

**Draft**  
**Record of Decision for RVAAP-03 Open Demolition Area #1**

**Ravenna Army Ammunition Plant**  
**Ravenna, Ohio**

**Contract No. W912QR-08-D-0013**  
**Delivery Order No. 0002**

**Prepared for:**



**US Army Corps  
of Engineers** ®

Louisville District

**U.S. Army Corps of Engineers**  
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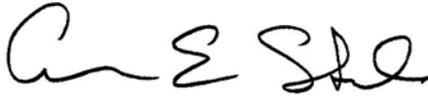
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## CONTRACTOR'S STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Shaw Environmental & Infrastructure, Inc., a CB&I company, has completed the *Draft Record of Decision for RVAAP-03 Open Demolition Area #1* at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy, principles, and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets customer's needs consistent with law and existing United States Army Corps of Engineers policy.

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ARNG—Army National Guard  
BRACD—Base Realignment and Closure Division  
OHARNG—Ohio Army National Guard  
RVAAP—Ravenna Army Ammunition Plant  
Shaw—Shaw Environmental & Infrastructure, Inc.  
USACE—United States Army Corps of Engineers  
USAEC—United States Army Environmental Command

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# 1 Acronyms and Abbreviations

2	AOC	area of concern
3	ARAR	applicable or relevant and appropriate requirement
4	bgs	below ground surface
5	Camp Ravenna	Camp Ravenna Joint Military Training Center
6	CERCLA	Comprehensive Environmental Response, Compensation and Liability
7		Act of 1980
8	CERCLIS	Comprehensive Environmental Response, Compensation and Liability
9		Information System
10	COC	chemical of concern
11	COPC	chemical of potential concern
12	EPA	U.S. Environmental Protection Agency
13	ERA	ecological risk assessment
14	FS	Feasibility Study
15	FWCUG	Facility-Wide Cleanup Goal
16	HHRA	human health risk assessment
17	IRA	Interim Removal Action
18	IRP	Installation Restoration Program
19	MD	munitions debris
20	MEC	munitions and explosives of concern
21	mg/kg	milligrams per kilogram
22	NCP	National Oil and Hazardous Substances Pollution Contingency Plan
23	NTA	National Advisory Committee for Aeronautics Test Area
24	O&M	operation and maintenance
25	OB	open burning
26	OD	open detonation
27	ODA1	Open Demolition Area #1
28	OHARNG	Ohio Army National Guard
29	Ohio EPA	Ohio Environmental Protection Agency
30	RAB	Restoration Advisory Board
31	RAO	remedial action objective
32	RCRA	Resource Conservation and Recovery Act
33	RI	Remedial Investigation
34	ROD	Record of Decision
35	RVAAP	Ravenna Army Ammunition Plant
36	SAIC	Science Applications International Corporation
37	Shaw	Shaw Environmental & Infrastructure, Inc.
38	SRC	site-related contaminant
39	TNT	trinitrotoluene
40	TSCA	Toxic Substances Control Act
41	U.S.	United States
42	U.S. Army	U.S. Department of the Army
43	USACE	U.S. Army Corps of Engineers
44	UXO	unexploded ordnance
45		

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# **PART I: DECLARATION**

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## **A. Site Name and Location**

This Record of Decision (ROD) addresses soil at the Open Demolition Area #1 (ODA1), Ravenna Army Ammunition Plant (RVAAP), Ravenna, Portage County, Ohio (**Figure 1**). ODA1 is identified in the United States (U.S.) Department of the Army (U.S. Army) Environmental Database for Restoration as RVAAP-03. The ODA1 area of concern (AOC) is located in the southwestern part of the RVAAP (**Figure 2**). The U.S. Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Identifier for the RVAAP is OH5210020736.

## **B. Statement of Basis and Purpose**

The U.S. Army is the lead agency and has chosen the selected remedy for ODA1 soil in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on information contained in the Administrative Record file for ODA1.

The Ohio Environmental Protection Agency (Ohio EPA), the lead regulatory agency, approved the *Final Phase II Remedial Investigation and Feasibility Study for RVAAP-03 Open Demolition Area #1* (U.S. Army Corps of Engineers [USACE], 2013). The Remedial Investigation (RI) and Feasibility Study (FS) evaluated contaminated soil remedies at ODA1 and recommended Institutional Controls. The Ohio EPA concurs with the above recommendation. Work under this ROD is subject to the terms and conditions as set forth in the agreement between the Ohio EPA and the U.S. Army entitled *Director's Final Findings and Orders*, dated June 10, 2004 (Ohio EPA, 2004).

## **C. Assessment of the Site**

The response action selected in this ROD is to protect public health, welfare, and the environment from actual or potential releases of hazardous substances into the environment.

## **D. Description of the Selected Remedy**

The remedy described in this ROD addresses the remediation of soil at ODA1 at the RVAAP with concentrations of one chemical of concern (COC) exceeding the remedial goals for unrestricted land use. The timing for conducting remedial action at ODA1 has not yet been determined. Other AOCs at the RVAAP, including facility-wide groundwater, will be managed as separate actions by the U.S. Army.

1 The selected remedy addresses soil through institutional controls. The major components of the  
2 selected remedy, Alternative S2, Institutional Controls, include the following (descriptions of this and  
3 other remedial alternatives are presented in Sections II.I and II.J of this ROD):

- 4 • Access restrictions—Administrative policies that specify access controls, installing Seibert  
5 stakes, long-term maintenance, and monitoring; installing signage and structural access  
6 barriers to prevent vehicular traffic in the contaminated area; and restricting future property  
7 use (i.e., unrestricted land use);
- 8 • Land-use Restrictions—Prohibition of residential use of the property, vehicular traffic, and  
9 invasive (digging) activities without unexploded ordnance (UXO) support; and
- 10 • Five-Year Reviews.

## 11 **E. Statutory Determination**

12 The selected remedy is protective of human health and the environment, complies with federal and  
13 State laws and regulations that are applicable or relevant and appropriate to the remedial action, and is  
14 cost effective.

15 The remedy does not satisfy the statutory preference for treatment. The majority of treatment  
16 technologies and process options identified in the initial screening were eliminated from further  
17 consideration primarily due to their not being applicable for explosives, the only COC for the AOC, or  
18 their not being consistent with the anticipated future land use, Ohio Army National Guard (OHARNG)  
19 land use for military training. Any remaining treatment technologies were eliminated in the evaluation  
20 of process options due to high relative cost.

21 Because this remedy will result in the COC remaining on site above concentrations that allow for  
22 unrestricted use and exposure, Five-Year Reviews will be performed in compliance with CERCLA  
23 Section 121(c). These reviews will ensure that the remedy remains protective of human health and the  
24 environment consistent with the land use.

## 25 **F. Record of Decision Data Certification Checklist**

26 **Table 1** provides the location of key remedy selection information contained in Part II, Decision  
27 Summary. Additional information can be found in the Administrative Record file for ODA1.

28

1 **Table 1**  
 2 **ROD Data Certification Checklist**

<b>ROD Data Checklist Item</b>	<b>ROD Section</b>	<b>Section Start Page</b>
COCs and their respective concentrations	II.G	10
Baseline risk represented by the COCs	II.G	10
Cleanup goals established for COCs and the basis for these goals	II.H	12
How source materials constituting principal threats are addressed	II.K	20
Current and reasonably anticipated future land-use assumptions used in the baseline risk assessment and ROD	II.F	10
Suitable potential land uses following the selected remedy	II.L.4	21
Estimated capital, annual O&M, and the total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected	II.L.3	21
Key factor(s) that led to selecting the remedy	II.L.1	20

3 *COC denotes chemical of concern.*  
 4 *O&M denotes operation and maintenance.*  
 5 *ROD denotes Record of Decision.*  
 6

7 **G. Authorizing Signatures and Support Agency Acceptance of Remedy**

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10  
 11

12 \_\_\_\_\_  
 13 William J. O'Donnell II, Branch Chief  
 14 Operational Army and Medical Branch  
 15 Department of the Army  
 16 Assistant Chief of Staff for Installation Management  
 17 Base Realignment and Closure Division (DAIM-ODB)

\_\_\_\_\_ Date

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23 \_\_\_\_\_  
 24 Scott Nally  
 25 Director  
 26 Ohio Environmental Protection Agency

\_\_\_\_\_ Date

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## 1 **PART II: DECISION SUMMARY**

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### 2 **A. Site Name, Location, and Description**

3 The current RVAAP consists of 1,260 acres scattered throughout the OHARNG Camp Ravenna Joint  
4 Military Training Center, hereafter referred to as Camp Ravenna. Camp Ravenna is federally owned  
5 and licensed to the OHARNG for use as a military training site. The Ohio EPA is the lead regulatory  
6 agency for the remediation conducted by the U.S. Army under the U.S. Department of Defense  
7 Installation Restoration Program (IRP). The EPA CERCLIS Identifier for the RVAAP is  
8 OH5210020736.

9 Camp Ravenna is located in northeastern Ohio within Portage and Trumbull Counties, approximately  
10 3 miles east-northeast of the city of Ravenna and approximately 1 mile northwest of the city of Newton  
11 Falls (**Figure 1**). The RVAAP portions of the property are located solely within Portage County. The  
12 RVAAP and Camp Ravenna occupy a parcel of property approximately 11 miles long and 3.5 miles  
13 wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the  
14 south; Garret, McCormick, and Berry Roads on the west; the Norfolk Southern Railroad on the north;  
15 and State Route 534 on the east (**Figures 1 and 2**). Camp Ravenna is surrounded by several  
16 communities: Windham is to the north, Garrettsville is 6 miles to the northwest, Newton Falls is 1 mile  
17 to the southeast, Charlestown is to the southwest, and Wayland is 3 miles to the south.

