FINAL
REMEDIAL DESIGN FOR SOIL, SEDIMENT, AND SURFACE WATER AT RVAAP-38 NACA TEST AREA

FORMER RAVENNA ARMY AMMUNITION PLANT PORTAGE AND TRUMBULL COUNTIES, OH

March 19, 2021

Contract Number: W912QR17C0045

Prepared for:

U.S. ARMY CORPS OF ENGINEERS, LOUISVILLE DISTRICT
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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. REPORT DATE *(03-19-2021)*	**2. REPORT TYPE** Final	**3. DATES COVERED** *(From - To)* April-March 2021

4. TITLE AND SUBTITLE

Final
Remedial Design for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area

Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

5a. CONTRACT NUMBER
W912QR17C0045

5b. GRANT NUMBER
NA

5c. PROGRAM ELEMENT NUMBER
NA

6. AUTHOR(S)

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5d. PROJECT NUMBER
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5e. TASK NUMBER
Task 1a

5f. WORK UNIT NUMBER
NA

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8. PERFORMING ORGANIZATION REPORT NUMBER
NA

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

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10. SPONSOR/MONITOR'S ACRONYM(S)

USACE

11. SPONSOR/MONITOR'S REPORT NUMBER(S)
NA

12. DISTRIBUTION/AVAILABILITY STATEMENT

Reference distribution page.

13. SUPPLEMENTARY NOTES

None

14. ABSTRACT

This Remedial Design (RD) outlines the requirements and procedures to be implemented by the Alaniz-Endpoint joint venture team for this task order under the requirements of the Performance Work Statement dated December 2018 and amended on November 21, 2019. Specifically, this RD sets forth details for site preparation, excavation, onsite thermal treatment of soil, transportation, and off-site disposal of soil exceeding clean-up goals at the RVAAP-38 NACA Test Area Area of Concern as required under this contract.

15. SUBJECT TERMS
Remedial design, project organization and responsibilities, excavation and thermal treatment activities, confirmation sampling, site restoration and field documentation.

16. SECURITY CLASSIFICATION OF:			**17. LIMITATION OF ABSTRACT**	**18. NUMBER OF PAGES**	**19a. NAME OF RESPONSIBLE PERSON**
a. REPORT	**b. ABSTRACT**	**c. THIS PAGE**			Nathaniel Peters, Ph.D., PE
U	U	U	U	110	**19b. TELEPHONE NUMBER** *(Include area code)* 502-315-2624

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RVAAP-38 NACA Test Area
Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

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ARNG = Army National Guard
OHARNG = Ohio Army National Guard
Ohio EPA CO = Ohio Environmental Protection Agency, Central Office
Ohio EPA DERR = Ohio Environmental Protection Agency, Division of Environmental Response and Revitalization
Ohio EPA SWDO = Ohio Environmental Protection Agency, Southwest District Office
REIMS = Ravenna Environmental Information Management System
USACE = United States Army Corps of Engineers

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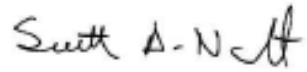
Certification 4

CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Endpoint Consulting, Inc., has completed the preparation of this Remedial Design for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area at the former Ravenna Army Ammunition Plant. 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 independent technical review included evaluation of data quality objectives; technical assumptions; methods, procedures, and material to be used in analyses; 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 USACE policy.



2-20-2021

Scott Nesbit, P.E. Date
Quality Assurance Manager/Independent Technical Review

2-20-2021

Tim Naughton, P.E. Date
Director of Operations & Engineering

Significant concerns and explanation of the resolution are documented within the project file.
As noted above, all concerns resulting from independent technical review of the project have been considered.

2-20-2021

M. Chris Pestana Date
Program Manager

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REMEDIAL DESIGN FOR SOIL, SEDIMENT, AND SURFACE WATER AT RVAAP-38 NACA TEST AREA

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PORTAGE AND TRUMBULL COUNTIES, OHIO

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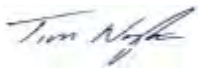
Reviewed and Approved by:



Tim Naughton, P.E.
Director of Operations & Engineering
Endpoint Consulting, Inc.

M. Chris Pestana
Program Manager
Alaniz Associates Corporation

The Alaniz-Endpoint Joint Venture (Alaniz-Endpoint Team) has prepared this report under the direction of USACE Louisville District (LRL). This document should be used only with the approval of USACE LRL. This report is based in part on information provided in other documents and is subject to the limitations and qualifications presented in the referenced documents.

