1	Shaw Environmental, Inc.	JAN-2008
	Final Remedial Investigation Report Addendum No. 1 for the RVAAP-49 Central Burn Pits	SAIC	JUN-2008
	Final ROD for Soil and Dry Sediment at RVAAP-05, Winklepeck Burning Grounds	SAIC	AUG-2008
	Final Proposed Plan for Soil and Dry Sediment at the RVAAP-49 Central Burn Pits	SAIC	OCT-2008
2009	Final ROD for Soil and Dry Sediment at RVAAP-49, Central Burn Pits	SAIC	FEB-2009
	Final ROD for Soil and Dry Sediment at RVAAP-01, Ramsdell Quarry Landfill	SAIC	MAR-2009
	Final ROD for Soil and Dry Sediment at RVAAP-12, Load Line 12	SAIC	MAR-2009
	Final Facility Wide Groundwater Monitoring Program Annual Report 2008	EQM	MAR-2009
	Final ROD for Soil and Dry Sediment at RVAAP-49 Central Burn Pits	SAIC	APR-2009
	Final DQO Report for RVAAP-28 Mustard Agent Burial Site	Shaw	JUN-2009
	Final Facility Wide Groundwater Monitoring Program October 2008 Sampling Event	EQM	JUN-2009
	Final Remedial Design for RVAAP-16 Fuze and Booster Quarry Landfill	SAIC	JUN-2009
	Final Remedial Design for RVAAP-12 Load Line 12	SAIC	JUL-2009
	Final Facility Wide Groundwater Monitoring Program January 2009 Sampling Event	EQM	JUL-2009
	Final DQO Report for RVAAP-34 Sand Creek Disposal Landfill	Shaw	JUL-2009
	Final PBA 08 LL 1-4 Sub Slab Sampling Short Report	URS	SEP-2009
	Final Remedial Design Approval for RVAAP-12 Load Line 12	SAIC	OCT-2009
	Final DQO Report for RVAAP-03 Open Demo Area 1	Shaw	OCT-2009
	Final ROD Signoff for Soil and Dry Sediment at RVAAP-12 Load Line 12	SAIC	OCT-2009
	Final ROD Signoff for Soil and Dry Sediment at RVAAP-01 Ramsdell Quarry Landfill	SAIC	OCT-2009
	Final Remedial Action Closeout Report for RVAAP-05 Winklepeck Burning Grounds	MKM	NOV-2009
	Final Facility Wide Groundwater Monitoring Program April 2009 Sampling Event	EQM	NOV-2009
	Final TCRA Closeout Report for RVAAP-04 ODA 2 Rocket Ridge	PIKA	DEC-2009
	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	URS	DEC-2009
2010	Final Facility Wide Groundwater Monitoring Program July 2009 Sampling Event	EQM	JAN-2010
	Final Remedial Design Approval for RVAAP-01 Ramsdell Quarry Landfill	SAIC	JAN-2010

## IRP Previous Studies

2010

Title	Author	Date
LL 1-4 Sub Slab Final Field Sampling Report	URS	MAR-2010
Final Facility Wide Human Health Cleanup Goals	SAIC	MAR-2010
Final Remedial Action Closeout Report for RVAAP-16 Fuze and Booster Quarry Landfill	SAIC	MAR-2010
Final Facility Wide Groundwater Monitoring Program Annual Report 2009	EQM	MAR-2010
Final Geophysical Prove-out Report for Environmental Services at RVAAP- 34 Sand Creek Disposal Road Landfill, RVAAP- 03 Open Demolition Area #1, And RVAAP- 28 Mustard Agent Burial Site, Version 1.0	Shaw	MAR-2010
Final Project Management Plan for the Performance-Based Acquisition of Six Environmental Areas of Concern, Revision 1	SAIC	MAR-2010
Final Facility Wide Groundwater Monitoring Program October 2009 Sampling Event	EQM	APR-2010
Final Monitoring Report for the Deep Bedrock Well Installation in the Basal Sharon Conglomerate	SAIC	MAY-2010
Final Quality Control Plan for the Geochemical Evaluation of Metals in Groundwater	Shaw	MAY-2010
Final Facility-Wide Groundwater Monitoring Program Report on the 2009 Metals Sampling Event	EQM	JUN-2010
Revised Final Remedial Design for the RVAAP- 01 Ramsdell Quarry Landfill	SAIC	JUN-2010
Load Lines 2 & 3 Excavation Soil Removal	URS	JUL-2010
Final Facility-Wide Groundwater Monitoring Program Report on the January 2010 Sampling Event	EQM	JUL-2010
Final Quality Control Plan for the Revision of the Facility-Wide Environmental Documents	SAIC	JUL-2010
Final Work Plan for Sampling & Closure of Load Lines 1, 2, 3, 4, and 12 (RVAAP-08, RVAAP-09, RVAAP-10, RVAAP-11, RVAAP-12) and other Areas of Concern	Prudent	JUL-2010
Final Project Management Plan for Sampling & Closure of Load Lines 1, 2, 3, 4, 12 (RVAAP-08, 09, 10, 11, and 12) and other Areas of Concern	Prudent	JUL-2010
Geochemical Evaluation Of Metals In Groundwater Draft Geochem Report	Shaw	AUG-2010
Final Remedial Action Report for the RVAAP-12 Load Line 12	SAIC	AUG-2010
Final Site Characterization and Focused Feasibility Study Work Plan for the RVAAP- 51 Dump Along Paris-Windham Road at Ravenna Army Ammunition Plant	SAIC	AUG-2010
Removal Load Line 1 Excavation Soil	URS	SEP-2010
Final Sampling and Analysis of Soils Below Floor Slabs at RVAAP- 08 Load Line 1 and Other Building Locations	URS	SEP-2010
ISSUE FINAL COMPLETION REPORT (LL2, 3, & 4)	URS	DEC-2010
LL 1-4 ISSUE FINAL COMPLETION REPORT (LL2, 3, & 4)	URS	DEC-2010

2011

FINAL GEOPHYSICAL REPORT	Shaw	JAN-2011
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## IRP Previous Studies

2011

Title	Author	Date
RVAAP-28 FINAL GEOPHYSICAL REPORT	Shaw	JAN-2011
RVAAP-34 FINAL GEOPHYSICAL REPORT	Shaw	JAN-2011
Facility-wide Task 16 - Issue Final (Sampling and Analysis Plan/Quality Assurance Project Plan/Health and Safety Plan)	SAIC	FEB-2011
ISSUE FINAL COMPLETION REPORT (LL1)	URS	MAR-2011
LL 1-4, 12, AND OTHER SAMPLING AND CLOSURE Issue Final MI Sampling Report	Prudent	MAR-2011
RVAAP-04 Final WHITE PHOSPHORUS Workplans Submittal	TOLT	MAR-2011
LL 1 -4 ISSUE FINAL COMPLETION REPORT (LL1)	URS	MAR-2011
LL 1-4, 12 Issue Final MI Sampling Report	Prudent	MAR-2011
RVAAP-66 FWGW FINAL ANNUAL REPORT	EQM	MAR-2011
FINAL DQO REPORT	Shaw	JUN-2011
Geochemical Evaluation of Metals in Groundwater FINAL GEOCHEM REPORT	SHAW	JUN-2011
RVAAP-05 FINAL DQO REPORT	Shaw	JUN-2011

2012

RVAAP-48 Final RI/FS Report	SAIC	JAN-2012
RVAAP-66 Facility-Wide Groundwater July 2011 Sampling Event	EQM	FEB-2012
RVAAP-66 Facility-Wide Groundwater 2011 Annual Report	EQM	FEB-2012
RVAAP-13 Final RI/FS Report	SAIC	MAR-2012
RVAAP-01 Revised Final PP	SAIC	APR-2012
RVAAP-66 Facility-Wide Groundwater October 2011 Sampling Event	EQM	MAY-2012
RVAAP-66 Facility-Wide Groundwater January 2012 Sampling Event	EQM	JUL-2012
RVAAP-04 Final IRA After Action Report	PIKA	JUL-2012
RVAAP-05 Final Property Management Plan	AAA	AUG-2012
RVAAP-66 Facility-Wide Groundwater April 2012 Sampling Event	EQM	OCT-2012
RVAAP-05 Final Work Plan for Additional Evaluation	AAA	OCT-2012
RVAAP-66 Final Well Installation Report	EQM	DEC-2012

2013

Final Results of April 2011 Groundwater Sampling for Major Cations and Anions, Trace Elements, Nutrients, Organic Chemicals, and Isotopes of Hydrogen and Oxygen at RVAAP-66 Facility-Wide Groundwater	USGS	JAN-2013
RVAAP-13 Final PP Building 1200	SAIC	APR-2013
Final Former Water Production Wells and Oil and Gas Wells Survey RVAAP and Camp Ravenna	Vista	APR-2013



## IRP Previous Studies

**2013**

Title	Author	Date
RVAAP-01 Final ROD Amendment	SAIC	MAY-2013
RVAAP-48 Final PP Anchor Test Area	SAIC	MAY-2013
RVAAP-05 Final Risk Amendment Assumptions Document Addendum to the Work Plan for the Additional Evaluation of the Winklepeck Burning Ground	AAA	JUL-2013
Final Technical Memorandum for Land Uses and Facility-Wide Cleanup Goals	AAA	SEP-2013
RVAAP-66 Facility-Wide Groundwater Program Final Report for January 2013 Sampling Event, Volume 1 and 2	EQM	SEP-2013
RVAAP-66 Facility-Wide Groundwater Annual Report for 2012, Revision 1.0	EQM	OCT-2013

**2014**

Final Project Management Plan for Interim Removal Action Well Abandonment	Plexus Scientific Corporation	JAN-2014
Final Quality Control Plan for Interim Removal Action Well Abandonment	Plexus Scientific Corporation	JAN-2014
Final Construction Completion Report for Closure for Clean Hard-Fill Sites RVAAP-08 Site CB-23 and Site CB-22 on Load Line 1 and George Rd.	Semper Tek - Intersteel , JV, LLC	FEB-2014
Final Technical Memorandum for Land Uses and Facility-Wide Cleanup Goals	Angela L. Schmidt & Brett A. Merkel	FEB-2014
Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Annual Report for 2013	Environmental Quatlity Management, Inc.	MAR-2014
Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the August 2013 Sampling Event	Environmental Quality Management, Inc.	MAR-2014
Final Project Work Plan for Site Inspection at Compliance Restoration Site CC-RVAAP-80 Group 2 Propellant Can Tops, Revision 1	PIKA International, Inc.	MAR-2014
Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-13 Building 1200	Leidos Engineering of Ohio, Inc.	MAR-2014
Final Record of Decision for Soil, Sediment, and Surface Water at RVAAP-48 Anchor Test Area	Leidos Engineering of Ohio, Inc.	MAR-2014
Final Quality Control Plan for Interim Removal Action Well Abandonment	Shaw Environmental & Infrastructure, Inc.	MAR-2014
Final FY 2013 Fourth Quarter Property Management Plan Quarterly Land Use Control (LUC) Inspection RVAAP-05 Winklepeck Burning Grounds	Vista Sciences Corporation	APR-2014
Final Remedial Design for Soil and Dry Sediment at the RVAAP-01 Ramsdell Quarry Landfill	SAIC Engineering of Ohio, Inc.	APR-2014
Final Project Management Plan for Environmental Services at 14 Military Munitions Response Program Sites, Version 2.0	Shaw Environmental Inc.	JUN-2014
Final FY 2013 Annual Report for the Quarterly Land Use Control Inspections at RVAAP-05 Winklepeck Burning Grounds	Vista Sciences Corporation	JUL-2014
Final FY 2014 First Quarter Land Use Control Inspection, RVAAP-05 Winklepeck Burning Grounds	Vista Sciences Corporation	JUL-2014
Final FY 2014 Second Quarter Land Use Control Inspection RVAAP-05 Winklepeck Burning Grounds	Vista Sciences Corporation	JUL-2014
Final Community Relations Plan for the Ravenna Army	Vista Sciences Corporation	AUG-2014



## IRP Previous Studies

2014

Title	Author	Date
Ammunition Plant Restoration		
Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the January 2014 Sampling Event	Environmental Quality Management, Inc.	AUG-2014
Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the August 2013 Sampling Event	Leidos Engineering of Ohio, Inc.	AUG-2014
Final Site Characterization and Focused Feasibility Study for the RVAAP- 51 Dump Along Paris-Windham Road, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio	SAIC Engineering of Ohio, Inc.	SEP-2014
Final Facility-Wide Groundwater Monitoring Program RVAAP-66 Facility-Wide Groundwater Report on the August 2013 Sampling Event	Leidos Engineering of Ohio, Inc.	SEP-2014
Final Community Relations Plan for the Ravenna Army Ammunition Plant Restoration	Vista Sciences Corporation	OCT-2014
Final FY 2014 Fourth Quarter Land Use Control Inspection RVAAP-05 Winklepeck Burning Grounds	Vista Sciences Corporation	OCT-2014
Final FY 2014 Third Quarter Land Use Control Inspection RVAAP-05 Winklepeck Burning Grounds	Vista Sciences Corporation	OCT-2014

**RAVENNA ARMY AMMUNITION PLANT**  
**Installation Restoration Program**  
**Site Descriptions**

# Site ID: PBC at Ravenna

## Site Name: PBA 2008

### STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200308.....	200308
RI/FS.....	200807.....	201507
RD.....	200807.....	201507
RA(C).....	200807.....	201507

RIP Date: N/A

RC Date: 201609

### SITE DESCRIPTION

This site includes work for Performance Based Contract (PBC) 2005 and Performance Based Acquisition (PBA) 2008. It no longer carries funding requirements (all requirements were funded) for USACE oversight of the PBC 2005. PBC 2005 was awarded to Science Applications International Corporation. The remedial action at Ramsdell Quarry Landfill (RVAAP-01) was completed. The PBC 2005 sites included RVAAP-01, 02, 04, 12, 16 and 49.

PBA 2008 was awarded in July 2008 (tasks 1 through 4). Optional Task 5 was awarded in October 2010. The PBA 2008 now has a projected expiration of July 2015. This PBA includes portions or all of RVAAP-06, 12, 13, 19, 29, 33, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 50, and 67. USACE oversight costs for PBA 2008 are carried in this site.

### CLEANUP/EXIT STRATEGY

Cleanup strategies are addressed in the individual sites. Due to funds expiring, part of PBA 2008 will be de-scoped in FY15. A follow-on contract will address the remaining work and will be tracked under the individual sites.

Site ID: RVAAP-01

## Site Name: RAMSDELL QUARRY LANDFILL

### STATUS

Regulatory Driver: CERCLA

RRSE: HIGH

Contaminants of Concern: Asbestos, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	200306.....	200910
RD.....	200706.....	201209
RA(C).....	201006.....	201503
LTM.....	201503.....	204502

RIP Date: N/A

RC Date: 201503

### SITE DESCRIPTION

RVAAP-01 (Ramsdell Quarry Landfill) is located in the eastern section of the RVAAP facility and is approximately 14 acres. The landfill portion is 4 acres. The quarry was excavated to the underlying Sharon Sandstone/Conglomerate. The depth of the soil in the remaining portion of the quarry varies from zero to several feet. A pool of water is intermittently present at the bottom of the quarry at approximately 10.7 meters (35 feet (ft)) below ground surface (bgs).

This landfill was used from 1941 to 1989. During the period of 1946 to 1950 the site was used as a land-surface burning site to thermally destroy waste explosives from Load Line 1 and napalm bombs. From 1976 to 1989, a portion of the site was used strictly as a nonhazardous solid waste landfill. No historical information has been located for 1950 to 1976. The landfill ceased operation in September 1989. Closure of the landfill was completed in May 1990 under state of Ohio solid waste regulations.

Landfilled material consists of variable domestic, commercial, industrial, and solid wastes including but not limited to explosives (TNT, Composition B), napalm, gasoline, acid dip liquor, annealing residue (sulfuric acid, shell casings, sodium ortho silicate, chromic acid and alkali), aluminum chloride, and inert material. The volume of landfilled material is unknown (Jacobs Engineering 1989).

Five groundwater monitoring wells were installed around the landfill perimeter in 1987. These wells were decommissioned under regulatory guidelines in 2006. New wells were installed in 1998 to further investigate the nature and extent of groundwater contamination at the landfill. A report of findings was published in October 1998.

Installation of additional wells and the acquisition of soil, sediment, and surface water samples taken in fall 2003 further determined the nature and extent of the contamination of the CERCLA portion of the quarry. The new wells are monitored on a regular basis as part of the facility-wide groundwater-monitoring program. Low levels of explosives and metals have been detected in groundwater. The groundwater unit transferred from the RCRA solid waste program to CERCLA in June 2004. A PBC was awarded in 2005 to complete the investigation and any required remediation in accordance with the Defense Planning Guidance. A final RI/FS was completed and approved in April 2007. A ROD was signed by the Army and Ohio EPA in October 2009. The approved remediation consisted of removing PAHs contamination within an 18-inch soil depth that encompassed 2.5 acres of the quarry bottom. The remediation was immediately curtailed in July 2010 by the discovery of buried transite, an asbestos containing material (ACM). By August 2010, all disturbed ACM was removed.

An Engineering Evaluation/Cost Analysis (EE/CA) was prepared and accepted by the Ohio EPA in September 2011. A Proposed Plan (PP) was completed in November 2012. A signed ROD Amendment was completed in August 2013. In June 2014 the RD was approved by the Ohio EPA. In October 2014, the remedial action was completed. MEC is being addressed under the MMRP site RVAAP-001-R-01.

**Site ID: RVAAP-01**

**Site Name: RAMSDELL QUARRY LANDFILL**

## **CLEANUP/EXIT STRATEGY**

The remedial action includes LUCs consisting of fencing around the AOC, personnel briefing, inspections, asbestos signage, and access and digging restrictions. The next five year review will be in FY17.

Groundwater monitoring requirements are carried in RVAAP-66.

Site ID: RVAAP-03

Site Name: OPEN DEMOLITION AREA #1

### STATUS

Regulatory Driver: CERCLA

RRSE: HIGH

Contaminants of Concern: Explosives, Metals

Media of Concern: Soil

Phases	Start	End
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199910.....	201611
RD.....	201611.....	201703
IRA.....	199910.....	200309
RA(C).....	201703.....	201705
LTM.....	201705.....	204704

RIP Date: N/A

RC Date: 201705

### SITE DESCRIPTION

RVAAP-03 (Open Demolition Area 1), consisting of approximately six acres, was used to thermally treat munitions by OB/OD. The site now consists of a circular one-ft berm surrounding a grassed area of approximately 1.5 acres. The entire AOC is located within the National Advisory Committee on Aeronautics (NACA) Test Area. Contaminants of Concern (COCs) include explosive compounds and metals. The 1989 report from Jacobs Engineering indicates that munition fragments including scrap metal, small arms primers, and fuzes were found outside the bermed area and that the area was operational from 1941 through 1949.