18 When the RVAAP was operational, Camp Ravenna did not exist and the entire 21,683-acre parcel was  
19 a federal government-owned, contractor-operated, industrial facility. The RVAAP IRP encompasses  
20 investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP.  
21 References to the RVAAP in this document indicate the historical extent of the RVAAP, which is  
22 inclusive of the combined acreages of the current Camp Ravenna and the RVAAP, unless otherwise  
23 specifically stated.

24 The only industrial activities still performed at the RVAAP are environmental restoration, ordnance  
25 clearance, infrequent demolition of any UXO discovered during investigation and remediation  
26 activities, and building decontamination and demolition.

27 ODA1 is approximately 6 acres in size and is located in the southwestern quadrant of Camp Ravenna,  
28 north of Hinkley Creek (**Figure 3**), in the middle of and surrounded by the National Advisory  
29 Committee for Aeronautics Test Area (NTA). ODA1 consisted of an oval open burning (OB) and open  
30 detonation (OD) area, which was surrounded by a 25-foot-wide by 1.5-foot-tall earthen berm, and a  
31 plane storage area located on the south side of the AOC.

32 The U.S. Army is the lead agency for any remediation decisions, and any applicable cleanup at ODA1.  
33 These activities are being conducted under the IRP. The Ohio EPA is the lead regulatory agency.

## 1 **B. Site History and Enforcement Activities**

2 The RVAAP was constructed in 1940 and 1941 for depot storage and ammunition assembly/loading  
3 and placed on standby status in 1950. Production activities resumed from 1954 to 1957 and again from  
4 1968 to 1972. Demilitarization activities, including disassembly of munitions and explosives melt-out  
5 and recovery, continued until 1992. In addition to production and demilitarization activities at the load  
6 lines, other facilities at the RVAAP include sites that were used for burning, demolition, testing of  
7 munitions, and other activities to support the RVAAP's mission.

8 ODA1 was in operation from 1941 to 1949, and was primarily used for the thermal destruction of  
9 munitions, explosives, and related materials by OB/OD operations. During the late 1940s through the  
10 early 1950s, ODA1 was also used as a plane storage area for the NTA. ODA1 has been inactive and  
11 access restricted since the cessation of OB/OD activities.

12 The following environmental reports have been completed for ODA1:

- 13 • *Ravenna Army Ammunition Plant Water Quality Surveillance Program* (U.S. Army Toxic  
14 and Hazardous Materials Agency, 1980–1992);
- 15 • *Final Preliminary Assessment for Ravenna Army Ammunition Plant, Ravenna, Ohio* (U.S.  
16 Army Center for Health Promotion and Preventive Medicine, 1996);
- 17 • *Phase I Remedial Investigation Report for Demolition Area 1 at the Ravenna Army*  
18 *Ammunition Plant, Ohio* (Science Applications International, Inc. [SAIC], 2001);
- 19 • *Final OE/UXO Removal & Interim Removal Action Report for the Open Demolition Area #1*  
20 (MKM Engineers, Inc., 2004);
- 21 • *Final Data Quality Objectives Report for the RVAAP-03 Open Demolition Area #1* (Shaw  
22 Environmental & Infrastructure, Inc. [Shaw], 2009);
- 23 • *Final Digital Geophysical Mapping Report for RVAAP-34 Sand Creek Disposal Road*  
24 *Landfill, RVAAP-03 Open Demolition Area #1, and RVAAP-28 Mustard Agent Burial Site*  
25 (Shaw, 2011); and
- 26 • *Phase II Remedial Investigation and Feasibility Study for RVAAP-03 Open Demolition Area*  
27 *#1, Draft Version 2.0* (Shaw, 2013).

## 28 **C. Highlights of Community Participation**

29 Using the RVAAP community relations program, the U.S. Army and the Ohio EPA have interacted  
30 with the public through news releases, public meetings, reading materials, direct mailing, an internet  
31 website, and receiving and responding to public comments. Specific items of the community relations  
32 program include the following:

- 33 • **Restoration Advisory Board (RAB):** The U.S. Army established the RAB in 1996 to  
34 promote community involvement in the U.S. Department of Defense environmental cleanup

1 activities and to allow the public to review and discuss the progress with decision makers.  
2 RAB meetings are held every two months and are open to the public.

- 3 • **RVAAP Community Relations Plan:** The RVAAP Community Relations Plan  
4 (USACE, 2003) was prepared to establish processes to keep the public informed of activities  
5 at the RVAAP. The plan is available in the Administrative Record at the RVAAP.
- 6 • **RVAAP Internet Website:** The U.S. Army established an internet website in 2004 for the  
7 RVAAP. This internet website is accessible to the public at [www.rvaap.org](http://www.rvaap.org).

8 In accordance with Section 117(a) of CERCLA and Section 300.430(f)(2) of the NCP, the U.S. Army  
9 released the *Proposed Plan for RVAAP-03 Open Demolition Area #1* (Shaw, 2013b) to the public in  
10 September 2013. The Proposed Plan and other project-related documents were made available to the  
11 public in the Administrative Record maintained at the RVAAP in Ravenna, Ohio and in the two  
12 Information Repositories at Reed Memorial Library in Ravenna, Ohio and Newton Falls Public Library  
13 in Newton Falls, Ohio. The notice of availability for the Proposed Plan was sent to the following media  
14 outlets: radio stations, television stations, and newspapers (*Newton Falls Press*, *Youngstown*  
15 *Vindicator*, *Warren Tribune-Chronicle*, *Akron Beacon Journal*, and *Ravenna Record Courier*) as  
16 specified in the RVAAP Community Relations Plan (USACE, 2003). The notice of availability  
17 initiated the 30-day public comment period beginning September XX, 2013 and ending October XX,  
18 2013.

19 The U.S. Army held a public meeting on October XX, 2013 at the LOCATION TBD to present the  
20 Proposed Plan to the public. At this meeting, representatives of the U.S. Army provided information  
21 and answered questions about soil contamination at ODA1. A transcript of the public meeting is  
22 available to the public and has been included in the Administrative Record. Responses to the verbal and  
23 written comments received at this meeting and during the public comment period are included in the  
24 Responsiveness Summary, which is Part III of this ROD.

25 The U.S. Army considered public input from the public meeting on the Proposed Plan in selecting the  
26 remedial alternative to be used for soil at ODA1.

#### 27 **D. Scope and Role of Response Actions within AOC Strategy**

28 The overall program goal of the IRP at the RVAAP is to clean up previously-contaminated lands to  
29 reduce contamination to concentrations that are not anticipated to cause risks, with primary emphasis  
30 on those areas that may impact human health and the environment. ODA1 is one of 54 AOCs in the  
31 IRP at the RVAAP. This ROD addresses soil and does not address other potentially contaminated  
32 media at ODA1. The selected remedy described in the ROD is consistent with the stated future  
33 action(s) to be performed at the RVAAP. Other media at ODA1, and other AOCs at the RVAAP, will  
34 be managed as separate actions or decisions by the U.S. Army and will be considered under separate  
35 RODs.

1 This ROD addresses soil at ODA1. The 2,4,6-trinitrotoluene (2,4,6-TNT) contamination in soil present  
2 at ODA1 poses a potential human health cancer risk greater than  $1 \times 10^{-5}$  and/or a hazard index greater  
3 than 1.0 for a Resident (Adult and Child) receptor for unrestricted land use. Implementation of the  
4 remedy described in this ROD will reduce the potential exposure pathways to contaminated soil  
5 through implementation of institutional controls.

## 6 **E. Summary of Site Characteristics**

7 Characteristics, nature and extent of contamination, and the conceptual site model of ODA1 are based  
8 on the various assessments and investigations conducted at ODA1 from 1980 through 2010 as  
9 presented in the RI/FS for ODA1 (Shaw, 2013a).

### 10 **E.1 Topography/Physiography**

11 Topography across ODA1 is relatively flat with little change in elevation. The elevation at ODA1 is  
12 approximately 1,085 feet above mean sea level. Currently, ODA1 occupies an open, gently sloping  
13 parcel of land that is bounded to the south, east, and west by woodlands. The berms around the OB/OD  
14 area are essentially removed and a low area immediately south and east of the former berm collects  
15 runoff during rainfall events. Surface water drains to Hinkley Creek to the south and west of the AOC  
16 (Shaw, 2013a).

### 17 **E.2 Soils and Geology**

18 The regional geology at the RVAAP consists of horizontal to gently dipping bedrock strata of  
19 Mississippian and Pennsylvanian age overlain by varying thicknesses of unconsolidated glacial  
20 deposits. Soils at ODA1 consist of the Fitchville silt loam series. This series exhibits 2 to 6 percent  
21 slopes, is somewhat poorly drained, and has low permeability. The surficial geology at ODA1 consists  
22 of the Lavery Till. In general, the clayey, silty Lavery Till consists of approximately 28 percent sand  
23 and 30 percent clay, but percentages can vary. ODA1 lies within the Sharon Conglomerate  
24 (Shaw, 2013a).