March 2021

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ACRONYMS AND ABBREVIATIONS

Alaniz	Alaniz Associates Corporation
AOC	Area of Concern
ARNG	Army National Guard
bgs	below ground surface
BMP	Best Management Practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIH	Certified Industrial Hygienist
CJAG	Camp James A. Garfield Joint Military Training Center
COC	Chemical of Concern
COPECs	Chemicals of Potential Ecological Concern
COR	Contracting Officer's Representative
CRM	Cultural Resources Manager
DFFO	Director's Final Findings and Orders
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
Endpoint	Endpoint Consulting, Inc.
ERA	Ecological Risk Assessment
F	Fahrenheit
ft	feet
FSA	Field Staging Area
FTL	Field Task Leader
FWCUG	Facility-Wide Cleanup Goal
FWSHP	Facility-Wide Safety and Health Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HHRA	Human Health Risk Assessment
IDW	Investigation-Derived Waste
ISM	Incremental Sampling Methodology
KO	Contracting Officer
LDC	Laboratory Data Consultants
LRL	Louisville District
mg/kg	milligrams per kilogram
mg/m^3	milligrams per cubic meter
MKM	MKM Engineers, Inc
mph	miles per hour
MRS	Munitions Response Site

ACRONYMS AND ABBREVIATIONS (CONTINUED)

NACA	National Advisory Committee on Aeronautics
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PID	Photoionization Detector
PP	Proposed Plan
QA	Quality Assurance
QC	Quality Control
RACR	Remedial Action Completion Report
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SAP	Sampling and Analysis Plan
SSHO	Site Safety and Health Officer
SSHP	Site Specific Safety and Health Plan
TCLP	Toxicity Characteristic Leaching Potential
USACE	United States Army Corps of Engineers
USACE LRL	United States Army Corps of Engineers Louisville District
USACHPPM	United States Army Center for Health Promotion and Preventative Medicine
U.S. Army	United States Department of the Army
USATHAMA	United States Army Toxic and Hazardous Materials Agency
USEPA	United States Environmental Protection Agency
VEG	Vapor Energy Generator

1.0 INTRODUCTION

The Alaniz Associates Corporation (Alaniz) and Endpoint Consulting, Inc. (Endpoint) Joint Venture (Alaniz-Endpoint Team) has been contracted by the United States Army Corps of Engineers, Louisville District (USACE LRL) to provide environmental remediation services within the RVAAP-38 National Advisory Committee on Aeronautics (NACA) Test Area of Concern (AOC) at the former Ravenna Army Ammunition Plant (RVAAP) located in Portage and Trumbull Counties, Ohio; the former RVAAP is now known as the Camp James A. Garfield Joint Military Training Center (CJAG). All work will be overseen by USACE and the Army National Guard (ARNG). This work is being performed in accordance with USACE LRL, Remediation Contract W912QR17C0045, issued on July 31, 2017 and amended on November 21, 2019. In addition, planning and performance of all work elements will be conducted in accordance with the requirements of the Ohio Environmental Protection Agency (Ohio EPA).

The RVAAP Restoration Program has identified several AOCs which require soil remediation for various contaminants, with polycyclic aromatic hydrocarbons (PAHs) being the predominant chemical of concern (COC) at several AOCs targeted for remediation using Endpoint's patented Vapor Energy Generator (VEG) Technology. An onsite pilot study performed by Endpoint at the Atlas Scrap Yard (RVAAP-50) site at CJAG (Former Camp Ravenna) demonstrated the efficiency and effectiveness of the VEG Technology for remediating PAH-contaminated soil to unrestricted reuse levels (Endpoint, 2015). With remediation of PAHs at a total of five AOCs covered under this contract, application of the VEG Technology is considered most feasible and cost-effective if the VEG remediation system is set up at the RVAAP-38 NACA Test Area AOC, with PAH-impacted soil from the NACA Test Area AOC (and four other AOCs) transported to this location for treatment. Following successful treatment, soil will be returned to each of the AOCs for use as backfill and site restoration. Independent Remedial Design (RD) or Non-Time-Critical Removal Action workplans are under preparation for each of the other AOCs to be remediated under this contract.

