

**Final**

**Proposed Plan  
for Soil, Sediment, and Surface Water  
at RVAAP-29 Upper and Lower Cobbs Ponds**

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

**Contract No. W912QR-15-C-0046**

**Prepared for:**



**US Army Corps  
of Engineers®**

**U.S. Army Corps of Engineers  
Louisville District**



**Prepared by: Leidos  
8866 Commons Boulevard, Suite 201  
Twinsburg, Ohio 44087**

**January 12, 2018**

**REPORT DOCUMENTATION PAGE**

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<b>14. ABSTRACT</b> This Proposed Plan for Upper and Lower Cobbs Ponds presents to the public the physical characteristics, geology, and hydrogeology of the Upper and Lower Cobbs Ponds AOC. This plan summarizes nature and extent of contamination in soil, sediment, and surface water; contaminant fate and transport; and human health and ecological risk assessments. These evaluations indicate there are no chemicals of concern (COCs) that pose unacceptable risk. Therefore, this plan presents to the public a recommendation of No Further Action (NFA) with respect to soil, sediment, and surface water to attain Unrestricted (Residential) Land Use.					
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**CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW**

Leidos has completed the Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing U.S. Army Corps of Engineers (USACE) policy. In addition, an independent verification was performed to ensure all applicable changes were made per regulatory and Army comments.



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Elias H. Rogatz  
Study/Design Team Leader

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1/12/18

Date



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Selvam Arunachalam, P.E.  
Independent Technical Review Team Leader

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1/12/18

Date

Significant concerns and the explanation of the resolution are as follows:

Internal Leidos Independent Technical Review comments are recorded on a Document Review Record per Leidos standard operating procedure ESE A3.1 Document Review. This Document Review Record is maintained in the project file. Changes to the report addressing the comments have been verified by the Study/Design Team Leader. As noted above, all concerns resulting from independent technical review of the project have been considered.



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Lisa Jones-Bateman  
Senior Program Manager

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1/12/18

Date



John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
Craig W. Butler, Director

Received March 5, 2018

March 2, 2018

Mr. Mark Leeper, P.G., MBA  
Team Lead  
Cleanup and Restoration Branch  
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111 South George Mason Drive  
Arlington, VA 22204

**Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859028**

**Subject: Review of the "Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated January 12, 2018 (Work Activity No. 267000859028)**

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "*Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds*" dated January 12, 2018. This document received by Ohio EPA's NEDO on January 12, 2018, was prepared by Leidos in response to the investigation completed under the installation restoration program.

Based on the information contained in the final proposed plan (PP), other investigation documents/reports and Ohio EPA's oversight participation during the investigation, Ohio EPA concurs with the final PP for addressing soil, sediment and surface water at the Upper and Lower Cobbs Ponds. The Army will offer a public comment period, and hold an open house/public meeting to be determined at a later date.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Proffitt", is written over a horizontal line.

Michael Proffitt, Chief  
Division of Environmental Response and Revitalization

NCR/nvp

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**Final**

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**DOCUMENT DISTRIBUTION**  
**for the**  
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**at RVAAP-29 Upper and Lower Cobbs Ponds**  
**Former Ravenna Army Ammunition Plant**  
**Portage and Trumbull Counties, Ohio**

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ARNG = Army National Guard.

DERR = Division of Environmental Response and Revitalization.

IED = Installation & Environment Division.

NEDO = Northeast District Office.

OHARNG = Ohio Army National Guard.

Ohio EPA = Ohio Environmental Protection Agency.

REIMS = Ravenna Environmental Information Management System.

SWDO = Southwest District Office.

USACE = U.S. Army Corps of Engineers.

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>RVAAP DESCRIPTION AND BACKGROUND.....</b>	<b>2</b>
<b>3.0</b>	<b>UPPER AND LOWER COBBS PONDS DESCRIPTION AND BACKGROUND.....</b>	<b>2</b>
3.1	Site Description.....	2
3.2	Background and Potential Sources of Contamination.....	3
3.2.1	Load Line 3.....	3
3.2.2	Load Line 12.....	3
<b>4.0</b>	<b>REMEDIAL INVESTIGATIONS .....</b>	<b>4</b>
4.1	Surface and Subsurface Soil.....	4
4.2	Sediment and Surface Water.....	4
4.3	Impacts to Groundwater.....	5
<b>5.0</b>	<b>SCOPE AND ROLE OF RESPONSE ACTION .....</b>	<b>6</b>
<b>6.0</b>	<b>SUMMARY OF HUMAN AND ECOLOGICAL RISKS.....</b>	<b>6</b>
6.1	Human Health Risk Assessment.....	6
6.2	Ecological Risk Assessment .....	6
<b>7.0</b>	<b>CONCLUSIONS.....</b>	<b>7</b>
<b>8.0</b>	<b>COMMUNITY PARTICIPATION .....</b>	<b>7</b>
8.1	Community Participation .....	7
8.2	Public Comment Period .....	7
8.3	Written Comments .....	8
8.4	Public Meeting .....	8
8.5	Army Review of Public Comments .....	8
	<b>GLOSSARY OF TERMS.....</b>	<b>8</b>
	<b>REFERENCES.....</b>	<b>9</b>

## LIST OF FIGURES

Figure 1.	General Location and Orientation of Camp Ravenna.....	13
Figure 2.	Location of Upper and Lower Cobbs Ponds at Camp Ravenna.....	15
Figure 3.	Upper and Lower Cobbs Ponds Site Features .....	17
Figure 4.	Upper and Lower Cobbs Ponds Sample Locations .....	18

## LIST OF ACRONYMS

AOC	Area of Concern
Army	U.S. Department of the Army
bgs	Below Ground Surface
BHC	Hexachlorocyclohexane
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
COPEC	Chemical of Potential Ecological Concern
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
FWCUG	Facility-wide Cleanup Goal
FWGWMP	Facility-wide Groundwater Monitoring Program
HHRA	Human Health Risk Assessment
HMX	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
HQ	Hazard Quotient
Ohio EPA	Ohio Environmental Protection Agency
PBA08	2008 Performance-based Acquisition
PCB	Polychlorinated Biphenyl
PP	Proposed Plan
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
TNT	2,4,6-Trinitrotoluene
TR	Target Risk
ULCP	Upper and Lower Cobbs Ponds

## LIST OF ATTACHMENTS

Attachment A. Ohio EPA Correspondence

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## 1.0 INTRODUCTION

This Proposed Plan (PP) presents the conclusions and recommendations for soil, sediment, and surface water within the Upper and Lower Cobbs Ponds (ULCP) area of concern (AOC) at the former Ravenna Army Ammunition Plant (RVAAP). The former RVAAP is now known as Camp Ravenna Joint Military Training Center, abbreviated as Camp Ravenna, and is located in Portage and Trumbull counties, Ohio (Figure 1). ULCP is designated as AOC RVAAP-29. The U.S. Department of the Army (Army), in coordination with the Ohio Environmental Protection Agency (Ohio EPA), issues this PP to provide the public with information necessary to comment on the selection of an appropriate response action. The remedy will be selected for ULCP after all comments submitted during the 30-day public comment period are considered. Therefore, the public is encouraged to review and comment on all alternatives presented in this PP.