### 25 **E.3 Hydrogeology**

26 The depth to the water table at ODA1 has been observed from approximately 5 feet below ground  
27 surface (bgs) to 11 feet bgs. Shallow groundwater present in the unconsolidated glacial material is  
28 suspected to flow across the AOC from north to south, following topographic trends and surface water  
29 flow patterns. Deeper groundwater is likely to flow along strike of the regional buried bedrock valley  
30 (i.e., to the southwest) and off of the RVAAP property (Shaw, 2013a).

### 31 **E.4 Ecology**

32 ODA1 is within a dry, upland fields plant community and the dry, Early Successional Herbaceous  
33 Field Herbaceous Alliance. The Early Successional Herbaceous Field Herbaceous Alliance is  
34 associated with recently disturbed areas lacking sufficient recovery time for further successional  
35 (shrub) development. No sensitive habitats were identified on or near ODA1 during the natural  
36 heritage data searches. No Special Interest Areas have been designated within or include any portion of

1 ODA1. Based on planning-level survey data, no wetland areas were identified at ODA1. An abundance  
2 of wildlife is present at the RVAAP. There are currently no federally listed species or critical habitats  
3 at the RVAAP. State-listed species have been confirmed to be present on the RVAAP, although ODA1  
4 has not been previously surveyed for rare species (Shaw, 2013a).

## 5 **E.5 Nature and Extent of Contamination**

6 The Phase I RI results, based on sampling conducted in 1999, indicated the primary media of concern  
7 were surface and subsurface soil (SAIC, 2001). Site-related contamination in soil was identified as  
8 explosives and metals. The Phase I RI identified human health as the primary factor for facilitating  
9 further remedial activities at ODA1 based on the present and continued use of the site for military  
10 training.

11 In conjunction with the Phase I RI, a munitions and explosives of concern (MEC) debris removal and  
12 Interim Removal Action (IRA) were conducted at ODA1 in 2000 and 2001 (MKM Engineers,  
13 Inc., 2004). The presence of MEC/munitions debris (MD) was identified on the ground surface at  
14 ODA1 during the Phase I RI. The objective of the removal action at ODA1 was to remove the  
15 MEC/MD, and the hazards associated with it, to a depth of 4 feet bgs, and to eliminate the human  
16 health exposure to explosives and metals identified in the Phase I RI.

17 Surface soils at the site, characterized as 0 to 1 foot bgs at the RVAAP, consist of silty loam. Previous  
18 surface soil samples collected at ODA1 focused primarily on identified potential source areas within  
19 the AOC boundaries. These source areas included the OB/OD area, plane storage areas, and low-lying  
20 drainage areas. Sample results indicated that surface soils had been impacted primarily by metals and  
21 low-level explosives, and the bulk of the contamination was concentrated around the south ditch and  
22 other isolated hotspots (Shaw, 2013a). Subsurface soils at the site, characterized as greater than 1 foot  
23 bgs at the RVAAP, consist mostly of fine sands with interbedded lenses of silty sands and silty clays.

24 Following the removal of soils from grids established during the 2000 to 2001 IRA, confirmatory  
25 composite samples from the base of these excavations indicated that subsurface soils were still  
26 impacted by metals (aluminum, arsenic, beryllium, chromium, copper, and lead) (Shaw, 2013a). The  
27 scope of the IRA was limited and no further removal was conducted at that time.

28 A review of the sampling program through the time of performance of the Data Quality Objectives  
29 Report (Shaw, 2009), indicated that previous activities (i.e., Phase I RI and IRA) have not adequately  
30 evaluated the primary media of concern (surface and subsurface soils) at ODA1 and additional  
31 information was needed to support selection of an environmental closure remedy for the site. A Phase  
32 II RI consisting of surface and subsurface soil sampling was conducted in 2010.

33 In addition, a geophysical survey was performed in 2010 with the primary objective for ODA1 of  
34 characterizing the anomaly density in the subsurface. The geophysical survey identified numerous  
35 distinct areas of extremely high anomaly density that surround the center of the ODA1 investigation  
36 area (Shaw, 2013a). Anomalies associated with the former berm around the OB/OD area likely contain

1 debris that was pushed or moved to clear the OB/OD area after each demolition shot. Further  
2 investigation at the AOC requires intrusive activities to characterize the buried anomalies and to  
3 substantiate whether potential MEC and/or MD are present. This additional investigation is not part of  
4 the current IRP and would likely be addressed under a separate contract or program.

5 Select Phase II RI soil sampling locations were biased based on the geophysical survey results. The  
6 Phase II RI results indicated site-related contaminants (SRCs) in surface and subsurface soils along the  
7 western, northern, and southern perimeters, and in the central portion of the AOC (Shaw, 2013a).  
8 Sediment and surface water were not evaluated during the Phase II RI, since there is no permanent  
9 surface water or sediment at ODA1 and ODA1 was not determined to be a source for impact to nearby  
10 sediment and surface water. Therefore, no further action is necessary for these media and remedial  
11 alternatives only address soil. Groundwater will be addressed in a separate decision under the RVAAP  
12 Facility-Wide Groundwater AOC (RVAAP-66). However, the selected remedy for soil at ODA1 must  
13 also be protective of groundwater (Shaw, 2013a).

#### 14 **E.6 Contaminant Fate and Transport**

15 The SRCs found in the surface and subsurface soil samples during the Phase II RI were used as the  
16 primary contamination sources in the fate and transport assessment for ODA1. Fate and transport  
17 analysis indicates that some of the SRCs may leach from soil into the groundwater beneath the source.  
18 The SRCs that have the potential for impacting groundwater, based on leaching analysis and modeling  
19 and detection in soil samples collected from below the water table, include 2,4,6-TNT, 2-amino-4,6-  
20 dinitrotoluene, isophorone, antimony, arsenic, barium, cadmium, chromium, lead, mercury, selenium,  
21 silver, and thallium (Shaw, 2013a).

#### 22 **F. Current and Potential Future Land Uses**

23 The planned future land use at ODA1 is Military Training. The OHARNG is currently unable to use  
24 the site for training purposes due to concerns related to MEC. The OHARNG does utilize the adjacent  
25 NTA for training purposes. Unrestricted land use is not planned for the RVAAP or ODA1, and is only  
26 evaluated in accordance with current requirements.

#### 27 **G. Summary of Site Risks**

28 A human health risk assessment (HHRA) and an ecological risk assessment (ERA) were performed for  
29 ODA1. The risk assessments identify exposure pathways, COCs (if any), and provide a basis for the  
30 remedial decisions. This section of the ROD summarizes the results of the HHRA and ERA for ODA1,  
31 specifically for soil, as presented in detail in the *Phase II Remedial Investigation and Feasibility Study*  
32 *for RVAAP-03 Open Demolition Area #1*, Draft Version 2.0 (Shaw, 2013a) located in the  
33 Administrative Record and Information Repositories.

#### 34 **G.1 Human Health Risk Assessment**

35 A HHRA was conducted to evaluate whether site conditions may pose a risk to current or future site  
36 receptors and to identify which, if any, site conditions need to be addressed in the FS. ODA1 is

1 currently restricted access, but the planned future use is Military Training. The National Guard Trainee  
2 receptor is the representative receptor for Military Training land use. Although unrestricted land use is  
3 not anticipated at the RVAAP or ODA1, the HHRA also evaluated the Resident (Adult and Child)  
4 receptor in accordance with CERCLA guidance.

5 The first step in the process is to identify chemicals of potential concern (COPCs) for human health by  
6 comparing site concentrations to soil background concentrations, eliminating essential nutrients, and  
7 comparing site concentrations to final facility-wide cleanup goals (FWCUGs). The FWCUGs at the  
8  $1 \times 10^{-6}$  cancer risk level and noncarcinogenic risk hazard index using the 0.1 risk value for each of the  
9 receptors were selected. For the Resident (Adult and Child) receptor, the representative receptors for  
10 the unrestricted land-use scenario, 2,4,6-TNT was identified as a COPC in surface (0 to 1 foot bgs) and  
11 subsurface (1 to 13 feet bgs) soil. In addition for the Resident (Adult and Child) receptor, aluminum,  
12 antimony, arsenic, cadmium, copper, lead, silver, and thallium were identified as COPCs in subsurface  
13 soil. For the National Guard Trainee receptor, aluminum, arsenic, cobalt, and manganese were  
14 identified as COPCs in deep surface soil (0 to 4 feet bgs); and arsenic, barium, cadmium, and lead  
15 were identified as COPCs in subsurface soil (4 to 7 feet bgs).

16 The second step in the process is to identify COCs by comparing SRCs to specific FWCUGs and using  
17 a “sum of ratios” approach to account for cumulative effects from exposure to multiple chemicals. The  
18 FWCUGs at the  $1 \times 10^{-5}$  cancer risk level and noncarcinogenic risk hazard index using the 1 risk value  
19 for each of the receptors during the Phase II RI were selected. In subsurface soil for the Resident  
20 (Adult and Child) receptor, 2,4,6-TNT was identified as a COC at one soil sampling location (DA1sb-  
21 070) at the 1- to 4-foot bgs interval. The area of contamination addressed by this ROD is shown in  
22 **Figure 4**. No other COCs for soil for the Resident (Adult and Child) receptor and no COCs for soil for  
23 the National Guard Trainee receptor were identified.

## 24 **G.2 Ecological Risk Assessment**

25 An ERA was conducted to evaluate the potential for adverse ecological effects to ecological receptors  
26 from SRCs at ODA1 to determine if any ecological receptors need to be recommended for further  
27 evaluation in the FS. The ERA included characterizing the ecological communities in the vicinity of  
28 the site, determining the particular contaminants present, identifying pathways for receptor exposure,  
29 and estimating the magnitude of the likelihood of potential adverse effects to identified receptors.