In July 2001 a Base Realignment and Closure (BRAC)-funded IRA involving removal of approximately six acres of surface hot spots containing high levels of metals and explosives was completed. In December 2001, a Final Phase I RI report was completed. Site closeout documentation was initiated in FY03. Concern remained over potential MEC kick-outs and push-out material beyond the IRA area. Because this site is located on the Operational Range Inventory System, the area is considered an active range, and therefore ineligible for MMRP.

A geophysical investigation was conducted in FY10 to investigate the potential MEC kick-outs/push-outs outside the IRA area. Results of the geophysical investigation were received in the fourth quarter of FY10 and the final report was published in January 2011. A Draft RI/FS was completed in August 2012.

Groundwater monitoring is being conducted under the Facility-Wide Groundwater Monitoring Program (FWGWMP). This area is currently signed and Siebert staked.

### CLEANUP/EXIT STRATEGY

The anticipated cleanup strategy is to complete the RI/FS followed by LUCs restricting access by Siebert stakes and signage. LUC costs are carried under this site.

Site Name: WINKLEPECK BURNING GROUNDS

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199410.....	201510
RD.....	201409.....	201510
IRA.....	200608.....	200912
RA(C).....	201502.....	201710
LTM.....	201710.....	204709

RIP Date: N/A

RC Date: 201710

SITE DESCRIPTION

The Winklepeck Burning Grounds (RVAAP-05), consisted of approximately 216 acres and, operated from 1948 to 1998. Prior to 1980, there were open-burning activities performed in unlined pits, pads, and sometimes on the roads within the 216-acre area. Materials that were burned included: RDX, antimony sulfide, Composition B, lead azide, TNT, propellants, black powder, waste oils, sludge from the load lines, domestic wastes, explosively contaminated wastes (e.g. rags, papers, cardboard) and small amounts of laboratory chemicals. The pre-1980 burning was conducted on bare ground and resulting ash was abandoned in-place. Munitions, munitions debris (primarily scrap metal) and explosive constituents are present at the site. From 1980-1998, burning of scrap explosives, propellants, and explosively contaminated materials was conducted within raised refractory-lined trays located within a 1.5-acre area.

In 1994, the Army notified Ohio EPA of their intent to withdraw the Part B permit application. The burn trays along with the 90-day storage unit, Building 1601, were closed in accordance with Ohio EPA guidance in 1998.

The deactivation furnace soils were transferred from the RCRA to the CERCLA program under the DFFOs in June 2004. The management of groundwater monitoring is under the FWGWMP.

A limited MEC clean-up took place within various portions of the site during 2004, 2005, 2008, and 2009. A PP was finalized in 2006.

A September 2008 contract was awarded to conduct a Data Quality Objectives (DQO) study for MEC and chemical contaminants remaining within the AOC. The DQO report was completed in 2010. A Work Plan for additional sampling was finalized in 2012. Additional sampling was conducted in Fall 2012 in support of the upcoming multi-purpose machine gun range. Additional cleanup consisting of soil excavation will be required to support construction of a multi-purpose machine gun range which will partially overlap with the existing Mark 19 range.

Additional sampling results and analysis of the previously selected remedy with additional soil excavation was documented in the RI/FS Supplement.

CLEANUP/EXIT STRATEGY

The anticipated exit strategy for this site includes completing an Explanation of Significant Differences to the approved ROD documenting the increase in volume and cost relative to the previously established remedy, a RD (funded), and remedial actions to execute the additional soil excavation with off-site disposal.

Future LUCs will include no residential use and a potable groundwater use restriction. The first five year review will be completed

**Site ID: RVAAP-05**  
**Site Name: WINKLEPECK BURNING GROUNDS**

in FY22.



**Site ID: RVAAP-06**  
**Site Name: C BLOCK QUARRY**

**STATUS**

**Regulatory Driver:** CERCLA  
**RRSE:** LOW  
Contaminants of Concern: Asbestos, Metals  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	200408.....	201703
RD.....	201703.....	201707
RA(C).....	201708.....	201803
LTM.....	201803.....	204802
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201803	

**SITE DESCRIPTION**

RVAAP-06 (C Block Quarry) is an abandoned quarry, approximately 0.3 acres. It was used as a disposal area for annealing process wastes (chromic acid) for a short time during the 1950s. Liquid wastes were reported to have been dumped in the pit bottom. The site is now heavily forested with trees of one-ft diameter or larger. The IRP COC is metals.

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by removal of surficial asbestos and implementation of LUCs. Anticipated LUCs will include access restrictions and personnel briefings on potential hazards and safety precautions (related to asbestos). LTM will include inspections and annual reporting. The first five year review will be completed in FY22.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-08**  
**Site Name: LOAD LINE 1**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** HIGH

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199410.....	201810
RD.....	201710.....	201810
IRA.....	200309.....	200807
RA(C).....	201802.....	201902

**RIP Date:** N/A

**RC Date:** 201902

**SITE DESCRIPTION**

Load Line 1 (RVAAP-08) was used between 1941 and 1971 to melt and load TNT and Composition B into large-caliber projectiles. Workers would periodically use steam and hot water to hose down equipment and the floors and walls of buildings contaminated with explosive dust, spills, and vapors. Wash-down water and wastewater from the load line operations was collected in concrete sumps, pumped through sawdust filtration units, and then discharged to a settling pond, known as Criggy's Pond. Wash-down water from the melt-pour buildings would, in some instances, be swept out through doorways onto the ground surrounding the buildings. The load line also was used for the demilitarization of projectiles and the production and reconditioning of anti-tank mines from 1973 -1974.

COCs at this site are explosive compounds, SVOCs, and heavy metals. The media of concern include soils, surface water, sediment, and groundwater. The following remedial actions have occurred at the site:

1. Structures underwent demolition between FY00 and FY09. Demolition activities were completed as BRAC Division projects. Environmental controls were implemented during all demolition activities to prevent /mitigate potential migration of contaminants from the buildings to the ground surface. Elevated walkways between buildings remain in place.
2. A PBC was awarded in September 2003 to complete an interim soil and dry sediment removal action at Load Lines 1, 2, 3 and 4 (RVAAP-08, 09, 10, and 11).
3. The final Interim ROD addressing only soil and dry sediment was signed by the Army and Ohio EPA in July 2007.
4. Additional contract action was initiated in December 2007 to sample the soils within the former building slab footprints (building slabs were left in place during the initial investigation, and were then removed). A January 2008 change memorandum to the interim ROD was prepared by the Army and submitted to the Ohio EPA describing additional removal actions. Underslab sampling reports associated with this action were finalized in March 2010.
5. Contaminated soils were removed from Load Line 1 and transported off-site for disposal in September 2010 and from Load Lines 2 and 3 in June 2010. The Final Remediation Completion Report for Load Line 1 was approved on March 25, 2011. The Final Remediation Completion Report for Load Lines 2 and 3 was approved on January 11, 2011. No additional remediation was required at Load Line 4.
6. Underslab subsurface incremental sampling was conducted in August 2010. The sampling report documenting this sampling and the USACE-led 2009 sampling event was finalized in March 2011.
7. Additional characterization sampling was completed in July 2011.

RVAAP-008-R-01 is collocated within a portion of this AOC.

**CLEANUP/EXIT STRATEGY**

Under an existing contract, additional characterization sampling will be completed in FY15, and a RI/FS Supplement will be completed in FY16. The anticipated exit strategy for this site includes further characterization and soil excavation with off-site

**Site ID: RVAAP-08**  
**Site Name: LOAD LINE 1**

disposal to achieve unrestricted use of the property. A ROD amendment will be completed prior to any additional remediation.

Costs for a data gap analysis for surface water are carried under this site. ROD addendums will be completed in October 2018.

This work covers remediation at RVAAP-08, 09, 10, 11, and 12. Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-09**  
**Site Name: LOAD LINE 2**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** HIGH

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199410.....	201709
RD.....	201710.....	201802
IRA.....	200309.....	200807
RA(C).....	201802.....	201902

**RIP Date:** N/A

**RC Date:** 201902

**SITE DESCRIPTION**

Load Line 2 (RVAAP-09) was used between 1941 and 1971 to melt and load TNT and Composition B into large-caliber projectiles. Workers would periodically use steam and hot water to hose down equipment and the floors and walls of buildings contaminated with explosive dust, spills, and vapors. Wash-down water and wastewater from the load line operations was collected in concrete sumps, pumped through sawdust filtration units, and then discharged to a settling pond. Wash-down water from the melt-pour buildings would, in some instances, be swept out through doorways onto the ground surrounding the buildings. The settling pond, known as Kelley's Pond, was an unlined triangular-shaped pond approximately one acre in size with an average depth of four feet. Water from the impoundment discharged to a stream that ultimately exited the installation.

COCs at this site are explosive compounds, SVOCs, and heavy metals. The media of concern include soils, surface water, sediment, and groundwater. The following remedial actions have occurred at the site:

1. Structures underwent demolition between FY00 and FY09. Demolition activities were completed as BRAC Division projects. Environmental controls were implemented during all demolition activities to prevent /mitigate potential migration of contaminants from the buildings to the ground surface. Elevated walkways between buildings remain in place.
2. A PBC was awarded in September 2003 to complete an interim soil and dry sediment removal action at Load Lines 1, 2, 3 and 4 (RVAAP-08, 09, 10, and 11).
3. The final Interim ROD addressing only soil and dry sediment was signed by the Army and Ohio EPA in July 2007.
4. Additional contract action was initiated in December 2007 to sample the soils within the former building slab footprints (building slabs were left in place during the initial investigation, and were then removed). A January 2008 change memorandum to the interim ROD was prepared by the Army and submitted to the Ohio EPA describing additional removal actions. Underslab sampling reports associated with this action were finalized in March 2010.
5. Contaminated soils were removed from Load Line 1 and transported off-site for disposal in September 2010 and from Load Lines 2 and 3 in June 2010. The Final Remediation Completion Report for Load Line 1 was approved on March 25, 2011. The Final Remediation Completion Report for Load Lines 2 and 3 was approved on Jan. 11, 2011. No additional remediation was required at Load Line 4.
6. Underslab subsurface incremental sampling was conducted in August 2010. The sampling report documenting this sampling and the USACE-led 2009 sampling event was finalized in March 2011.
7. Additional characterization sampling was completed in July 2011.

**CLEANUP/EXIT STRATEGY**

Under an existing contract, additional characterization sampling will be completed in FY15, and a RI/FS Supplement will be completed in FY16. The anticipated exit strategy for this site includes further characterization and soil excavation with off-site disposal to achieve unrestricted use of the property. A ROD amendment will be completed prior to any additional remediation.

**Site ID: RVAAP-09**  
**Site Name: LOAD LINE 2**

This work covers remediation at RVAAP-08, 09, 10, 11, and 12. Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-10**  
**Site Name: LOAD LINE 3**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** HIGH

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199410.....	201709
RD.....	201710.....	201802
IRA.....	200309.....	200807
RA(C).....	201802.....	201902
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201902	

**SITE DESCRIPTION**

Load Line 3 (RVAAP-10) was used between 1941 and 1971 to melt and load TNT and Composition B into large-caliber projectiles. Workers would periodically use steam and hot water to hose down equipment and the floors and walls of buildings contaminated with explosive dust, spills, and vapors. Wash-down water and wastewater from the load line operations was collected in concrete sumps, pumped through sawdust filtration units, and then discharged to a settling pond. Wash-down water from the melt-pour buildings would, in some instances, be swept out through doorways onto the ground surrounding the buildings. Water from the impoundment discharged to a stream that flowed in a northerly direction and ultimately discharged into RVAAP-29 Cobbs Pond.

The COCs at this site are explosive compounds, SVOCs, and heavy metals. The media of concern include soils, surface water, sediment, and groundwater. The following remedial actions have occurred at the site:

1. Structures underwent demolition between FY00 and FY09. Demolition activities were completed as BRAC Division projects. Environmental controls were implemented during all demolition activities to prevent /mitigate potential migration of contaminants from the buildings to the ground surface. Elevated walkways between buildings remain in place.
2. A PBC was awarded in September 2003 to complete an interim soil and dry sediment removal action at Load Lines 1, 2, 3 and 4 (RVAAP-08, 09, 10, and 11).
3. The final Interim ROD addressing only soil and dry sediment was signed by the Army and Ohio EPA in July 2007.
4. Additional contract action was initiated in December 2007 to sample the soils within the former building slab footprints (building slabs were left in place during the initial investigation, and were then removed). A January 2008 change memorandum to the interim ROD was prepared by the Army and submitted to the Ohio EPA describing additional removal actions. Underslab sampling reports associated with this action were finalized in March 2010.
5. Contaminated soils were removed from Load Line 1 and transported off-site for disposal in September 2010 and from Load Lines 2 and 3 in June 2010. The Final Remediation Completion Report for Load Line 1 was approved on March 25, 2011. The Final Remediation Completion Report for Load Lines 2 and 3 was approved on Jan. 11, 2011. No additional remediation was required at Load Line 4.
6. Underslab subsurface incremental sampling was conducted in August 2010. The sampling report documenting this sampling and the USACE-led 2009 sampling event was finalized in March 2011.
7. Additional characterization sampling was completed in July 2011.

**CLEANUP/EXIT STRATEGY**

Under an existing contract, additional characterization sampling will be completed in FY15, and a RI/FS Supplement will be completed in FY16. The anticipated exit strategy for this site includes further characterization and soil excavation with off-site disposal to achieve unrestricted use of the property. A ROD amendment will be completed prior to any additional remediation.

**Site ID: RVAAP-10**  
**Site Name: LOAD LINE 3**

This work covers remediation at RVAAP-08, 09, 10, 11, and 12. Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-11**  
**Site Name: LOAD LINE 4**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199410.....	201709
RD.....	201710.....	201802
IRA.....	200309.....	200807
RA(C).....	201802.....	201902
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201902	

**SITE DESCRIPTION**

Load Line 4 (RVAAP-11) was used between 1941 and 1971 to melt and load TNT and Composition B into large-caliber projectiles. Workers would periodically use steam and hot water to hose down equipment and the floors and walls of buildings contaminated with explosive dust, spills, and vapors. Wash-down water and wastewater from the load line operations was collected in concrete sumps, pumped through sawdust filtration units, and then discharged to a settling pond. Wash-down water from the melt-pour buildings would, in some instances, be swept out through doorways onto the ground surrounding the buildings. The on-site settling pond, known as Load Line 4 Pond, was an unlined earthen impoundment approximately one acre, based on a Geographic Information Systems approximation. Water from the impoundment discharged to a stream that ultimately exited through the southern side of the installation.

The COCs at this site are explosive compounds, SVOCs, and heavy metals. The media of concern include soils, surface water, sediment, and groundwater. The following remedial actions have occurred at the site:

1. Structures underwent demolition between FY00 and FY09. Demolition activities were completed as BRAC Division projects. Environmental controls were implemented during all demolition activities to prevent /mitigate potential migration of contaminants from the buildings to the ground surface. Elevated walkways between buildings remain in place.
2. A PBC was awarded in September 2003 to complete an interim soil and dry sediment removal action at Load Lines 1, 2, 3 and 4 (RVAAP-08, 09, 10, and 11).
3. The final Interim ROD addressing only soil and dry sediment was signed by the Army and Ohio EPA in July 2007.
4. Additional contract action was initiated in December 2007 to sample the soils within the former building slab footprints (building slabs were left in place during the initial investigation, and were then removed). A January 2008 change memorandum to the interim ROD was prepared by the Army and submitted to the Ohio EPA describing additional removal actions. Underslab sampling reports associated with this action were finalized in March 2010.
5. Contaminated soils were removed from Load Line 1 and transported off-site for disposal in September 2010 and from Load Lines 2 and 3 in June 2010. The Final Remediation Completion Report for Load Line 1 was approved on March 25, 2011. The Final Remediation Completion Report for Load Lines 2 and 3 was approved on Jan. 11, 2011. No additional remediation was required at Load Line 4.
6. Underslab subsurface incremental sampling was conducted in August 2010. The sampling report documenting this sampling and the USACE-led 2009 sampling event was finalized in March 2011.
7. Additional characterization sampling was completed in July 2011.

**CLEANUP/EXIT STRATEGY**

Under an existing contract, additional characterization sampling will be completed in FY15, and a RI/FS Supplement will be completed in FY16. The anticipated exit strategy for this site includes further characterization and soil excavation with off-site



**Site ID: RVAAP-11**  
**Site Name: LOAD LINE 4**

disposal to achieve unrestricted use of the property. A ROD amendment will be completed prior to any additional remediation.

This work covers remediation at RVAAP-08, 09, 10, 11, and 12. Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** HIGH

Contaminants of Concern: Explosives, Metals, Nitrate/Nitrite

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	199910.....	201709
RD.....	201710.....	201802
IRA.....	200807.....	201010
RA(C).....	201802.....	201902
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201902	

**SITE DESCRIPTION**

From 1941-1943 and 1946-1950, ammonium nitrate was produced at Load Line 12 (RVAAP-12). From 1949 to 1993, munitions were periodically demilitarized at this AOC. Building wash-down water and wastewater from the bomb melt out facility operations was collected in a house gutter system, and flowed through a piping system to two stainless steel tanks. The first tank was used for settling, and the second tank was used for filtration. Prior to the 1980s, the water leaked under the building and ponded there. Building wash-down water from Building F-904 was also swept out through doorways onto the ground surrounding the building. After 1981, the water was treated in the Load Line 12 wastewater treatment system, which discharged to an on-site pond then discharged to a receiving stream that ultimately entered into RVAAP-29, Cobbs Ponds.

The COCs at this site include explosive compounds, nitrates and heavy metals. Media of concern include soil, surface water, sediment and groundwater. The National Pollutant Discharge Elimination System (NPDES) permit for the original pink water treatment plant located at Building F-904 was terminated May 1,2000. The treatment plant is considered formally closed under the NPDES permit.

In 2000, a composting pilot study was conducted using soils contaminated with explosives from the area of Building F-904. This pilot project was successful for the bioremediation of explosives.

Under PBC05 an RI/FS was completed in 2006 for soil and dry sediment. A PP was completed in May 2007. The PP recommended soil and dry sediment removal. Public review of the PP was completed in January 2009, The ROD was signed by the Ohio EPA and the US Army in October 2009, and the RD was finalized in the first quarter of FY10. A removal action was completed in the fourth quarter of FY10.

Additional characterization sampling was conducted in June-July 2011.