The Army is issuing this PP as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and Section 300.430(f) (2) of the National Oil and Hazardous Substances Pollution Contingency Plan (40 *Code of Federal Regulations* 300). Selecting and implementing a remedy will also be consistent with the requirements of the Ohio EPA *Director's Final Findings and Orders*, dated June 10, 2004.

This PP summarizes information that can be found in detail in the *Phase III Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds* (USACE 2017a) (herein referred to as the Phase III RI Report) and other documents contained in the Administrative Record file for ULCP.

The Army's preferred alternative at ULCP is no further action for soil, sediment, and surface

### **Public Comment Period:**

June 6, 2018 to July 6, 2018

### **Public Meeting:**

The Army will hold an open house and public meeting to present the conclusions and additional details presented in the *Phase III Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds* (USACE 2017a). Oral and written comments will also be accepted at the meeting. The open house and public meeting are scheduled for 6:00PM, June 21, 2018, at the Shearer Community Center, 9355 Newton Falls Road, Ravenna, Ohio 44266.

### **Information Repositories:**

Information used in selecting the remedy is available for public review at the following locations:

#### **Reed Memorial Library**

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

#### Hours of operation:

9AM-9PM Monday-Thursday  
9AM-6PM Friday  
9AM-5PM Saturday  
1PM-5PM Sunday

#### **Newton Falls Public Library**

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

#### Hours of operation:

9AM-8PM Monday-Thursday  
9AM-5PM Friday and Saturday

#### **Online**

<http://www.rvaap.org/>

The **Administrative Record File**, containing information used in selecting the remedy, is available for public review at the following location:

#### **Camp Ravenna Joint Military Training Center (former Ravenna Army Ammunition Plant)**

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

*Note: Access is restricted to Camp Ravenna, but the file can be obtained or viewed with prior notice to Camp Ravenna.*

water. The Army encourages the public to review the site background documents to gain a more comprehensive understanding of the AOC, activities that have been conducted to

date, and the rationale for the preferred alternative.

## **2.0 RVAAP DESCRIPTION AND BACKGROUND**

The facility, consisting of 21,683 acres, is federally owned and located in northeastern Ohio within Portage and Trumbull counties, approximately 4.8 km (3 miles) east/northeast of the city of Ravenna and approximately 1.6 km (1 mile) northwest of the city of Newton Falls (Figure 1). The facility, previously known as 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 U.S. Property and Fiscal Officer for Ohio and subsequently licensed to the Ohio Army National Guard 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.

## **3.0 UPPER AND LOWER COBBS PONDS DESCRIPTION AND BACKGROUND**

### **3.1 Site Description**

ULCP is a 39-acre AOC in the east-central portion of Camp Ravenna (Figure 2). The AOC includes approximately 18 acres of pond banks, the 5.2-acre Backwater Area, the 9.4-acre Upper Cobbs Pond, and the 6.4-acre Lower Cobbs Pond (Figure 3). Remaining site features at ULCP include three railroad trackbeds that dissect the site and separate the ponds from the Backwater Area. No fences or perimeter boundaries exist at the AOC.

ULCP contains grass, trees, and aquatic vegetation. The ground surface at ULCP is generally flat with elevations ranging from approximately 960–980 ft above mean sea level. The topographic high is located near the southeastern portion of the AOC.

Perennial surface water is present within Upper Cobbs Pond, Lower Cobbs Pond, and the Backwater Area. Surface water flows south to north, originating from drainage ditches from Load Line 3 and Load Line 12. Surface water flows through the Backwater Area to Upper Cobbs Pond then to Lower Cobbs Pond. Surface water ultimately exits the AOC through a dam overflow spillway located near the intersection of Remalia and Paris-Windham Roads. The spillway then enters an unnamed tributary that discharges into Sand Creek, northwest of the AOC.

There are planning level survey wetlands and wetland complexes at the AOC. The Phase III RI Report (USACE 2017a) names and describes these wetlands, as below:

- Wetland 1 – A small 0.34-acre forested wetland around the Lower Cobbs Pond outlet.
- Wetland 2 – A 4.75-acre wetland at the fringe areas around the shoreline, shallow coves and embayment, and floodplains of larger tributaries associated with the Backwater Area between Track 33 and Track Functional Area.
- Wetland 3 – A 3.9-acre wetland complex south of Track Functional Area consisting of several small- and medium-sized wetland habitat types, including portions of the drainage ditches from Load Lines 3 and 12.

Silty loam overlies sandstone bedrock at ULCP. Soil at the AOC exhibits seasonal wetness, rapid runoff, and low permeability. During site investigations, bedrock was not encountered. Groundwater was encountered from 5.75–39.75 ft below ground surface (bgs), and groundwater elevations ranged from 957.38–973.40 ft above mean sea level with a flow pattern to the northwest towards Sand Creek. The average hydraulic gradient at the AOC is 0.0046 ft/ft (USACE 2017a).

### 3.2 Background and Potential Sources of Contamination

No primary sources are present within the AOC. The existing features include two sedimentation basins (ponds), primary drainage conveyances, and flow control structures (e.g., dam overflow spillway).

The 1978 Installation Assessment identified pink water and washout of residue, dusts, and spills at Load Lines 3 and 12 that were discharged through surface drainage channels towards Upper Cobbs Pond (USATHAMA 1978) as site contaminants. Potential site-specific contaminants include 2,4,6-trinitrotoluene (TNT); hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX); octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX); nitrate; nitrocellulose; and heavy metals (i.e., lead, chromium, mercury, and arsenic) from the pink water. Other contaminants identified include washout from explosives melt-out and demilitarization activities at Load Lines 3 and 12 and ammonium nitrate and aluminum chloride from Load Line 12. Many other chemicals were analyzed in the site investigations and are discussed in this PP.

The following subsections present site histories and remedial activities at Load Lines 3 and 12.

#### 3.2.1 Load Line 3

Load Line 3 is upstream and southeast of ULCP. The northernmost sediment/surface water aggregate at Load Line 3 (Load Line 3 Downgradient Channel) flows directly into the Backwater Area.

Load Line 3 operated from 1941–1945, from 1951–1957, and again from 1969–1971. Load Line 3 was primarily used to melt bulk explosives and load composition B (a combination of TNT and RDX) into large-caliber shells and bombs. Demilitarization activities were conducted between 1951 and 1957, during which time approximately 228,000 munitions were processed at the load line. Building wash-down water and wastewater from the load line operations were

collected in concrete sumps, pumped through sawdust filtration units, and ultimately discharged to a drainage ditch leading to a settling pond (Upper Cobbs Pond and, ultimately, Lower Cobbs Pond). During the operation of Load Line 3, approximately 304,800 L of pink water were generated each month (Jacobs 1989).