30 Elevated concentrations of SRCs were detected and the potential for localized ecological impacts  
31 cannot be completely discounted. However, given the fact that the terrestrial area evaluated for ODA1  
32 is approximately 6 acres in size, and that the ERA uses a highly conservative assumption, it is unlikely  
33 that exposure to the surface soil chemical of potential ecological concern identified in the ERA would  
34 adversely impact populations of ecological receptors at ODA1. Therefore, no further investigation or  
35 action is considered necessary at ODA1 for ecological purposes.

1 **G.3 Basis for Action Statement**

2 Results of the risk assessment for ODA1 indicate that there are no risks from exposure to soil under  
3 current and anticipated future land use by the OHARNG for Military Training. Results of the risk  
4 assessment for ODA1 indicate that exposure to subsurface soil under the Unrestricted Land Use  
5 scenario may result in unacceptable risks to the Resident (Adult and Child) receptor, unless  
6 remediation is undertaken to reach established cleanup goals. As the Unrestricted Land Use scenario is  
7 not likely for ODA1, the response action selected in this ROD is necessary to protect the OHARNG  
8 from MEC.

9 **H. Remedial Action Objectives**

10 The remedial action objective (RAO) references cleanup goals and target risk levels that are considered  
11 protective of human health under current and reasonably anticipated future use scenarios. The RAO for  
12 this remedy at ODA1 is to prevent direct human contact with the COC, 2,4,6-TNT, in soil at  
13 concentrations greater than the remedial goals. The remedial goals are presented in **Table 2**. The  
14 remedy must also comply with applicable or relevant and appropriate requirements (ARARs) and to-  
15 be-considered guidance.

16 **Table 2**  
17 **Identification of Remedial Goals for ODA1 Subsurface Soil for Unrestricted Land Use**

Analyte	Receptor	Noncancer Final FWCUG Hazard Index = 1	Cancer Final FWCUG 10 <sup>-5</sup>
2,4,6-TNT	Resident Receptor, Adult and Child	36.5 mg/kg	284 mg/kg

18 *FWCUG denotes facility-wide cleanup goal.*  
19 *mg/kg denotes milligrams per kilogram.*  
20 *TNT denotes trinitrotoluene.*  
21

22 No further action is warranted for the Unrestricted Land Use scenario for the Resident (Adult and  
23 Child) receptor for surface soil (0 to 1 foot bgs) because the HHRA did not identify any COCs. No  
24 further action for soil is warranted for the National Guard Trainee for the OHARNG future land use of  
25 military training because the HHRA did not identify any COCs.

26 This ROD does not address any MEC issues that may remain at ODA1, as any MEC issues would be  
27 investigated under a separate program, for example, the Military Munitions Response Program.  
28 Therefore, no RAOs were developed involving MEC.

29 **I. Description of Alternatives**

30 The FS developed and evaluated remedial alternatives for soil at ODA1 based on the RI results. Four  
31 remedial alternatives were developed:

- 32 • No Action;
- 33 • Institutional Controls;

- 1 • Excavation and On-Site Capping; and
- 2 • Excavation and Off-Site Disposal.

3 This section includes a description of the various components of the four remedial alternatives  
4 indentified in the FS, including land-use controls and monitoring, removal, and disposal and handling.  
5 Any alternative protective of the Resident (Adult and Child) receptor would also be protective of the  
6 National Guard receptors, given the COC.

### 7 **I.1 Alternative S1, No Action**

8 This remedial alternative provides no further remedial action and is required under NCP as a baseline  
9 for comparison with other remedial alternatives. Under this alternative, contaminated soil would  
10 remain in place. No action would be taken to reduce the hazards present at ODA1 to potential human  
11 or ecological receptors. Five-Year Reviews would not be conducted in accordance with CERCLA  
12 121(c). This alternative will not have capital or operation and maintenance (O&M) costs.

### 13 **I.2 Alternative S2, Institutional Controls**

14 Institutional controls include access and land-use restrictions, and long-term monitoring, which would  
15 reduce the potential for exposure to contaminated soil at ODA1. Under this alternative, contaminated  
16 soil would remain in place. No action would be taken to reduce the hazards present at ODA1 to  
17 potential human or ecological receptors. Off-site migration of the contaminant would not be mitigated  
18 under the Institutional Controls alternative.

19 Under this alternative, institutional restrictions to control access to contaminated areas by  
20 implementing administrative policies that specify access controls, installing Seibert stakes, long-term  
21 maintenance, and monitoring, would be implemented at ODA1. Administrative policies would include  
22 restricting future property use within the contaminated area of ODA1 that would result in any  
23 unacceptable risks. It should be noted that besides the fencing installed around the RVAAP property,  
24 no access controls exist at ODA1, and the area is accessible to those who do have access to the  
25 RVAAP. In addition, maintenance of the facility's perimeter fence is not a component of this  
26 alternative.

27 Land-use restrictions would include prohibition of residential use of the property, vehicular traffic, and  
28 invasive (digging) activities. These restrictions would be incorporated into the Property Management  
29 Plan and subsequent facility Master Plan. All restrictions would be incorporated into any real property  
30 documents should the property be transferred. Any restrictions or land-use controls would need to be  
31 properly managed, including compliance documentation through inspections and an annual report to  
32 the Ohio EPA.

33 This alternative includes the following components:

- 34 • Installing Seibert stakes;

- 1 • Installing warning/restrictive signs around areas of contamination;
- 2 • Regulating intrusive activities into staked areas;
- 3 • Not allowing intrusive activities without UXO support;
- 4 • Maintaining Seibert stake integrity;
- 5 • Implementing land-use restrictions for the Resident (Adult and Child) receptor;
- 6 • Installing and maintaining signage and structural access barriers to prevent vehicular traffic;
- 7 • Conducting maintenance; and
- 8 • Performing Five-Year Reviews.

### 9 **I.3 Alternative S3, Excavation and On-Site Capping**

10 This alternative would involve the excavation of contaminated subsurface soil from one discrete area  
11 with elevated concentrations of 2,4,6-TNT and consolidation in a lined and capped stockpile. Surface  
12 controls would be necessary to prevent erosion damage and to control runoff or other disturbances to  
13 the cap. Following excavation of the contaminated subsurface soil, clean backfill would be placed in  
14 the excavated area.

15 This alternative would also require the use of institutional controls to prevent access and invasive  
16 activities in the capped area, as well as land-use controls to prevent the use of the capped area by the  
17 National Guard Trainee, National Guard Range Maintenance Soldier, National Guard Dust/Fire  
18 Control Worker, and Resident (Adult and Child) receptors.

19 The construction would be complete within a few months; however, monitoring would need to  
20 continue in perpetuity. Therefore, the time to achieve RAOs would be approximately 6 months.

21 This alternative includes the following components:

- 22 • Excavating a discrete area of contaminated subsurface soil with UXO support;
- 23 • Off-site disposing of soils exceeding Toxic Substances Control Act (TSCA) and/or Resource  
24 Conservation and Recovery Act (RCRA) criteria;
- 25 • Consolidating soils in on-site stockpile(s) on an impermeable liner;
- 26 • Replacing excavated material with compacted clean backfill;
- 27 • Installing a cap of asphalt pavement or clay over the consolidated and graded stockpile;
- 28 • Installing surface water diversion and runoff controls for the cap;
- 29 • Regulating intrusive activities into the cap;
- 30 • Maintaining cap integrity;

- 1 • Implementating land-use restrictions for the National Guard Trainee, National Guard Range
- 2 Maintenance Soldier, National Guard Dust/Fire Control Worker, and Resident (Adult and
- 3 Child) receptors;
- 4 • Installing and maintaining signage and structural access barriers to prevent vehicular traffic;
- 5 • Periodic groundwater monitoring to ensure the remedy does not impact groundwater;
- 6 • Conducting maintenance; and
- 7 • Performing Five-Year Reviews.

#### 8 **I.4 Alternative S4, Excavation and Off-Site Disposal**

9 This alternative would involve the excavation of contaminated subsurface soil from a discrete area and  
10 permanent disposal in a RCRA-permitted landfill as nonhazardous, hazardous, or TSCA waste,  
11 depending on waste characterization. Following excavation of the contaminated subsurface soil, clean  
12 backfill would be placed in the excavated area.

13 This alternative would support the planned Military Training land use (i.e., National Guard Trainee  
14 receptor and the Resident [Adult and Child] receptor) Unrestricted Land Use. The time to achieve  
15 RAOs would be approximately 4 months.

16 This alternative includes the following components:

- 17 • Excavating a discrete area of contaminated subsurface soil with UXO support;
- 18 • Temporary storing soil on site via stockpiling for characterization;
- 19 • Disposing of excavated soil off site at a RCRA and/or TSCA permitted landfill; and
- 20 • Replacing excavated material with compacted clean backfill.

#### 21 **J. Summary of Comparative Analysis of Alternatives**

22 The alternatives were evaluated with respect to the nine comparative analysis criteria outlined by  
23 CERCLA (**Table 3**). The nine criteria are categorized into three groups: Threshold Criteria, Primary  
24 Balancing Criteria, and Modifying Criteria. These criteria groups are as follows:

25 Threshold Criteria must be met for the alternative to be eligible for selection as a remedial option:

- 26 1. Overall Protection of Human Health and the Environment.
- 27 2. Compliance with ARARs.

