Final

Proposed Plan
for Soil, Sediment, and Surface Water
at RVAAP-42 Load Line 9

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

March 31, 2017

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None.

14. ABSTRACT

This Proposed Plan for Load Line 9 presents to the public the physical characteristics, geology, and hydrogeology of Load Line 9. 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 chemicals of concern (COCs) that pose unacceptable risk. Therefore, this plan presents Alternative 3: Excavation and Off-site Disposal and Ex-situ Thermal Treatment to attain Unrestricted (Residential) Land Use as the preferred alternative to the public with respect to soil, sediment, and surface water.

15. SUBJECT TERMS

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a. REPORT	b. ABSTRACT	c. THIS PAGE			Nathaniel Peters, II
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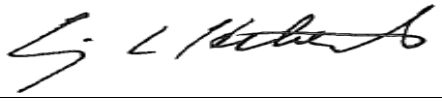
CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

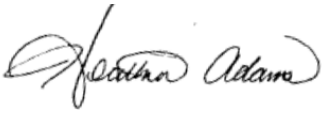
Leidos has completed the Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9 at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk 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 policy. In addition, an independent verification was performed to ensure all applicable changes were made per regulatory and Army comments.



3/31/2017

Craig Hebert, P.G.
Study/Design Team Leader

Date



3/31/2017

Heather Adams, P.G.
Independent Technical Review Team Leader

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.

3/31/2017

Lisa Jones-Bateman
Senior Program Manager

Date

Ohio Environmental Protection Agency

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

July 27, 2017

Re: US Army Ravenna Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Trumbull County
267000859120

Mr. Mark Leeper
Restoration Program Manager
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22203

SUBJECT: "RAVENNA ARMY AMMUNITION PLANT PORTAGE/TRUMBULL COUNTIES, FINAL, PROPOSED PLAN FOR SOIL, SEDIMENT, AND SURFACE WATER AT RVAAP-42 LOAD LINE 9" DATED MARCH 31, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Proposed Plan (PP) for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9" document for the Ravenna Army Ammunition Plant (RVAAP), Portage/Trumbull Counties. The document was dated and received at the Northeast District Office (NEDO) on March 31, 2017. This letter serves to document Ohio EPA's approval regarding the proposal of remediation of lead, mercury and polynuclear aromatic hydrocarbons (PAHs) to attain unrestricted (residential) use for the RVAAP Load Line 9 site contained in the Final Proposed Plan.

Based on the information contained in the Final PP document, other investigation documents/reports, and Ohio EPA's oversight participation during the investigation, Ohio EPA approves the Final PP document for the RVAAP Load Line 9 for remedial activities. As stated in the Final PP, the Army will offer a public comment period and hold an open house/public meeting in the near future to present the conclusions and investigative findings for Load Line 9.

If you have any questions concerning the above, please feel free to contact Vicki Deppisch, NEDO, DERR at (330) 963-1207.

Sincerely,

for MPP

Michael Proffitt, Chief
Division of Environmental Response and Revitalization

VD/nvr

cc: Gail Harris/Rebecca Shreffler, Vista Sciences

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Final

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Former Ravenna Army Ammunition Plant
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March 31, 2017

DOCUMENT DISTRIBUTION
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Name/Organization	Number of Printed Copies	Number of Electronic Copies
Vicki Deppisch, Project Manager, Ohio EPA NEDO-DERR	1	3
Brian Tucker, Ohio EPA, CO-DERR	1	1
Bob Princic, Ohio EPA, NEDO-DERR	Email transmittal letter only	
Rod Beals, Ohio EPA, NEDO-DERR	Email transmittal letter only	
Tom Schneider, Ohio EPA, SWDO-DERR	Email transmittal letter only	
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Nathaniel Peters II, USACE – Louisville District	1	1
Admin Records Manager – Camp Ravenna	2	2
Pat Ryan, Leidos-REIMS	0	1
Jed Thomas, Leidos	1	1
Leidos Contract Document Management System	0	1

ARNG = Army National Guard.
CO = Central Office.
DERR = Division of Environmental Response and Revitalization.
IED = Installation and 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

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

LIST OF ACRONYMS

AOC	Area of Concern
ARAR	Applicable and Relevant or Appropriate Requirement
Army	U.S. Department of the Army
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
COPEC	Chemical of Potential Ecological Concern
CUG	Cleanup Goal
DWA	Dry Well Area
ERA	Ecological Risk Assessment
FPA	Former Production Area
FWCUG	Facility-wide Cleanup Goal
HHRA	Human Health Risk Assessment
HQ	Hazard Quotient
NPA	Non-production Area

OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
PAH	Polycyclic Aromatic Hydrocarbon
PBA08	2008 Performance-based Acquisition
PCB	Polychlorinated Biphenyl
PP	Proposed Plan
RAO	Remedial Action Objective
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI	Remedial Investigation
ROD	Record of Decision
RVAAP	Ravenna Army Ammunition Plant
SVOC	Semi-volatile Organic Compound
TNT	2,4,6-Trinitrotoluene
TR	Target Risk
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Proposed Plan (PP) presents the conclusions and recommendations for soil, sediment, and surface water within the Load Line 9 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). Load Line 9 is designated as RVAAP-42. 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 the necessary information to comment on selecting an appropriate response action. The remedy will be selected for Load Line 9 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 II Remedial Investigation Report and Feasibility Study for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9* (USACE 2016) and other documents contained in the Administrative Record file for Load Line 9. The Army's preferred alternative at Load Line 9 is Alternative 3: Excavation and Off-site Disposal at LL9ss-011 and Ex-situ Thermal Treatment at LL9ss-096/097—Attain Unrestricted (Residential) Land Use. The Army encourages the public to review background documents to gain a more comprehensive understanding of the AOC, activities conducted to date, and the rationale for the preferred alternative.

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 *Final Phase II Remedial Investigation Report and Feasibility Study for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9* (USACE 2016). 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.

2.0 RVAAP DESCRIPTION AND BACKGROUND

The facility, consisting of 21,683 acres, is federally owned and is 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 (OHARNG) for use as a military training site (Camp Ravenna). References in this document to RVAAP relate to previous activities at the facility as related to former munitions production activities or to activities being conducted under the restoration/cleanup program.

3.0 LOAD LINE 9 DESCRIPTION AND BACKGROUND

3.1 Site Description

Load Line 9, formerly known as the detonator line, is a 69-acre, fenced AOC located north of Fuze and Booster Road, west of George Road, and northeast of Load Line 10 in the south-central portion of Camp Ravenna (Figure 2).

The remaining features at Load Line 9 are an old elevated water tank (WW-32) and perimeter fence. The elevated water tank is no longer connected to a water distribution system, and neither the elevated water tank nor the perimeter fence are currently maintained. There are gravel perimeter roads within the AOC, as well as two dirt mounds immediately north-northeast of the locations of former Buildings DT-2 and DT-5 (Figure 3). Small construction drainage ditches border the gravel perimeter road. Load Line 9 is currently overgrown with grass, trees, and scrub vegetation.

Also included in the Remedial Investigation (RI) is an investigation of the area surrounding a former 6-in dry well. This dry well received runoff from two subsurface vitrified earthen lines that ran from Building DT-2 (Fulminate Mix House) to DT-5 (Azide Mix House). The location of the dry well is presented on historical figures, but the dry well was not identified in the field during the 2010 Performance-based Acquisition (PBA08) RI and may have been removed. Generally, dry wells are porous chambers that allow received water to slowly percolate into the ground. The area investigated around the location of the dry well was designated the Dry Well Area (DWA). As indicated in the following sections, no risk was identified and no remediation is required at the DWA.