Groundwater is being addressed under RVAAP-66, Facility-wide Groundwater. Surface water and wet sediment are being addressed under PBA08.

**CLEANUP/EXIT STRATEGY**

Under an existing contract, additional characterization sampling will be completed in FY15, and a RI/FS Supplement will be completed in FY16. The anticipated exit strategy for this site includes further characterization and soil excavation with off-site disposal to achieve unrestricted use of the property. A ROD amendment will be completed prior to any additional remediation.

This work covers remediation at RVAAP-08, 09, 10, 11, and 12. Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

Site Name: BLDG 1200-DILUTION\SETTLING POND

**STATUS**

Regulatory Driver: CERCLA  
RRSE: LOW  
Contaminants of Concern: Metals  
Media of Concern: Groundwater, Soil

Phases	Start	End
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	200408.....	201407
RD.....	200807.....	201408
RA(C).....	200807.....	201507

RIP Date: N/A  
RC Date: 201507

**SITE DESCRIPTION**

From approximately 1941 to 1971, ammunition was demilitarized by steaming out munitions rounds at building 1200 (RVAAP-13). The steam decontamination generated pink water, which drained to a man-made ditch. The ditch discharged into a 0.5-acre sedimentation pond, and the overflow from this pond discharged into Sand Creek.

The buildings were demolished, and all foundations and footings were removed.

This was one of 14 sites investigated in FY04-FY05 to provide data for a future contract. A PBA was awarded in FY08 and will address all investigation and cleanup through RC for this site. Tasks 1 through 4 (investigations) were awarded in FY08. Task 5 (remediation) was awarded in FY10. The RI was completed in 2012. The Final RI/FS determined this site will achieve unrestricted use. The PP was completed in August 2013. The ROD was finalized in May 2014. The remedial action was completed in December 2014.

**CLEANUP/EXIT STRATEGY**

The Final Remedial Action Completion report will be submitted to Ohio EPA.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

Site Name: LANDFILL NORTH OF WINKLEPECK BURN GRND

**STATUS**

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	200408.....	201703
RD.....	201704.....	201707
RA(C).....	201708.....	201803
LTM.....	201803.....	204802

RIP Date: N/A

RC Date: 201803

**SITE DESCRIPTION**

RVAAP-19 is a 2.5-acre unlined and unpermitted landfill (a non-regulated solid waste disposal unit), which operated from 1969 to 1976 and is located upgradient of a wetland. The general appearance of the site suggests that a trench and fill method type of operation was used for waste disposal. Waste types possibly associated with this landfill include booster cups, aluminum liners, municipal waste, explosive and munitions waste and ash, and scrap metal from the Winklepeck Burning Grounds (RVAAP-05). The landfill was covered with soil in 1978.

Potential COCs at this site include metals, explosives, and SVOCs.

This site is currently in the RI/FS phase. RVAAP-019-R-001 will address MEC concerns.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by Restricted Access to the disturbed area, and implementation of LUCs under the FY08 PBA to prevent direct contact with residual surface debris. The first five year review will be completed in FY22.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

Site Name: SUSPECTED MUSTARD AGENT BURIAL SITE

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Chemical weapon munitions (CWM)/Chemical agent

Media of Concern: Soil

Phases	Start	End
PA.....	198802.....	198804
SI.....	198906.....	201508
IRA.....	201503.....	201610

RIP Date: N/A

RC Date: 201610

SITE DESCRIPTION

RVAAP-28 consists of three potential disposal areas:

Area 1: Records indicate that in 1969 an Explosive Ordnance Disposal Unit excavated a suspected mustard agent burial site near the west end of the NACA crash strip. Recovered from the site in 1969 were one 190-liter (50 gallon) drum and seven rusty canisters. All recovered items were empty and no evidence of contamination was found.

Area 2: Another suspected area, located to the southwest across Hinckley Creek, is presently marked by reflective Seibert stakes. Surface soil samples collected in 1996 as part of the Relative Risk Site Evaluation (RRSE) conducted by US Army Center for Health Promotion and Preventative Medicine contained no thiodiglycol (mustard agent breakdown product). There were two non-intrusive geophysical surveys (EM-31, and EM-61) completed in 1998. The two surveys identified the demarcated area with positive metallic responses. Many responses may be related to artificial features (e.g. rusted fencing) at or near the ground surface.

Groundwater samples were collected in 2004 and no mustard agent or mustard agent breakdown products were found. Groundwater monitoring is ongoing. Accountability for the site was transferred to ARNG in May 1999.

In 2006, additional wells were installed and sampled for mustard agent and associated breakdown products. The chemical analysis reported no detections of mustard agent or breakdown products. An additional groundwater monitoring event was conducted in October 2011, also with no detections reported

Area 3: An additional potential burial area located at the west end of the NACA crash strip was suggested by a member of the public and investigated in FY08. The geophysical investigation detected unidentified anomalies. A follow-on FY08 contract was awarded to perform a DQO study and an additional geophysical survey that included areas on the north and south sides of the test crash strip. The geophysical survey work and report were completed in the fourth quarter of FY10 and the study detected additional unidentified anomalies.

An additional groundwater monitoring event was conducted at the second area in October 2011, and groundwater samples were analyzed for the mustard agent degradation products. No mustard agent degradation products were detected in the groundwater samples.

Data collected to date has not confirmed the presence of mustard gas or chemical agents identification kits with mustard gas. The Huntsville Center of Expertise prepared a Probability Assessment that was issued in January 2013. The probability was judged to be seldom.

CLEANUP/EXIT STRATEGY

The final SI will be submitted to the Ohio EPA. An EE/CA will be completed under the IRA phase. It is assumed a fence will be installed around the suspected areas. LUCs will likely include restricted access.

**Site ID: RVAAP-29**

**Site Name: UPPER AND LOWER COBBS PONDS**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals

Media of Concern: Groundwater, Sediment, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	198802.....	198804
SI.....	198906.....	198906
RI/FS.....	200101.....	201703
RD.....	201704.....	201707
RA(C).....	201708.....	201803
LTM.....	201803.....	204802

**RIP Date:** N/A

**RC Date:** 201803

**SITE DESCRIPTION**

RVAAP-29 is comprised of approximately five acres (Upper Cobbs Pond) and four acres (Lower Cobbs Pond). The Upper and Lower Cobbs Ponds are unlined ponds that contain abundant fish and wildlife. A ponded area known as "a backwater area" is located south of Upper Cobbs Pond. This area, approximately one acre, was created by beaver activity and was not present during facility operations.

The Upper and Lower Cobbs Ponds were used as sedimentation basins for Load Line 12 (RVAAP-12) and Load Line 3 (RVAAP-10) wastewater effluent from 1941 to 1971 and storm water runoff. Waste types associated with this site include, but are not limited to, TNT, RDX, HMX, Composition B, lead, chromium, mercury, and aluminum chloride.

This site is currently in the RI/FS phase. Currently fishing at Cobbs Pond is catch and release only.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by LUCs. LUCs will likely include personnel briefings and catch and release fishing restrictions. The first five year review will be in FY22.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-33**  
**Site Name: LOAD LINE 6**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199407.....	199602
SI.....	199407.....	199901
RI/FS.....	200207.....	201703

**RIP Date:** N/A

**RC Date:** 201703

**SITE DESCRIPTION**

Load Line 6 (RVAAP-33) is approximately 45 acres and operated primarily as a fuze assembly line from 1941 to 1945. Demolition of all Load Line 6 buildings was completed July 2006.

A portion of the AOC was reactivated in 1950 when the Firestone Defense Products Division became a tenant which lasted until the late-1980s. During this time frame Firestone sold its Defense Products Division to Physics International. Three years later, Physics International became a subsidiary of Olin Corporation and Olin remained as a tenant until early-1993. Throughout the history of the tenant occupancy the work regimen remained the same. As reported by former workers at RVAAP, Load Line 6 was a classified experimental test facility for munitions. Shaped charges were constructed and tested under contract for the Department of Defense. The site consisted of a pond (underwater test chamber), two above ground test-firing chambers, and several buildings. The test chamber foundation and the concrete blocks around the test pond remain at the site. No original file documentation exists for this site.

This site is currently in the RI/FS phase. MMRP issues will be addressed separately under RVAAP-033-R-01.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

Site Name: SAND CREEK DISPOSAL ROAD LANDFILL

**STATUS**

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Sediment, Soil, Surface Water

Phases	Start	End
PA.....	199407.....	199602
SI.....	199407.....	199906
RI/FS.....	200409.....	201703
RD.....	201703.....	201707
IRA.....	200209.....	200409
RA(C).....	201708.....	201803
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201803	

**SITE DESCRIPTION**

RVAAP-34 was reported by former workers at RVAAP to have been an open dump for materials including, but not limited to, concrete, wood, asbestos debris, lab bottles, 55-gallon drums and fluorescent light tubes. Debris was disposed at the surface, but became covered by vegetation. The site is approximately 2.7 acres and located adjacent to Sand Creek. The dates of operation of this site are unknown, but believed to be between 1950 and 1960.

A surface soil and debris removal (IRA) was completed in summer 2003. The IRA was documented in a report submitted in April 2004. An FY08 DQO study was awarded to determine data gaps for the FY03 IRA. Following the DQO study, the recommended geophysical magnetometer study and soil sampling were conducted in the fourth quarter of FY10 and first quarter of FY11. A Draft RI was submitted to Ohio EPA in 2012.

This site used to carry the facility-wide non-groundwater LTM and programmatic support requirements. These requirements are now carried in Program Management and RVAAP-66. MMRP issues will be addressed separately under RVAAP-034-R-01.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by a ROD, (funded in FY15). The ROD is expected to be completed in FY17 and the Remedial Action (Construction) (RA(C)) will begin.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.



**Site ID: RVAAP-38**  
**Site Name: NACA TEST AREA**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199508.....	199602
SI.....	199508.....	199812
RI/FS.....	199909.....	201703
RD.....	201704.....	201707
RA(C).....	201708.....	201803
LTM.....	201803.....	204802

**RIP Date:** N/A

**RC Date:** 201803

**SITE DESCRIPTION**

RVAAP-38 (NACA Test Area), an approximately 69-acre site, was previously used as an aircraft test area by NACA. Surplus military aircraft crashed into constructed barriers, using a fixed rail attached to the aircraft landing gear, in an attempt to develop crash-worthy fuel tanks and/or high flashpoint aviation fuel. Burial of some demolished aircraft occurred at the site after the tests. Open Demolition Area 1, RVAAP-03, is surrounded by RVAAP-38.

In the late-1990s, soil analyses detected low levels of metals and organics and dry sediment analyses detected nitrocellulose. As such, it was determined that additional study was needed of the area, and a SI/Phase 1 RI, for the site was completed in 2002.

Twelve groundwater monitoring wells were installed and sampled in 2004. Analytical results indicated metals and low levels of SVOCs.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by soil excavation with off-site disposal. Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

LUCs will likely include personnel briefing and a possible digging restriction. Five Year reviews will begin in FY22.

**Site ID: RVAAP-39**  
**Site Name: LOAD LINE 5**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200408.....	201703

**RIP Date:** N/A

**RC Date:** 201703

**SITE DESCRIPTION**

RVAAP-39 (Load Line 5) operated from 1941 to 1945 to produce fuzes for artillery projectiles. Load Line 5 was deactivated and its equipment was removed in 1945.

Since 1978, Load Line 5 has been included in various assessments and investigations. A key evaluation was conducted in conjunction with the removal of buildings, including slabs and foundations in FY07. An underslab soil and dry sediment survey was completed by USACE during this effort and the report was finalized in 2009. The findings indicated that of all 13 process buildings evaluated for surface soil contamination, only two required additional evaluation for contaminant releases. Buildings 1F-12 (the fuze testing building) had the SVOC, benzo (a) anthracene identified as a COPC and Building 1F-10 (the detonator service magazine) had chromium identified as a COPC. As a result of these findings and the results from prior investigations, Load Line 5 was recommended for an RI/FS.

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-40**  
**Site Name: LOAD LINE 7**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200408.....	201703
RD.....	201704.....	201707
RA(C).....	201708.....	201803

**RIP Date:** N/A

**RC Date:** 201803

**SITE DESCRIPTION**

RVAAP-40 (Load Line 7) was used to assemble booster charges for artillery projectiles between 1941 and 1945. Load Line 7 was deactivated and the equipment was removed in 1945. Load Line 7 was used again in 1969 and 1970 to produce 40 millimeter (mm) projectiles. The site was reactivated between 1989 and 1993 under a tenant contract operated by an Olin Corporation subsidiary, Physics International, for the manufacture of large caliber conventional weaponry. The Physics International Load Line 7 munitions process constructed and utilized a carbon-adsorption filtration plant to treat process wastewaters contaminated with explosives. The plant was closed in May 2000 with the termination of the NPDES permit.

An earlier site investigation indicated the presence of metals, VOCs, SVOCs and explosives in soil, sediment, surface water and groundwater above agreed upon screening levels.

Removal of buildings, including slabs and foundations, was completed in FY07. An FY08 USACE underslab soil and dry sediment survey was completed.

The site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by a soil excavation with off-site disposal.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-41**  
**Site Name: LOAD LINE 8**

**STATUS**

**Regulatory Driver:** CERCLA  
**RRSE:** MEDIUM  
Contaminants of Concern: Explosives, Metals  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200408.....	201703
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201703	

**SITE DESCRIPTION**

RVAAP-41 (Load Line 8) was used to assemble booster charges for artillery projectiles between 1941 and 1945. Load Line 8 was deactivated and the equipment was removed in 1945.

Removal of buildings, including slabs and foundations, was completed in FY07. An FY08 USACE underslab soil and dry sediment survey was completed.

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

## STATUS

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Polycyclic Aromatic Hydrocarbons (PAH)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200208.....	201703
RD.....	201704.....	201707
RA(C).....	201708.....	201803

**RIP Date:** N/A

**RC Date:** 201803

## SITE DESCRIPTION

RVAAP-42 (Load Line 9) operated from 1941 to 1945 to produce detonators. Load Line 9 was deactivated and its equipment removed in 1945.

Limited samples collected and analyzed in 2000 indicated low levels (below two percent) of lead azide in sediment and surface water in the sumps. The removal of buildings, including slabs and foundations, was completed in FY07.

This site is currently in the RI/FS phase.

## CLEANUP/EXIT STRATEGY

The anticipated exit strategy for this site includes completion of the RI/FS followed by a soil excavation with off-site disposal.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-43**  
**Site Name: LOAD LINE 10**

**STATUS**

**Regulatory Driver:** CERCLA  
**RRSE:** MEDIUM  
Contaminants of Concern: Explosives, Metals  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200408.....	201703

**RIP Date:** N/A  
**RC Date:** 201703

**SITE DESCRIPTION**

RVAAP-43 (Load Line 10) operated from 1941 to 1945 to produce percussion elements. Load Line 10 went on standby status in 1945. From 1951 to 1957, Load Line10 produced primers and percussion elements. From 1969 to 1971, Load Line10 was reactivated, and produced munitions primers. The load line has been inactive since that time frame.

Removal of buildings, including slabs and foundations, was completed in FY07. An FY08 USACE underslab soil and dry sediment survey was completed.

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-44**  
**Site Name: LOAD LINE 11**

**STATUS**

**Regulatory Driver:** CERCLA  
**RRSE:** MEDIUM  
Contaminants of Concern: Explosives, Metals, Volatiles (VOC)  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	199910.....	201703
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201703	

**SITE DESCRIPTION**

RVAAP-44 (Load Line 11) operated from 1941 to 1945 to produce primers for artillery projectiles. Load Line 11 was placed on standby in 1945. From 1951 to 1957, Load Line11 was used to produce primers and fuzes.

The removal of lead/asbestos-lined sumps, lead-contaminated sediments, and solvent-contaminated soils occurred during an IRA in 2001. The Final IRA report was completed in April 2004. Several of the sewer lines were intentionally plugged with grout to prevent migration of contaminants.

The SI/Phase I RI was completed in FY05 prior to demolition of the buildings. The complete removal of buildings, including slabs and foundations, occurred in FY05.

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-45**  
**Site Name: WET STORAGE AREA**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** LOW

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200409.....	201703

**RIP Date:** N/A

**RC Date:** 201703

**SITE DESCRIPTION**

RVAAP-45 (Wet Storage Area) was used from 1941 to 1945 to store primary explosives in water-filled tanks and metal carboys. There is no documentation of any spills in the area.

Four of the six igloos were demolished in spring 2003-2004.

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.



**Site ID: RVAAP-46**  
**Site Name: BUILDING F-15 AND F-16**

**STATUS**

**Regulatory Driver:** CERCLA  
**RRSE:** MEDIUM  
Contaminants of Concern: Explosives, Metals  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200312.....	201703
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201703	

**SITE DESCRIPTION**

RVAAP-46 (Building F-15 and F-16) was used during World War II, the Korean Conflict and Vietnam War to test disassembly processes and munitions surveillance. Quantities and types of materials utilized as well as exact dates of testing are unknown.

An SI/Phase I RI (2005-2006) found metals, explosives, SVOCs in soil and surface water above the agreed upon screening criteria. The Phase I RI did not investigate groundwater.

All buildings, foundations, and slabs were removed from both sites in the fourth quarter of FY09. Following removal, confirmation sampling within and outside the buildings footprints was completed in the first quarter of FY10. Analytical results were evaluated in FY11 to determine any cleanup strategy (e.g. soil removal, clean closure, no further action).

This site is currently in the RI/FS phase.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI under the FY08 PBA. The FS is expected to be awarded in FY15. An NFA PP and ROD will be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-48**  
**Site Name: ANCHOR TEST AREA**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

**Contaminants of Concern:** Metals

**Media of Concern:** Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200408.....	201409
RD.....	200807.....	201409
RA(C).....	200807.....	201507

**RIP Date:** N/A

**RC Date:** 201507

**SITE DESCRIPTION**

RVAAP-48 (Anchor Test Area) is located in the central part of the installation. Limited information is known about this research and development area, including dates of operation. It is believed that the site was used for testing explosively driven soil anchoring devices. It currently consists of several dirt mounds with a nearby sand pit (approximately six by 30 feet). There is metal debris in the area.

The Final RI/FS was issued in January 2012. The Final PP was issued in May 2013. The Final ROD was finalized in July 2014. The RD was completed in September 2014. The RA was completed in December 2014.