28  
29 Primary Balancing Criteria are used to weigh major trade-offs among alternatives:

- 30 3. Long-term Effectiveness and Permanence.
- 31 4. Reduction of Toxicity, Mobility, or Volume Through Treatment.
- 32 5. Short-term Effectiveness.

- 6. Implementability.
- 7. Cost.

Modifying Criteria may be considered to the extent that information is available during development of the FS, but can be fully considered only after public comment on the Proposed Plan:

- 8. State Acceptance.
- 9. Community Acceptance.

**Table 3**  
**CERCLA Evaluation Criteria**

---

**Overall Protection of Human Health and the Environment** considers whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

---

**Compliance with ARARs** considers how a remedy will meet all the applicable or relevant and appropriate requirements of other federal and State environmental statutes and/or provide grounds for invoking a waiver.

---

**Long-term Effectiveness and Permanence** considers the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

---

**Reduction of Toxicity, Mobility, or Volume Through Treatment** considers the anticipated performance of the treatment technologies that may be employed in a remedy.

---

**Short-term Effectiveness** considers the speed with which the remedy achieves protection, as well as the potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

---

**Implementability** considers the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the solution.

---

**Cost** considers capital costs and O&M costs associated with the implementation of the alternative.

---

**State Acceptance** indicates whether the State concurs with, opposes, or has no comment on the preferred alternative.

---

**Community Acceptance** will be addressed in the ROD following a review of the public comments received on the RI/FS, and the Proposed Plan.

---

*ARAR denotes applicable or relevant and appropriate requirement.*

*CERCLA denotes Comprehensive Environmental Response, Compensation, and Liability Act.*

*FS denotes Feasibility Study.*

*O&M denotes operation and maintenance.*

*RI denotes Remedial Investigation.*

*ROD denotes Record of Decision.*

**J.1 Overall Protection of Human Health and the Environment**

This criterion must be met for an alternative to be considered for final selection. Alternative S1, No Action, will not reduce the short- or long-term risks for human or environmental receptors from potential exposure to the COC in soil. Alternative S2, Institutional Controls, with land-use controls will reduce the short-term risks for human or environmental receptors from potential exposure to the COC. Alternative S3, Excavation and On-Site Capping, and Alternative S4, Excavation and Off-Site Disposal, provide long-term protection of human health by removing the source of contamination from potential human exposure through ingestion, inhalation, or contact. These two alternatives also eliminate the mobility of COCs from the impacted soils; therefore, protect environmental receptors from potential exposure to COC-impacted media. Removing the most grossly contaminated soil will

1 reduce the toxicity, mobility, and volume of the COC at ODA1 and protect the Resident (Adult and  
2 Child) receptor in the long term. Alternative S2, Institutional Controls, and Alternative S3, Excavation  
3 and On-Site Capping, result in restricted land use for the National Guard Trainee and the Resident  
4 (Adult and Child) receptors, and requires the capped area to be off-limits to vehicular traffic. The  
5 institutional controls would be implemented through the RVAAP in concurrence with the Ohio EPA.  
6 These alternatives would provide protection of human health through AOC-perimeter fencing and  
7 warning signs, institutional controls placed on the use of on-site soils, and structural barriers around  
8 the capped areas (Alternative S3). Short-term exposure risks will be mitigated through the use of best  
9 management practices, Occupational Safety and Health Administration training, and the use of  
10 appropriate personal protective equipment.

## 11 **J.2 Compliance with ARARs**

12 This criterion must be met for an alternative to be considered for final selection. CERCLA Section 121  
13 specifies that remedial actions must comply with requirements or standards under federal or more  
14 stringent State environmental laws that are “applicable or relevant and appropriate to the hazardous  
15 substances or particular circumstances at the site.” These include action-, location-, and chemical-  
16 specific ARARs. Each alternative, except Alternative S1, No Action, could be designed and  
17 implemented to meet respective ARARs.

## 18 **J.3 Long-Term Effectiveness and Permanence**

19 Alternative S4, Excavation and Off-Site Disposal, would afford the highest degree of long-term  
20 effectiveness and permanence. Alternative S4 would provide for removal of the COC whose  
21 concentrations are greater than acceptable risk levels. The alternative would reduce risk to levels in  
22 accordance with RAOs and could be implemented in approximately 6 months.

23 The long-term effectiveness and permanence of Alternative S2, Institutional Controls, and Alternative  
24 S3, Excavation and On-Site Capping, would be less reliable because contaminated soil would remain  
25 on site and long-term controls would be necessary to prevent disturbance to the cap. The cap would  
26 require about 1 to 2 months longer to implement than Alternative S4, Excavation and Off-Site  
27 Disposal. Long-term maintenance of the Seibert stakes or cap would be required as long as the COC  
28 remains at ODA1 and above acceptable risk levels. Alternative S1, No Action, is neither effective nor  
29 permanent in the long term.

## 30 **J.4 Reduction of Toxicity, Mobility, or Volume**

31 None of the remedial alternatives include treatment as a principal element; therefore, universal  
32 reduction of toxicity, mobility, and volume cannot be achieved. Although Alternative S4, Excavation  
33 and Off-Site Disposal, will permanently reduce the toxicity, mobility, and volume of the COC in soil at  
34 ODA1, the reduction would not be achieved through treatment. The removed material would simply be  
35 transferred to a new location. Alternative S3, Excavation and On-Site Capping, would reduce the  
36 mobility of the COC by preventing infiltration of precipitation; however, not through treatment.

1 Alternative S1, No Action, and Alternative S2, Institutional Controls, do not reduce the toxicity,  
2 mobility, or volume of the COC in the soil at ODA1.

### 3 **J.5 Short-Term Effectiveness**

4 Short-term effectiveness addresses the period of time needed to implement the remedy and any adverse  
5 impacts that may be posed to workers, the community, and environment during construction and  
6 operation of the remedy until cleanup goals are achieved. Alternative S2, Institutional Controls, and  
7 Alternative S3, Excavation and On-Site Capping, would have the greatest short-term effectiveness  
8 because they would present the least risk to the community by maintaining the majority of  
9 contaminated soils on site. Alternative S4, Excavation and Off-Site Disposal, would require potential  
10 exposure controls, but could be effective in the short term and would be completed in less time than  
11 Alternative S3, but not Alternative S2. Alternative S1, No Action, is not effective in the short term.

### 12 **J.6 Implementability**

13 Alternative S1, No Action, would involve no implementability issues. Alternative S2, Institutional  
14 Controls, would be easy to implement by installing Seibert stakes and establishing administrative  
15 controls. Alternative S3, Excavation and On-Site Capping, would be moderately easy to implement by  
16 requiring excavation of the discrete area and materials handling for consolidation and capping.  
17 Alternative S4, Excavation and Off-Site Disposal, would be moderately easy to implement by  
18 requiring excavation of the discrete area and materials handling.

### 19 **J.7 Cost**

20 Costs were estimated for comparison purposes only and are expected to provide an accuracy of  
21 +50 percent to -30 percent. The estimated costs for each of the alternatives are shown in **Table 4**.  
22 Alternative S1, No Action, does not have capital or O&M costs. The capital costs for Alternative S2,  
23 Institutional Controls, has the lowest capital costs. The capital costs for Alternative S4, Excavation and  
24 Off-Site Disposal, are lower compared to Alternative S3, Excavation and On-Site Capping, and there  
25 are no O&M costs for Alternative S4.

26 **Table 4**  
27 **Estimated Costs of Alternatives**

Alternative	Capital Cost	O&M Cost	Operation Time Frame	Total Present Worth Cost
S1	\$0	\$0	Not Applicable	\$0
S2	\$107,990	\$61,168	30 years	\$133,292
S3	\$525,046	\$1,118,845	30 years	\$952,019
S4	\$351,504	\$0	Not Applicable	\$351,504

28 *O&M denotes operation and maintenance.*

29

1 **J.8 State Acceptance**

2 State acceptance was evaluated formally after the public comment period on the Proposed Plan. The  
 3 Ohio EPA concurs that Alternatives S1, No Action; S2, Institutional Controls; and S3, Excavation and  
 4 On-Site Capping, do not provide adequate protection of human health and the environment for  
 5 Unrestricted Land Use. Alternative S4, Excavation and Off-Site Disposal, is protective of human  
 6 health for Unrestricted Land Use. Given that Unrestricted Land Use is unlikely and the corresponding  
 7 high relative costs of Alternatives S3 and S4, the Ohio EPA concurs that Alternative S2, Institutional  
 8 Controls, is sufficiently protective for the planned Military Training Land Use. **EDIT FOR ACTUAL**  
 9 **OHIO EPA COMMENTS AFTER PP.**

10 **J.9 Community Acceptance**

11 Community acceptance was evaluated formally after the Proposed Plan public comment period.  
 12 During the public meeting, the community voiced few objections to Alternative S2, Institutional  
 13 Controls, as indicated in Part III of this ROD, the Responsiveness Summary. **EDIT FOR ACTUAL**  
 14 **PUBLIC COMMENTS AFTER PP.**

15 **Table 5** summarizes the comparative analysis of remedial alternatives for ODA1 from the FS.