The south-central portion of the AOC is the topographic high that slopes radially downward towards the AOC boundaries. There is a topographic low near the northwest boundary of the AOC. Ground surface elevations within Load Line 9 range from approximately 1,088–1,136 ft above mean sea level (Figure 3).

There are no perennial surface water features present within Load Line 9 or in the immediate vicinity. Surface water occurs intermittently as storm water runoff and generally follows the topography of Load Line 9 flowing through constructed drainage conveyances and drains to the north-northwest. No planning or jurisdictional wetlands exist within the fenced AOC boundary. There are small wetlands near the AOC to the northeast, southeast, and southwest. There is no known connection between Load Line 9 and any off-site wetlands.

Except where disturbed by RVAAP activities, unconsolidated deposits of silty sand and silty clay overlies sandstone bedrock of the Homewood Sandstone Member of the Pennsylvanian Pottsville Formation at Load Line 9. During site investigations, bedrock was encountered from site surface exposures to 15.5 ft below ground surface (bgs).

Groundwater was encountered from 10–23.4 ft bgs and groundwater elevations ranged from 1,110.36–1,124.15 ft above mean sea level. Groundwater at the site flows to the northeast. The average hydraulic gradient at the AOC is 0.0231 ft/ft (USACE 2016).

3.2 Background

From 1941–1945, Load Line 9 operated at full capacity to produce fuze component parts for artillery projectiles. The Installation Assessment (USATHAMA 1978) indicated 19,257,297 miscellaneous fuzes were produced. Fuzes are mechanical, chemical, or electrical ignition devices whose purpose is to cause the projectile or bomb to function.

Load Line 9 was deactivated at the end of World War II, and the process equipment was removed. Load Line 9 has not been used since 1945, and no historical information exists to indicate Load Line 9 was used for any other processes. No fuel storage tanks were present at the AOC during operations. Building DT-33 was the only building at Load Line 9 whose purpose was solvent storage.

All 54 process and support buildings within the AOC were demolished in 2003. The slabs and foundations of the former buildings were removed in 2003 and 2007. Soil near the former production buildings were extensively disturbed during building demolition activities. The work areas were re-graded, and the area was vegetated in 2003 and 2007.

3.3 Potential Contaminants

The 1978 Installation Assessment identified the major contaminants of the former RVAAP to be 2,4,6-trinitrotoluene (TNT), composition B [a combination of TNT and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)], sulfates, nitrates, lead styphnate, and lead azide (USATHAMA 1978). Based on operation history, additional potential site-specific contaminants at Load Line 9 include mercury fulminate and heavy metals (lead, chromium, mercury, and arsenic) from munitions assembly activities.

In summary, potential contaminants at Load Line 9 include explosives and inorganic chemicals (e.g., metals). Other potential contaminants at Load Line 9 include volatile organic compounds (VOCs) from former Building DT-33 that was utilized for solvent storage and polychlorinated biphenyls (PCBs) from on-site transformers. Polycyclic aromatic hydrocarbons (PAHs) were also identified as potential contaminants at former Buildings DT-32 and DT-41 through DT-50, which were used as a heater houses.

4.0 REMEDIAL INVESTIGATIONS

The AOC characteristics, nature and extent of contamination, and conceptual site model are based on investigations conducted from 1978–2011.

The following environmental investigations have been conducted at Load Line 9:

- Installation Assessment (USATHAMA 1978);
- Resource Conservation and Recovery Act Facility Assessment (Jacobs 1989);
- Preliminary Assessment (USACE 1996);
- Relative Risk Site Evaluation (USACHPPM 1998);
- Lead azide screening in the 2003 *Phase I RI* (MKM 2007); and
- 2008 Performance-based Acquisition (PBA08) Remedial Investigation (RI), as summarized in the *Phase II Remedial Investigation Report and Feasibility Study for Soil, Sediment, and Surface Water at the RVAAP 42 Load Line 9* (USACE 2016).

4.1 Surface and Subsurface Soil

In surface soil (0–1 ft bgs) and subsurface soil (less than 1 ft bgs), the prevalent site-related contaminants and chemicals of potential concern were identified as discussed below.

Figure 4 shows sample locations included in the RI. The results of the PBA08 RI sampling completed in 2010 and 2011 were combined

with the results of the 2002 lead azide screening and the 2003 Phase I RI 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.

The 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 evaluation summarized below was performed to assess which chemicals exceeded a TR of 1E-05, HQ of 1, and to establish which chemicals were above their respective background concentrations.

- All explosive, propellant, VOC, PCB, and pesticide concentrations were below a TR of 1E-05, HQ of 1, or their respective background concentrations in surface and subsurface soil.
- Five semi-volatile organic compound (SVOC) PAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene] had some samples exceeding a TR of 1E-05, HQ of 1 in surface soil. However, indeno(1,2,3-cd)pyrene was not identified as a chemical of concern (COC) in the HHRA because the exposure point concentration was lower than the Resident Receptor facility-wide cleanup goal (FWCUG). Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene were identified as COCs to be carried forward for potential remediation and are discussed further in Section 6.1.
- The only metals that had concentrations that exceeded a TR of 1E-05, HQ of 1, and their respective background concentrations were arsenic, lead, manganese and mercury. However, arsenic and manganese were not identified as COCs in the HHRA. Lead and mercury were identified as COCs to be carried forward for potential remediation and are discussed further in Section 6.1.
- Only 6 of 57 soil samples exceeded the arsenic subsurface background concentration. Only 11 of 67 soil samples exceeded the arsenic surface background concentration. The exposure point concentration of arsenic in surface and subsurface soil was below the background concentration. Thus, arsenic is present at naturally occurring conditions and is not a COC in soil.
- Only 4 of 67 soil samples exceeded the manganese surface soil background concentration of 1,450 mg/kg. The maximum concentration of 3,800 mg/kg was at surface soil sample location LL9ss-027, in the non-production area (NPA). None of the subsurface soil samples exceeded the subsurface background concentration of 3,030 mg/kg, indicating that manganese at Load Line 9 is present at naturally occurring concentrations.

4.2 Sediment and Surface Water

Although there are no perennial surface water bodies at Load Line 9, sediment and surface water samples were collected from site drainage ditches and DWA. The results of the samples taken from the drainage ditches are summarized below:

- All explosive, propellant, inorganic chemical, SVOC, VOC, PCB, and pesticide concentrations were below a TR of 1E-05, HQ of 1, or their respective background concentrations in sediment and surface water.
- No COCs were identified for sediment or surface water.

The results of the samples collected from the DWA are summarized below:

- All explosive, propellant, and inorganic chemicals were below a TR of 1E-05, HQ of 1, or their respective background concentrations in sediment and surface water.
- No COCs were identified for sediment or surface water.

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 II RI Report (USACE 2016). The fate and transport evaluation included modeling and compared the model results to current groundwater monitoring data. The modeling evaluated the potential for contaminants to leach from soil and sediment and impact groundwater beneath the AOC. The modeling also evaluated if contaminants could potentially migrate from Load Line 9 to the closest downgradient groundwater receptor (e.g., stream). Modeling results indicated five soil and seven sediment contaminant migration chemicals of potential concern could potentially leach from soil or sediment and mix with groundwater beneath Load Line 9, resulting in concentrations above maximum contaminant levels, U.S. Environmental Protection Agency regional screening levels, and RVAAP groundwater FWCUGs.