Load Line 3 has had multiple remedial activities completed to address contaminated media. From August to November 2007, 893 tons of hazardous [polychlorinated biphenyl (PCB)-contaminated] soil and 2,538 tons of non-hazardous soil were removed from Load Line 3 (Shaw 2007). In 2010, 1,602 cubic yards of soil were excavated from five distinct areas at Load Line 3 (URS 2010).

The Army evaluated protectiveness in soil, sediment, and surface water to attain Commercial/Industrial and Unrestricted Residential Land Use at Load Line 3 (USACE 2017b). This evaluation concluded that there are no sediment and surface water chemicals of concern (COCs) at Load Line 3.

#### 3.2.2 Load Line 12

Load Line 12 is upstream and south of ULCP. The northernmost sediment/surface water aggregate at Load Line 12 (North of Active Area Channel) flows directly into the Backwater Area.

Load Line 12 was formerly utilized for producing ammonium nitrate from 1941–1943 and 1946–1950. From 1951–1961, explosives melt-out and demilitarization activities occurred at Load Line 12. From 1941–1971, the ponds received effluent from the Load Line 12 sawdust filtration units, wash water, storm water runoff, and surface water runoff. Rinsate from demilitarization operations at Load Line 12 was initially allowed to flow out of buildings and directly onto the ground or to drainage ditches, which ultimately discharged to Upper Cobbs Pond and Lower Cobbs Pond. Since there were no wash water collection tanks or settling ponds at Load Line 12 during these operations, all residues, dusts, and pills

were washed into the drainage system that eventually discharged into Upper Cobbs Pond.

From 1965–1967, Hercules Alcor, Inc. leased Building FF-19 in Load Line 12 for producing aluminum chloride. On November 15, 1966, a fish kill occurred at Lower Cobbs Pond as a result of improper handling of aluminum chloride during manufacturing operations. The pond that received the contaminated waste from drainage ditches was settled, drained, and the contaminants were removed to Ramsdell Quarry.

In June 2010, 1,181 tons of contaminated dry sediment were removed from the Main Ditch within Load Line 12. There are no expected future impacts to ULCP from Load Line 12 sediment or surface water, as the *Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12* (USACE 2017c) recommended no further action to attain Unrestricted (Residential) Land Use for these media.

#### 4.0 REMEDIAL INVESTIGATIONS

The AOC characteristics, nature and extent of contamination, and conceptual site model are based on investigations conducted from 1978–2010. The following environmental investigations have been conducted at ULCP:

- Installation Assessment (USATHAMA 1978);
- 1982 Soil and Sediment Analysis (Mogul 1982);
- Preliminary Assessment Screening of Boundary Load Line Areas (USAEHA 1994);
- 1996 Phase I Remedial Investigation (RI) Report (USACE 1998);
- Relative Risk Site Evaluation for Newly Added Sites (USACHPPM 1998);
- 2001 Phase II RI Report for Upper and Lower Cobbs Ponds (MKM 2005);
- 2003 Facility-wide Biological and Water Quality Study (USACE 2005); and

- 2010 Performance-based Acquisition 2008 (PBA08) RI, as summarized in the Phase III RI Report (USACE 2017a).

Figure 4 shows sample locations included in the RI. The results of the PBA08 RI sampling completed in 2010 were combined with the results of the 1996 Phase I RI (USACE 1998), 2001 Phase II RI (MKM 2005), and 2003 Facility-wide Biological and Water Quality Study (USACE 2005). These reports and samples were used to evaluate the nature and extent of contamination, assess potential future impacts to groundwater, conduct human health risk assessments (HHRAs) and ecological risk assessments (ERAs), and evaluate the need for remedial alternatives.

Ohio EPA identifies a target risk (TR) of 1E-05 as a cancer risk for carcinogens and an acceptable hazard quotient (HQ) of 1 for non-carcinogens. The media-specific evaluation in the following subsections presents chemicals exceeding Resident Receptor facility-wide cleanup goals (FWCUGs) at a TR of 1E-05, HQ of 1 and their background concentrations.

##### 4.1 Surface and Subsurface Soil

Surface soil (0–1 ft bgs) and subsurface soil (greater than 1 ft bgs) was collected from the Pond Bank Aggregate. Arsenic was the only metal to exceed a TR of 1E-05, HQ of 1 and its background concentration in soil. However, only 1 of 30 soil samples exceeded the subsurface soil background concentration of 19.8 mg/kg. Sample ULCPsd-010 (classified as a soil sample) had an arsenic concentration of 28.4 mg/kg. All other metal concentrations in soil were below a TR of 1E-05, HQ of 1 or their background concentrations.

No semi-volatile organic compound, volatile organic compound, pesticide, PCB, explosive, or propellant concentrations exceeded a TR of 1E-05, HQ of 1 in soil.

##### 4.2 Sediment and Surface Water

Sediment and surface water samples were collected from the site's three main surface

water features: the Backwater Area, Upper Cobbs Pond, and Lower Cobbs Pond. The evaluation summarized below was performed to assess which chemicals exceeded a TR of 1E-05, HQ of 1 and their respective background concentrations.

- No sediment or surface water samples had concentrations of explosives, propellants, PCBs, or volatile organic compounds that exceeded a TR of 1E-05, HQ of 1.
- The only metals that exceeded a TR of 1E-05, HQ of 1 and background concentrations are arsenic, manganese, and cobalt.
  - Two sediment samples in Lower Cobbs Pond had arsenic exceedances (34.3 mg/kg at ULCPsd-026 and 20.2 mg/kg at ULCPsd-021). No surface water samples exceeded a TR of 1E-05, HQ of 1 and background concentrations for arsenic.
  - Two surface water samples in the Backwater Area had manganese exceedances (15.8 mg/L at ULCPsw-002 and 8.59 mg/L at ULCPsw-001). None of the sediment samples exceeded a TR of 1E-05, HQ of 1 and the background concentration for manganese.
  - One surface water sample in the Backwater Area had a cobalt exceedance (0.0107 mg/L at ULCPsw-001). None of the sediment samples exceeded a TR of 1E-05, HQ of 1 and the background concentration for cobalt.
- The only semi-volatile organic compound that exceeded a Resident Receptor FWCUG at a TR of 1E-05, HQ of 1 is benzo(a)pyrene in the Backwater Area. Two of the exceedances were in sediment samples (ULCPsd-015 and ULCPsd-047) at locations between the two railroad beds with a maximum concentration of 0.89J mg/kg. However, these samples had concentrations below the 2017 U.S. Environmental Protection Agency Resident soil regional screening level (RSL) of 1.1 mg/kg.

- The only pesticide that exceeded a TR of 1E-05, HQ of 1 is delta-hexachlorocyclohexane (BHC) in Upper Cobbs Pond. This exceedance was at an estimated concentration of 0.0018J mg/kg in the 0.5–2 ft bgs interval. Delta-BHC was not detected in other sediment samples collected in sediment or surface water at ULCP, including the co-located 0–0.5 ft bgs interval.