16 **Table 5**  
 17 **Comparative Analysis of Remedial Action Alternatives for ODA1, Resident (Adult and Child) Receptor**  
 18 **Unrestricted Land Use Scenario**

Evaluation Criteria	S1, No Action	S2, Institutional Controls	S3, Excavation and On-Site Capping	S4, Excavation and Off-Site Disposal
Protective of Human Health and Environment	No	Yes	Yes	Yes
Complies with ARARs	No	Yes	Yes	Yes
Effective and Permanent	No	No	Yes	Yes
Reduces Toxicity, Mobility, or Volume	No	No	No	Yes
Short-Term Effectiveness	Unacceptable	Acceptable	Acceptable	Acceptable
Implementable	Yes	Yes	Yes	Yes
<b>Costs</b>				
Capital	\$0	\$107,990	\$525,046	\$351,504
Nondiscounted O&M	\$0	\$61,168	\$1,118,845	\$0
Total Present Worth	\$0	\$133,292	\$952,019	\$351,504
State Acceptance	Unacceptable	Acceptable	Acceptable	Acceptable
Community Acceptance	Unacceptable	Acceptable	Unacceptable	Acceptable

19 *ARAR denotes applicable or relevant and appropriate requirement.*

20 *O&M denotes operation and maintenance.*

21

1 **K. Principal Threat Wastes**

2 Principal threat wastes, as defined by EPA, are those source materials considered to be highly toxic or  
3 highly mobile that generally cannot be reliably contained, or would present a significant risk to human  
4 health or the environment should exposure occur. There are no principal threat wastes identified for  
5 ODA1.

6 **L. Selected Remedy**

7 Alternative S2, Institutional Controls, is the selected remedy at ODA1. This alternative involves the  
8 implementation of institutional controls for the area of soil with concentrations of the COC that are  
9 greater than cleanup goals for the Resident (Adult and Child) receptor. This remedial action will  
10 protect the Resident (Adult and Child) receptor, and subsequently the National Guard receptors for  
11 Military Training Land Use, from direct contact with the contaminated soil.

12 The cost for the alternative is estimated to be \$133,292. Five-Year Reviews will be conducted in  
13 accordance with CERCLA 121(c) to ensure protectiveness of the remedy. The remedial action includes  
14 a 30-year O&M period to account for the post-implementation activities, including land-use controls.  
15 This remedy is consistent with the planned Military Training Land Use at ODA1.

16 Although the planned future land use for ODA1 is Military Training and no further action for soil is  
17 warranted for National Guard receptors, this alternative will also be protective of the Resident (Adult  
18 and Child) receptor.

19 **L.1 Rationale for the Selected Remedy**

20 The U.S. Army, in coordination with the Ohio EPA, is recommending Alternative 2, Institutional  
21 Controls, be implemented as the remedial action for soil at ODA1. This alternative was selected due to  
22 its expediency, consistency with approved future land use, low relative cost, feasibility, and  
23 implementability. The selected remedy meets the threshold criteria.

24 **L.2 Description of the Selected Remedy**

25 This alternative, Institutional Controls, includes access and land-use restrictions, and long-term  
26 monitoring, which would reduce the potential for exposure to contaminated soil at ODA1.

27 **Access Restrictions**

28 Institutional restrictions to control access to the contaminated area by implementing administrative  
29 policies that specify access controls, installing Seibert stakes, long-term maintenance, and monitoring,  
30 would be implemented at ODA1. Signage and structural access barriers to prevent vehicular traffic in  
31 the contaminated area will be installed. Administrative policies would include restricting future  
32 property use within the contaminated area of ODA1 that would result in any unacceptable risks (i.e.,  
33 unrestricted land use). It should be noted that besides the fencing installed around the RVAAP, no  
34 access controls exist at ODA1, and the area is accessible to those who do have access to the RVAAP.  
35 In addition, maintenance of the facility's perimeter fence is not a component of this alternative.

1 **Land-Use Restrictions**

2 Land-use restrictions would include prohibition of residential use of the property, vehicular traffic, and  
3 invasive (digging) activities without UXO support. These restrictions would be incorporated into the  
4 Property Management Plan and subsequent facility Master Plan. All restrictions would be incorporated  
5 into any real property documents should the property be transferred. Any restrictions or land-use  
6 controls would need to be properly managed, including compliance documentation through inspections  
7 and an annual report to the Ohio EPA.

8 **Five-Year Reviews**

9 As the contaminated soil will remain in place at ODA1, Five-Year Reviews will be conducted to  
10 evaluate the effectiveness of the remedy. Institutional controls will be maintained until the  
11 concentrations of hazardous substances in the soil are reduced to levels that allow for unrestricted use.

12 The U.S. Army is responsible for implementation, maintenance, periodic reporting, and enforcement of  
13 this remedy. Although the U.S. Army may transfer these responsibilities to another party by contract,  
14 property transfer agreement, or through other means, the U.S. Army remains responsible for remedy  
15 integrity to include (1) CERCLA 121(c) Five-Year Reviews; (2) notification of the appropriate  
16 regulators and/or local government representatives of any known deficiencies or violations of the  
17 institutional controls; (3) provisions of access to the property to conduct any necessary response; (4)  
18 the ability to change, modify, or terminate institutional controls and any related deed or lease  
19 provisions; and (5) assurance that the objectives of the institutional controls are met to maintain  
20 remedy protectiveness.

21 **L.3 Summary of the Estimated Remedy Costs**

22 The total capital cost of this alternative is estimated at \$107,990, while the total annual O&M costs are  
23 estimated at \$61,168 (nondiscounted). The total present worth of capital and annual O&M costs is  
24 approximately \$133,292 calculated over 30 years at a discount rate of 7 percent.

25 **L.4 Expected Outcomes of the Selected Remedy**

26 Implementation of the selected remedy will allow for the planned Military Training Land Use at  
27 ODA1.

28 **M. Statutory Determination**

29 Based on information currently available, the U.S. Army believes the selected remedy meets the  
30 threshold criteria and provides the best option among the other alternatives with respect to balancing  
31 and modifying criteria. The selected remedy satisfies the statutory requirements of CERCLA Section  
32 121 and the NCP, as described below.

33 **M.1 Protection of Human Health and the Environment**

34 Human exposure to site COCs will be eliminated or controlled to levels that are protective through the  
35 implementation of institutional controls at ODA1.

1 **M.2 Compliance with ARARs**

2 The selected remedy will comply with the location-specific ARARs listed in **Appendix A**. The  
3 selected remedy does not have action-specific ARARs as there is no construction activity performed  
4 under the alternative. Chemical-specific ARARs are those remedial goals for the COC listed in  
5 **Table 2**. Chemical-specific ARARs for other receptors and other constituents are the Final FWCUGs.

6 **M.3 Cost Effectiveness**

7 The selected remedy meets the statutory requirement for a cost-effective remedy. Cost effectiveness is  
8 concerned with the reasonableness of the relationship between the effectiveness afforded by each  
9 alternative and its costs compared to other available options. Alternative S2 is considered to be cost  
10 effective. **Table 4** provides the costs of the selected remedy compared to the other alternatives  
11 evaluated.

12 **M.4 Utilization of Permanent Solutions and Alternative Treatment (or Resource  
13 Recovery) Technologies to the Maximum Extent Practicable**

14 The selected remedy is not a permanent solution or alternative treatment technology. No treatment  
15 technologies were included in the remedial alternatives evaluated for ODA1.

16 **M.5 Preference for Treatment as a Principal Element**

17 The remedy does not satisfy the statutory preference for treatment. No treatment technologies were  
18 included in the remedial alternatives evaluated for ODA1.

19 **M.6 Five-Year Review Requirements**

20 Five-Year Reviews will be conducted in compliance with CERCLA Section 121(c) and the NCP  
21 Section 300.430(f)(4)(ii). Five-Year Reviews are required until such a time as ODA1 allows for  
22 unrestricted access.

23 **N. Documentation of No Significant Change**

24 **The Proposed Plan for ODA1 was released for public comment in MONTH YEAR.** The Proposed Plan  
25 identified Alternative S2, Institutional Controls, as the recommended alternative for soil at ODA1.  
26 After the public comment period, no significant changes regarding the recommended alternative, as  
27 originally identified in the Proposed Plan, were necessary or appropriate.

28

1 **PART III: RESPONSIVENESS SUMMARY FOR PUBLIC**  
2 **COMMENTS ON THE PROPOSED PLAN FOR ODA1 AT RAVENNA**  
3 **ARMY AMMUNITION PLANT, RAVENNA, OHIO**

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4 **A. Overview**

5 In September 2013, the U.S. Army released the *Proposed Plan for Open Demolition Area #1 at the*  
6 *Ravenna Army Ammunition Plant* for public comment. A 30-day public comment period was held  
7 between September XX, 2013 and October XX, 2013. The U.S. Army hosted a public meeting on  
8 October XX, 2013, to present the preferred alternative and take questions and comments from the  
9 public for the record.

10 The preferred alternative for ODA1 that was proposed by the U.S. Army in the Proposed Plan, and  
11 presented during the public meeting was Alternative S2, Institutional Controls. During the public  
12 meeting, the Ohio EPA concurred with the recommendation of this alternative. Several oral comments  
13 were received at the public meeting and are addressed under Section B. Written comments received  
14 during the public comment period are also addressed under Section B.

15 Based on comments received, the community voiced few objections to institutional controls and this  
16 alternative is selected as the final remedy for soil at ODA1 in this ROD.

17 **B. Summary of Public Comments and Agency Responses**

18 Comments were received verbally during the public meeting or in writing during the 30-day public  
19 comment period.

20 **B.1 Oral Comments from Public Meeting**

21 Oral comments received during the public meeting are grouped together in the following general topic  
22 categories: **SUBJECTS TBD**. The transcript from the meeting was incorporated into the  
23 Administrative Record. Oral comments and responses are paraphrased, as required for brevity and  
24 presentation in this section.