Evaluation of modeling results with respect to current AOC groundwater data and model limitations indicates that identified soil site-related contaminants are not currently impacting groundwater beneath the source areas and that 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 chemicals of concern for soil or sediment were identified as impacting groundwater. The groundwater will be further evaluated under the Facility-wide Groundwater Monitoring Program.

5.0 SCOPE AND ROLE OF RESPONSE ACTION

Resident Receptor (Adult and Child) FWCUGs were used to evaluate Unrestricted (Residential) Land Use. Unrestricted (Residential) Land Use is considered protective for all Land Uses 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. The response action evaluated alternatives to attain Unrestricted (Residential) Land Use for soil, sediment, and surface water.

Groundwater will be addressed under the RVAAP Facility-wide Groundwater AOC (RVAAP-66) as a separate decision. However, the selected remedy for soil at Load Line 9 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 of the PP, 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. Soil data associated with Load Line 9 were grouped into surface and subsurface soil at the former production area (FPA), non-production area (NPA), and DWA. Surface water and sediment were evaluated at the Drainage Ditches and the DWA. No COCs were identified for any receptor in subsurface soil, sediment, or surface water. Additionally, there were no COCs identified for any receptor for surface soil in the DWA.

In the surface soil, lead, mercury and four PAHs [benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene] were identified as COCs to be carried forward for potential remediation. Lead and mercury were carried forward for potential remediation at the NPA in the area of the former Detonator Destroying House (DT-34). The elevated levels of lead and mercury may be present as a result of the use of lead azide and mercury fulminate in detonators.

The four PAHs listed above were identified as COCs within the FPA surrounding the location of the former Change House (DT-28). PAHs are present at the NPA, but at lower concentrations than the FPA.

The HHRA identified lead and mercury as surface soil COCs to be carried forward for potential remediation near sample location LL9ss-011, in the area of the former Detonator Destroying House (DT-34) to be protective of the Resident Receptor (Adult and Child). In addition, the PAHs benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene were identified as surface soil COCs to be carried forward for potential remediation near sample locations LL9ss-096 and LL9ss-097, in the area of the Former Change House (DT-28) for Unrestricted (Residential) Land Use.

6.2 Ecological Risk Assessment

The ecological habitat in Load Line 9 consists of 69 acres of mostly field (grasses), shrubland, and forest. There is no aquatic habitat; the closest perennial surface water feature is a tributary to Sand Creek approximately 1,100 ft to the north-northwest of the AOC. No wetlands exist within the fenced AOC boundary, and there is no known connection between Load Line 9 and any off-site wetlands. Drainage from the southern and eastern portions of Load Line 9 flows into large drainage ditches that border Fuze and Booster Road and George Road. The terrestrial vegetation provides a habitat for birds, mammals, insects, and other organisms. The northern long-eared bat (*Myotis septentrionalis*; federally threatened) exists at Camp Ravenna. There are no other federally listed species or critical habitats on Camp Ravenna. Load Line 9 has not been previously surveyed for federal- or state-listed species; however, there have been no documented sightings of state-listed, federally listed, threatened, or endangered species at the AOC (OHARNG 2014).

The Level I Scoping ERA (USACE 2016) presents important ecological resources on the AOC and evaluates whether chemical contamination is present in the environment. Ecological resources at Load Line 9 were compared to the list of important ecological places and resources (USACE 2016). Based on the 39 criteria defining important places and resources as identified by the Army and Ohio EPA, no important ecological resources were identified. The ERA incorporates available data to identify integrated chemicals of potential ecological concern (COPECs). There are 18 integrated COPECs in deep surface soil at the FPA, 12 integrated COPECs in deep surface soil at the NPA, 5 integrated COPECs in sediment at the Drainage Ditches, 2 integrated COPECs in sediment at the DWA, 1 integrated COPEC in surface water at the Drainage Ditches, and 2 integrated COPECs in surface water at the DWA. These COPECs consist of inorganic chemicals, explosives, propellants, and SVOCs.

The Level I ERA concluded that there are no important ecological resources present near contamination at Load Line 9. Per the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008), the ERA can be completed. No further action is recommended to be protective from an ecological perspective at Load Line 9.

7.0 REMEDIAL INVESTIGATION CONCLUSIONS

Based on the investigation results, Load Line 9 has been adequately characterized and the nature and extent of the contamination has been defined. The fate and transport assessment concluded that chemicals in soil and sediment are not adversely impacting groundwater quality and are not predicted to have future impacts. The ERA concluded that there are no important or ecologically significant resources at the AOC; consequently, no further action is recommended from the ecological risk perspective.

The HHRA identified lead and mercury as surface soil COCs for potential remediation near LL9ss-011, in the area of the former Detonator Destroying House (DT-34). PAHs were also identified as surface soil COCs near LL9ss-096 and LL9ss-097, in the area of the Former Change House (DT-28). As a result, an FS was developed to establish remedial alternatives to address these COCs.

8.0 REMEDIAL ACTION OBJECTIVE

The remedial action objective (RAO) for Load Line 9 is to prevent Resident Receptor exposure to surface soil (0–1 ft bgs) with 1) concentrations above lead and mercury cleanup goals (CUGs) at sample location LL9ss-011 and 2) concentrations above benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene CUGs at sample locations LL9ss-096 and LL9ss-097. Table 1 presents the COCs and CUGs. Figure 5 presents the estimated extent of surface soil requiring remediation. The purpose of the FS discussed below was to evaluate and select an alternative that best achieves the RAO.

In addition to the RAO CUGs, applicable and relevant or appropriate requirements (ARARs) were developed to be applied during the evaluation of FS alternatives.

9.0 SUMMARY OF FEASIBILITY STUDY ALTERNATIVES

Remedial technologies and process options were screened to identify potential remedial alternatives that can achieve the RAO. The remedial alternatives developed are presented in the following subsections.

9.1 Alternative 1: No Action.

No Action is required for evaluation under the NCP and provides the baseline against which other remedial alternatives are compared. This alternative assumes all current actions (e.g., access restrictions and environmental monitoring) are discontinued and that no future actions will take place to protect human receptors or the environment. Consequently, COCs at the AOC are not removed or treated.

9.2 Alternative 2: Excavation and Off-site Disposal—Attain Unrestricted (Residential) Land Use

This alternative involves removing surface soil (0–1 ft bgs) to achieve CUGs for the Resident Receptor COCs near sample locations LL9ss-011 and LL9ss-096/097 (Figure 5). Approximately 1,165 yd^3 (ex-situ) of soil would require removal and disposal from these two distinct locations under this alternative. Excavations would be backfilled with approved, clean soil. Disturbed areas would be restored to grade and re-vegetated using an OHARNG-approved seed mixture and mulched. No land use controls or five-year reviews pursuant to CERCLA would be required because this alternative attains a level of protection for Unrestricted (Residential) Land Use.