### 4.3 Impacts to Groundwater

The potential for soil and sediment contaminants to impact groundwater was evaluated in a fate and transport evaluation presented in the Phase III RI Report (USACE 2017a). The fate and transport evaluation included analyzing leaching and migration from soil and sediment to groundwater. The modeling evaluated the potential for contaminants to leach from soil and sediment and impact groundwater beneath the AOC. Modeling results indicated arsenic, nickel, selenium, and thallium in soil and hexavalent chromium in sediment were predicted to exceed the screening criteria in groundwater beneath the source area. Only arsenic and hexavalent chromium were predicted to exceed the screening criteria in groundwater at the downgradient receptor location.

Evaluation of modeling results with respect to current AOC groundwater data and model limitations indicate that identified soil and sediment site-related contaminants are not currently influencing groundwater beneath the source areas. Predicted future impacts would be mitigated by factors such as chemical and biological degradation and lateral dispersivity. Based on the fate and transport evaluation, no contaminant migration COCs for soil or sediment were identified as impacting groundwater. The groundwater will be further evaluated under the Facility-wide Groundwater Monitoring Program (FWGWMP).

## 5.0 SCOPE AND ROLE OF RESPONSE ACTION

An evaluation using Resident Receptor (Adult and Child) FWCUGs was used to provide an Unrestricted (Residential) Land Use evaluation. Unrestricted (Residential) Land Use is considered protective for all categories of Land Use at Camp Ravenna, such as Military Training and Commercial/Industrial Land Use. Additional human health receptors associated with Camp Ravenna are the National Guard Trainee and Industrial Receptor.

Groundwater will be addressed under the RVAAP Facility-wide Groundwater AOC (RVAAP-66) as a separate decision. However, the selected remedy for soil, sediment, and surface water at ULCP must also be protective of groundwater.

## 6.0 SUMMARY OF HUMAN AND ECOLOGICAL RISKS

### 6.1 Human Health Risk Assessment

Using information presented in Section 4.0, an HHRA was performed to identify COCs and provide a risk management evaluation to determine if remediation is required under CERCLA based on potential risks to human receptors.

The media evaluated in the HHRA for the Resident Receptor (Adult and Child) were surface soil (0–1 ft bgs), subsurface soil (1–13 ft bgs), sediment, and surface water.

While COPCs [aluminum, arsenic, chromium, cobalt, cyanide, and benzo(a)pyrene] were identified in soil, none of the chemicals had an exposure point concentration (EPC) that exceeded the Resident Receptor FWCUG at a TR of 1E-05, HQ of 1.

Sediment and surface water COCs were identified. As indicated in Section 4.0, arsenic concentrations appear to represent naturally occurring levels in sediment. The EPC of cobalt (0.01 mg/L) is less than two times the

tap water regional screening level. Although the EPC of manganese in surface water at the Backwater Area exposure unit (15.1 mg/L) exceeds the FWCUG for the Resident Receptor (Adult and Child) (6.326 mg/L), it is strongly influenced by the maximum concentration of 15.8 mg/L in sample ULCPsw-002 collected in 2001. The field duplicate of this sample reported a concentration of 7.36 mg/L. The manganese concentrations in all samples collected in 2010 are below the facility-wide background concentration of 0.391 mg/L.

The evaluation in the Phase III RI Report concluded that no COCs require remediation for any media of concern for the Resident Receptor. Therefore, the site is protective for Unrestricted (Residential) Land Use. Because the site is protective for Unrestricted (Residential) Land Use, it is also protective for Commercial/Industrial Land Use and Military Training Land Use.

### 6.2 Ecological Risk Assessment

The three surface water features (Upper Cobbs Pond, Lower Cobbs Pond, and the Backwater Area) are the predominant features at ULCP. Surface water originates from a series of drainage ditches from Load Lines 3 and 12, flows into the Backwater Area, through a culvert to Upper Cobbs Pond, then to Lower Cobbs Pond. Surface water in Lower Cobbs Pond discharges to a dam overflow spillway that flows into an unnamed tributary that discharges into Sand Creek, northwest of the AOC. These surface water features are sufficient to maintain aquatic habitat.

Although the ponds constitute much of ULCP, the terrestrial vegetation provides a habitat for birds, mammals, insects, and other organisms. Red maple successional forest; dry, mid-successional cold-deciduous shrubland; three types of herbaceous communities; and three additional types of forests were observed. ULCP also contains numerous wetlands that cover multiple AOCs.

The northern long-eared bat (*Myotis*

*septentrionalis*; federally threatened) exists at Camp Ravenna. ULCP has not been previously surveyed for rare, threatened, or endangered species; however, there has been one sighting of a state-threatened species at the AOC—the Least Bittern (*Ixobrychus exilis*) (OHARNG 2014).

The Level I Scoping ERA presents important ecological resources on or near the AOC and evaluates the potential for current contamination to impact ecological resources. There is chemical contamination present in soil, sediment, and surface water at ULCP. This contamination was identified using historical and PBA08 RI data.

Ecological resources at ULCP were compared to the list of important ecological places and resources. Based on the 39 criteria defining important places and resources identified by the Army and Ohio EPA, the wetlands and surface water are important and significant ecological resources at ULCP (USACE 2017a). Because contamination is at or near important resources, these findings invoked a requirement of a Level II ERA. The Level II ERA incorporated available data to identify integrated chemicals of potential ecological concern (COPECs). There were 12 integrated soil COPECs, 40 integrated sediment COPECs, and 8 integrated surface water COPECs identified in the Level II ERA at ULCP.

The soil, sediment, and surface water COPECs were further evaluated with technical and refinement factors agreed upon by the Army and Ohio EPA. The Level II ERA concluded that there are no chemicals requiring remediation or further evaluation to be protective of the environment. Per the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008), once the Level II assessment eliminates COPECs from further ecological evaluation, the ERA can be completed. No further action is recommended to be protective from an ecological perspective at ULCP.

## 7.0 CONCLUSIONS

The HHRA determined that no remediation is required to be protective for the Resident Receptor (Adult and Child). The ERA concluded that no chemicals require remediation or further evaluation to protect the environment. The fate and transport assessment determined chemicals in soil and sediment will not impact groundwater. Groundwater will be further evaluated under the FWGWMP. Accordingly, the Army, in coordination with Ohio EPA, is recommending no further action to attain Unrestricted (Residential) Land Use for soil, sediment, and surface water at ULCP.

This recommendation is not a final decision. The Army, in coordination with Ohio EPA, will select the remedy for ULCP after reviewing and considering all comments submitted during the 30-day public comment period.

## 8.0 COMMUNITY PARTICIPATION

### 8.1 Community Participation

Public participation is an important component of the remedy selection. The Army, in coordination with Ohio EPA, is soliciting input from the community on the preferred alternative.