25 1. SUBJECT

26 Comment: .

27 Response: .

28

29 2. SUBJECT

30 Comment: .

31 Response: .

32 **B.2 Written Comments**

33 Written comments received during the public comment period are grouped together in the following  
34 general topic categories: **SUBJECTS TBD**. Each comment was reformatted, where appropriate, for  
35 presentation in this section. Each comment is followed by a response.

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- 1. SUBJECT  
Comment: .  
Response: .
- 2. SUBJECT  
Comment: .  
Response: .

**C. Technical and Legal Issues**

There were no technical or legal issues raised during the public comment period.

# 1 REFERENCES

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7 *for Demolition Area 1 at the Ravenna Army Ammunition Plant, Ohio*, December.
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9 *RVAAP-03 Open Demolition Area #1*, October.
- 10 Shaw, 2011. *Digital Geophysical Mapping Report for the RVAAP-34 Sand Creek Disposal Road*  
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12 Version 1.0, January.
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14 *Area #1*, Draft Version 2.0. September.
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- 16 U.S. Army Corps of Engineers (USACE), 2003. *Ravenna Army Ammunition Plant, Ravenna, Ohio,*  
17 *Community Relations Plan*, prepared by the U.S. Army Corps of Engineers, September.
- 18 USACE, 2013. *Phase II Remedial Investigation and Feasibility Study for RVAAP-03 Open Demolition*  
19 *Area #1*, Final.
- 20 U.S. Army Center for Health Promotion and Preventive Medicine. 1996. *Final Preliminary Assessment*  
21 *for Ravenna Army Ammunition Plant, Ravenna, Ohio*, February.
- 22 U.S. Army Toxic and Hazardous Materials Agency, 1980–1992. *Ravenna Army Ammunition Plant*  
23 *Water Quality Surveillance Program*.
- 24 U.S. Environmental Protection Agency (EPA), 1999. *A Guide to Preparing Superfund Proposed*  
25 *Plans, Records of Decision, and Other Remedy Selection Decision Documents*, EPA 540-R-98-031,  
26 *OSWER 9200.1-23P*, July.

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**FIGURES**

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Note:  
The scale is for the Upper Map Only  
Showing the RVAAP Location



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

INSTALLATION RESTORATION PROGRAM

RAVENNA ARMY AMMUNITION PLANT  
RAVENNA, OHIO

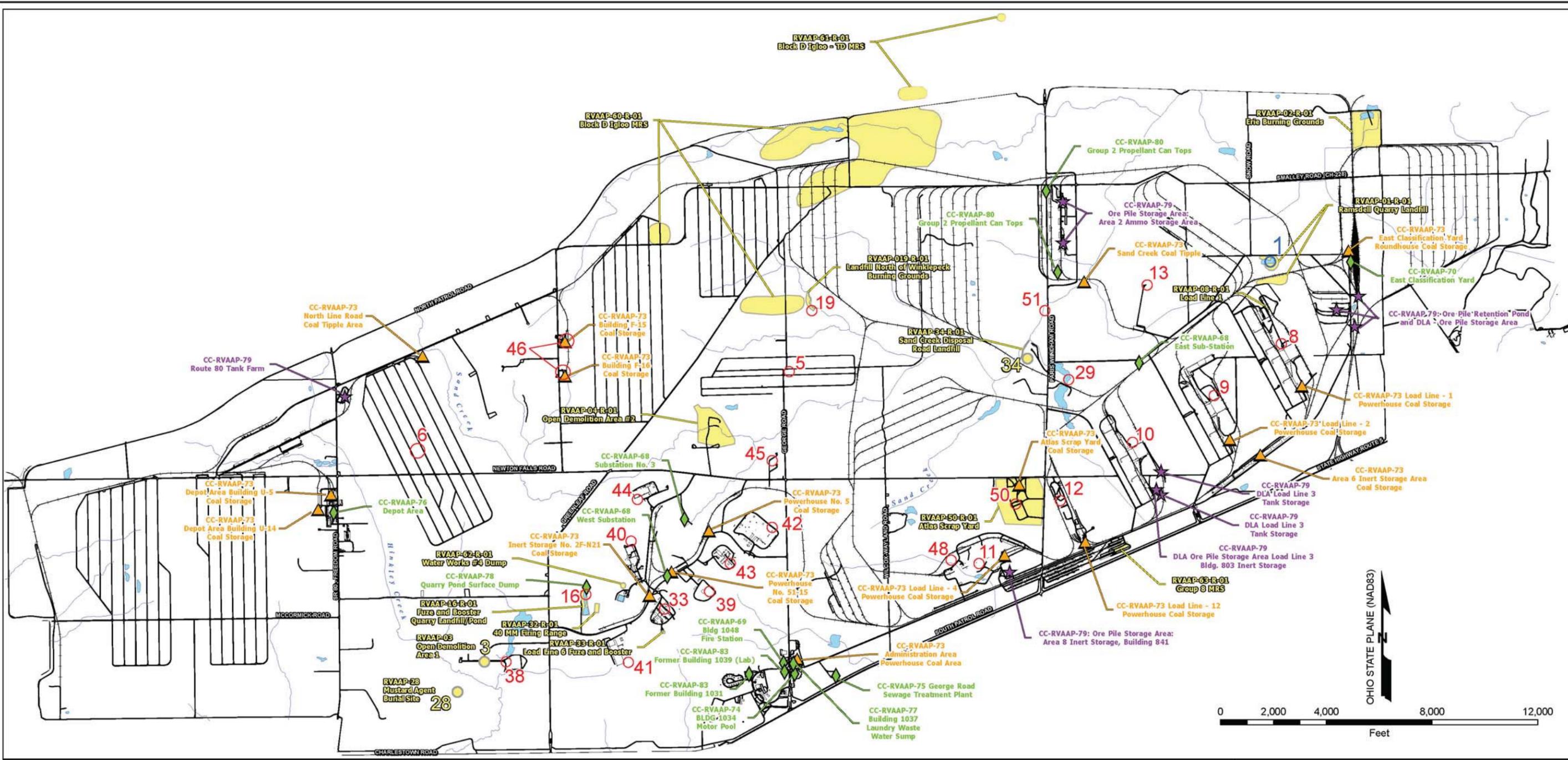


Shaw Environmental & Infrastructure, Inc.  
(A CB&I Company)  
150 Royall Street  
Canton, MA 02021

**FIGURE 1 RVAAP INSTALLATION LOCATION MAP**

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**LEGEND OF SITES**

<p><b>IRP SITES (29 SITES)</b></p> <p>RVAAP-01 ..... RAMSDELL QUARRY LANDFILL</p> <p>RVAAP-02 ..... OPEN DEMOLITION AREA 1</p> <p>RVAAP-05 ..... WINKLEPECK BURNING GROUNDS</p> <p>RVAAP-06 ..... C BLOCK QUARRY</p> <p>RVAAP-08 ..... LOAD LINE 1</p> <p>RVAAP-09 ..... LOAD LINE 2</p> <p>RVAAP-10 ..... LOAD LINE 3</p> <p>RVAAP-11 ..... LOAD LINE 4</p> <p>RVAAP-12 ..... LOAD LINE 12</p> <p>RVAAP-13 ..... BLDG 1200 AND DILLUTION/SETTLING POND</p> <p>RVAAP-16 ..... FUZE AND BOOSTER QUARRY LANDFILL/PONDS</p> <p>RVAAP-19 ..... LANDFILL NORTH OF WINKLEPECK BURNING GROUND</p> <p>RVAAP-28 ..... MUSTARD AGENT BURIAL SITE</p> <p>RVAAP-29 ..... UPPER AND LOWER COBBS POND</p>	<p>RVAAP-33 ..... LOAD LINE 6</p> <p>RVAAP-34 ..... SAND CREEK DISPOSAL ROAD LANDFILL</p> <p>RVAAP-38 ..... NACA TEST AREA</p> <p>RVAAP-39 ..... LOAD LINE 5</p> <p>RVAAP-40 ..... LOAD LINE 7</p> <p>RVAAP-41 ..... LOAD LINE 8</p> <p>RVAAP-42 ..... LOAD LINE 9</p> <p>RVAAP-43 ..... LOAD LINE 10</p> <p>RVAAP-44 ..... LOAD LINE 11</p> <p>RVAAP-45 ..... WET STORAGE AREA</p> <p>RVAAP-46 ..... BUILDINGS F-15 AND F-16</p> <p>RVAAP-48 ..... ANCHOR TEST AREA</p> <p>RVAAP-50 ..... ATLAS SCRAP YARD</p> <p>RVAAP-51 ..... DUMP ALONG PARIS-WINDHAM ROAD</p> <p>RVAAP-66 ..... FACILITY-WIDE GROUNDWATER</p>	<p>RVAAP-67 ..... FACILITY-WIDE SEWERS</p> <p><b>COMPLIANCE RESTORATION SITES (13 SITES)</b></p> <p>CC-RVAAP-68 ..... ELECTRIC SUBSTATIONS (E.W.N.3)</p> <p>CC-RVAAP-69 ..... BUILDING 1048 - FIRE STATION</p> <p>CC-RVAAP-70 ..... EAST CLASSIFICATION YARD</p> <p>CC-RVAAP-72 ..... FACILITY-WIDE USTS (46 SITES)</p> <p>CC-RVAAP-73 ..... FACILITY-WIDE COAL STORAGE</p> <p>CC-RVAAP-74 ..... BUILDING 1034 MOTOR POOL HYDRAULIC LIFT</p> <p>CC-RVAAP-75 ..... GEORGE ROAD SEWAGE TREATMENT PLANT</p> <p>CC-RVAAP-76 ..... DEPOT AREA</p> <p>CC-RVAAP-77 ..... BUILDING 1037 LAUNDRY WASTE WATER SUMP</p> <p>CC-RVAAP-78 ..... QUARRY POND SURFACE DUMP</p> <p>CC-RVAAP-79 ..... DLA ORE STORAGE SITES</p> <p>CC-RVAAP-80 ..... GROUP 2 PROPELLANT CAN TOPS</p> <p>CC-RVAAP-83 ..... FORMER BUILDINGS 1031 AND 1039</p>	<p><b>MMRP SITES (14 SITES)</b></p> <p>RVAAP-01-R-01 ..... RAMSDELL QUARRY LANDFILL MRS</p> <p>RVAAP-02-R-01 ..... ERIE BURNING GROUNDS MRS</p> <p>RVAAP-04-R-01 ..... OPEN DEMOLITION AREA #2 MRS</p> <p>RVAAP-08-R-01 ..... LOAD LINE 1 MRS</p> <p>RVAAP-09-R-01 ..... FUZE AND BOOSTER QUARRY MRS</p> <p>RVAAP-19-R-01 ..... LANDFILL NORTH OF WINKLEPECK MRS</p> <p>RVAAP-28-R-01 ..... 40MM FIRING RANGE MRS</p> <p>RVAAP-29-R-01 ..... FIRESTONE TEST FACILITY MRS</p> <p>RVAAP-34-R-01 ..... SAND CREEK DUMP MRS</p> <p>RVAAP-50-R-01 ..... ATLAS SCRAP YARD MRS</p> <p>RVAAP-60-R-01 ..... BLOCK D IGLOO MRS</p> <p>RVAAP-61-R-01 ..... BLOCK D IGLOO -TD MRS</p> <p>RVAAP-62-R-01 ..... WATER WORKS #4 DUMP MRS</p> <p>RVAAP-68-R-01 ..... GROUP 8 MRS</p>	<p>○ ..... CERCLA</p> <p>○ ..... RCRA</p> <p>○ ..... MMRP SITES</p> <p>◇ ..... COMPLIANCE RESTORATION SITES - APPROVED</p> <p>★ ..... DLA ORE STORAGE AREAS (7 SITES)</p> <p>▲ ..... COAL STORAGE AREAS (17 SITES)</p> <p>● ..... AOC UNDER A/E SERVICES CONTRACT</p>
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**RAVENNA ARMY AMMUNITION PLANT  
RAVENNA, OHIO**