Table 1. Chemicals of Concern and Cleanup Goals for Load Line 9

Location	Chemical of Concern	Concentration (mg/kg)	Cleanup Goal (mg/kg)
LL9ss-011	Mercury	882	22.7
	Lead	1,330	400
LL9ss-096	Benz(a)anthracene	17	2.21
	Benzo(a)pyrene	15	0.221
	Benzo(b)fluoranthene	20	2.21
	Dibenz(a,h)anthracene	2.2	0.221
LL9ss-097	Benz(a)anthracene	1	2.21
	Benzo(a)pyrene	1.7	0.221
	Benzo(b)fluoranthene	2.4	2.21
	Dibenz(a,h)anthracene	0.36	0.221

The Resident Receptor facility-wide cleanup goals at hazard quotient=1, target risk=10^{-5} are used to attain Unrestricted (Residential) Land Use.
mg/kg = Milligrams per kilogram.

9.3 Alternative 3: Excavation and Off-site Disposal at LL9ss-011 and Ex-situ Thermal Treatment at LL9ss-096/097—Attain Unrestricted (Residential) Land Use

This alternative involves soil removal, disposal, and thermal treatment. The estimated 24 yd^3 (ex-situ) of surface soil contaminated with mercury and lead at location LL9ss-011 (Figure 5) would involve removal and disposal under this alternative.

The soil contaminated with PAHs associated with LL9ss-096/097 would be excavated and placed into a thermal treatment system to remove COCs from soil. Once the treated soil is sampled and confirmed to be below CUGs, the treated soil will be placed back into the excavated area. Both disturbed areas will be restored to grade, using approved clean backfill, as necessary; re-vegetated using an OHARNG-approved seed mixture; and mulched. No land use controls or five-year reviews pursuant to CERCLA would be required because this alternative attains a level of protection for Unrestricted (Residential) Land Use.

10.0 EVALUATION OF FEASIBILITY STUDY ALTERNATIVES

A comparative analysis was performed for all three alternatives in order to provide a direct comparison to one another with respect to common criteria. Table 2 provides a comparative analysis of the alternatives conducted. Alternative 1 was determined not to be protective of human health and is not compliant with ARARs. In addition, Alternative 1 did not meet the RAO to prevent Resident Receptor exposure to surface soil (0–1 ft bgs). Therefore, Alternative 1 was not eligible for selection.

For the remaining two alternatives, the balancing criteria (short- and long-term effectiveness; reduction of contaminant toxicity, mobility, or volume through treatment; ease of implementation; and cost) are used to select a recommended alternative among the alternatives that satisfies the threshold criteria.

Table 2. Summary of Comparative Analysis of Remedial Alternatives

NCP Evaluation Criteria	Alternative 1: No Action	Alternative 2: Excavation and Off-site Disposal—Attain Unrestricted (Residential) Land Use	Alternative 3: Excavation and Off-site Disposal at LL9ss-011 and Ex-situ Thermal Treatment at LL9ss-096/097—Attain Unrestricted (Residential) Land Use
Threshold Criteria	***Result***	***Result***	***Result***
1. Overall Protectiveness of Human Health and the Environment	Not protective	Protective	Protective
2. Compliance with ARARs	Not compliant	Compliant	Compliant
Balancing Criteria	***Score***	***Score***	***Score***
3. Long-term Effectiveness and Permanence	Not applicable	1	2
4. Reduction of Toxicity, Mobility, or Volume through Treatment	Not applicable	1	2
5. Short-term Effectiveness	Not applicable	1	2
6. Implementability	Not applicable	2	1
7. Cost	Not applicable ($0)	1 ($410,360)	2 ($296,732)
Balancing Criteria Score	*Not applicable*	*6*	*9*

Any alternative considered "not protective" for overall protectiveness of human health and the environment or "not compliant" for compliance with ARARs is not eligible for selection as the recommended alternative. Therefore, that alternative is not scored as part of the balancing criteria evaluation.

Scoring for the balancing criteria is as follows: Most favorable = 2, least favorable = 1. The alternative with the highest total balancing criteria score is considered the most feasible.

ARAR = Applicable and Relevant or Appropriate Requirement.

NCP = National Contingency Plan.

11.0 PREFERRED FEASIBILITY STUDY ALTERNATIVE

The recommended alternative for Load Line 9 is Alternative 3: Excavation and Off-site Disposal at LL9ss-011 and Ex-situ Thermal Treatment at LL9ss-096/097—Attain Unrestricted (Residential) Land Use. Alternative 3 had the highest score in the balancing criteria analysis. Alternative 3 meets the threshold and primary balancing criteria and is protective of the Resident Receptor by thermally treating PAH-contaminated soil and disposing the mercury- and lead-contaminated soil offsite at an engineered landfill.

The cost of Alternative 3 is $296,732 and has no operation and maintenance costs, as implementing the alternative results in attaining Unrestricted (Residential) Land Use. Additionally, Alternative 3 is a green and highly sustainable alternative for on-site treatment and unrestricted reuse of soil and implements a treatment alternative to reduce the toxicity, mobility, and volume of contamination. In the event that a thermal treatment system is not on site at the former RVAAP, Alternative 2: Excavation and Off-site Disposal—Attain Unrestricted (Residential) Land Use is readily available and considered for implementation by the Army.

This recommendation is not a final decision. The Army, in coordination with Ohio EPA, will select the remedy for Load Line 9 after reviewing and considering all comments submitted during the 30-day public comment period. Comments received from the public

on this PP will be considered in preparing a Record of Decision (ROD) to document the final remedy. The ROD will also include a responsiveness summary addressing comments received on the PP.

12.0 COMMUNITY PARTICIPATION

12.1 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 and accept oral and written comments.

12.2 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 Load Line 9.

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

12.3 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

12.4 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.

12.5 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 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.

Contaminant Migration Chemical of Concern (CMCOC): a chemical substance specific to an area of concern (AOC) that potentially poses significant potential to leach to groundwater at a concentration above human health risks goals. CMCOCs are typically further evaluated for remedial action.

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

Chemical of Potential Concern (COPC): a chemical substance specific to an AOC that potentially poses human health risks and requires further evaluation in the RI. COPCs are typically not evaluated for remedial action.

Chemical of Potential Ecological Concern (COPEC): a chemical substance specific to an AOC 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.

Exposure Point Concentration (EPC): in accordance with the *RVAAP Facility-wide Human Health Risk Assessors Manual – Amendment 1* (USACE 2005), the EPC is the calculated 95% upper confidence limit of the mean concentration of a chemical or the maximum detected concentration of a chemical, whichever value is lowest.

Feasibility Study: a CERCLA document that reviews and evaluates multiple remedial technologies under consideration at a site. It also identifies the preferred remedial action alternative.

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 RVAAP.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): the set of regulations that implement CERCLA and address responses to hazardous substances and pollutants or contaminants.

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 Action Objective (RAO): medium-specific goal for protecting human health and the environment that specifies contaminants, media of interest, and cleanup goals.

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

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

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.

Sum-of-Ratio (SOR): to adjust for multiple chemicals, divide the standard for each COC by the number of COCs. The adjusted value can then be compared to the single chemical value, and each ratio summed. If the summed ratios are less than one, the applicable standards are met. If summed ratios exceed one, the applicable standards are not met.

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 Joint Military Training Center. 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.

MKM (MKM Engineers, Inc.) 2007. *Report for the Phase I Remedial Investigation at Load Line 9.* August 2007.

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.

USACE (U.S. Army Corps of Engineers) 1996. *Preliminary Assessment for the Characterization of Areas of Contamination at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. February 1996.