The comment period extends from June 6, 2018 to July 6, 2018. This period includes a public meeting at which the Army will present this PP. The Army will accept oral and written comments at this meeting.

### 8.2 Public Comment Period

The 30-day comment period is from June 6, 2018 to July 6, 2018, and provides an opportunity for public involvement in the decision-making process for the proposed action. The public is encouraged to review and comment on this PP.

The Army and Ohio EPA will consider all public comments before selecting a remedy.

During the comment period, the public is encouraged to review documents pertinent to ULCP.

This information is available at the Information Repository and online at [www.rvaap.org](http://www.rvaap.org). To obtain further information, contact Kathryn Tait of the Camp Ravenna Environmental Office at [kathryn.s.tait.nfg@mail.mil](mailto:kathryn.s.tait.nfg@mail.mil).

### 8.3 Written Comments

If the public would like to comment in writing on this PP or other relevant issues, please deliver comments to the Army at the public meeting or mail written comments (postmarked no later than July 6, 2018).

**POINT OF CONTACT FOR  
WRITTEN COMMENTS**

**Mailing Address:**  
**Camp Ravenna Joint Military Training Center**  
Environmental Office  
Attn: Kathryn Tait  
1438 State Route 534 SW  
Newton Falls, Ohio 44444

E-mail Address:  
[kathryn.s.tait.nfg@mail.mil](mailto:kathryn.s.tait.nfg@mail.mil)

### 8.4 Public Meeting

The Army will hold an open house and public meeting on this PP on June 21, 2018, at 6:00PM, in the Shearer Community Center, 9355 Newton Falls Road Ravenna, Ohio 44266 to accept comments.

This meeting will provide an opportunity for the public to comment on the proposed action. Comments made at the meeting will be transcribed.

### 8.5 Army Review of Public Comments

The Army will review the public's comments as part of the process in reaching a final

decision for the most appropriate action to be taken.

The Responsiveness Summary, a document that summarizes the Army's responses to comments received during the public comment period, will be included in the Record of Decision (ROD). The Army's final choice of action will be documented in the ROD.

The ROD will be added to the RVAAP Restoration Program Administrative Record and Information Repositories.

**ADMINISTRATIVE RECORD FILE**

**Camp Ravenna Joint Military Training Center (former Ravenna Army Ammunition Plant)**  
Environmental Office  
1438 State Route 534 SW  
Newton Falls, Ohio 44444  
(614) 336-6136  
Note: Access is restricted to Camp Ravenna, but the file can be obtained or viewed with prior notice to Camp Ravenna.

**INFORMATION REPOSITORIES**

**Reed Memorial Library**  
167 East Main Street  
Ravenna, Ohio 44266  
(330) 296-2827  
Hours of operation:  
9AM-9PM Monday-Thursday  
9AM-6PM Friday  
9AM-5PM Saturday  
1PM-5PM Sunday

**Newton Falls Public Library**  
204 South Canal Street  
Newton Falls, Ohio 44444  
(330) 872-1282  
Hours of operation:  
9AM-8PM Monday-Thursday  
9AM-5PM Friday and Saturday

**Online**  
<http://www.rvaap.org/>



## GLOSSARY OF TERMS

**Administrative Record:** a collection of documents, typically reports and correspondence, generated during site investigation and remedial activities. Information in the Administrative Record represents the information used to select the preferred alternative.

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

**Chemical of Concern (COC):** a chemical substance specific to an area of concern that potentially poses significant human health or ecological risks. COCs are typically further evaluated for remedial action.

**Chemical of Potential Ecological Concern (COPEC):** a chemical substance specific to an area of concern that potentially poses ecological risks and requires further evaluation in the RI. COPECs are typically not evaluated for remedial action.

**Ecological Receptor:** a plant, animal, or habitat exposed to an adverse condition.

**Human Receptor:** a hypothetical person, based on current or potential future land use, who may be exposed to an adverse condition. For example, the National Guard Trainee is considered the hypothetical person when evaluating Military Training Land Use at the former Ravenna Army Ammunition Plant (RVAAP).

**Record of Decision (ROD):** a signed legal record that describes the cleanup action or remedy selected for a site, the basis for selecting that remedy, public comments, and responses to comments.

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

**Responsiveness Summary:** a section of the ROD that documents and responds to written and oral comments received from the public about the Proposed Plan.

**Risk Assessment:** an evaluation that determines potential harmful effects, or lack thereof, posed to human health and the environment due to exposure to chemicals found at a CERCLA site.

**Target Risk:** the Ohio Environmental Protection Agency (2009) identifies 1E-05 as a target for cancer risk for carcinogens and an acceptable target hazard quotient of 1 for non-carcinogens.

**Unrestricted (Residential) Land Use:** defined for the former RVAAP restoration that is considered protective for all three Land Uses at Camp Ravenna. If an AOC meets the requirements for Unrestricted (Residential) Land Use, then the AOC can also be used for Military Training and Commercial/Industrial purposes.

## REFERENCES

Jacobs (Jacobs Engineering Group, Inc.) 1989. *RCRA Facility Assessment, Preliminary Review/ Visual Site Inspection Ravenna Army Ammunition Plant, Ravenna, Ohio*. October 1989.

Mogul (Mogul Corporation) 1982. *Soil and Sediment Analysis Performed for Ravenna Arsenal, Ravenna, Ohio*. May 1982.

MKM (MKM Engineers, Inc.) 2005. *Phase II Remedial Investigation Report for Upper and Lower Cobbs Ponds*. September 2005.

OHARNG (Ohio Army National Guard) 2014. *Integrated Natural Resources Management Plan at the Camp Ravenna Joint Military Training Center, Portage and Trumbull Counties, Ohio*. December 2014.

Ohio EPA (Ohio Environmental Protection Agency) 2004. *Director's Final Findings and Orders for the Ravenna Army Ammunition Plant*. June 2004.

Ohio EPA 2008. *Guidance for Conducting Ecological Risk Assessments*. Division of Emergency and Remedial Response. April 2008.

Ohio EPA 2009. *Technical Decision Compendium: Human Health Cumulative Carcinogenic Risk and Non-carcinogenic Hazard Goals for DERR Remedial Response Program*. August 2009.

Shaw (Shaw Environmental, Inc.) 2007. *Interim Record of Decision for the Remediation of Soils at Load Lines 1 through 4 at the Ravenna Army Ammunition Plant*. January 2007.

URS (URS Group, Inc.) 2010. *Remediation Completion Report Sub-Slab Soils at RVAAP-09 Load Line 2, RVAAP-10 Load Line 3, and RVAAP-11 Load Line 4*. December 2010.

USACE (U.S. Army Corps of Engineers) 1998. *Phase I Remedial Investigation Report for High-Priority Areas of Concern at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. February 1998.