This RD describes the requirements to implement the recommended remedial actions at the NACA Test Area AOC, as documented in:

- *Final Phase II Remedial Investigation Report and Feasibility Study (RI/FS) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area (Leidos, 2018);*
- *Final Proposed Plan (PP) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area* (Leidos, 2019); *and*
- *Final Record of Decision (ROD) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area* (Leidos, 2019).

As identified in the above referenced documents, five PAH COCs (benzo[a]anthracene, benzo(a)pyrene, benzo[b]fluoranthene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene) had maximum concentrations requiring remediation. Four areas within this AOC require remediation. Specifically, Areas 1, 2, and 3, require excavation and onsite thermal treatment of PAHs in soils to levels below established cleanup goals using the VEG Technology. Soils treated by the VEG Technology and meeting cleanup goals will be returned to the excavation areas, providing unrestricted reuse of the land. COCs and their respective cleanup goals are discussed further in Section 3.2. The area of the Well Pit requires abandonment of the production

well and excavation of lead impacted soils for subsequent profiling and offsite disposal.

1.1 PURPOSE

As defined in the RI/FS and PP/ROD, surface soil, defined as soil within 0-1 foot below ground surface (bgs), in four distinct areas of the NACA Test Area AOC contain chemicals with concentrations above established cleanup goals and should be remediated to a level protective of human health. No COCs were found in sediment or surface water; thus, no remedial actions are required for those media. Based on the fate and transport evaluation, no contaminant migration COCs for soil or sediment were identified as impacting groundwater. Groundwater will be further evaluated under the RVAAP-66 Facility-wide Groundwater Monitoring Program.

The selected remedial alternative for soil at the NACA Test Area AOC, as recommended in PP/ROD, is Alternative 3: Ex Situ Thermal Treatment of Soil at Areas 1, 2, and 3 and Well Pit Removal – Attain Unrestricted (Residential) Land Use. The Well Pit Removal involves abandonment of the production well and removal and disposal of lead-contaminated soil from the Well Pit. To this end, this RD details requirements and procedures necessary to implement the selected remedial action alternative, including a plan for the excavation and thermal treatment of PAH-impacted soils exceeding residential regional screening levels (RSLs), and the removal and disposal of lead-contaminated soil, allowing for unrestricted (i.e., residential) reuse of the AOC.

This RD provides specific remedial actions that will reduce chemical contamination in surface soil at the NACA Test Area AOC. The remedial action objective (RAO) and established cleanup goals for the NACA Test Area are presented in Section 3.0. In summary, the RAO is to prevent resident receptor exposure to surface soil exceeding established RSLs. Once the RAO and RSLs are met following the implementation of this RD, soil will be considered protective for Unrestricted (residential) Land Use, which is inherently protective of potential planned future use of this AOC as Military Training Land Use or Commercial Industrial Land Use (Leidos, 2017).

Specific elements of the remedial actions described in this RD include:

- Excavating PAH contaminated surface soil exceeding RSLs within Areas 1, 2, and 3;
- Profiling, transportation, and offsite disposal of the estimated 0.15 cubic yards of lead impacted surface soil at an offsite permitted disposal facility;
- Abandonment of the production well;
- Thermal treatment of an estimated 840 cubic yards (in-situ) of PAH-impacted surface soils using the VEG Technology;
- Conducting confirmation sampling of excavation areas and treated soil to ensure that FWCUGs/RSLs have been met; and
- Restoring disturbed areas to their original elevation and site conditions.

The aforementioned remediation volume is based on the in-situ volume defined in the approved Final ROD

(Leidos, 2019). As previously mentioned, the ROD established the transition from historical FWCUGs for PAHs to the recently revised (June 2017) residential soil RSLs for PAHs. Benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and lead are COCs requiring remediation at this AOC. Excavation sidewall and bottom confirmation sampling proposed in this RD will determine the final volume of soil to be excavated at this AOC. Remediation volumes are further discussed in Sections 5.2.1 and 5.2.3.