USACE 2005. *RVAAP Facility-wide Human Health Risk Assessors Manual – Amendment 1*. December 2005.

USACE 2016. *Phase II Remedial Investigation Report and Feasibility Study for Soil, Sediment, Surface Water at RVAAP-42 Load Line 9, Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio.* June 2016.

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.

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

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FIGURES

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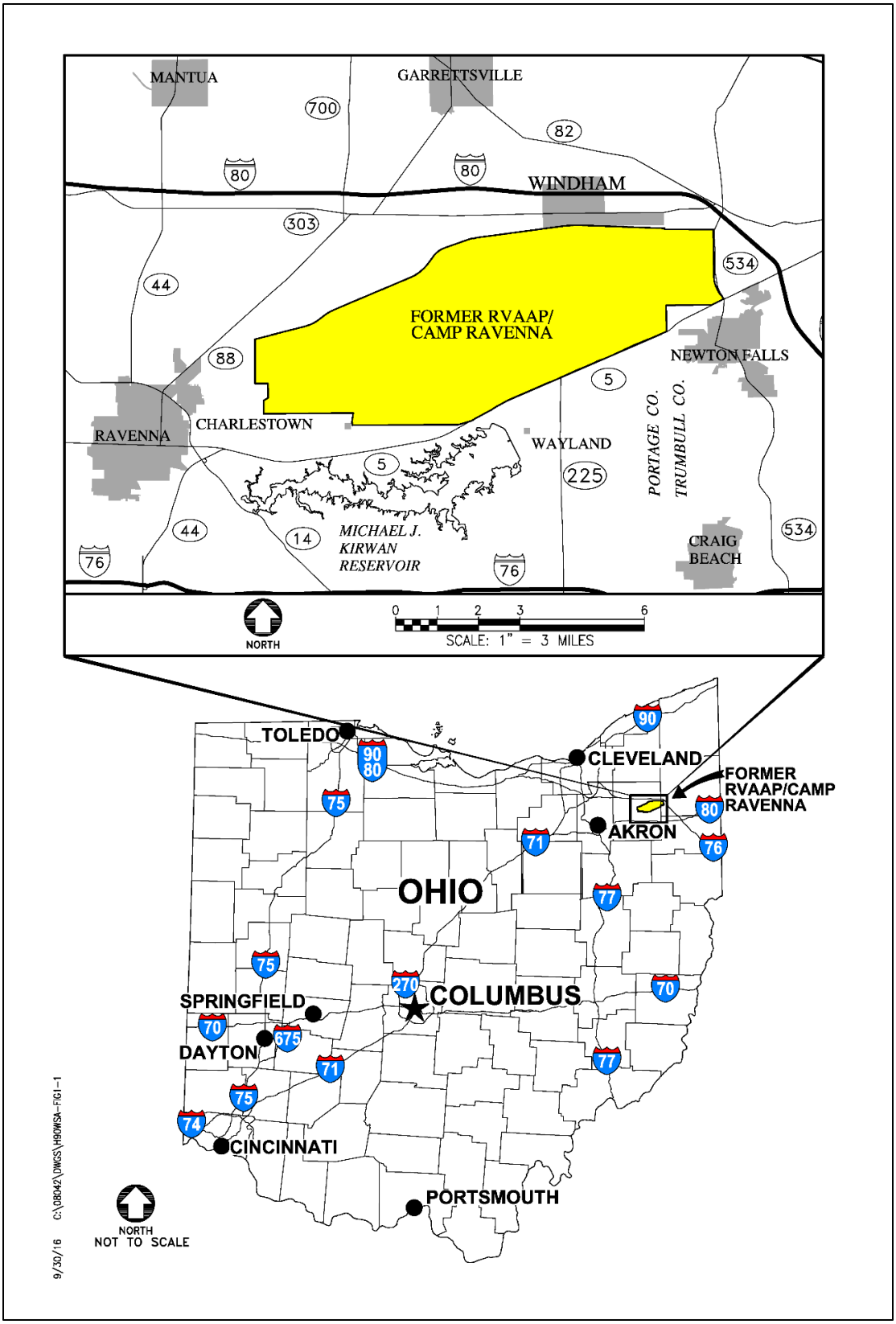