**CLEANUP/EXIT STRATEGY**

The Remedial Action Completion Report will be finalized.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-50**  
**Site Name: ATLAS SCRAP YARD**

**STATUS**

**Regulatory Driver:** CERCLA

**RRSE:** MEDIUM

Contaminants of Concern: Explosives, Metals, Semi-volatiles (SVOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200408.....	201703
RD.....	201704.....	201707
RA(C).....	201708.....	201803
LTM.....	201803.....	204802

**RIP Date:** N/A

**RC Date:** 201803

**SITE DESCRIPTION**

In the 1940s, RVAAP-50 (Atlas Scrap Yard) contained a complex of buildings including barracks type housing that supported the principal construction and engineering company staff and included barracks type housing. After WWII, a majority of the Atlas building complex was demolished leaving the remaining portion of structures to support the installation roads and grounds maintenance staff and equipment as well as a large contingent of railroad maintenance personnel. The post WWII structures stood until after the Vietnam War at which point all remaining buildings were demolished and the site became a storage/stockpile yard for various types of bulk materials used in the day-to-day installation operations such as gravel, railroad ballast, sand, culvert pipe, railroad ties, and telephone poles. In the mid to late-1980s, the southeastern portion of the old Atlas area became a staging area for salvaged ammunition boxes from the demilitarization of defunct Vietnam War era munitions.

This site is currently in the RI/FS phase.

MEC issues are covered under RVAAP-050-R-01.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by a removal action with LUCs. Inspections and five year reviews will also be completed.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: RVAAP-51**

**Site Name: DUMP ALONG PARIS-WINDHAM ROAD**

## STATUS

**Regulatory Driver:** CERCLA

**RRSE:** LOW

**Contaminants of Concern:** Asbestos, Polycyclic Aromatic Hydrocarbons (PAH)

**Media of Concern:** Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	199802.....	199806
SI.....	199807.....	199807
RI/FS.....	200109.....	201602
RD.....	201602.....	201610
IRA.....	200209.....	200409
RA(C).....	201610.....	201705
LTM.....	201705.....	204704

**RIP Date:** N/A

**RC Date:** 201705

## SITE DESCRIPTION

RVAAP-51 (Dump Along Paris-Windham Road) is adjacent to the Sand Creek flood plain and was used as an open dump for miscellaneous materials, including transite siding. The dates of operation for the landfill are unknown.

Collection and analyses of surface water, sediment and biological samples occurred in Sand Creek adjacent to the site. There were no detections above background levels identified in the RVAAP-specific surface water and sediment. Biological samples collected in Sand Creek under a separate initiative and in the vicinity of the dump reflected excellent stream quality.

Debris removal was completed in January 2004. Confirmation sampling detected PAHs and asbestos close to the road within the embankment. No attempt was made to remove remaining debris within the roadbed embankment as it would have compromised the stability of Paris-Windham Road.

The Final Site Characterization Focused Feasibility Study report was issued in April 2013. A Draft Proposed Plan was issued in June 2013.

## CLEANUP/EXIT STRATEGY

The Final Site Characterization Focused Feasibility Study and Proposed Plan will be finalized in 2015.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

LUCs will likely include personnel briefing, access controls, signage and Siebert stakes, and digging restrictions due to residual asbestos. Five Year review will be completed beginning in FY17.

Site ID: RVAAP-66

Site Name: FACILITY-WIDE GROUNDWATER

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Explosives, Metals, Polycyclic Aromatic Hydrocarbons (PAH), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater

Phases	Start	End
PA.....	198802.....	198804
SI.....	198805.....	198906
RI/FS.....	199910.....	201807
IRA.....	201110.....	201606

RIP Date: N/A

RC Date: 203106

SITE DESCRIPTION

Groundwater at RVAAP are managed through a facility-wide approach called the FWGWMP under RVAAP-66. The FWGWMP is a component of the DFFO, June 2004. The FWGWMP at RVAAP now consists of 291 wells facility wide.

Both shallow aquifers and deeper regional aquifers are being monitored. Several COPCs have been identified in the shallow aquifers that exceed drinking water standards and facility-wide cleanup goals. Some of the source areas are known but nature and extent is not yet established. Site-related constituents have been identified at low concentration and are still being evaluated in the deeper aquifers.

Three wells were installed in 2013 along the facility boundary.

CLEANUP/EXIT STRATEGY

The anticipated exit strategy for this site includes completion of the RI/FS Facility-wide groundwater monitoring will continue until the RI/FS is completed. USACE technical support will be provided in the IRA phase (for well abandonment). Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

**STATUS**

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Explosives

Media of Concern: Soil

Phases	Start	End
PA.....	198802.....	198804
SI.....	198805.....	198906
RI/FS.....	199910.....	201705
RD.....	201705.....	201709
RA(C).....	201709.....	201809

RIP Date: N/A

RC Date: 201809

**SITE DESCRIPTION**

The RVAAP started operations in 1941 and continued intermittently until the late-1970s either loading or demilitarizing ammunition. Plant operations required processing large quantities of secondary explosives and lesser quantities of primary explosives. Periodic cleaning of the process areas resulted in explosive residues in the sanitary and storm sewers and settling ponds. Facility-wide sewers are addressed by RVAAP-67.

Sewers thought to have transported explosive residues during plant operations are believed to be limited to the 12 process areas and Buildings 1037 (laundry) and 1039 (laboratory) in the administrative area of the plant. The sanitary sewers (approximately 28,500-ft) are assembled from either vitreous clay tile that has been lined with resin or cast iron. Storm sewers (estimated at 30,000-ft) are fabricated from either vitreous clay or corrugated galvanized steel.

Sewers were installed in trenches lined with washed gravel then covered by about six-inches of gravel and backfilled with the removed soil, generally heavy clay. If the sewers leaked contaminants they should be in the gravel fill, trapped by the clay backfill. The main sources of explosives in sanitary sewers are change houses within the various load lines where coveralls were removed and people showered prior to leaving the facility, the laundry where the clothes were washed and the laboratory where small quantities of explosives were tested.

Storm sewers within the load lines were subject to contamination by virtue of wash-down procedures where explosive residue and dusts were scrubbed from the floors and washed through doorways onto the surrounding grounds and which could then migrate to the storm water drain system. Explosives could also enter the storm system from explosive filter effluent traveling to settling ponds.

Lakeshore Engineering was contracted to determine the explosive residues in sewers and make recommendations as recorded in its report, Explosive Evaluation of Sewers, dated November 2007. The Lakeshore Engineering study was done under safety qualification parameters; not to quantify the presence of any explosive deposits. The Corps of Engineers Research Laboratory performed a similar investigation of explosive contamination in the sewer system in a letter report dated 15 June 2007 which has been included in the Lakeshore report as an appendix.

Following an Ohio EPA approved work plan, Tier I (sediment and liquids) surveys/investigation were completed in the second quarter of FY10 with Tier II video analyses of critical area LAP production area sewers completed in September FY11. A Draft RI/FS report was submitted to Ohio EPA in 2012.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI/FS followed by soil excavation with off-site disposal.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RVAAP-02	ERIE BURNING GROUNDS	200809	An NFA ROD for soil and dry sediment was signed by Ohio EPA in January 2008. Any MEC issues at the site are being covered under RVAAP-002-R-01.
RVAAP-04	OPEN DEMOLITION AREA #2	200801	An NFA ROD for soil and dry sediment was signed by Ohio EPA in January 2008. Any MEC issues at the site are being covered under RVAAP-004-R-01.
RVAAP-07	BLD 1601 HAZ WST STG	198906	Closure plan approval letter from Director of Ohio EPA, dated Feb. 12, 1998 (with modifications). Letter from RVAAP responded with modified pages June 26, 2000. Closed under RCRA.
RVAAP-14	LOAD LINE 6 EVAPORATION UNIT	198906	Operational from 1987-1993. Not eligible for ER,A funding. Closure letter from Ohio EPA dated Jan. 20, 2003
RVAAP-15	LOAD LINE 6 TREATMENT PLANT	200001	Operational from 1987-1993. Not eligible for ER,A funding.
RVAAP-16	FUZE&BOOSTER QUARRY LANDFILL/PONDS	201009	An NFA ROD for soil and dry sediment was signed by Ohio EPA in January 2008. Any MEC issues at the site are being covered under RVAAP-002-R-01.
RVAAP-17	DEACTIVATION FURNACE	198906	The DFA building was closed under RCRA. Soils and groundwater were moved over to the CERCLA side of the house under the June 10, 2004 Directors Findings and Orders (see section VI (9) (c). RCRA closure plan submitted Feb. 23, 2001. Soils and Groundwater are covered under Winklepeck (RVAAP-05)
RVAAP-18	LOAD LINE 12 WWT PLANT	199703	Operational until 1983. Termination of NPDES permit effective May 1, 2000.
RVAAP-20	SAND CREEK STP	198906	Operational until 1993. NPDES permit terminated May 1, 2000.
RVAAP-21	DEPOT STP	198906	Operational until 1983. NPDES was terminated May 1, 2000.
RVAAP-22	GEORGE RD STP	198906	Activities for this site are carried under CC RVAAP-75.
RVAAP-23	UNIT TRAINING EQUIPMENT SITE UST	198911	Closeout Letter from the Bureau of Underground Storage Tank Regulations dated Feb. 5, 2003.
RVAAP-24	DEPOT AREA	198906	Activities for this site are carried under CC RVAAP-76.
RVAAP-25	BLD 1034 MOTOR POOL AST	198906	Not eligible for ER,A funding.
RVAAP-26	FUZE BOOSTER AREA SETTLING TANKS	200001	15 tanks scattered among LL 5 (1 tank), 7 (1 removed in 1988), 9 (2 tanks), 10 (9 tanks-1 AST, 8 USTs), 11 (3 tanks); all tanks emptied, cleaned and covered in 1971. Soils are being investigated in conjunction with site-specific media investigation/cleanup. (RVAAP-39, -40, -42, -43, & -44)

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RVAAP-27	BUILDING 854, PCB STORAGE	198906	Letter from Ohio EPA dated September 1, 1999 stating NFA.
RVAAP-30	LL 7 TREATMENT PLANT	200001	Operational until 1983. Termination of NPDES permit effective May 1, 2000.
RVAAP-31	ORE PILE RETENTION POND	200001	Termination of NPDES permit effective May 1, 2000.
RVAAP-32	40 MM FIRING RANGE	200709	All concerns are being addressed under MMRP.
RVAAP-35	1037 BUILDING-LAUNDRY WASTEWATER SUMP	199809	Activities for this site are carried under CC RVAAP-77.
RVAAP-36	PISTOL RANGE	200509	Letter from Ohio EPA regarding the delay of clean-up until range no longer used, dated February 14, 2006. Range being used by OHARNG.
RVAAP-37	PESTICIDE BUILDING S-4452	199602	Closure letter from Ohio EPA dated Sept. 19, 2000.
RVAAP-47	BUILDING T-5301	200109	Statement of Basis - signed by RVAAP and Ohio EPA on Dec. 07, 2000. Clean up to background/bedrock. IRA in FY00 left no contaminants in place.
RVAAP-49	CENTRAL BURN PITS	200907	An NFA ROD for soil and dry sediment was signed by Ohio EPA in January 2008. Any MEC issues at the site are being covered under RVAAP-002-R-01.



# IRP Schedule

Date of IRP Inception: 198802

## Past Phase Completion Milestones

### 1988

PA (RVAAP-01 - RAMSDELL QUARRY LANDFILL, RVAAP-02 - ERIE BURNING GROUNDS, RVAAP-03 - OPEN DEMOLITION AREA #1, RVAAP-04 - OPEN DEMOLITION AREA #2, RVAAP-05 - WINKLEPECK BURNING GROUNDS, RVAAP-06 - C BLOCK QUARRY , RVAAP-08 - LOAD LINE 1 , RVAAP-09 - LOAD LINE 2, RVAAP-10 - LOAD LINE 3, RVAAP-11 - LOAD LINE 4, RVAAP-12 - LOAD LINE 12, RVAAP-13 - BLDG 1200-DILUTION\SETTLING POND, RVAAP-15 - LOAD LINE 6 TREATMENT PLANT, RVAAP-16 - FUZE&BOOSTER QUARRY LANDFILL/PONDS, RVAAP-18 - LOAD LINE 12 WWT PLANT, RVAAP-19 - LANDFILL NORTH OF WINKLEPECK BURN GRND, RVAAP-20 - SAND CREEK STP, RVAAP-21 - DEPOT STP, RVAAP-22 - GEORGE RD STP, RVAAP-24 - DEPOT AREA, RVAAP-25 - BLD 1034 MOTOR POOL AST, RVAAP-26 - FUZE BOOSTER AREA SETTLING TANKS, RVAAP-28 - SUSPECTED MUSTARD AGENT BURIAL SITE, RVAAP-29 - UPPER AND LOWER COBBS PONDS, RVAAP-30 - LL 7 TREATMENT PLANT, RVAAP-31 - ORE PILE RETENTION POND, RVAAP-66 - FACILITY-WIDE GROUNDWATER, RVAAP-67 - FACILITY-WIDE SEWERS)

ISC (RVAAP-23 - UNIT TRAINING EQUIPMENT SITE UST)

RFA (RVAAP-07 - BLD 1601 HAZ WST STG, RVAAP-14 - LOAD LINE 6 EVAPORATION UNIT, RVAAP-17 - DEACTIVATION FURNACE, RVAAP-27 - BUILDING 854, PCB STORAGE)

### 1989

CS (RVAAP-07 - BLD 1601 HAZ WST STG, RVAAP-14 - LOAD LINE 6 EVAPORATION UNIT, RVAAP-17 - DEACTIVATION FURNACE, RVAAP-27 - BUILDING 854, PCB STORAGE)

SI (RVAAP-01 - RAMSDELL QUARRY LANDFILL, RVAAP-02 - ERIE BURNING GROUNDS, RVAAP-03 - OPEN DEMOLITION AREA #1, RVAAP-04 - OPEN DEMOLITION AREA #2, RVAAP-05 - WINKLEPECK BURNING GROUNDS, RVAAP-06 - C BLOCK QUARRY , RVAAP-08 - LOAD LINE 1 , RVAAP-09 - LOAD LINE 2, RVAAP-10 - LOAD LINE 3, RVAAP-11 - LOAD LINE 4, RVAAP-12 - LOAD LINE 12, RVAAP-13 - BLDG 1200-DILUTION\SETTLING POND, RVAAP-15 - LOAD LINE 6 TREATMENT PLANT, RVAAP-16 - FUZE&BOOSTER QUARRY LANDFILL/PONDS, RVAAP-18 - LOAD LINE 12 WWT PLANT, RVAAP-19 - LANDFILL NORTH OF WINKLEPECK BURN GRND, RVAAP-20 - SAND CREEK STP, RVAAP-21 - DEPOT STP, RVAAP-22 - GEORGE RD STP, RVAAP-24 - DEPOT AREA, RVAAP-25 - BLD 1034 MOTOR POOL AST, RVAAP-26 - FUZE BOOSTER AREA SETTLING TANKS, RVAAP-29 - UPPER AND LOWER COBBS PONDS, RVAAP-30 - LL 7 TREATMENT PLANT, RVAAP-31 - ORE PILE RETENTION POND, RVAAP-66 - FACILITY-WIDE GROUNDWATER, RVAAP-67 - FACILITY-WIDE SEWERS)

INV (RVAAP-23 - UNIT TRAINING EQUIPMENT SITE UST)

### 1990

IMP(C) (RVAAP-23 - UNIT TRAINING EQUIPMENT SITE UST)

### 1996

PA (RVAAP-32 - 40 MM FIRING RANGE, RVAAP-33 - LOAD LINE 6 , RVAAP-34 - SAND CREEK DISPOSAL ROAD LANDFILL, RVAAP-35 - 1037 BUILDING-LAUNDRY WASTEWATER SUMP, RVAAP-36 - PISTOL RANGE, RVAAP-37 - PESTICIDE BUILDING S-4452, RVAAP-38 - NACA TEST AREA)

SI (RVAAP-37 - PESTICIDE BUILDING S-4452)

### 1997

SI (RVAAP-32 - 40 MM FIRING RANGE)

RI/FS (RVAAP-18 - LOAD LINE 12 WWT PLANT)

### 1998

PA (RVAAP-39 - LOAD LINE 5 , RVAAP-40 - LOAD LINE 7 , RVAAP-41 - LOAD LINE 8 , RVAAP-42 - LOAD LINE 9, RVAAP-43 - LOAD LINE 10, RVAAP-44 - LOAD LINE 11, RVAAP-45 - WET STORAGE AREA, RVAAP-46 - BUILDING F-15 AND F-16, RVAAP-47 - BUILDING T-5301, RVAAP-48 - ANCHOR TEST AREA, RVAAP-49 - CENTRAL BURN PITS, RVAAP-50 - ATLAS SCRAP YARD, RVAAP-51 - DUMP ALONG PARIS-WINDHAM ROAD)

SI (RVAAP-35 - 1037 BUILDING-LAUNDRY WASTEWATER SUMP, RVAAP-39 - LOAD LINE 5 , RVAAP-40 - LOAD LINE 7 , RVAAP-41 - LOAD LINE 8 , RVAAP-42 - LOAD LINE 9, RVAAP-43 - LOAD LINE 10, RVAAP-44 - LOAD LINE 11, RVAAP-45 - WET STORAGE AREA, RVAAP-46 - BUILDING F-15 AND F-16, RVAAP-47 - BUILDING T-5301, RVAAP-48 - ANCHOR TEST AREA, RVAAP-49 - CENTRAL BURN PITS, RVAAP-50 - ATLAS SCRAP YARD, RVAAP-51 - DUMP ALONG PARIS-WINDHAM ROAD)