Remedial activities will be overseen by USACE LRL and implemented by the Alaniz-Endpoint Team. The Alaniz-Endpoint Team (under contract with USACE LRL) is responsible for excavation, thermal treatment of PAH-impacted soils, confirmation sampling, profiling and disposal of the lead contaminated soil, production well abandonment, and restoring excavation sites to pre-remediation conditions using treated soils. Implementation of these activities will meet the requirements of this RD, Standard Operating Procedures specified in Appendix I (Sampling and Analysis Plan [SAP]) of the "Draft Remedial Design for Soil, Sediment, And Surface Water At RVAAP-42 Load Line 9", submitted to Ohio EPA in May 2020 (Endpoint, 2021), and the following documents:

- *Facility-Wide Safety and Health Plan for Environmental Investigations* (USACE 2011b); and
- *Site-Specific Health and Safety Plan* (to be prepared under separate cover)

1.2 FACILITY DESCRIPTION

The former RVAAP facility consists of 21,683 acres 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. It consists of a parcel approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide and is bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garrett, McCormick, and Berry roads to the west; the Norfolk Southern Railroad on the north; and State Route 534 on the east (see Figure 1-1). The former RVAAP facility was used as a load, assemble, and pack facility for munitions production.

As of September 2013, administrative control of the 21,683-acre facility has been transferred to the United States Property and Fiscal Officer for Ohio and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site (CJAG).

During the RVAAP operational years, prior to CJAG, the entire 21,683- acre property was a government-owned, contractor-operated industrial facility. The RVAAP Restoration Program encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP; therefore, references to the RVAAP in this document are considered to be inclusive of the historical extent of the former RVAAP and CJAG, unless otherwise specifically stated.

The Army National Guard (ARNG) is the lead agency for remediation, decisions, and applicable cleanup within the former RVAAP facility. The Ohio EPA is the supporting state regulatory agency. The USACE-LRL is the contracting agency hired by the ARNG and OHARNG and is responsible for implementation

and technical oversight of remedial activities. It is important to note that the RVAAP Restoration Program is bound to the Director's Final Findings and Orders (DFFO) issued June 10, 2004 by the Ohio EPA pursuant to the authority vested under Chapters 3734, 3745, and 6111 of the Ohio Revised Code. The objective of the DFFO is to ensure that the public health, safety, and welfare, as well as the environment, are protected from the disposal, discharge, or release of contaminants.

1.3 SITE BACKGROUND

NACA Test Area is located west of Greenleaf Road at the southern end of Demolition Road in the southwestern portion of CJAG (Figure 1-2). The AOC is approximately 47 acres and its boundary encompasses all known or suspected former operations areas but excludes Open Demolition Area #1, which is being evaluated as a separate AOC designated as RVAAP-03.

This AOC was designed and used by NACA from 1947–1953. The site was used to conduct experimental crash tests of excess military aircraft in order to develop explosion-proof fuel tanks and fuel for aircraft. Excess airplanes were flown to the former RVAAP under their own power, taxied along installation roads, and staged at NACA Test Area. Seventeen excess aircraft were used during NACA Test Area operations. The planes were fueled and then propelled under their own power on a guide monorail. The planes were crashed into a concrete barrier at speeds from 80–105 miles per hour. During the tests, high-speed films were made to study fuel spillage, generation of ignition sources, flame front progression, and toxic gas generation, among other parameters. Combustible liquids involved in testing activities included 100/130 octane aviation fuels, low-volatility fuel, flame retardants, lubricating oil, coolant compounds, hydraulic fluids, alcohol, and brake fluid. Some aircraft were completely consumed by fire. Aircraft that were significantly damaged during testing were stripped of instrumentation and salvageable parts, and all aircraft were removed from the site (see Figure 1-3). Today, the site is an active military training area.

The NACA Test Area has been included in various assessments and investigations including:

- Phase I RI Report at RVAAP-38 NACA Test Area (SAIC, 2001);
- Characterization of 14 AOCs (MKM Engineers, Inc. [MKM], 2007a); and
- Final Phase II Remedial Investigation Report and Feasibility Study (RI/FS) for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area (Leidos, 2018).

Sampling results from the 2018 Phase II RI/FS were combined with applicable results of previous sampling events to evaluate the nature and extent of contamination, examine contaminant fate and transport, conduct risk assessments, and evaluate potential remedial alternatives. A human health risk assessment (HHRA) and ecological risk assessment (ERA) were conducted to document COCs that may pose potential risks to human health and the environment resulting from exposure to contamination within the AOC. The HHRA identified COCs based on the exceedances of Resident Receptor FWCUG, developed in the *Facility-Wide Human Health Cleanup Goals Report* (USACE, 2010), at a target risk level (TRL) of 1E-05 and hazard quotient (HQ) of 1.