Figure 1. General Location and Orientation of Camp Ravenna

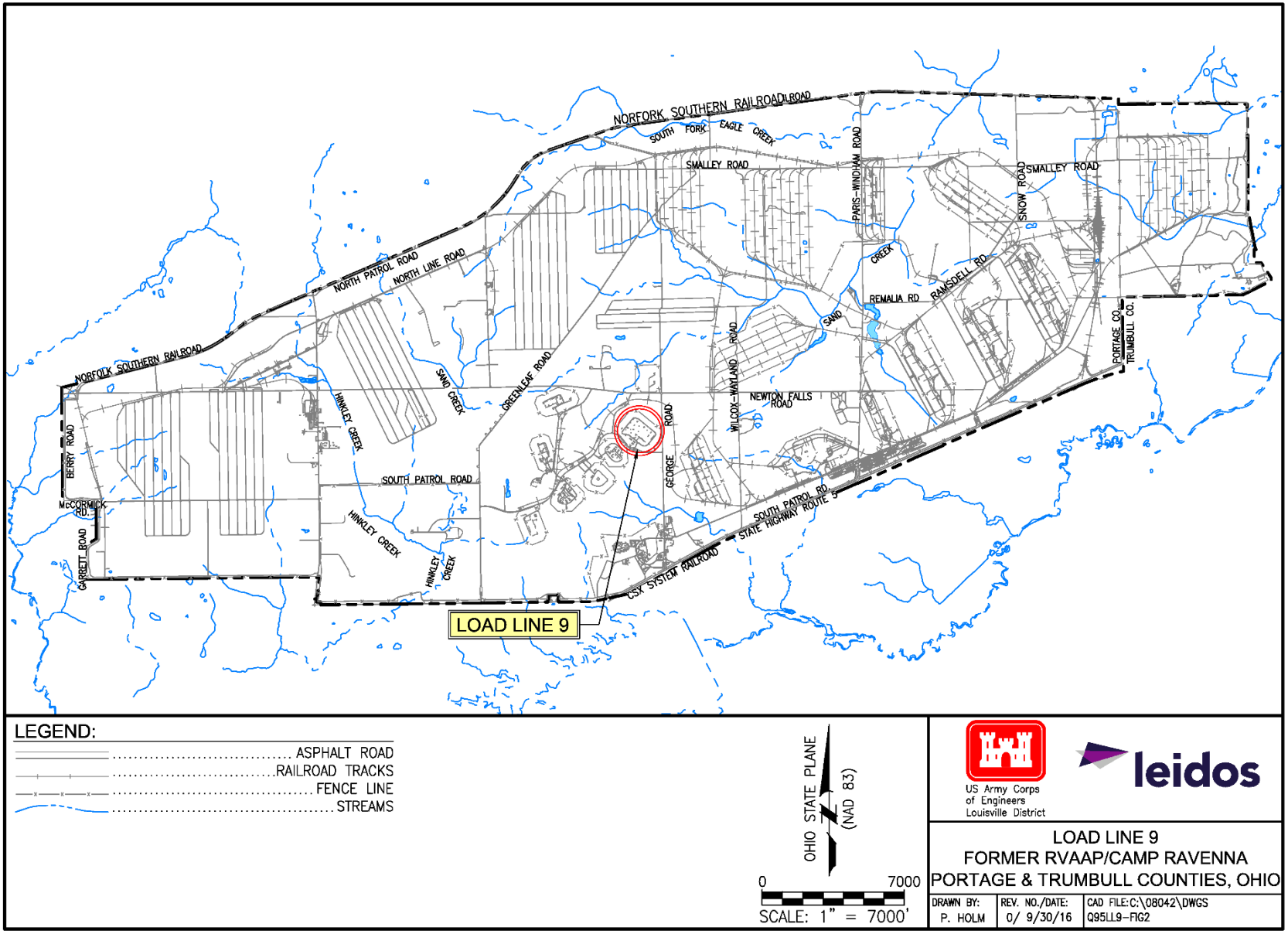
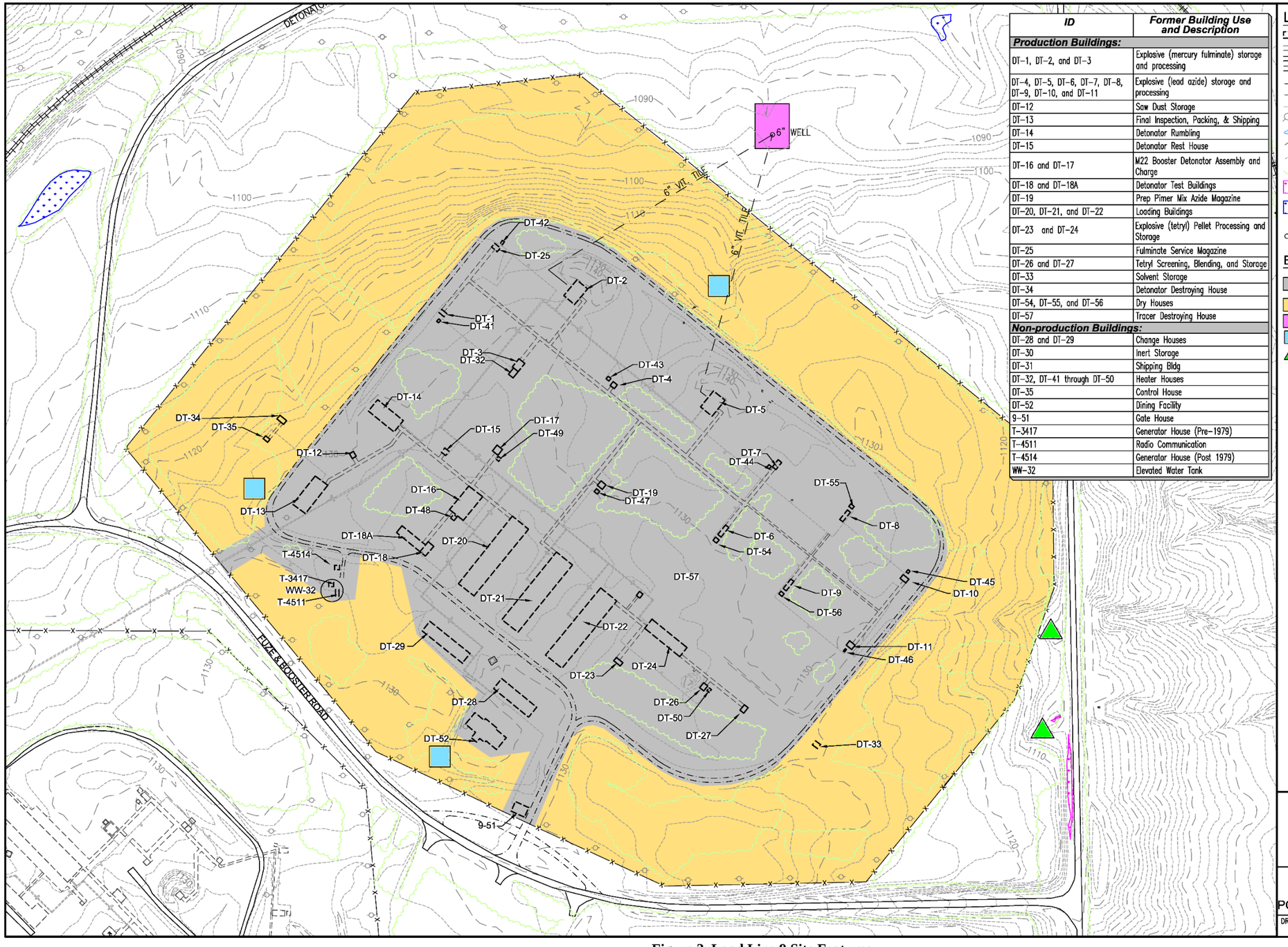


Figure 2. Location of Load Line 9 at Camp Ravenna



ID	Former Building Use and Description
Production Buildings:	
DT-1, DT-2, and DT-3	Explosive (mercury fulminate) storage and processing
DT-4, DT-5, DT-6, DT-7, DT-8, DT-9, DT-10, and DT-11	Explosive (lead azide) storage and processing
DT-12	Saw Dust Storage
DT-13	Final Inspection, Packing, & Shipping
DT-14	Detonator Rumbling
DT-15	Detonator Rest House
DT-16 and DT-17	M22 Booster Detonator Assembly and Charge
DT-18 and DT-18A	Detonator Test Buildings
DT-19	Prep Primer Mix Azide Magazine
DT-20, DT-21, and DT-22	Loading Buildings
DT-23 and DT-24	Explosive (tetryl) Pellet Processing and Storage
DT-25	Fulminate Service Magazine
DT-26 and DT-27	Tetryl Screening, Blending, and Storage
DT-33	Solvent Storage
DT-34	Detonator Destroying House
DT-54, DT-55, and DT-56	Dry Houses
DT-57	Tracer Destroying House
Non-production Buildings:	
DT-28 and DT-29	Change Houses
DT-30	Inert Storage
DT-31	Shipping Bldg
DT-32, DT-41 through DT-50	Heater Houses
DT-35	Control House
DT-52	Dining Facility
9-51	Gate House
T-3417	Generator House (Pre-1979)
T-4511	Radio Communication
T-4514	Generator House (Post 1979)
WW-32	Elevated Water Tank

LEGEND:

- DEMOLISHED BUILDING
- DEMOLISHED WALKWAY
- ASPHALT ROAD
- GRAVEL ROAD
- RAILROAD TRACKS
- FENCE LINE
- DEMOLISHED STEAM LINE
- FORMER UTILITY POLE
- SURFACE WATER
- GROUND CONTOUR (10-FT)
- GROUND CONTOUR (2-FT)
- VEGETATION
- JURISDICTIONAL WETLAND
- PLANNING LEVEL SURVEY WETLAND
- 6" WELL WITH CONNECTING VITRIFIED TILE

EXPOSURE UNITS:

- FORMER PRODUCTION AREA (FPA) EXPOSURE UNIT
- NON-PRODUCTION AREA (NPA) EXPOSURE UNIT
- DRY WELL AREA (DWA)
- DRAINAGE DITCH SAMPLE LOCATION
- OFF-AOC SAMPLE LOCATION

OHIO STATE PLANE (NAD 83)

0 125 250 500

SCALE: 1" = 250'