# IRP Schedule

<b>1999</b>	
SI	(RVAAP-33 - LOAD LINE 6 , RVAAP-34 - SAND CREEK DISPOSAL ROAD LANDFILL, RVAAP-36 - PISTOL RANGE, RVAAP-38 - NACA TEST AREA)
<b>2000</b>	
RD	(RVAAP-47 - BUILDING T-5301)
<b>2001</b>	
RA(C)	(RVAAP-47 - BUILDING T-5301)
<b>2003</b>	
PA	(PBC at Ravenna - PBA 2008)
IRA	(RVAAP-03 - OPEN DEMOLITION AREA #1)
<b>2004</b>	
IRA	(RVAAP-34 - SAND CREEK DISPOSAL ROAD LANDFILL, RVAAP-51 - DUMP ALONG PARIS-WINDHAM ROAD)
<b>2005</b>	
RI/FS	(RVAAP-36 - PISTOL RANGE)
<b>2007</b>	
RI/FS	(RVAAP-32 - 40 MM FIRING RANGE)
<b>2008</b>	
IRA	(RVAAP-08 - LOAD LINE 1 , RVAAP-09 - LOAD LINE 2, RVAAP-10 - LOAD LINE 3, RVAAP-11 - LOAD LINE 4)
RI/FS	(RVAAP-02 - ERIE BURNING GROUNDS, RVAAP-04 - OPEN DEMOLITION AREA #2, RVAAP-16 - FUZE&BOOSTER QUARRY LANDFILL/PONDS)
<b>2009</b>	
RD	(RVAAP-16 - FUZE&BOOSTER QUARRY LANDFILL/PONDS)
RI/FS	(RVAAP-49 - CENTRAL BURN PITS)
IRA	(RVAAP-49 - CENTRAL BURN PITS)
<b>2010</b>	
RA(C)	(RVAAP-16 - FUZE&BOOSTER QUARRY LANDFILL/PONDS)
RI/FS	(RVAAP-01 - RAMSDELL QUARRY LANDFILL)
IRA	(RVAAP-05 - WINKLEPECK BURNING GROUNDS)
<b>2011</b>	
IRA	(RVAAP-12 - LOAD LINE 12)
<b>2012</b>	
RD	(RVAAP-01 - RAMSDELL QUARRY LANDFILL)
<b>2014</b>	
RI/FS	(RVAAP-13 - BLDG 1200-DILUTION\SETTLING POND, RVAAP-48 - ANCHOR TEST AREA)
RD	(RVAAP-13 - BLDG 1200-DILUTION\SETTLING POND, RVAAP-48 - ANCHOR TEST AREA)

## Projected Phase Completion Milestones

See attached schedule

## Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

Site ID	Site Name	ROD/DD Title	ROD/DD Date
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## IRP Schedule

**Final RA(C) Completion Date:** 201902

**Schedule for Next Five-Year Review:** 2017

**Estimated Completion Date of IRP at Installation (including LTM phase):** 204802

## RAVENNA ARMY AMMUNITION PLANT IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-01	RAMSDELL QUARRY LANDFILL	LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-03	OPEN DEMOLITION AREA #1	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-05	WINKLEPECK BURNING GROUNDS	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-06	C BLOCK QUARRY	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-08	LOAD LINE 1	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-09	LOAD LINE 2	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-10	LOAD LINE 3	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-11	LOAD LINE 4	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-12	LOAD LINE 12	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-19	LANDFILL NORTH OF WINKLEPECK BURN GRND	RI/FS						
		RD						
		RA(C)						
		LTM						

## RAVENNA ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-28	SUSPECTED MUSTARD AGENT BURIAL SITE	IRA						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-29	UPPER AND LOWER COBBS PONDS	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-33	LOAD LINE 6	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-34	SAND CREEK DISPOSAL ROAD LANDFILL	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-38	NACA TEST AREA	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-39	LOAD LINE 5	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-40	LOAD LINE 7	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-41	LOAD LINE 8	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-42	LOAD LINE 9	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-43	LOAD LINE 10	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-44	LOAD LINE 11	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-45	WET STORAGE AREA	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-46	BUILDING F-15 AND F-16	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-50	ATLAS SCRAP YARD	RI/FS						
		RD						
		RA(C)						
		LTM						

## RAVENNA ARMY AMMUNITION PLANT IRP Schedule

SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-51	DUMP ALONG PARIS-WINDHAM ROAD	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-66	FACILITY-WIDE GROUNDWATER	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-67	FACILITY-WIDE SEWERS	RI/FS						
		RD						
		RA(C)						

**RAVENNA ARMY AMMUNITION PLANT**  
**Army Defense Environmental Restoration Program**  
**Military Munitions Response Program**

# MMRP Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 20/5

## Installation Site Types with Future and/or Underway Phases

- 2 Disposal Pit/Dry Well  
(RVAAP-019-R-01, RVAAP-032-R-01)
- 2 Explosive Ordnance Disposal Area  
(PBA@MR Ravenna, RVAAP-034-R-01)
- 4 Open Burn  
(RVAAP-001-R-01, RVAAP-002-R-01, RVAAP-004-R-01, RVAAP-016-R-01)
- 7 Unexploded Munitions/Ordnance  
(RVAAP-008-R-01, RVAAP-033-R-01, RVAAP-050-R-01, RVAAP-060-R-01, RVAAP-061-R-01, RVAAP-062-R-01, RVAAP-063-R-01)

## Most Widespread Contaminants of Concern

Munitions and explosives of concern (MEC), Munitions constituents (MC)

## Media of Concern

Groundwater, Sediment, Soil, Surface Water

## Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
N/A				

## Duration of MMRP

**Date of MMRP Inception** 200209

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 201910/201910

**Date of MMRP completion including Long Term Management (LTM):** 204909



# MMRP Contamination Assessment

## Contamination Assessment Overview

In October 2007 a CERCLA Site Inspection (SI) was completed at RVAAP to initially assess the munitions response sites (MRSs) at the facility. The MMRP SI activities included Historical Records Reviews (HRRs), magnetometer assisted UXO surveys, and sampling and laboratory analysis of surface soils. The results of these activities are presented in Engineering-Environmental Management, Inc. Final SI report, dated May 2008.

Nineteen MRSs were originally identified at RVAAP. Two of the MRSs became ineligible for the MMRP because of their redevelopment as active operational ranges. As such, they were not investigated during the SI. The MRSs not eligible for the MMRP include: the Winklepeck Burning Grounds (RVAAP-005-R-01) and the Old Hayfield (RVAAP-064-R-01). In addition to the two sites removed from further consideration as describe above, three sites were recommended by the SI for NFA. These sites are: Anchor Test Area (RVAAP-048-R-01), Load Line 12 (RVAAP-012-R-01), and Building F15/F16 (RVAAP-046-R-01).

The Winklepeck Burning Ground MRS had also been formerly addressed with BRAC and IRP funding. Chemical contamination at this MRS was addressed under the IRP, whereas BRAC funding was used to address explosive safety.

Overall, only 14 sites were determined to require further investigation by the RI.

## Cleanup Exit Strategy

The 2009 PBA was awarded. The RIs will be completed at all MMRP sites by 2015, and RIP/RC will be completed at all MMRP sites by 2019.

## MMRP Previous Studies

Year	Title	Author	Date
2003	Final US Army Closed, Transferring and Transferred Range/Site Inventory for Ravenna Army Ammunition Plant, Ohio	engineering-environmental Management, Inc.	NOV-2003
2004	Archives Search Report for the Ravenna Army Ammunition Plant	US Army Corps of Engineers	JUN-2004
2007	Military Munitions Response Program Historical Records Review, Ravenna Army Ammunition Plant, Ohio	Engineering-Environmental Management, Inc.	JAN-2007
	Final Work Plan for the Military Munitions Response Program, Munitions Response Sites Site Inspection	Engineering-Environmental Management, Inc.	SEP-2007
	Final Work Plan for Sand Creek Survey Rocket Ridge Area of Open Demolition Area #2 Military Munitions Response Program Time Critical Response Action	Engineering-Environmental Management, Inc.	OCT-2007
2008	Final Site Inspection for the Military Munitions Response Program	Engineering-Environmental Management, Inc.	MAY-2008
2009	Final Project Work Plan for the Time Critical Removal Action (TCRA) at Rocket Ridge Area within RVAAP-004-R-01 Open Demolition Area #2 at Ravenna Army Ammunition Plant	PIKA	JUN-2009
	Final Public Involvement Plan Addendum for Rocket Ridge at Ravenna Army Ammunition Plant	PIKA	JUN-2009
	Final Explosives Safety Submission Time Critical Removal (TCRA) at the Rocket Ridge Area of RVAAP-004-R-01 Open Demolition Area #2, Version 6.0	PIKA	JUL-2009
	Addendum to the Final Site Safety and Health Plan, Time Critical Removal Action at the Rocket Ridge Area within RVAAP-004-R-01 Open Demolition Area #2 at Ravenna Army Ammunition Plant	PIKA	JUL-2009
	Final Amendment 1 Explosives Safety Submission Disposal of Material Potentially Presenting an Explosive Hazard	PIKA	AUG-2009
	Operations and Maintenance Trip Reports and Quarterly Effectiveness Evaluation Reports Time Critical Response Action for the Rocket Ridge Area of Open Demolition Area #2 (RVAAP-004-R-01 Open Demolition Area #2 MRS) Military Munitions Response Program, August 2008 - September 2009	Engineering-Environmental Management, Inc.	SEP-2009
	Final Explosive Siting Plan 2008 Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services	USA Environ	SEP-2009
	Final Work Plan Performance-Based Acquisition for Environmental Investigation and Remediation MEC Avoidance/Removal Services	USA Environ	SEP-2009
	Final Project Management Plan for Environmental Services at 14 Military Munitions Response Program Sites, Version 1.0	Shaw	SEP-2009
	Operations and Maintenance Trip Reports and Quarterly Effectiveness Evaluation Reports Time Critical Response Action for the Rocket Ridge Area of	Vista	OCT-2009

## MMRP Previous Studies

2009	Title	Author	Date
	Open Demolition Area #2 (RVAAP-004-R-01 Open Demolition Area #2 MRS) Military Mentions Response Program, October 2009 - September 2010		
	Final Removal Action Report for the Time Critical Removal Action (TCRA) at the Rocket Ridge Area within RVAAP-004-R-01 Open Demolition Area #2 MRS	PIKA	DEC-2009
2010			
	Disposal of Munitions Debris, Munitions Constituents and Miscellaneous Demo Final Report	PIKA	MAR-2010
	Final Explosives Safety Submission, Munitions and Explosives of Concern (MEC) Non-Time Critical Construction Support at the RVAAP-01 Ramsdell Quarry Landfill	SAIC/PIKA	MAY-2010
	Final Project Work Plan for the Time Critical Removal Action (TCRA) at Rocket Ridge Area of RVAAP- 004-R-01 Open Demolition Area #2 at Ravenna Army Ammunition Plant	PIKA	MAY-2010
	Final Public Involvement Plan Addendum for the Time Critical Removal Action at the Rocket Ridge Area	PIKA	MAY-2010
	Final Explosives Safety Submission Munitions and Explosives of Concern Non-Time Critical Interim Removal Action at the Rocket Ridge Area of RVAAP-004-R-01 Open Demolition Area #2 MRS, Version 3.1	PIKA	MAY-2010
	Final Project Management Plan for the Time Critical Removal Action (TCRA) at the Rocket Ridge Area within RVAAP-004-R-01 Open Demolition Area #2 MRS	PIKA	MAY-2010
	Final Explosives Safety Submission Munitions and Explosives of Concern Non-Time Critical Interim Removal Action at the Rocket Ridge Area of RVAAP-004-R-01 Open Demolition Area #2 MRS, Version 3.1, Amendment 1	PIKA	AUG-2010
	Final Public Involvement Plan Addendum for Military Munitions Response Program Remedial Investigation Environmental Services	Shaw	SEP-2010
2011			
	FY09 PBA - (001,004,008,019,033,050,060) Final RI Work Plan	Shaw	MAR-2011
	FY09 PBA - (002,016,032,034,061,062,063) Draft RI Work Plan	Shaw	JUL-2011
	RVAAP-002-R-01 Final RI Work Plan	Shaw	DEC-2011
	RVAAP-016-R-01 Final RI Work Plan	Shaw	DEC-2011
	RVAAP-032-R-01 Final RI Work Plan	Shaw	DEC-2011
	RVAAP-034-R-01 Final RI Work Plan	Shaw	DEC-2011
	RVAAP-061-R-01 Final RI Work Plan	Shaw	DEC-2011
	RVAAP-062-R-01 Final RI Work Plan	Shaw	DEC-2011
	RVAAP-063-R-01 Final RI Work Plan	Shaw	DEC-2011
2014			

## MMRP Previous Studies

2014

Title	Author	Date
Final Remedial Investigation Report for RVAAP-050-R-01 Atlas Scrap Yard MRS, Version 1.0	Shaw Environmental & Infrastructure, Inc.	MAR-2014
Final Remedial Investigation for RVAAP-008-R-01 Load Line #1A MRS, Version 2.0	CB&I Federal Services	AUG-2014

**RAVENNA ARMY AMMUNITION PLANT**  
**Military Munitions Response Program**  
**Site Descriptions**

**Site ID: PBA@MR Ravenna**  
**Site Name: MR PBA 2009**

**STATUS**

**Regulatory Driver:** CERCLA  
**MRSPP Score:** No known or suspected hazard

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200905.....	201610
RD.....	200905.....	201610
RA(C).....	200905.....	201610

**RIP Date:** N/A  
**RC Date:** 201610

**SITE DESCRIPTION**

PBA@MR Ravenna tracks funding requirements of a PBA that was awarded in FY09 (PBA09) and addresses 14 MR sites. Seven of the sites (RVAAP-001-R-01, 004-R-01, 008-R-01, 019-R-01, 033-R-01, 050-R-01, and 060-R-01) received base award funding in FY09 for all requirements through the RI, except for RVAAP-008-R-01 and 033-R-01, which were funded through RIP.

The other seven sites (RVAAP-002-R-01, 016-R-01, 032-R-01, 034-R-01, 061-R-01, 062-R-01, and 063-R-01) received option awards in FY10. All sites are funded through the RI except for RVAAP-034-R-01 and 062-R-01, which are funded through RIP.

Funding for an NFA Explosive Safety Submittal associated with this work is carried in this site.

**CLEANUP/EXIT STRATEGY**

All 14 Munitions Response (MR) sites will undergo RI activities under the PBA09. Four of the MR sites will be funded through RIP.

Funding for an NFA Explosives Safety Submittal will be required and it is tracked at this site.

Remaining unfunded requirements addressing the RI/FS, RD, and RA(C) all of the MR sites are addressed in the respective sites.

**Site ID: RVAAP-001-R-01**  
**Site Name: RAMSDELL QUARRY**

**STATUS**

**Regulatory Driver:** CERCLA  
**MRSPP Score:** 05  
 Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)  
 Media of Concern: Soil

Phases	Start	End
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200810.....	201810
RD.....	201810.....	201901
RA(C).....	201902.....	201910
LTM.....	201910.....	204909
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201910	

**SITE DESCRIPTION**

The Ramsdell Quarry (RVAAP-001-R-01) MRS is a former OB/OD area used to thermally treat waste explosives and napalm bombs between 1946 and 1950. A portion of the site was used as a nonhazardous solid waste landfill. The landfill acreage is not part of the MRS. An SI was completed for the Ramsdell Quarry site in 2008. The SI recommended 13.4 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Ramsdell Quarry (RVAAP-001-R-01) MRS. The RI is currently underway and expected to be completed in FY15. The RI Report was finalized in January 2015. Ohio EPA approval of the document is expected in April 2015.

The RI Report concluded that a release of MEC had not occurred at the site. Some MC was detected, but not at levels that presented an unacceptable risk to potential receptors. The RI Report recommended decreasing the size of the MRS to 6.93 acres and recommended remedial alternatives be evaluated in a feasibility study for the site. The presumptive remedy for the site is Land-use controls due to the presence of Material Potentially Presenting an Explosive Hazard (MPPEH) (confirmed to be munitions debris / Material Documented as Safe (MDAS)).

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI (under the PBA09). Following the RI, an FS will be prepared to evaluate remedial alternatives for MC, followed by a PP, DD, RD, RA(C) and LTM. LTM will most likely consist of LUCs and five-year reviews.

Five-year reviews for RVAAP-001-R-01, RVAAP-002-R-01, RVAAP-016-R-01, RVAAP-032-R-01, RVAAP-060-R-01, and RVAAP-063-R-01 are captured at this site.

**Site ID: RVAAP-002-R-01**  
**Site Name: ERIE BURNING GROUNDS**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 03

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Sediment

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201810
RD.....	201810.....	201901
RA(C).....	201902.....	201910
LTM.....	201910.....	204909
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201910	

**SITE DESCRIPTION**

The Erie Burning Grounds (RVAAP-002-R-01) MRS was used from 1941 to 1951 to thermally treat bulk, obsolete, off-spec propellants, conventional explosives, rags, and large explosive contaminated items (such as railcars) through open burning on the ground surface. The MRS is co-located with an IRP AOC (RVAAP-02 Erie Burning Grounds). An SI was completed for the Erie Burning Grounds site in 2008. The SI recommended 33.93 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Erie Burning Grounds (RVAAP-002-R-01) MRS. The option for this site was exercised in FY10. The Final RI Report was published in August 2014, and approved by the Ohio EPA in September 2014.

The RI Report concluded that a release of MEC and MC had not occurred at the site. However MPPEH (munitions debris) was identified at the site. The RI Report recommended retaining the MRS acreage as 33.9 acres and recommended remedial alternatives be evaluated in a feasibility study for the site. The presumptive remedy for the site is Land-use controls due to the presence of MPPEH (confirmed to be munitions debris/MDAS).

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI (under the PBA09). Following the RI, an FS will be prepared to evaluate remedial alternatives for MC, followed by a PP, DD, RD, RA(C) and LTM. LTM will most likely consist of LUCs and five-year reviews.

Five-year reviews for this site are being funded under RVAAP-001-R-01.



**Site ID: RVAAP-004-R-01**  
**Site Name: OPEN DEMOLITION AREA #2**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 03

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200810.....	201810
IRA.....	201503.....	201803

**RIP Date:** N/A

**RC Date:** 201810

**SITE DESCRIPTION**

The Open Demolition Area #2 (RVAAP-004-R-01) MRS is a former open burn / open detonation area that was used between 1948 and 1991 for munitions and explosives disposal. The MRS is co-located with an IRP AOC (RVAAP-04). An SI was completed in 2008. The Final SI Report identified the MRS as being 35.4 acres and recommended the site for further evaluation for MEC and MC.

Two TCRA's have been conducted at ODA #2. In 2008, a TCRA was conducted to address the potential for migration of munitions offsite in Sand Creek. In 2009-2011, a second TCRA was conducted at Rocket Ridge to address MEC and MPPEH contamination along the leading slope of the creek.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the ODA #2 (RVAAP-004-R-01) MRS. The RI Report was finalized and submitted in February 2015. Ohio EPA approval of the Final RI is expected in April 2015.

The RI Report concluded that the MRS was much larger due to the presence of a significant kickout area. Some MC was detected, but not at levels that presented an unacceptable risk to potential receptors. MEC and MPPEH was confirmed at the site. The MRS was increased to 317.4 acres. The RI Report recommended evaluation of remedial alternatives for MEC in a FS.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI (under the PBA09). Following the RI, an FS will be prepared to evaluate remedial alternatives for MEC, followed by a PP and DD. At this time, there isn't sufficient data to determine what the proposed alternative will be at the site so no future phases have been planned.

An interim removal action is planned in FY15 to delineate moderate to high probability areas for encountering MEC, and to conduct surface and subsurface removal actions for MEC in subject areas. In addition, actions are planned to stabilize the slope at Rocket Ridge, and to develop and implement interim land-use controls for the site.