USACE 2005. *Facility-wide Biological and Water Quality Study 2003 Ravenna Army Ammunition Plant, Ravenna, Ohio, Part I-Streams, Part II-Ponds*. November 2005.

USACE 2010. *Risk Assessment Handbook Volume II: Environmental Evaluation*. December 2010.

USACE 2017a. *Phase III Remedial Investigation Report for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Ponds, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio*. August 2017.

USACE 2017b. *Feasibility Study Addendum for Soil, Sediment, and Surface Water at RVAAP Load Lines 1, 2, 3, 4, and 12 at the Former Ravenna Army Ammunition Plant*. June 2017.

USACE 2017c. *Phase III Remedial Investigation Report for Wet Sediment and Surface Water at RVAAP-12 Load Line 12 at the Former Ravenna Army Ammunition Plant*. February 2017.

USACHPPM (U.S. Army Center for Health Promotion and Preventive Medicine) 1998. *Relative Risk Site Evaluation for Newly Added Sites at the Ravenna Army Ammunition Plant, Ravenna, Ohio. Hazardous and Medical Waste Study No. 37-EF-5360-99*. October 1998.

USAEHA (U.S. Army Environmental Hygiene Agency) 1994. *Preliminary Assessment Screening No. 38-26-1329-94, Boundary Load Line Areas, Ravenna Army Ammunition Plant, Ravenna, Ohio*. June 1994.

USATHAMA (U.S. Army Toxic and Hazardous Materials Agency) 1978. *Installation Assessment of Ravenna Army Ammunition Plant, Records Evaluation Report No. 132*. November 1978.

**FIGURES**

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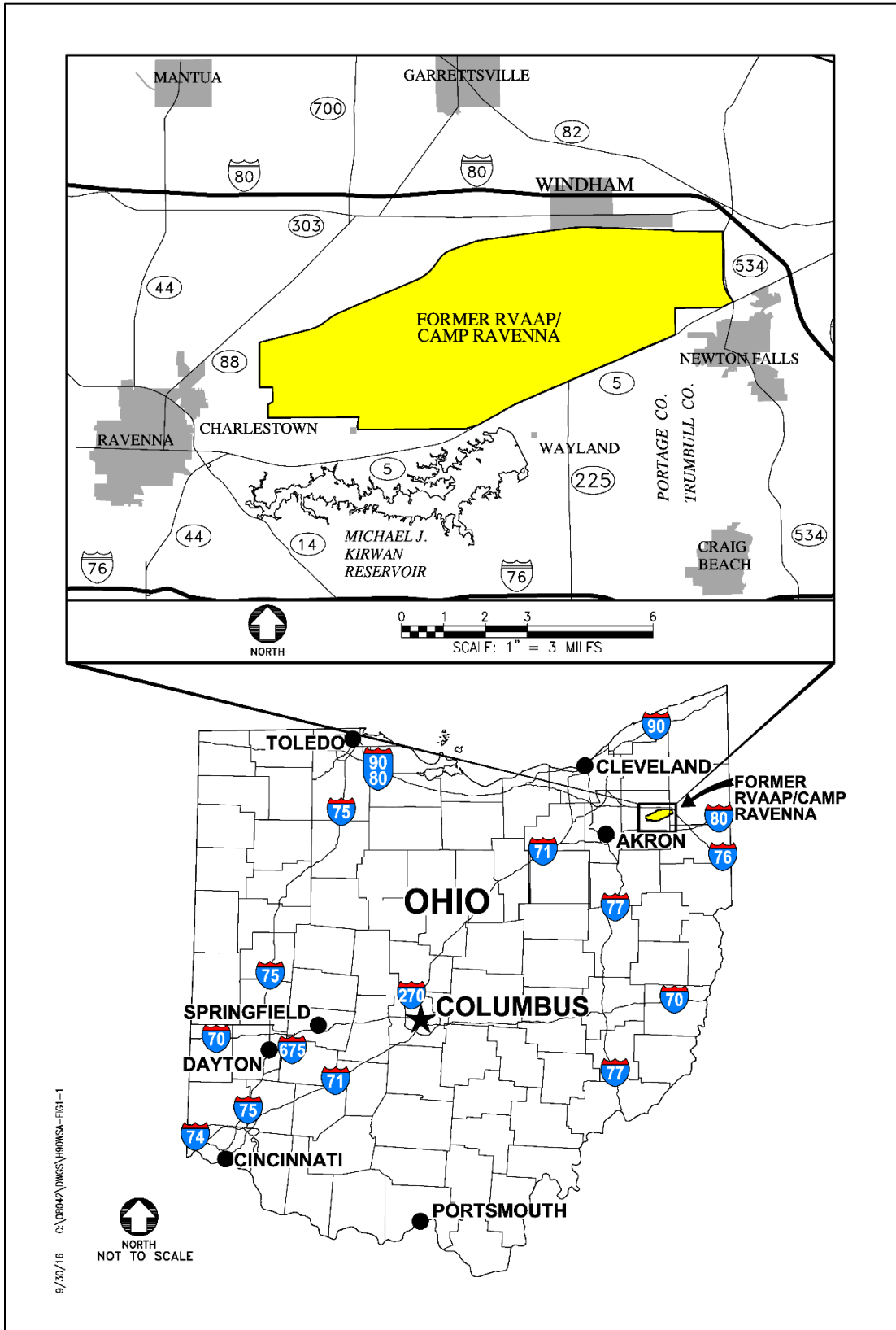
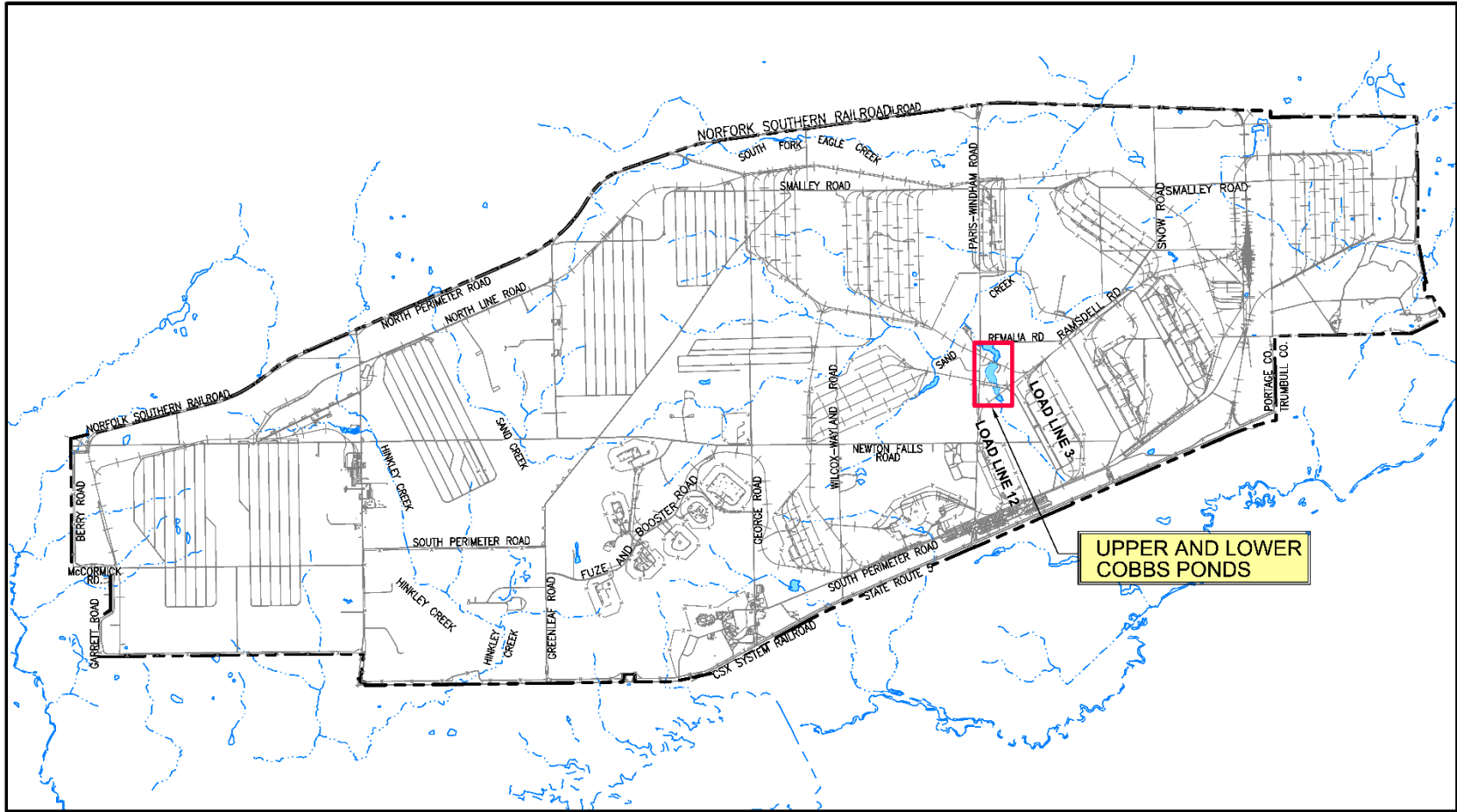