US Army Corps of Engineers Louisville District

leidos

LOAD LINE 9
FORMER RVAAP/CAMP RAVENNA
PORTAGE & TRUMBULL COUNTIES, OHIO

DRAWN BY:	REV. NO./DATE:	CAD FILE:
P. HOLM	REV. 1/02-08-16	08042/DWGS/K53LL9-FIG2-3

Figure 3. Load Line 9 Site Features

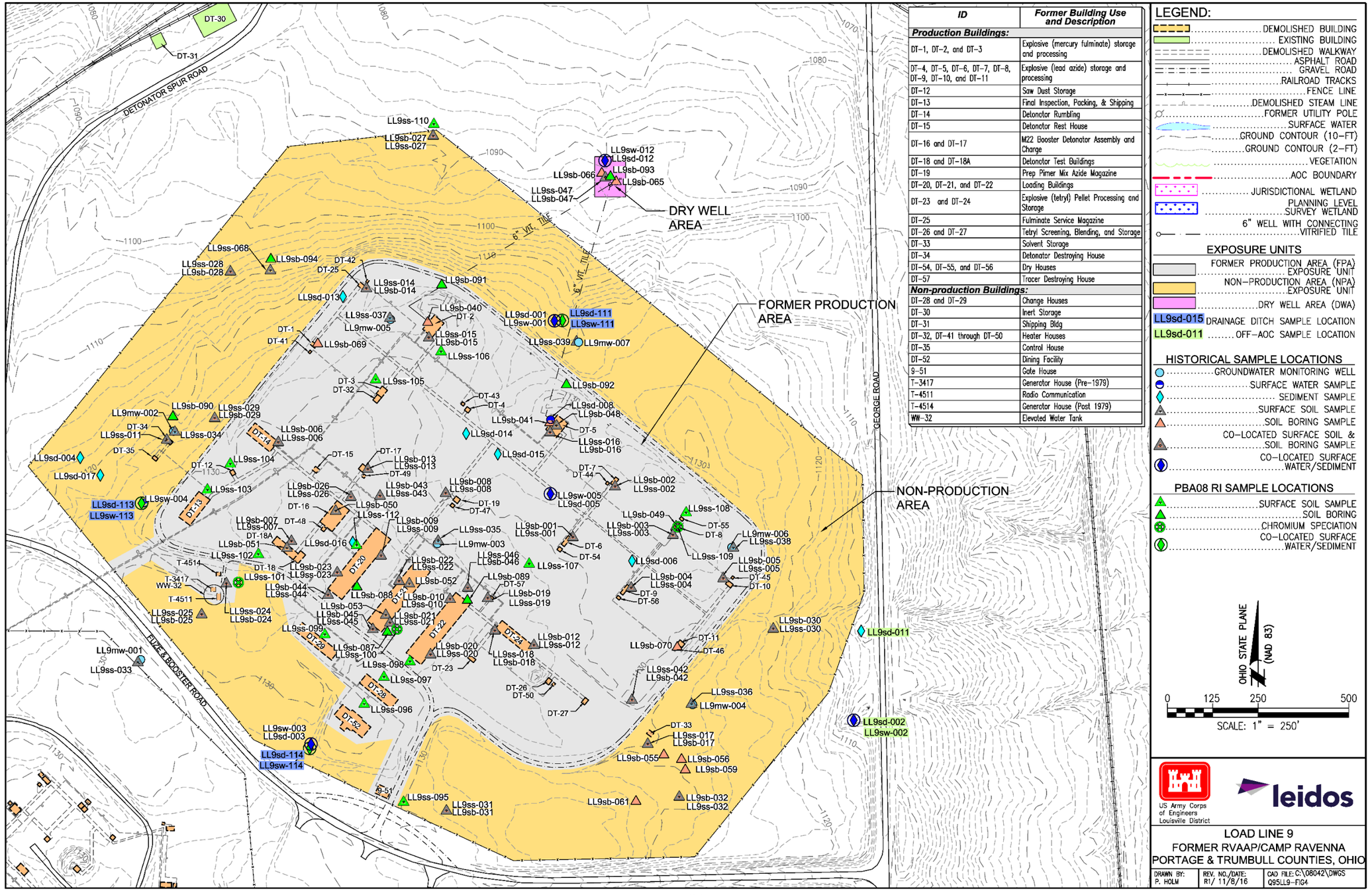


Figure 4. Load Line 9 Sample Locations

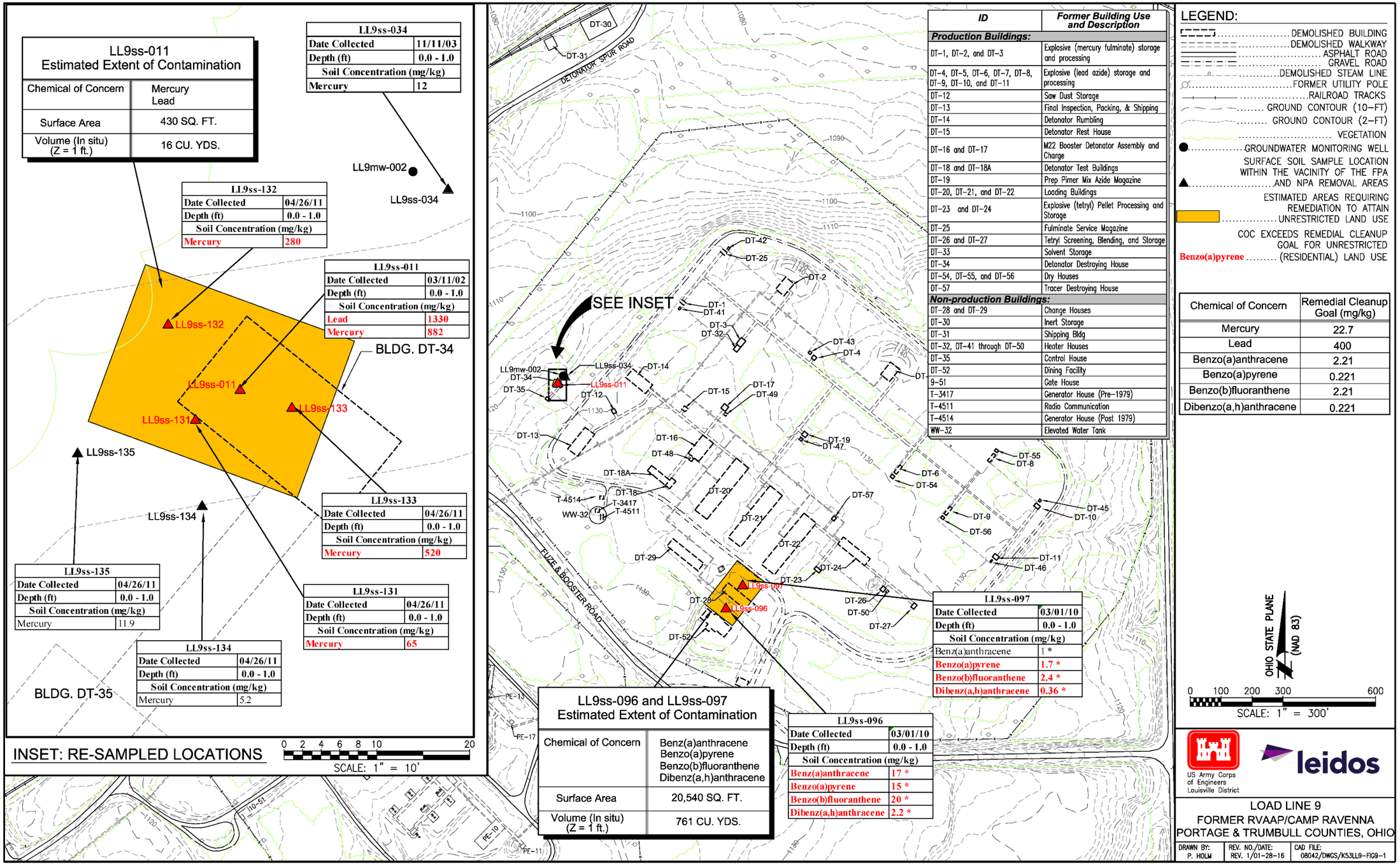


Figure 5. Estimated Extents of Surface Soil Requiring Remediation at Load Line 9

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ATTACHMENT A

Ohio EPA Comments and Responses

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Ohio Environmental Protection Agency