**IMPORTANT NOTE:** Portions of the ODA #2 MRS overlap operational range (MK19 Range). The installation will need to evaluate this overlap and adjust the MRS boundary to remove the operational acreage from the MRS. Any additional work at ODA #2 will be evaluated in accordance with DERP eligibility criteria.

**Site ID: RVAAP-008-R-01**  
**Site Name: LOAD LINE #1**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200810.....	201610

**RIP Date:** N/A

**RC Date:** 201610

**SITE DESCRIPTION**

Load Line 1 (RVAAP-008-R-01) operated from approximately 1941 to 1971 for loading various types of projectiles. Additionally, ordnance was demilitarized at this site from 1973 to 1974. The site was referred to the MMRP due to potential impacts from triple based propellants. RVAAP-08 addresses Installation Restoration (IR) concerns at this location. An SI was completed for the Load Line 1 site in 2008. The SI recommended 0.4 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination, and to achieve Remedy-in-Place (RIP) at the Load Line 1 (RVAAP-008-R-01) MRS. The option for this site was exercised in FY10. The Final RI Report was published in August 2014, and approved by the Ohio EPA in September 2014.

The RI Report concluded that a release of MEC and MC had not occurred at the site (referenced as Load Line #1A). The RI Report recommended NFA for MEC and MC.

It is anticipated that the NFA Proposed Plan and NFA Decision Document will be approved by September 2015.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes preparation of an NFA PP and DD. All remaining work will be completed as part of the PBA09.

## Site ID: RVAAP-016-R-01

### Site Name: FUZE AND BOOSTER QUARRY

#### STATUS

Regulatory Driver: CERCLA

MRSPP Score: 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Sediment, Soil

Phases	Start	End
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201810
RD.....	201810.....	201901
RA(C).....	201902.....	201910
LTM.....	201910.....	204909

RIP Date: N/A

RC Date: 201910

#### SITE DESCRIPTION

The Fuze and Booster Quarry (RVAAP-016-R-01) site consists of three elongated ponds separated by berms which were constructed within an abandoned rock quarry. The ponds were used for open burning of various types of munitions from 1945 to 1975. The site is collocated with an IRP AOC (RVAAP-16). An SI was completed for the Fuze and Booster Quarry site in 2008. The SI recommended 4.9 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Fuze and Booster Quarry (RVAAP-016-R-01) MRS. The option for this site was exercised in FY10. The RI is currently underway and expected to be completed in FY15. The Draft RI Report was submitted to the Ohio EPA in January 2015. It is anticipated that comments will be received and a Final Document submitted to Ohio EPA in March 2015. Ohio EPA approval of the Final RI Report is expected in April 2015.

The RI Report concluded that a release of MEC and MC had not occurred at the site. However MPPEH (confirmed to be munitions debris/MDAS) was identified at the site. The RI Report recommended retaining the MRS acreage as 4.9 acres and recommended remedial alternatives be evaluated in a feasibility study for the site. The presumptive remedy for the site is Land-use controls due to the presence of MPPEH (confirmed to be munitions debris/MDAS).

#### CLEANUP/EXIT STRATEGY

The anticipated exit strategy for this site includes completion of the RI (Under PBA09). The FS, PP, DD, RD, RA(C) and LTM will follow. The remedy for the site will include LUCs. LTM will consist of LUCs and five-year reviews.

Five-year reviews for this site are being funded under RVAAP-001-R-01.

**Site ID: RVAAP-019-R-01**

**Site Name: LANDFILL NORTH OF WINKLEPECK**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200810.....	201702

**RIP Date:** N/A

**RC Date:** 201702

**SITE DESCRIPTION**

The Landfill North of Winklepeck MRS (RVAAP-019-R-01) is a former dump area suspected of containing flare canisters and booster cups. RVAAP-19 addresses IR concerns at this location. A SI was completed for the MRS in 2008. The SI recommended 2.3 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Landfill North of Winklepeck MRS (RVAAP-019-R-01). The RI is currently underway and expected to be completed in FY15. The RI Report was finalized and submitted in February 2015. Ohio EPA approval of the Final RI document is expected in April 2015.

The RI Report concluded that a release of MEC and MC had not occurred at the site. The RI Report recommended NFA for MEC and MC.

RVAAP-19 addresses IR concerns at this location.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI (under the PBA). Following the RI, an NFA PP and DD will be completed.

**Site ID: RVAAP-032-R-01**  
**Site Name: 40MM FIRING RANGE**

**STATUS**

**Regulatory Driver:** CERCLA  
**MRSPP Score:** Evaluation pending  
Contaminants of Concern: Munitions and explosives of concern (MEC)  
Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201810
RD.....	201810.....	201901
RA(C).....	201902.....	201910
LTM.....	201910.....	204909
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201910	

**SITE DESCRIPTION**

The 40mm Firing Range (RVAAP-032-R-01) is a former test range for the 40mm cartridge that was used for testing between 1969 and 1971. The site is collocated with an IRP site (RVAAP-32). An SI was completed for the 40mm Firing Range site in 2008. The SI recommended 1.27 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the 40mm Firing Range (RVAAP-032-R-01) MRS. The option for this site was exercised in FY10. The RI is currently underway and expected to be completed in FY15. The Draft RI Report was submitted to the Ohio EPA in February 2015. It is anticipated that comments will be received and a Final Document submitted to Ohio EPA in March 2015. Ohio EPA approval of the Final RI Report is expected in April 2015.

The RI Report concluded that a release of MEC and MC had not occurred at the site. However MPPEH (confirmed munitions debris/MDAS) was identified at the site. The RI Report recommended increasing the size of the MRS to 8.55 acres and recommended remedial alternatives be evaluated in a feasibility study for the site. The presumptive remedy for the site is Land-use controls due to the presence of MPPEH (confirmed munitions debris/MDAS).

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for this site includes completion of the RI (under PBA09). The FS, PP, DD, RD, RA(C) and LTM will follow. The remedy for the site will include LUCs. LTM will consist of LUCs and five-year reviews.

Five-year reviews for this site are being funded under RVAAP-001-R-01.

**Site ID: RVAAP-033-R-01**  
**Site Name: FIRESTONE TEST FACILITY**

**STATUS**

**Regulatory Driver:** CERCLA  
**MRSPP Score:** 05  
Contaminants of Concern: Munitions and explosives of concern (MEC)  
Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200810.....	201610
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201610	

**SITE DESCRIPTION**

The Firestone Test Facility (RVAAP-033-R-01) was a former testing facility for Dragon missiles. In addition, shaped charges were tested in a small pond. The site was used for testing from the late-1960s to 1993. Only the building foundations and pond remain. The former test chambers have been demolished and all of the debris removed. The site is collocated with an IRP AOC Load Line 6 (RVAAP-33). An SI was completed for the Firestone Test Facility site in 2008. The SI recommended 0.41 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination, and to achieve Remedy-in-Place (RIP) at the Firestone Test Facility (RVAAP-033-R-01) MRS. The Final RI Report was published in August 2014, and approved by the Ohio EPA in November 2014.

The RI Report concluded that a release of MEC and MC had not occurred at the site. The RI Report recommended NFA for MEC and MC.

It is anticipated that the NFA Proposed Plan and NFA Decision Document will be approved by September 2015.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes preparation of an NFA PP and DD. All remaining work will be completed as part of the PBA09.

**Site ID: RVAAP-034-R-01**  
**Site Name: SAND CREEK DUMP**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 04

Contaminants of Concern: Munitions and explosives of concern (MEC)

Media of Concern: Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201610

**RIP Date:** N/A

**RC Date:** 201610

**SITE DESCRIPTION**

The Sand Creek Dump (RVAAP-034-R-01) MRS is co-located with Sand Creek Disposal Road Landfill (RVAAP-34). In October 2003, two 75mm inert projectiles were discovered at this site. An SI was completed for the Sand Creek site in 2008. The SI recommended 0.9 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination, and to achieve Remedy-in-Place (RIP) at the Sand Creek Dump (RVAAP-034-R-01) MRS. The option for this site was exercised in FY10. The RI is currently underway and expected to be completed in FY15. The Draft RI Report was submitted to the Ohio EPA in February 2015. It is anticipated that comments will be received and a Final RI Document submitted to Ohio EPA in March 2015. Ohio EPA approval of the Final RI Report is expected in April 2015.

The RI Report concluded that a release of MEC and MC had not occurred at the site. The RI Report recommended NFA for MEC and MC.

It is anticipated that the NFA Proposed Plan and NFA Decision Document will be approved by September 2015.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI. Following the RI, an NFA PP and DD will be completed. All remaining work will be completed as part of the PBA09.

**Site ID: RVAAP-050-R-01**  
**Site Name: ATLAS SCRAP YARD**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** Evaluation pending

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200907.....	201702

**RIP Date:** N/A

**RC Date:** 201702

**SITE DESCRIPTION**

The Atlas Scrap Yard (RVAAP-050-R-01) was used as metal scrap yard and construction camp. The site is co-located with IRP AOC RVAAP-50. A SI was completed for the Atlas Scrap Yard site in 2008. The SI recommended 66 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Atlas Scrap Yard (RVAAP-050-R-01). The RI Report was finalized in August 2014. Ohio EPA approval was received in November 2014.

The RI Report concluded that a release of MEC and MC had not occurred at the site. The RI Report recommended NFA for MEC and MC.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes preparation of an NFA PP and DD.



**Site ID: RVAAP-060-R-01**  
**Site Name: BLOCK D IGLOO**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

Phases	Start	End
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	200907.....	201810

**RIP Date:** N/A

**RC Date:** 201810

**SITE DESCRIPTION**

The Block D Igloo MRS (RVAAP-060-R-01) was the result of an explosion that occurred at Igloo 7-D-15 ("D" Block) on March 24, 1943. A munitions response was conducted by Explosives Ordnance Disposal team and a follow-on site assessment was later conducted by Huntsville District to assess the type of munitions stored in the bunker, as well as the size of the debris field created by the explosion. The site assessment identified a 3,000-foot blast radius around the former storage bunker. A SI was completed for the Block D Igloo site in 2008. The SI recommended 340.20 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Block D Igloo MRS (RVAAP-060-R-01). The RI is currently underway and expected to be completed in FY15. The RI Report was finalized and submitted in February 2015. Ohio EPA approval of the Final RI document is expected in April 2015.

The RI Report concluded that a release of MEC had occurred, but the extent of the release was much less than suspected in the SI. Some MC was detected, but not at levels that presented an unacceptable risk to potential receptors. The MRS acreage was reduced to 101.6 acres. The RI Report recommended evaluation of remedial alternatives for MEC in a FS. MPPEH (confirmed munitions debris/MDAS) was confirmed at the site.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI (under the PBA09). Following the RI, an FS will be prepared to evaluate remedial alternatives for MEC. Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

**Site ID: RVAAP-061-R-01**  
**Site Name: BLOCK D IGLOO -TD**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 04

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

Phases	Start	End
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201702

**RIP Date:** N/A

**RC Date:** 201702

**SITE DESCRIPTION**

The Block D Igloo - Transferred (TD) (RVAAP-061-R-01) MRS is the offsite portion of the Block D site. This site was the result of an explosion that occurred at Igloo 7-D-15 ("D" Block) on March 24, 1943 where debris was found off the installation. A munitions response was conducted by Explosives Ordnance Disposal Team and a follow-on site assessment was later conducted by Huntsville District to assess the type of munitions stored in the bunker, as well as the size of the debris field created by the explosion. The site assessment identified a 3,000-foot blast radius around the former storage bunker. Part of the blast radius extended beyond the installation boundary. This 19.25 acre site was recommended for further evaluation for potential release of MEC and MC.

An SI was completed for the Block D Igloo - TD site in 2008. The Final SI Report concluded that a release of MEC and MC had not occurred at the site, and the 19.25 acre MRS was recommended for NFA. However, the SI Report recommended that 14.13 dis-contiguous acres located outside the installation boundary be evaluated for MEC and MC.

PBA (PBA09) was awarded in June 2009 to complete an RI at the Block D Igloo - TD MRS. The option for this site was exercised in FY10. The investigation determined that a release of MEC and MC did not occur beyond the installation boundary. This determination was based on information/research contained in a technical memorandum demonstrating that the 1943 explosion could not have ejected MEC/MPPEH beyond the installation boundary. Fieldwork conducted in the adjacent Block D Igloo MRS corroborated that MEC/MPPEH had not been released at the site. The technical memorandum was approved by the Ohio EPA on 15 February 2011.

A discussion of the findings for the Block D Igloo - TD (RVAAP-061-R-01) MRS were reported in the Final RI Report for the Block D Igloo (RVAAP-060-R-01) MRS. A separate RI report was not prepared for the Block D Igloo - TD (RVAAP-061-R-01) MRS.

**CLEANUP/EXIT STRATEGY**

Following the completion of the PBA09, the exit strategy includes preparation of an NFA PP and DD.

**Site ID: RVAAP-062-R-01**  
**Site Name: WATER WORKS #4 DUMP**

**STATUS**

**Regulatory Driver:** CERCLA  
**MRSPP Score:** 06  
Contaminants of Concern: Munitions and explosives of concern (MEC)  
Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201610
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201610	

**SITE DESCRIPTION**

The Water Works #4 Dump (RVAAP-062-R-01) was reported to have been used to dispose of large caliber rounds in the 1940's. An SI was completed for the Water Works #4 Dump site in 2008. The SI recommended 0.77 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination, and to achieve Remedy-in-Place (RIP) at the Water Works #4 Dump (RVAAP-062-R-01) MRS. The option for this site was exercised in FY10. The RI is currently underway and expected to be completed in 2015. The Draft RI Report was submitted to the Ohio EPA in February 2015. It is anticipated that comments will be received and a Final RI Document submitted to Ohio EPA in March 2015. Ohio EPA approval of the Final RI Report is expected in April 2015.

The RI Report concluded that a release of MEC and MC had not occurred at the site. However MPPEH (munitions debris - ogives) was identified at the site. The RI Report recommended NFA for MEC and MC. The NFA recommendation is based on the fact that ogives do not present an explosive safety hazard.

It is anticipated that the NFA Proposed Plan and NFA Decision Document will be approved by September 2015.

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI. Following the RI, an NFA PP and DD will be completed. All remaining work will be completed as part of the PBA09.

**Site ID: RVAAP-063-R-01**  
**Site Name: GROUP 8 MRS**

**STATUS**

**Regulatory Driver:** CERCLA

**MRSPP Score:** 04

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200209.....	200312
SI.....	200509.....	200805
RI/FS.....	201004.....	201810

**RIP Date:** N/A

**RC Date:** 201810

**SITE DESCRIPTION**

The Group 8 (RVAAP-063-R-01) MRS consists of most of the area between Buildings 846 and 849 and may have been used for debris and rubbish burning. An SI was completed for the site in 2008. The SI recommended 2.65 acres be evaluated for MEC and MC.

In July 2009, PBA09 was awarded to characterize the nature and extent of MEC and MC contamination at the Group 8 (RVAAP-063-R-01) MRS. The option for this site was exercised in FY10. The RI is currently underway and expected to be completed in 2015. The Draft RI Report was submitted to the Ohio EPA in February 2015. It is anticipated that comments will be received and a Final Document submitted to Ohio EPA in March 2015. Ohio EPA approval of the Final RI Report is expected in April 2015.

The RI Report concluded that a release of MEC had not occurred at the site. However, MC was detected at the site at concentrations that posed an unacceptable risk to potential receptors. In addition, significant amounts of MPPEH were observed during the RI. The RI Report recommends retaining the 2.65 acre MRS, and recommends remedial alternatives be evaluated in a feasibility study for the site. The remedy for the site is currently unknown, but most likely will include a remedial action for MC and land-use controls due to the presence of MPPEH (munitions debris).

**CLEANUP/EXIT STRATEGY**

The exit strategy for this site includes completion of the RI (under the PBA09). Following the RI, a FS will be prepared to evaluate remedial alternatives for MEC. Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
RVAAP-005-R-01	WINKLEPECK BURNING GROUNDS	200603	Operational Range. Ineligible for ER,A funding.
RVAAP-012-R-01	LOAD LINE #12	200805	The May 2008 Final SI recommended NFA for the site.
RVAAP-046-R-01	BUILDING #F-15 AND F-16	200805	The May 2008 Final SI recommended NFA for the site.
RVAAP-048-R-01	ANCHOR TEST AREA	200805	The May 2008 Final SI recommended NFA for the site.
RVAAP-064-R-01	Old Hay Field MRS	200805	Operational Range. Ineligible for ER,A funding.