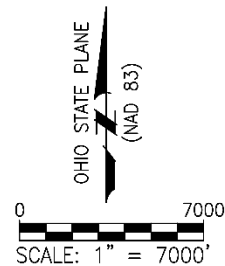
Figure 1. General Location and Orientation of Camp Ravenna

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**LEGEND:**

- ASPHALT ROAD
- RAILROAD TRACKS
- FENCE LINE
- STREAMS



US Army Corps  
of Engineers  
Louisville District



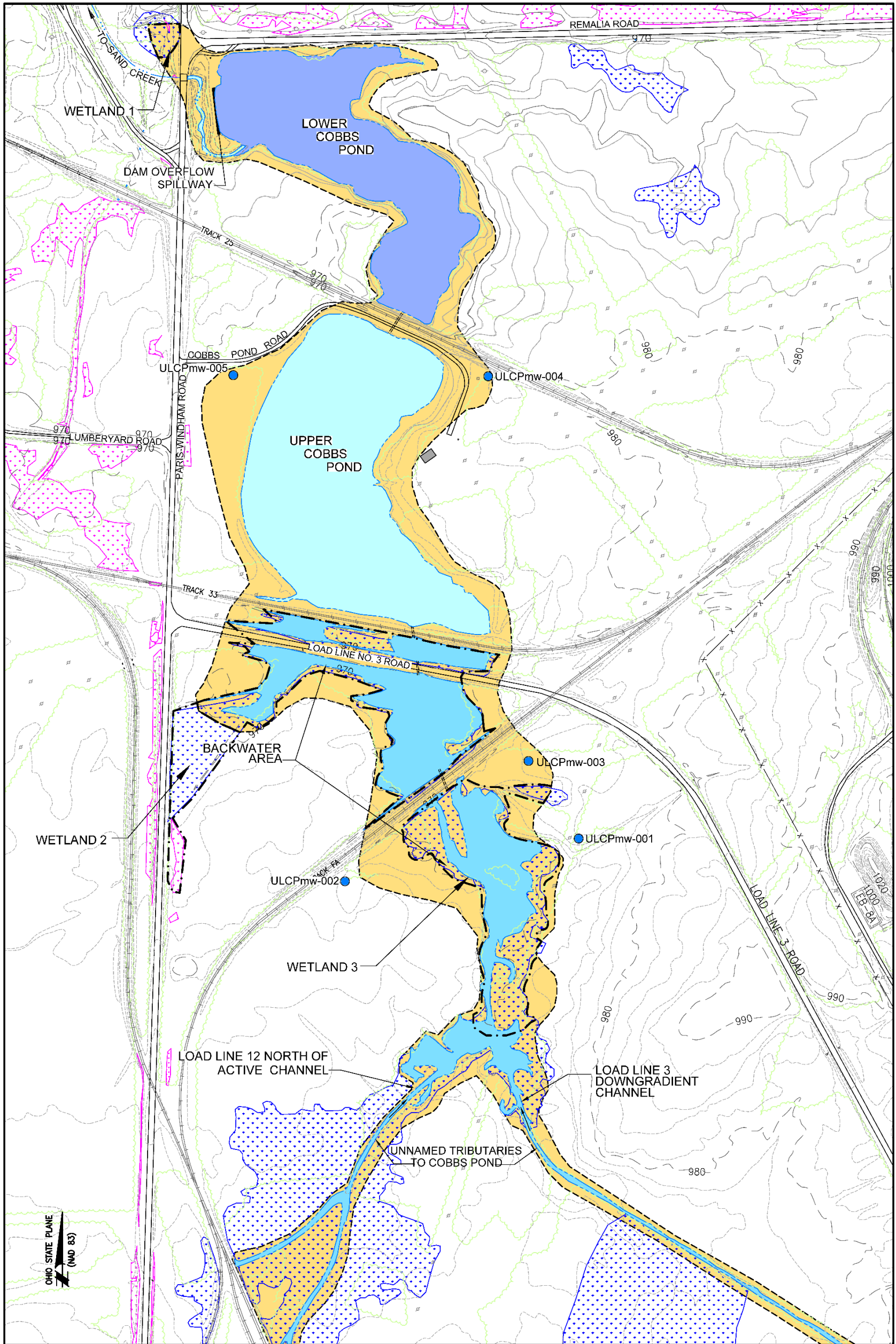
**UPPER AND LOWER COBBS PONDS**  
FORMER RVAAP/CAMP RAVENNA  
PORTAGE & TRUMBULL COUNTIES, OHIO

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**Figure 2. Location of Upper and Lower Cobbs Ponds at Camp Ravenna**