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

March 16, 2017

Mr. Mark Leeper
Chief (Acting)
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22204

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859120

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties, "Responses to Ohio EPA Comments on the Draft, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42, Load Line 9" Letter, Dated February 28, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Responses to Ohio EPA Comments on the Draft, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9" letter for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. The letter is dated February 28, 2017 and was received at Ohio EPA, Northeast District Office (NEDO) on March 2, 2017.

The following are Ohio EPA comments:

Comment 1 has been adequately addressed.

Comment 2, regarding the dry well that is identified in two figures, was not adequately addressed and may have been misread. Please discuss exactly what the "dry well" is (including physical description), the function during operational years, and any proposed remediation or removal.

Received
17MAR 2017

The above comment must be addressed to move forward with the PP for LL-9. Please address the above comment in the final version of this document and submit it to Ohio EPA.

Sincerely,

Vicki Deppisch

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.

ec: Bob Princic, Ohio EPA, NEDO DERR
Rodney Beals, Ohio EPA NEDO DERR
Tom Schneider, Ohio EPA, SWDO DERR
Tim Christman, Ohio EPA, CO DERR
Nat Peters, USACE
Vanessa Steigerwald-Dick, Ohio EPA NEDO DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 28, 2017

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Vicki Deppisch
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Responses to Ohio EPA Comments on the Draft Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9 for the Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties (Work Activity No. 267000859120)

Dear Ms. Deppisch:

The Army appreciates your review and comment letter (dated February 10, 2017) pertaining to the Draft Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9. Enclosed for your review and concurrence are responses to Ohio EPA's comments. Upon the final resolution, the Army will distribute the final version of this proposed plan.

Please contact the undersigned at (703) 607-7955 or mark.s.leeper.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mark Leeper
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Rodney Beals, Ohio EPA, NEDO-DERR
Robert Princic, Ohio EPA NEDO-DERR
Tom Schneider, Ohio EPA, SWDO-DERR
Vanessa Steigerwald-Dick, Ohio EPA, NEDO-DERR
Kevin Sedlak, ARNG, Camp Ravenna
Katie Tait, OHARNG, Camp Ravenna
Nat Peters, USACE Louisville
Craig Coombs, USACE Louisville
Gail Harris, Vista Sciences Corporation
Jed Thomas, Leidos

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-42 Load Line 9 Proposed Plan (Work Activity No. 267000859120)

Ohio EPA Comments:

1) Page 6, lines 54-58, regarding the ecological risk assessment: Please specify which Ohio EPA guidance document regarding ecological risk was used to provide "sufficient justification to recommend no further action to be protective of ecological receptors at Load Line 9." Please add, where appropriate, to all forthcoming PPs and Decision Documents.

   Army Response: Agree. The last paragraph of Section 6.2 (including page 6, lines 54-58) has been revised as presented below. This revision will be made to forthcoming proposed plans and decision documents, where appropriate.

   The Level I ERA concluded that there are no important ecological resources present near contamination at Load Line 9. Per the *Guidance for Conducting Ecological Risk Assessments* (Ohio EPA 2008), the ERA can be completed. No further action is recommended to be protective from an ecological perspective at Load Line 9.

   In addition, the following has been added to the References:

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

2) The dry well is identified in two figures, but a discussion could not be located in the text of the Draft PP. Please briefly discuss what it is/historical purpose, the sampling results, and any proposed remedial action.

   Army Response: Agree. The following sections have been revised. Please note that the dry well area (DWA) is discussed in the Human Health Risk Assessment. The HHRA states "Additionally, there were no COCs identified for any receptor for surface soil in the DWA."

   Section 3.1 Site Description:

   "Load Line 9 is currently overgrown with grass, trees, and scrub vegetation. Also included in the RI is the dry well area (DWA). The DWA contains a 6-inch well that is approximately 190 ft north of the AOC perimeter.

   The south-central portion …"

   Section 4.2 Sediment and Surface Water:

   "Although there are no perennial surface water bodies at Load Line 9, sediment and surface water samples were collected from site drainage ditches and DWA. The results of the samples taken from the drainage ditches are summarized below:

   • All explosive, propellant, inorganic chemical, SVOC, VOC, PCB, and pesticide concentrations were below a TR of 1E-05, HQ of 1, or their respective background concentrations in sediment and surface water.

- No COCs were identified for sediment or surface water.

The results of the samples collected from the DWA are summarized below:

- All explosive, propellant, and inorganic chemicals were below a TR of 1E-05, HQ of 1, or their respective background concentrations in sediment and surface water.
- No COCs were identified for sediment or surface water."

Ohio Environmental Protection Agency

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

February 10, 2017

Re: US Army Ammunition PLT RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
267000859120

Mr. Mark Leeper
Restoration Program Manager
Army National Guard Directorate
ARNGD-ILE Clean Up
111 South George Mason Drive
Arlington, VA 22204

Subject: Ravenna Army Ammunition Plant, Portage/Trumbull Counties, "Draft, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42, Load Line 9," Dated January 24, 2017

Dear Mr. Leeper:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft, Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-42 Load Line 9" document for the Ravenna Army Ammunition Plant, Portage/Trumbull Counties. The Draft Proposed Plan (PP) is dated and was received at Ohio EPA, Northeast District Office (NEDO) on January 24, 2017.

The following are Ohio EPA comments:

Page 6, lines 54-58, regarding the ecological risk assessment: Please specify which Ohio EPA guidance document regarding ecological risk was used to provide "sufficient justification to recommend no further action to be protective of ecological receptors at Load Line 9." Please add, where appropriate, to all forthcoming PPs and Decision Documents.

The dry well is identified in two figures, but a discussion could not be located in the text of the Draft PP. Please briefly discuss what it is/historical purpose, the sampling results, and any proposed remedial action.

The above comments must be addressed to move forward with the PP for LL-9. It is the understanding of Ohio EPA that a public meeting will be held for LL-7 and LL-9, once the PPs are approved.

Sincerely,

Bob Princic for

Vicki Deppisch
Hydrogeologist/Project Coordinator
Division of Environmental Response and Revitalization

VD/nvr

cc: Katie Tait/Kevin Sedlak OHARNG RTLS
Craig Coombs, USACE
Rebecca Shreffler/Gail Harris, VISTA Sciences Corp.

ec: Mark Leeper, ARNG
Bob Princic, Ohio EPA, NEDO, DERR
Rodney Beals, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, NWDO, DERR
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