# MMRP Schedule

**Date of MMRP Inception** 200209

## **Past Phase Completion Milestones**

### **2004**

PA (PBA@MR Ravenna - MR PBA 2009, RVAAP-001-R-01 - RAMSDELL QUARRY , RVAAP-002-R-01 - ERIE BURNING GROUNDS, RVAAP-004-R-01 - OPEN DEMOLITION AREA #2, RVAAP-005-R-01 - WINKLEPECK BURNING GROUNDS, RVAAP-008-R-01 - LOAD LINE #1, RVAAP-012-R-01 - LOAD LINE #12, RVAAP-016-R-01 - FUZE AND BOOSTER QUARRY, RVAAP-019-R-01 - LANDFILL NORTH OF WINKLEPECK, RVAAP-032-R-01 - 40MM FIRING RANGE, RVAAP-033-R-01 - FIRESTONE TEST FACILITY, RVAAP-034-R-01 - SAND CREEK DUMP, RVAAP-046-R-01 - BUILDING #F-15 AND F-16, RVAAP-048-R-01 - ANCHOR TEST AREA, RVAAP-050-R-01 - ATLAS SCRAP YARD, RVAAP-060-R-01 - BLOCK D IGLOO, RVAAP-061-R-01 - BLOCK D IGLOO -TD, RVAAP-062-R-01 - WATER WORKS #4 DUMP, RVAAP-063-R-01 - GROUP 8 MRS, RVAAP-064-R-01 - Old Hay Field MRS)

### **2008**

SI (PBA@MR Ravenna - MR PBA 2009, RVAAP-001-R-01 - RAMSDELL QUARRY , RVAAP-002-R-01 - ERIE BURNING GROUNDS, RVAAP-004-R-01 - OPEN DEMOLITION AREA #2, RVAAP-008-R-01 - LOAD LINE #1, RVAAP-012-R-01 - LOAD LINE #12, RVAAP-016-R-01 - FUZE AND BOOSTER QUARRY, RVAAP-019-R-01 - LANDFILL NORTH OF WINKLEPECK, RVAAP-032-R-01 - 40MM FIRING RANGE, RVAAP-033-R-01 - FIRESTONE TEST FACILITY, RVAAP-034-R-01 - SAND CREEK DUMP, RVAAP-046-R-01 - BUILDING #F-15 AND F-16, RVAAP-048-R-01 - ANCHOR TEST AREA, RVAAP-050-R-01 - ATLAS SCRAP YARD, RVAAP-060-R-01 - BLOCK D IGLOO, RVAAP-061-R-01 - BLOCK D IGLOO -TD, RVAAP-062-R-01 - WATER WORKS #4 DUMP, RVAAP-063-R-01 - GROUP 8 MRS, RVAAP-064-R-01 - Old Hay Field MRS)

## **Projected Phase Completion Milestones**

**See attached schedule**

## **Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates**

To Be Determined

**Final RA(C) Completion Date:** 201910

**Schedule for Next Five-Year Review:** 2017

**Estimated Completion Date of MMRP at Installation (including LTM phase):** 204909

## RAVENNA ARMY AMMUNITION PLANT MMRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
PBA@MR Ravenna	MR PBA 2009	RI/FS						
		RD						
		RA(C)						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-001-R- 01	RAMSDELL QUARRY	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-002-R- 01	ERIE BURNING GROUNDS	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-004-R- 01	OPEN DEMOLITION AREA #2	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-008-R- 01	LOAD LINE #1	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-016-R- 01	FUZE AND BOOSTER QUARRY	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-019-R- 01	LANDFILL NORTH OF WINKLEPECK	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-032-R- 01	40MM FIRING RANGE	RI/FS						
		RD						
		RA(C)						
		LTM						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-033-R- 01	FIRESTONE TEST FACILITY	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-034-R- 01	SAND CREEK DUMP	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-050-R- 01	ATLAS SCRAP YARD	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-060-R- 01	BLOCK D IGLOO	RI/FS						

## RAVENNA ARMY AMMUNITION PLANT MMRP Schedule

SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-061-R-01	BLOCK D IGLOO -TD	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-062-R-01	WATER WORKS #4 DUMP	RI/FS						
SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
RVAAP-063-R-01	GROUP 8 MRS	RI/FS						



**RAVENNA ARMY AMMUNITION PLANT**  
**Army Defense Environmental Restoration Program**  
**Compliance Restoration**

## CR Summary

**Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count:** 14/0

### Installation Site Types with Future and/or Underway Phases

- 1 Sewage Treatment Plant  
(CC RVAAP-75)
- 8 Spill Site Area  
(CC RVAAP-68, CC RVAAP-70, CC RVAAP-71, CC RVAAP-72, CC RVAAP-74, CC RVAAP-76, CC RVAAP-77, CC RVAAP-78)
- 3 Storage Area  
(CC RVAAP-73, CC RVAAP-79, CC RVAAP-80)
- 2 Surface Disposal Area  
(CC RVAAP-69, CC RVAAP-83)

### Most Widespread Contaminants of Concern

Asbestos, Explosives, Herbicides, Metals, Other (Propellants), Other (Solid Waste), Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

### Media of Concern

Groundwater, Sediment, Soil, Surface Water

### Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

Site ID	Site Name	Action	Remedy	FY
N/A				

### Duration of CR

**Date of CR Inception:** 200809

**Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC):** 201903/201903

**Date of CR completion including Long Term Management (LTM):** 201903

## CR Contamination Assessment

### Contamination Assessment Overview

Fourteen CR sites have been identified at the former RVAAP facility. The sites were identified during the time period FY09-FY10, and consist of new AOCs that qualify for environmental investigation and remediation under the Army's IRP expanded guidelines. The guidelines were expanded in December 2008 to extend the time period for eligible sites from Oct. 17, 1986 to present day activities. Initial investigation of CR sites was initiated under CERCLA in FY10. IRAs will be conducted as needed. Environmental restoration activities include the IRP and MMRP. On Dec. 29, 2008, the Office of the Deputy Under Secretary of Defense for Installations and Environment, issued an interim policy for DERP eligibility that rescinded the 1986 eligibility date for the IRP and the 2002 eligibility date for the MMRP. This made many sites previously addressed in the Army's compliance-related cleanup program eligible for the DERP. Sites that are now eligible for the MR program have been migrated from Army Environmental Database-Compliance-related Cleanup and given the naming convention of other MR sites. The newly eligible non-MR type sites are considered to be IR sites; however, the newly eligible sites are being coded as CR in AEDB-R to distinguish them from the original IR sites and IR metrics.

### Cleanup Exit Strategy

Achievement of RC is expected by the beginning of FY20 for all CR sites.

## CR Previous Studies

2010	Title	Author	Date
	Final Quality Control Plan for the 2010 Phase I Remedial Investigation Services at Compliance Restorations Sites (9 Areas of Concern)	SAIC	JUL-2010
	Final Project Management Plan for the 2010 Phase I Remedial Investigation Services at Compliance Restoration Sites (9 Areas of Concern)	SAIC	SEP-2010
	Final Site Safety and Health Plan for the 2010 Phase I Remedial Investigation Service at Compliance Restoration Sites (9 Areas of Concern), Addendum No. 1	SAIC	SEP-2010
	Final Site Safety and Health Plan Addendum for 2010 Phase I Remedial Investigation Services Compliance Restoration Sites CC-RVAAP-78 and CC-RVAAP-80	Prudent	SEP-2010
	Final Project Management Plan for 2010 Phase I Remedial Investigation Services Compliance Restoration Sites CC RVAAP-78 Quarry Pond Surface Dump & CC RVAAP-80 Group 2 Propellant Can Tops	Prudent	SEP-2010
2011	CC RVAAP-78 DRAFT PROJECT WORK PLAN	Prudent	AUG-2011
	CC RVAAP-80 DRAFT SI REPORT	PIKA	SEP-2011
	CC-RVAAP-78 Final Phase 1 RI Work Plan	PIKA	OCT-2011
2012	CC-RVAAP-80 Final Phase 1 RI Report	PIKA	JAN-2012
	CC-RVAAP-71 & 83 Final Historical Records Report	ECC	MAY-2012
	CC-RVAAP-70, 72, 75, & 77 Final Phase 1 RI Report	ECC	OCT-2012
	CC-RVAAP-68 Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-69 Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-73 Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-74 Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-76 Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-78 Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-79 (Main Ore Yard) Final RI Work Plan	ECC	OCT-2012
	CC-RVAAP-79 (Remaining Ore Sites) Final RI Work Plan	ECC	OCT-2012

# **RAVENNA ARMY AMMUNITION PLANT**

## **Compliance Restoration**

### **Site Descriptions**

Site ID: CC RVAAP-68

Site Name: ELECTRIC SUBSTATIONS (E,W,No. 3)

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200809.....	200904
SI.....	200905.....	201002
RI/FS.....	201003.....	201712

RIP Date: N/A

RC Date: 201712

SITE DESCRIPTION

Electricity for the installation was purchased from the Ohio Edison Company. The electricity was supplied from Newton Falls and Garrettsville, Ohio. Distribution occurred through three substations, each having approximately 24,000 volts. Three of these substations are included in CC RVAAP-68.

The East Substation is located close to the intersection of Remalia Road and Load Line No. 2 Road. The substation comprises an area of approximately 12,300 square ft, which includes the land surrounding Building 25-27. There are no documented releases. However, stained concrete was noted in the building during the historical records review. Target analytes noted in the HRR included Target Analyte List (TAL) metals, PCBs, and SVOCs.

The West Substation is located west of Load Line 5 on Fuze & Booster Service Road. The substation comprises an area of approximately 3,000 square ft, which includes the area north/northeast of Building 28-28 This AOC excludes building 28-28. One spill of approximately 500 gallons of transformer fluid occurred on the north side of the building. The impacted area was cleaned up by Emerald Environmental in 1997. Possible impacted soils may exist outside the building around the former transformers. No visual evidence of impacts was noted during the historical records review, Target analytes noted in the HRR included TAL metals, PCBs, and SVOCs.

Substation No. 3 is located in the Fuze & Booster area between Load Lines 10 and 11. The substation comprises an area of approximately 10,000 square ft. The substation and all transformer equipment have been removed from the site. There are no documented releases and no visual evidence of impacts was noted during the historical records review. Target analytes noted in the HRR included TAL metals, PCBs, and SVOCs.

An HRR was completed in December 2011. A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including the three areas in this site. The base award includes an RI. This site is currently undergoing an RI.

CLEANUP/EXIT STRATEGY

The anticipated exit strategy for the site includes completion of the RI/FS. Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-69**  
**Site Name: BUILDING 1048 - FIRE STATION**

**STATUS**

**Regulatory Driver:** CERCLA  
Contaminants of Concern: Volatiles (VOC)  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200809.....	200904
SI.....	200905.....	201002
RI/FS.....	201003.....	201712

**RIP Date:** N/A  
**RC Date:** 201712

**SITE DESCRIPTION**

The Building 1048 Fire Station (CC RVAAP-69) AOC was located in the former plant administration area in the northwest quadrant of the intersection of George Road and South Service Road. In 1968, the fire station was referred to as the Fire and Guard Building, and consisted of 12,130 square feet. The fire station building was demolished in late 2008, and the site currently remains undeveloped. The AOC consists of the ground area located west/northwest of the former building. The area is currently marked with Siebert stakes.

Reportedly, it was common practice for the fire department to clean out fire extinguishers behind the west side of the fire building, and to allow the contents of the fire extinguishers (carbon tetrachloride) to spill onto the ground surface. The area of potential impact (ground surface west of the building) is approximately 28,000 square ft.

An HRR was completed in December 2011. A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including the three areas in this site. The base award includes an RI. This site is currently undergoing an RI.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the RI/FS. Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-70**  
**Site Name: EAST CLASSIFICATION YARD**

**STATUS**

**Regulatory Driver:** CERCLA  
Contaminants of Concern: Herbicides, Metals, Semi-volatiles (SVOC), Volatiles (VOC)  
Media of Concern: Sediment, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200809.....	200904
SI.....	200905.....	201508
RI/FS.....	201603.....	201903
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201903	

**SITE DESCRIPTION**

The RVAAP was originally equipped with east and west classification yards during its early operational years. The classification yards were used for the switching and maintenance of railroad cars.

The East Classification Yard (CC RVAAP-70) is located east of Load Line 1 in close proximity to the intersection of Ramsdell Road and Irons Road. The rail-yard reportedly consisted of 18 tracks with a 750 car capacity, and 3 Hi-X tracks with a 120 car capacity, which also included the washrack south of the main track area.

This yard was equipped with a locomotive repair building (Round House), an herbicide storage shed, several outbuildings, a washrack area, and a storage tank area. The herbicide shed contained a mobile herbicide tank. The AOC area consists of the following areas within the East Classification Yard: storage tank area, herbicide shed, Round House building, and former washrack area.

An HRR was completed in December 2011. According to the HRR, a heating oil fuel spill occurred in 1986 within the vicinity of the storage tank area. The area was reportedly cleaned up; however, no final cleanup report was found. This area is now overgrown with vegetation. Staining from past operations was found within the Round House building. No visible evidence of impacts (stained soil, stressed vegetation) was noted in the vicinity of the herbicide shed or washrack. The HRR recommended further investigation for all four areas within the East Classification Yard.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. The base award included an SI for this site. Field work for the SI was completed in December 2012. The Draft SI report was submitted in June 2013.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the RI/FS. Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.



**Site ID: CC RVAAP-71**

**Site Name: BARN NO. 5 PETROLEUM RELEASE**

**STATUS**

**Regulatory Driver:** CERCLA

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200909.....	200910
SI.....	201110.....	201506

**RIP Date:** N/A

**RC Date:** 201506

**SITE DESCRIPTION**

Barn No. 5 was formerly located on the south central portion of the RVAAP close to the Post No. 6 gate. A letter dated May 13, 1964, documents the release of approximately 20 barrels of gasoline (840 gallons) to the ground surface inside of the south fence south of Barn No. 5. Reportedly, the release occurred from a buried pipeline that runs parallel to, and outside of, the RVAAP fence line at this location. This release is addressed by CC RVAAP-71.

The area of potential impact consists of approximately 0.6 acres, which includes the footprint of the former barn area and the land between the former barn and the fence line. Potential COCs consist of VOCs, SVOCs, and lead.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. A HRR has been performed.

**CLEANUP/EXIT STRATEGY**

The SI will be completed in 2015. The anticipated exit strategy is NFA following the SI.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-72**  
**Site Name: FACILITY-WIDE USTs**

**STATUS**

Regulatory Driver: CERCLA

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200809.....	200904
SI.....	200905.....	201508
RI/FS.....	201603.....	201903
IRA.....	201703.....	201710

**RIP Date:** N/A  
**RC Date:** 201903

**SITE DESCRIPTION**

CC RVAAP-72 consists of 58 underground storage tanks (USTs) located throughout the facility. USTs were located throughout RVAAP operational production areas including load lines, maintenance areas, gate houses, water works, power houses and fueling stations. Approximately 45 of the UST were installed in 1941 and the remaining were installed between 1941 and 1981. The USTs ranged in size from 100 gallons to 20,000 gallons and were used for storage of gasoline, diesel fuel, No. 5 heating oil, and No. 6 fuel oil. All USTs included as part of CC-RVAAP-72 are inactive and suspected to be removed. Petroleum impacted soils and/or groundwater may exist at the former UST sites.

An HRR was completed in December 2011. Each UST was assessed as an individual unit as part of the historical records review. Information on the chronological summary of each UST including installation, last use, purpose, and removal was researched and compiled. NFA was recommended for 43 of 58 USTs.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. The base award included an SI for this site. Fieldwork for the SI was completed in December 2012. The Draft report was submitted in April 2014.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the SI. An IRA with soil removal will be executed followed by completion of the RI with a NFA FS, PP and ROD. The IRA removal tasks are listed as professional labor management in AEDB-R because the contract didn't list removal quantities.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-73**  
**Site Name: FACILITY-WIDE COAL STORAGE**

**STATUS**

**Regulatory Driver:** CERCLA  
Contaminants of Concern: Metals, Semi-volatiles (SVOC)  
Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200809.....	200904
SI.....	200905.....	201002
RI/FS.....	201003.....	201712
IRA.....	201603.....	201610

**RIP Date:** N/A  
**RC Date:** 201712

**SITE DESCRIPTION**

Installation records document the former presence of 17 coal storage locations at the former RVAAP, all of which are included in CC RVAAP-73. Coal was historically used to fuel powerhouses and various other buildings at the site. Typically, coal storage consisted of placing the coal on the ground surface as surface piles or in railcars adjacent to the subject buildings. The total area of potentially impacted media associated with the coal consists of approximately 222,500 square ft (about five acres). The HRR documented coal storage occurred at the following locations at RVAAP:

- 1) Load Line 1 Powerhouse
- 2) Load Line 2 Powerhouse
- 3) Load Line 4 Powerhouse
- 4) Load Line 12 Powerhouse
- 5) Building F-15
- 6) Building F-16
- 7) Atlas Scrap Yard
- 8) North Line Road Coal Tipple
- 9) Sand Creek Coal Tipple
- 10) East Classification Yard Round House
- 11) Administration Area
- 12) Depot Area Building U-5
- 13) Depot Area Building U-14
- 14) Fuze and Booster Road Powerhouse No. 5
- 15) Fuze and Booster Road Inert Storage No. 2F-N21
- 16) Fuze and Booster Service Road Powerhouse
- 17) Area 6 Inert Storage

During a property visit conducted as part of the HRR, visual evidence of previously undocumented coal storage was found approximately 2,000 feet south of the East Classification Yard and at the Building U-16 boiler house in the Depot Area. Available historical aerial photographs and site observations indicate that coal residue may still remain on or at the ground surface at the above-described locations. As such, the surface soils may be impacted by typical coal contaminants (PAHs, metals).

A HRR was completed in December 2011 and included investigation into the 17 documented coal storage sites and the additional two undocumented sites. Remnants of coal were noted at the following locations during the historical records review: North Line Coal Tipple, Sand Creek Coal Tipple, Building U-16, and the undocumented coal location south of the East Classification Yard. Stressed vegetation was noted at the North Line Coal Tipple. No remnants or stressed vegetation was noted at any other coal sites. Further investigation was recommended for the following coal sites: North Line Coal Tipple, Sand Creek Coal Tipple, Building U-16 coal area, and the undocumented coal storage area south of the East Classification Yard.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. A Preliminary Draft RI was submitted in April 2013.

**Site ID: CC RVAAP-73**  
**Site Name: FACILITY-WIDE COAL STORAGE**

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the RI. An IRA with soil removal will be executed followed by completion of a NFA PP and ROD. The IRA removal tasks are listed as professional labor management in AEDB-R because the contract didn't list removal quantities.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

Site Name: BLDG 1034 MOTOR POOL HYDRAULIC LIFT

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Metals, Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200809.....	200904
SI.....	200905.....	201112
RI/FS.....	201003.....	201903
IRA.....	201703.....	201710

RIP Date: N/A

RC Date: 201903

SITE DESCRIPTION

An in-ground hydraulic floor lift system located at Building 1034 has been identified and included in CC RVAAP-74. The hydraulic floor lift system is depicted in a 1969 drawing as a twin-post lift system constructed of metal. The below-grade system consists of a cast in concrete L- shaped pit measuring approximately 12 feet in length and four feet in length, three feet in width, and four feet in height. The pit is reportedly buried at depths ranging from four feet bgs to approximately eight feet bgs. The twin-post lift reportedly has a clearance of six ft between the floor surface and the bottom of the lift (height in the air). The floor lift system remains in place, and has reportedly exhibited a slow leak of hydraulic fluids for an extended period of time. The potential COCs associated with the floor lift system are total petroleum hydrocarbons, PAHs, and PCBs.

A HRR was completed in December 2011. The review investigated the oil water separator and the former degreasing activities related to Building 1034. No documentation related to spills or release from the oil water separator was found. Interviews revealed that approximately 300 gallons of hydraulic oil were added to the lift unit over approximately 10 years. Hydraulic oil was observed within the unit. The report recommended further investigation for the hydraulic lift. No sampling was recommended in conjunction with the former degreasing activities at the site.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. The Preliminary Draft RI was submitted in April 2014.

CLEANUP/EXIT STRATEGY

The anticipated exit strategy for the site includes completion of the RI. An IRA with soil removal will be executed followed by completion of a NFA PP and ROD. The IRA removal tasks are listed as professional labor management in AEDB-R because the contract didn't list removal quantities.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-75**

**Site Name: GEORGE ROAD STP MERCURY SPILL**

**STATUS**

Regulatory Driver: CERCLA

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200809.....	200904
SI.....	200905.....	201506

RIP Date: N/A

RC Date: 201506

**SITE DESCRIPTION**

CC RVAAP-75 is related to a former mercury spill at the George Road sewage treatment plant (STP). The STP was used to treat industrial and residential effluent, including pink water from the production lines. Reportedly a pint-sized jar of mercury was spilled into a floor drain in the comminutor building. The mercury was never recovered.