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<b>LEGEND:</b> EXISTING BUILDING ASPHALT ROAD RAILROAD TRACKS CULVERT VEGETATION GROUND CONTOUR (10-FT) GROUND CONTOUR (2-FT) GROUNDWATER MONITORING WELL AOC BOUNDARY		JURISDICTIONAL WETLAND PLANNING LEVEL WETLANDS <b>SOIL AGGREGATE</b> (0-1 ft bgs Surface Soil and 1-13 ft bgs Subsurface Soil) POND BANK AGGREGATE SURFACE WATER AND SEDIMENT AGGREGATES (0-0.5 or 0-1.75 ft bgs) LOWER COBBS POND AGGREGATE UPPER COBBS POND AGGREGATE BACKWATER AREA AGGREGATE	
OHIO STATE PLANE (NAD 83)		OHIO STATE PLANE (NAD 83) 0 100 200 300 SCALE: 1" = 300'	
<b>leidos</b> US Army Corps of Engineers Louisville District		<b>UPPER AND LOWER COBBS PONDS</b> <b>FORMER RVAAP/CAMP RAVENNA</b> <b>PORTAGE &amp; TRUMBULL COUNTIES, OHIO</b> DRAWN BY: P. HOLM    REV. NO./DATE: 2/ 10/5/17    CAD FILE: C:\08042\DWGS\Q85ULCP-F1G3	

**Figure 3. Upper and Lower Cobbs Ponds Site Features**

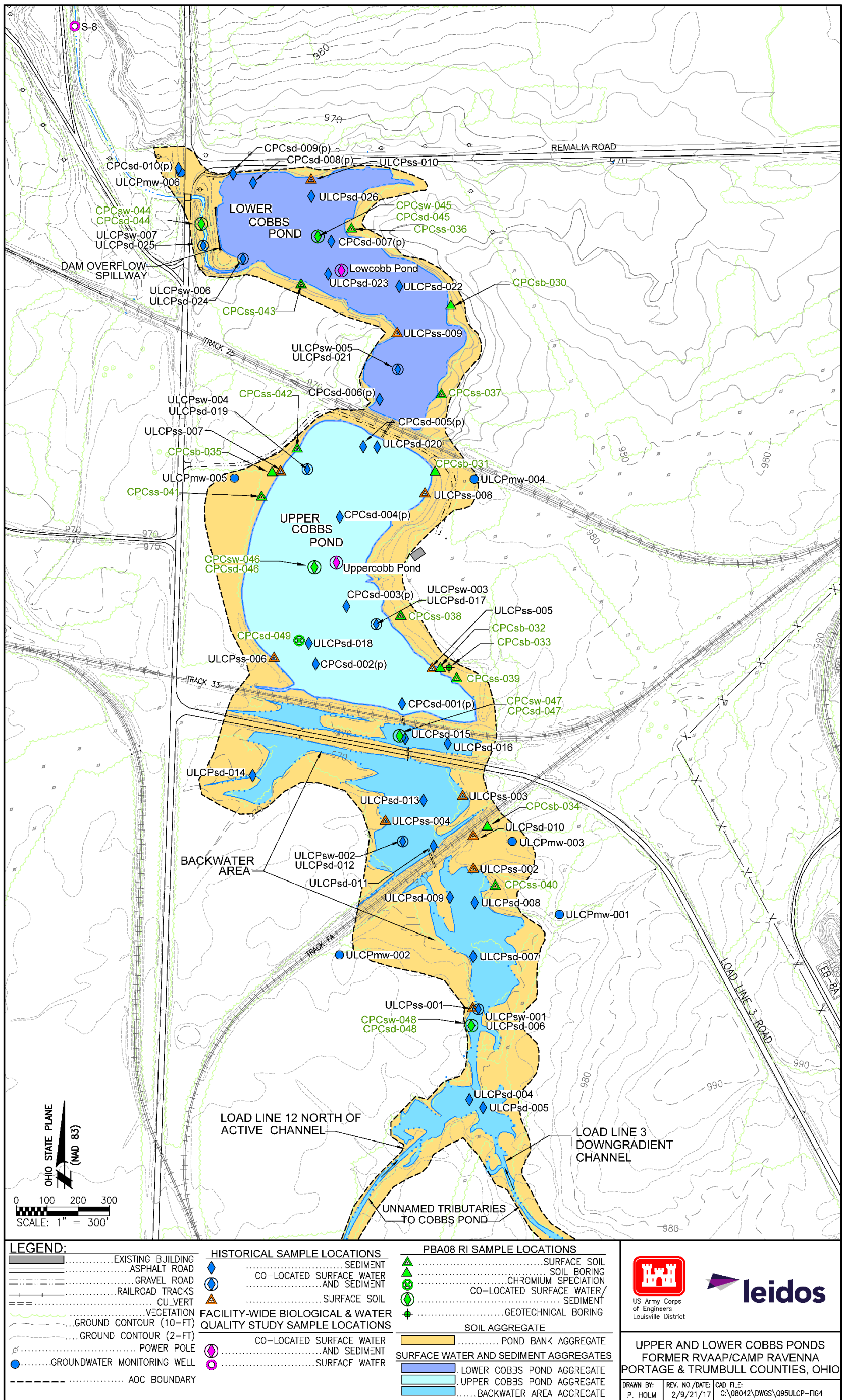


Figure 4. Upper and Lower Cobbs Ponds Sample Locations

**ATTACHMENT A**  
**OHIO EPA CORRESPONDENCE**

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John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
Craig W. Butler, Director

RECEIVED  
1/9/2018

January 5, 2018

Mr. Mark Leeper, P.G., MBA  
Team Lead  
Cleanup and Restoration Branch  
ARNG Directorate  
111 South George Mason Drive  
Arlington, VA 22204

Re: US Army Ravenna Ammunition Plt RVAAP  
Remediation Response  
Plans  
Remedial Response  
Portage County  
267000859028

**Subject:** Review of the "Draft Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Pond" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio: Dated November 21, 2017 (Work Activity No. 267000859028)

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled, "Draft Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-29 Upper and Lower Cobbs Pond," dated November 21, 2017. This document, received by Ohio EPA, NEDO on November 22, 2017, was prepared by Leidos.

This document was reviewed by personnel from Ohio EPA DERR, pursuant to the Director's Findings and Orders paragraph 39 (b), and we request the preferred plan in its final format. If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235.

Sincerely,

A handwritten signature in black ink, appearing to read "Nicholas Roope", written over a horizontal line.

Nicholas Roope  
Site Coordinator  
Division of Environmental Response and Revitalization

NCR/nvp

cc: Craig Coombs, USACE, Louisville District  
Katie Tait/Kevin Sedlak, Camp Ravenna Environmental Office  
Shreffler/Harris, Camp Ravenna Environmental Office, Vista Sciences

ec: Rod Beals, Ohio EPA, NEDO DERR  
Bob Princic, Ohio EPA, NEDO DERR  
Tom Schneider, Ohio EPA, SWDO DERR