**Figure 2  
RVAAP  
Facility Map**

**US Army Corps  
of Engineers**  
Louisville District



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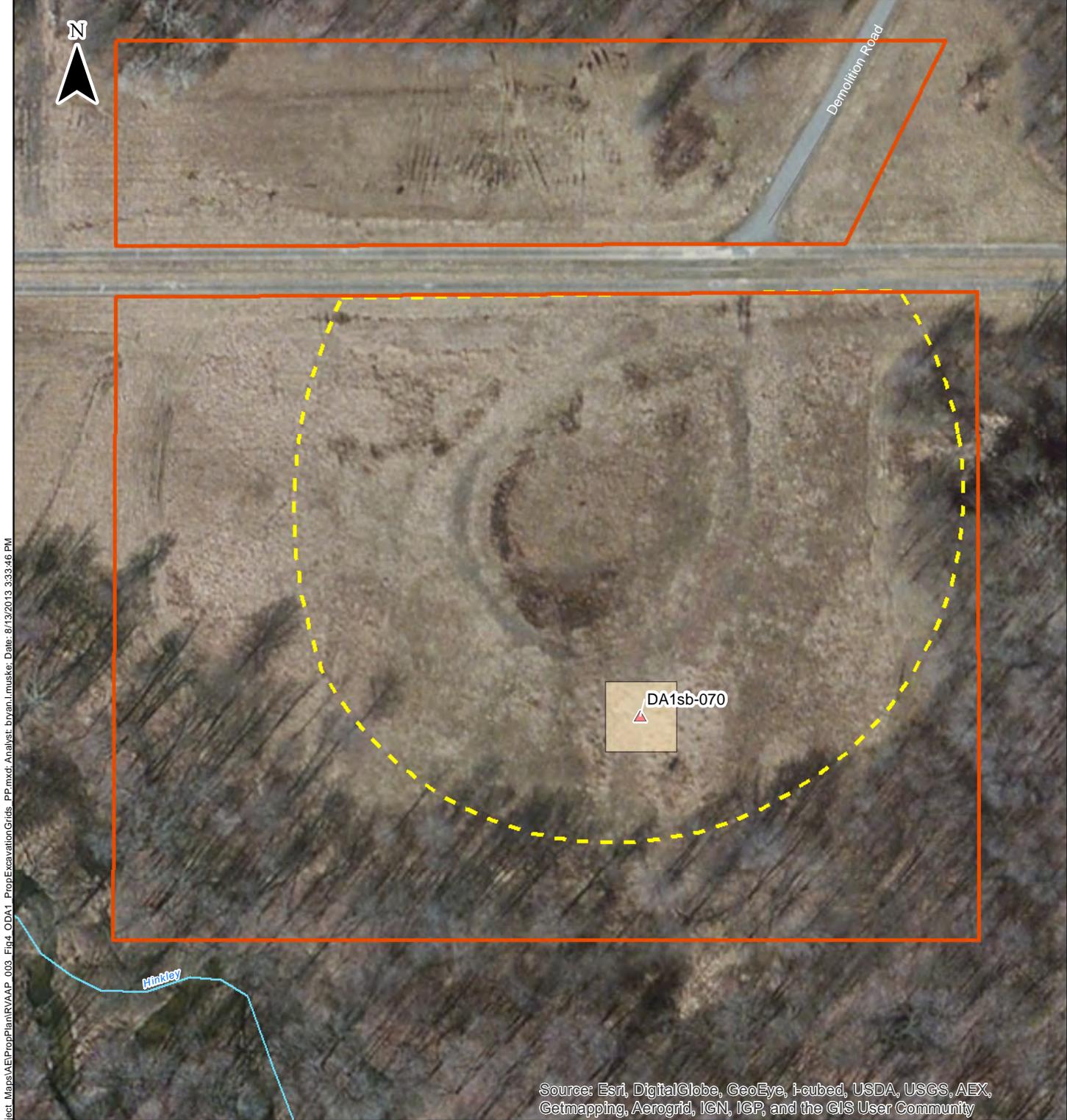


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**FIGURE 3 SITE FEATURES ON AERIAL PHOTOGRAPH**

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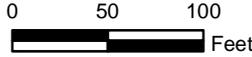
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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

\\rpbtrp01\arcgisprod3\WAMMS\Ravenna\GIS\_Documents\Project\_Maps\AEI\PropPlan\RVAAP\_003\_Fig4\_ODA1\_PropExcavationGrids\_PP.mxd; Analyst: bryan.Lmuske; Date: 8/13/2013 3:33:46 PM

- Investigation Area
  - ODA1 AOC Boundary
  - ▲ Subsurface Soil Sample
- Estimated Area of Contamination**
- 1-4 ft bgs



PROJECTION: NAD83 UTM Zone 17N



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

INSTALLATION RESTORATION PROGRAM

RVAAP-03  
OPEN DEMOLITION AREA #1  
RAVENNA ARMY AMMUNITION PLANT  
RAVENNA, OHIO



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**FIGURE 4 ESTIMATED AREA OF CONTAMINATION FOR THE RESIDENT FARMER (ADULT AND CHILD) LAND USE SCENARIO**

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**APPENDIX A**  
**DESCRIPTION OF ARARS**

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**Table A-1**  
**Location-Specific ARARs and TBC Guidance for Remediation of Soils at ODA1 with Alternative S2, Institutional Controls**  
**Open Demolition Area #1**  
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

Action	Requirements	Prerequisite	Citation(s)
Threatened and Endangered Species	Affords protection to species of wildlife within the State that may be found to be in jeopardy. Prohibits the taking, possession, transportation, or sale of endangered species.	<u>Relevant and Appropriate:</u> Several State-listed species have been observed at the RVAAP. There are no known documented sightings of rare or threatened and endangered species at the site.	Endangered Species Conservation Act RSA 212-A
	Prohibits removal or destruction of endangered animal species.	<u>Relevant and Appropriate:</u> There are no known documented sightings of rare or threatened and endangered species at the site.	ORC 1531.25 and OAC 1501-31-23
	Affords protection to plant species in the State that are threatened by the loss, drastic modification, or severe curtailment of their habitats.	<u>Relevant and Appropriate:</u> Several State-listed species have been observed at the RVAAP. There are no known documented sightings of rare or threatened and endangered species at the site.	Native Plant Protection RSA 217-A
	Prohibits removal or destruction of endangered plant species.	<u>Relevant and Appropriate:</u> No endangered plant species have been documented at the site.	ORC 1518.02 and OAC 1501-18-1

*ARAR denotes applicable or relevant and appropriate requirement.*

*OAC denotes Ohio Administrative Code.*

*ODA1 denotes Open Demolition Area #1 area of concern.*

*ORC denotes Ohio Revised Code.*

*RSA denotes Revised Statutes Annotated.*

*RVAAP denotes Ravenna Army Ammunition Plant.*

*TBC denotes to be considered.*

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**COMMENT RESPONSE TABLE**

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