The STP maintained Ohio NPDES permit (#31000000BD), which allowed discharge to Outfall No. 002 (to the adjacent receiving stream). The STP was gravity fed and consisted of two Imhoff tanks, two trickling filters, and a clarifier. Sludge was dried in a greenhouse structure and spread over the ground surface at the old hay fields located at the corner of Slagle and Newton Falls Roads. The design capacity was 350,000 gallons per day. Reportedly, approximately 1,200 cubic ft of sludge was spread every three years. The George Road STP was taken out of service in 1993 and was properly closed under NPDES permit (#31000000BD).

An HRR was completed in December 2011. The report indicated that interviewees verified that a pint-size jar of mercury was spilled into a floor drain at the facility. Building schematics show the floor drain leads outside the building and ties into a 15 inch vitrified clay pipe which appears to be channeled back into the treatment system. Interviewees also indicated that the floor drains likely have a P-trap which may have caught the spilled mercury. The HRR recommended further investigation including inspection of the piping and pipe trap.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. The base award included an SI for this site. Field work for the SI was completed in December 2012. The Preliminary Draft SI report was submitted in February 2013.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy is NFA following the SI.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-76**  
**Site Name: DEPOT AREA**

**STATUS**

**Regulatory Driver:** CERCLA  
Contaminants of Concern: Explosives, Metals, Other (Propellants), Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)  
  
Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200809.....	200904
SI.....	200905.....	201002
RI/FS.....	201003.....	201610
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201610	

**SITE DESCRIPTION**

The Depot Area (CC RVAAP-76) consists of multiple historical support buildings used for former operations including: fueling stations, locomotive repair shop, motor repair shop, petroleum storage building, solid waste incinerator, demilitarization activities at Building U-10, service station and an aboveground storage tank (AST) associated with Building U-5. The steel 400 gallon AST located between Depot Buildings U-5 and U-4 has been removed, but the soils beneath and around the former tank are stained. The tank sat on crushed slag next to the motor oil storage shed. Waste oil from the motor pool area was stored in the AST until it was removed by an oil reclaimer. The AST was in operation from 1983 through 1993. In 1993, the contents of the AST were removed and the tank remained inactive until its removal (after 1996).

A HRR was completed in December 2011. The report indicated that demilitarization activities occurred at Building U-10. It also indicated that the AST had been removed but its concrete supports still remain. No visual evidence of impacts (stained soil, stressed vegetation) was observed at the former AST site. Interviewees noted a historical spill from a Buffalo Tank containing waste oil which was cleaned up within a day. No documentation related to this spill was identified. A spill report was found documenting the discovery of 12 paint cans during a UST investigation. The cans were removed in 1991. Various maintenance activities occurred throughout the Depot Area. No documentation regarding spills related to maintenance activities was found. Eleven USTs were formerly operated at the Depot Area. These will be evaluated as part of CC-RVAAP-72. The following sites within the Depot Area were recommended for further investigation: Building U-4 POL Area, Building U-5 Locomotive Repair Shop, Building U-20 Incinerator, Building U-10 (demilitarization activities), Building A-3 Service Garage, Building U-3 Service Station (Kerosene UST), Building A-2 Motor Repair Facility, Bolton Barn (Tank Maintenance) Paint Can Burial Area, and ditch lines within the operational areas.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. RI field work was completed in December 2012.

The Draft RI was issued in June 2013.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the RI/FS. Once the RI/FS is completed future actions will be evaluated. At this time there isn't sufficient documentation to plan for future actions.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-77**

**Site Name: BLDG 1037 LAUNDRY WASTEWATER SUMP**

**STATUS**

**Regulatory Driver:** CERCLA

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200809.....	200904
SI.....	200905.....	201506

**RIP Date:** N/A

**RC Date:** 201506

**SITE DESCRIPTION**

CC RVAAP-77 consists of a former below ground concrete sump located on the north side of Building 1037. The sump had a capacity of approximately 5,765 gallons. The unit was previously used as a settling tank for the discharge of laundry rinse water. Wash water was emptied approximately 12 times during eight hours of operation and rinsing three times each eight hours. The wash water entering the tank prior to the rinse water discharge had sufficient settling time so that the increase in rate from the rinse water did not disturb the settled matter on the tank bottom. Rinse water was then sent to CC RVAAP-75 (George Road Sewage Treatment Plant). Wastes of concern are TNT and RDX. The concrete wastewater sump was removed in 2009.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. The base award included an SI for this site. Fieldwork for the SI was completed in December 2012. The Revised Draft SI report was submitted in November 2014.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy is NFA following the SI.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.



**Site ID: CC RVAAP-78**

**Site Name: QUARRY POND SURFACE DUMP**

**STATUS**

**Regulatory Driver:** CERCLA

Contaminants of Concern: Asbestos, Explosives, Metals, Other (Propellants), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Sediment, Soil, Surface Water

Phases	Start	End
PA.....	200904.....	200906
SI.....	200907.....	201510
RI/FS.....	201004.....	201712
IRA.....	201603.....	201610

**RIP Date:** N/A

**RC Date:** 201712

**SITE DESCRIPTION**

The Quarry Pond Surface Dump (CC RVAAP-78) consists of an area of former dumping along a small topographic ridge located north and northeast of the northern-most quarry pond within the Fuze and Booster Quarry. The potentially impacted area consists of approximately 8,750 (250 feet by 35 feet) square feet. The debris pile appears to have an average thickness of about five feet (where present). Contents of the debris pile appear to consist of potential ACM, construction debris, scrap metal, and other unknown materials. A former burn location is also present along the northeastern portion of the surface dump and is characterized by ground charring.

The Quarry Pond Surface Dump appears to be a possible northern extension of the existing Fuze and Booster Quarry AOC (RVAAP-16), which operated from 1945 through 1993.

Constituents of concern include explosives, propellants, VOCs, SVOCs, metals, asbestos, and PCBs in soil and groundwater.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one. This site is currently undergoing an RI. The Preliminary Draft RI was submitted in April 2014.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the SI & RI. An IRA with soil removal will be executed followed by completion of an NFA PP and ROD. The IRA removal tasks are listed as professional labor management in AEDB-R because the contract didn't list removal quantities.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-79**  
**Site Name: DLA ORE STORAGE SITES**

**STATUS**

**Regulatory Driver:** CERCLA

Contaminants of Concern: Metals

Media of Concern: Groundwater, Sediment, Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200904.....	200906
SI.....	200907.....	200909
RI/FS.....	201010.....	201712
IRA.....	201603.....	201610

**RIP Date:** N/A

**RC Date:** 201712

**SITE DESCRIPTION**

Various ores were historically stored (stock-piled) at this facility for the General Services Administration (GSA). The Defense Logistics Agency (DLA), Defense National Stockpile Center leased space at the Ravenna facility for the storage of the ore materials on the ground and in ASTs, which are addressed by CC RVAAP-79. The ASTs were referred to as strategic material tanks. Many of the ASTs were constructed without floors; therefore, the ores were allowed to make direct contact with the underlying soils.

The following GSA materials were stock-piled on the ground surface: brass ingots, chemical chrome ore, copper ingots, ferrochrome ore, ferro manganese ore, and metallurgical manganese ore.

The following GSA materials were stored in Strategic Material Tanks: magnesium, kyanite, antimony sulfide, asbestos (raw), cobalt rutile sand, cobalt zircon sand, monazite sand, nickel cathodes, rutile sand, silicon carbide, talc, and zircon sand ore. The monazite sand contained radioactive element Thorium 232.

Ore storage occurred at the following primary locations on the Ravenna property: DLA Load Line 3 Tank Storage and Building 803, DLA Route 80 Tank Farm, DLA Main Ore Pile Storage Area, DLA Area 8 Inert Storage, Building 841, and DLA Area 2 Ammunition Storage Area. The total area of potentially impacted media associated with the ore storage consists of approximately 333,582 square yards (about 68.92 acres).

This site also includes the former Ore Pile Retention Pond (RVAAP-31) constructed in the mid 1950s. The pond was constructed to control potentially contaminated surface water runoff from the adjacent manganese and chrome stock piles from entering a receiving stream. There remains the potential for releases of contaminants from this unit to the surrounding soils, groundwater, surface water and sediment.

Available aerial photographs and site observations indicate that ores still remain on the ground surface at several locations. As such, the surface soils may be impacted by these materials.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites at RVAAP, including this one.

A Preliminary Draft RI was submitted in April 2014.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy for the site includes completion of the RI. An IRA with soil removal will be executed followed by completion of a NFA PP and ROD. The IRA removal tasks are listed as professional labor management in AEDB-R because the contract didn't list removal quantities.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-80**  
**Site Name: GROUP 2 PROPELLANT CAN TOPS**

**STATUS**

**Regulatory Driver:** CERCLA  
Contaminants of Concern: Other (Solid Waste)  
Media of Concern: Soil, Surface Water

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200904.....	200906
SI.....	200907.....	201611

**RIP Date:** N/A  
**RC Date:** 201611

**SITE DESCRIPTION**

This area consists of approximately 539,572 square feet (12.4 acres). Propellant can tops were identified at the ground surface at the southern end of the former Group 2 Ammunition Storage Area. The area is addressed by CC RVAAP-80. The tops were observed by OHARNG trainees in fall 2008 in the vegetative area located immediately south of the ammunition storage magazines in the vicinity of the railroad spur lines. As a result, the Louisville District USACE performed an initial geophysical survey of the southern area ground surface. Results of the initial investigation revealed multiple magnetic anomalies in the surface and near surface soils. On-site UXO personnel visually identified the surface anomalies as propellant can lids or tops.

A geophysical survey and sampling activities were conducted in 2011. The geophysical survey revealed five anomaly cluster areas exist at the surface or within near surface soils (within 9 inches) at the site. Additional single (i.e. not clustered) anomalies appear throughout the AOC. No signs of disturbance within the subsurface lithology (signs of excavation or dumping) were noted based upon the geophysical investigation. Surface soil samples were collected within the boundaries of three of five selected anomaly clusters in order to assess potential releases of propellants. None of the samples reflected detectable concentrations of COCs above facility-wide cleanup goals.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy is NFA following the SI.  
Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

**Site ID: CC RVAAP-83**  
**Site Name: FORMER BUILDINGS 1031 AND 1039**

**STATUS**

**Regulatory Driver:** CERCLA  
Contaminants of Concern: Metals  
Media of Concern: Groundwater, Soil

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200904.....	200906
SI.....	201110.....	201508
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	201508	

**SITE DESCRIPTION**

Former Buildings 1031 and 1039 (CC RVAAP-83) consist of the former Hospital Building and former Laboratory Building, respectively. Both buildings were located within the Administration Area of the former RVAAP facility.

**Building 1031 - Former Hospital Building**

This building was constructed in 1942 and functioned as the facility hospital until it closed in 1988. The building was demolished in 2008. The former building was approximately 13,500 square feet. The west end of the Hospital Building included a gauge lab. The gauge lab was used for the development of large scale photos for a period of about 1.5 years in the early-1970s after the laboratory at Building 1039 was closed.

This site was investigated as part of a HRR in 2011/2012. The May 2012 Final HRR report concluded that NFA was required at this AOC based on a review of available resources.

**Building 1039 - Former Laboratory Building**

This former Laboratory Building measured approximately 16,500 square ft. The structure contained three powder test rooms for the routine analyses of lead azide, mercury fulminate, and percussion element mixes. The laboratory was used for the testing of Load Line materials. During operations, the building contained and operated a photography laboratory, a chemistry laboratory, and a medical x-ray facility. The photo laboratory was historically used for all large scale photo development activities until its closure in the early-1970s.

Waste x-ray acid/silver mix solutions were reportedly disposed in the sanitary George Road STP. The Defense Property Disposal Organization/Defense Reutilization and Marketing Office termed the waste as a reclaimed precious metal resource.

The laboratory building was demolished by Lakeshore Engineering Services, Inc. during the time period of May 2006 through July 2007. Following demolition, all unpainted and uncontaminated brick and concrete was crushed and recycled off-site. The basement of Building 1039 was filled with clean soil and was then seeded with grass seed.

A PBA contract was awarded in FY11 to address investigation and remediation of the 14 CR sites (CC RVAAP-68 through 80 and 83) at RVAAP, including this one.

A Preliminary Draft SI was submitted in May 2014.

**CLEANUP/EXIT STRATEGY**

The anticipated exit strategy is NFA following the SI.

Groundwater monitoring requirements are carried in RVAAP-66, Facility-wide Groundwater.

## Site Closeout (No Further Action) Summary

Site ID	Site Name	NFA Date	Documentation
There are no NFA sites			

## CR Schedule

**Date of CR Inception:** 200809

### **Past Phase Completion Milestones**

#### **2009**

SI (CC RVAAP-79 - DLA ORE STORAGE SITES)  
PA (CC RVAAP-68 - ELECTRIC SUBSTATIONS (E,W,No. 3), CC RVAAP-69 - BUILDING 1048 - FIRE STATION, CC RVAAP-70 - EAST CLASSIFICATION YARD , CC RVAAP-72 - FACILITY-WIDE USTs, CC RVAAP-73 - FACILITY-WIDE COAL STORAGE, CC RVAAP-74 - BLDG 1034 MOTOR POOL HYDRAULIC LIFT, CC RVAAP-75 - GEORGE ROAD STP MERCURY SPILL, CC RVAAP-76 - DEPOT AREA, CC RVAAP-77 - BLDG 1037 LAUNDRY WASTEWATER SUMP, CC RVAAP-78 - QUARRY POND SURFACE DUMP, CC RVAAP-79 - DLA ORE STORAGE SITES, CC RVAAP-80 - GROUP 2 PROPELLANT CAN TOPS, CC RVAAP-83 - FORMER BUILDINGS 1031 AND 1039)

#### **2010**

PA (CC RVAAP-71 - BARN NO. 5 PETROLEUM RELEASE)  
SI (CC RVAAP-68 - ELECTRIC SUBSTATIONS (E,W,No. 3), CC RVAAP-69 - BUILDING 1048 - FIRE STATION, CC RVAAP-73 - FACILITY-WIDE COAL STORAGE, CC RVAAP-76 - DEPOT AREA)

#### **2012**

SI (CC RVAAP-74 - BLDG 1034 MOTOR POOL HYDRAULIC LIFT)

### **Projected Phase Completion Milestones**

**See attached schedule**

### **Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates**

To Be Determined

### **Final RA(C) Completion Date:**

**Schedule for Next Five-Year Review:** 2017

**Estimated Completion Date of CR at Installation (including LTM phase):** 201903

## RAVENNA ARMY AMMUNITION PLANT CR Schedule

[Green Box] = phase underway

SITE ID	SITE NAME	PHASE	FY16	FY17	FY18	FY19	FY20	FY21+
CC RVAAP-68	ELECTRIC SUBSTATIONS (E,W,No. 3)	RI/FS	[Green]	[Green]	[Green]			
CC RVAAP-69	BUILDING 1048 - FIRE STATION	RI/FS	[Green]	[Green]	[Green]			
CC RVAAP-70	EAST CLASSIFICATION YARD	RI/FS	[Green]	[Green]	[Green]	[Green]		
CC RVAAP-72	FACILITY-WIDE USTs	RI/FS	[Green]	[Green]	[Green]	[Green]		
		IRA		[Green]	[Green]			
CC RVAAP-73	FACILITY-WIDE COAL STORAGE	RI/FS	[Green]	[Green]	[Green]			
		IRA		[Green]				
CC RVAAP-74	BLDG 1034 MOTOR POOL HYDRAULIC LIFT	RI/FS	[Green]	[Green]	[Green]	[Green]		
		IRA		[Green]	[Green]			
CC RVAAP-76	DEPOT AREA	RI/FS	[Green]	[Green]				
CC RVAAP-78	QUARRY POND SURFACE DUMP	SI	[Green]					
		RI/FS	[Green]	[Green]	[Green]			
		IRA	[Green]	[Green]				
CC RVAAP-79	DLA ORE STORAGE SITES	RI/FS	[Green]	[Green]	[Green]			
		IRA	[Green]	[Green]				
CC RVAAP-80	GROUP 2 PROPELLANT CAN TOPS	SI	[Green]	[Green]				

## Community Involvement

**Technical Review Committee (TRC):** None

**Community Involvement Plan (Date Published):** 201502

**Restoration Advisory Board (RAB):** RAB established 199610

**RAB Adjournment Date:** N/A

**RAB Adjournment Reason:** None

### Additional Community Involvement Information

The RVAAP RAB was established in 1996 and has 25 members consisting of 23 community members and two non-community members. The community members include an appointee from each of the surrounding six townships, one representative appointed by the Trumbull County Commissioners, a representative appointed by the Portage County Commissioners, and 15 members chosen from the general public. One of the community members is elected as a community co-chair by majority vote. The two non-community members include a representative of the Ohio EPA and an Army installation co-chair appointed by the installation. A RAB operating procedure was adopted by all members on Feb. 19, 1997. A copy can be found on the RVAAP web site [www.RVAAP.org](http://www.RVAAP.org), as well as in two public repositories (The Reed Memorial Library in Ravenna and the Newton Falls Public Library).

The RVAAP RAB generally meets every three or four months. All meetings are open to the public and are rotated among public places within the townships around the installation. Current topics are addressed at the meetings and a speaker is generally featured. The minutes of all RAB meetings are recorded. All meetings are announced in the local media.

All IRP records are made available to the RAB members and any other interested parties through the two public repositories. IRP and other RVAAP documents are available at [www.RVAAP.org](http://www.RVAAP.org). The RAB receives TAPP.

The Community Relations Plan was updated in 2015. The plan outlines the many ways that RVAAP involves the community in the restoration activities, including through the RAB, site tours, and the website.

### Administrative Record is located at

Camp Ravenna Environmental Office  
1438 State Route 534 SW  
Newton Falls, OH 44444

### Information Repository is located at

Reed Memorial Library  
167 East Main Street  
Ravenna, OH 44266

Newton Falls Public Library  
204 South Canal Street  
Newton Falls, OH 44444

**Current Technical Assistance for Public Participation (TAPP):**199906

**TAPP Title:** Winklepeck OB Grounds Phase II

**Current Technical Assistance for Public Participation (TAPP):**200102

**TAPP Title:** Winklepeck Burning Grounds site

**Current Technical Assistance for Public Participation (TAPP):**201109

**TAPP Title:** FacilityWide Groundwater Monitoring Prog

**Potential TAPP:** N/A