Based on the Revised Phase II Remedial Investigation Report and Feasibility Study (RI/FS) for this AOC

(Leidos, 2018), four areas of excavation have been delineated, referred to as Areas 1, 2, and 3, and the Well Pit (see Figure 1-4). Specifically, Area 1 encompasses an excavation extending 1 foot deep and spanning 8,590 square feet, Area 2 encompasses an excavation extending 1 foot deep and spanning 4,130 square feet, and Area 3 encompasses an excavation extending 1 foot deep and spanning 10,000 square feet. Combined, these excavations correspond to an approximate in-situ volume of 840 cubic yards (1,100 cubic yards ex-situ) of PAH-impacted soils warranting remediation relative to the June 2017 residential RSLs (Leidos, 2019). The Well Pit contains an estimated 0.15 cubic yards of lead-impacted soils requiring removal based on past investigation efforts (see Figure 1-4). Specific PAHs and metals included as COCs at this AOC are summarized in Table 3-1.

NACA Test Area is approximately 47 acres and includes approximately 1 acre of Wetland/Pond North of Former Crash Area. The habitat is mostly field, shrubland, and forest and is large enough to completely support cover and food for small birds and mammals that typically require approximately 1 acre of habitat (USEPA 1993). The habitat area at NACA Test Area represents 0.22% of the 21,683 acres at CJAG.

A Level II ecological assessment was conducted (Leidos, 2018). The Level II assessment evaluated soil, sediment, and surface water using historical and PBA08 RI data, identified integrated chemicals of primary ecological concern (COPECs), and evaluated the integrated COPECs using evaluation and refinement factor. The evaluation of these factors showed there is no further evaluation necessary for integrated COPECs, and there is no ecological chemical of potential concern (COPC) requiring remediation. Consequently, the ERA for NACA Test Area concluded with a Level II ERA that no further action is necessary to be protective of important ecological resources (Leidos, 2018).

In the RI/FS, lead and five PAHs in surface soil were initially compared to screening levels based on the Resident Receptor FWCUGs documented in the *Facility-Wide Human Health Cleanup Goals Report* (USACE, 2010) and the 2017 US Environmental Protection Agency (USEPA) residential soil RSLs. To support the remedial alternative selection process for soil remediation, these FWCUGs/RSLs were adopted as the numerical remedial action cleanup goals in the PP and ROD for the NACA Test Area AOC. FWCUG/RSL concentrations for COCs at this AOC are presented in Section 3.2.

1.4 COMMUNITY INVOLVEMENT AND REGULATORY APPROVAL

In accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 1179(a) and the National Oil and Hazardous Substance Pollution Contingency Plan Section 300.130(f)(2), the *Final Proposed Plan for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area* (Leidos, 2019) was released to the public on July 29, 2019, with documents made available in the Administrative Record maintained at CJAG and in the Information Repositories at Reed Memorial Library in Ravenna, Ohio, and at Newton Falls Public Library in Newton Falls, Ohio (Leidos, 2019). Notices of the availability of the Proposed Plan were sent to local radio stations, newspapers and television stations. A 30-day public comment period was held from July 29, 2019 to August 27, 2019 and a public meeting was held on August 15, 2019, to present the Proposed Plan, answer questions, and allow the public to provide comments for consideration. The Army considered input from the public meeting when selecting the remedy for this AOC (Leidos, 2019).

FORMER RAVENNA ARMY
AMMUNITION PLANT / CAMP JAMES A. GARFIELD

LEGEND:

- ASPHALT ROAD
- RAILROAD TRACKS
- FENCE LINE
- STREAMS

US Army Corps of Engineers Louisville District

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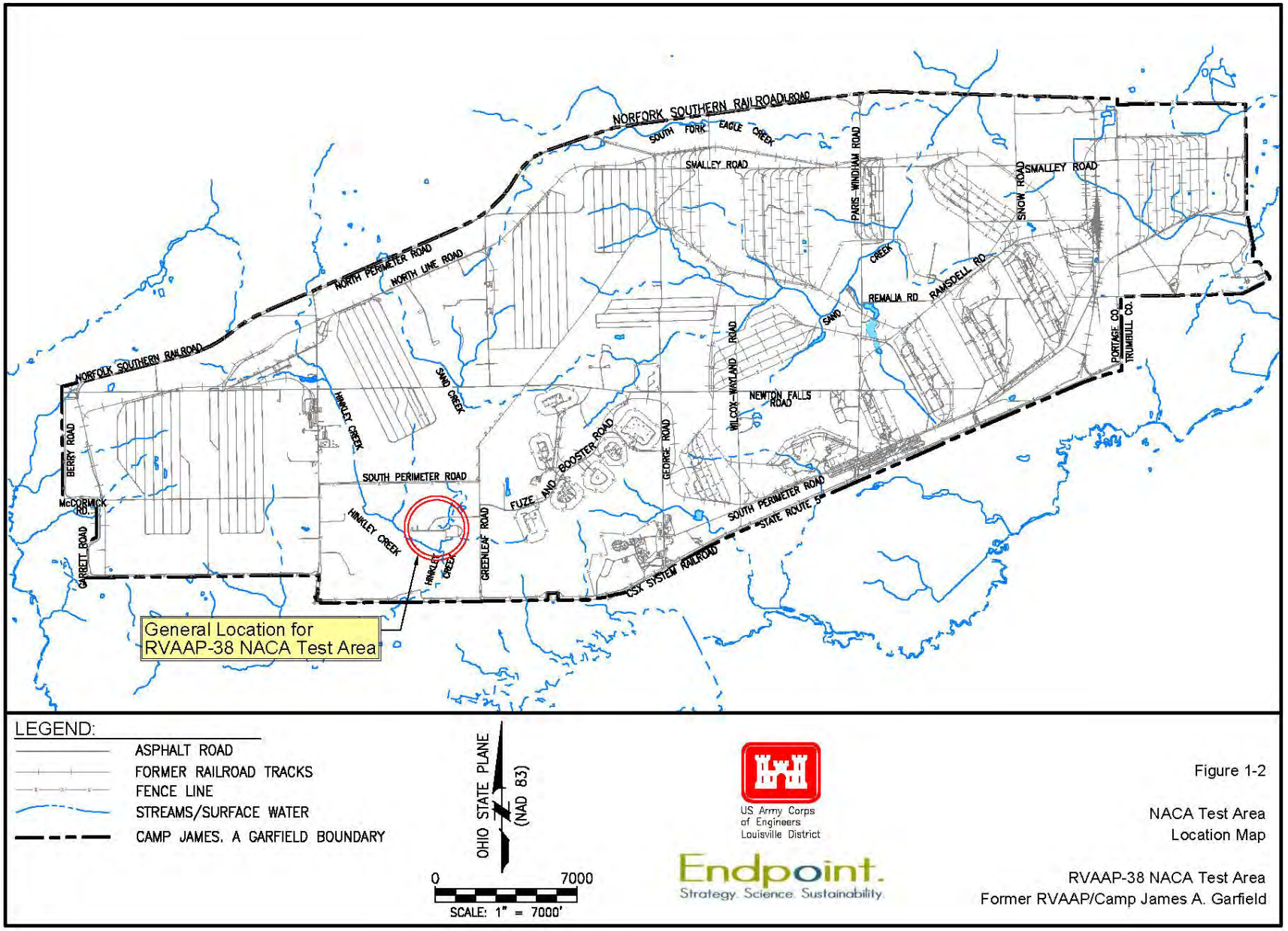
Figure 1-1

Facility Location Map

RVAAP-38 NACA Test Area
Former RVAAP/Camp James A. Garfield

Basemap Source: Leidos, 2017. Final Proposed Plan for Soil, Sediment and Surface Water at RVAAP-42 Load Line 9. Drawn by P. Holm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SOUTH FORK EAGLE CREEK
SWALLEY ROAD
PARIS-WINDHAM ROAD
SNOW ROAD
SMALLEY ROAD
NORTH PERIMETER ROAD
NORTH LINE ROAD
SAND CREEK
REMALIA RD
RAWSDELL RD
PORTAGE CO.
TRUMBULL CO.
WILCOX-WAYLAND ROAD
NEWTON FALLS ROAD
BERRY ROAD
HINKLEY CREEK
SOUTH PERIMETER ROAD
BOOSTER ROAD
GEORGE ROAD
FUZE AND
McCORMICK RD.
GARRETT ROAD
GREENLEAF ROAD
STATE ROUTE 5
CSX SYSTEM RAILROAD
General Location for
RVAAP-38 NACA Test Area
LEGEND:
ASPHALT ROAD
FORMER RAILROAD TRACKS
FENCE LINE
STREAMS/SURFACE WATER
CAMP JAMES, A GARFIELD BOUNDARY
OHIO STATE PLANE
(NAD 83)
0
7000
SCALE: 1" = 7000'
US Army Corps
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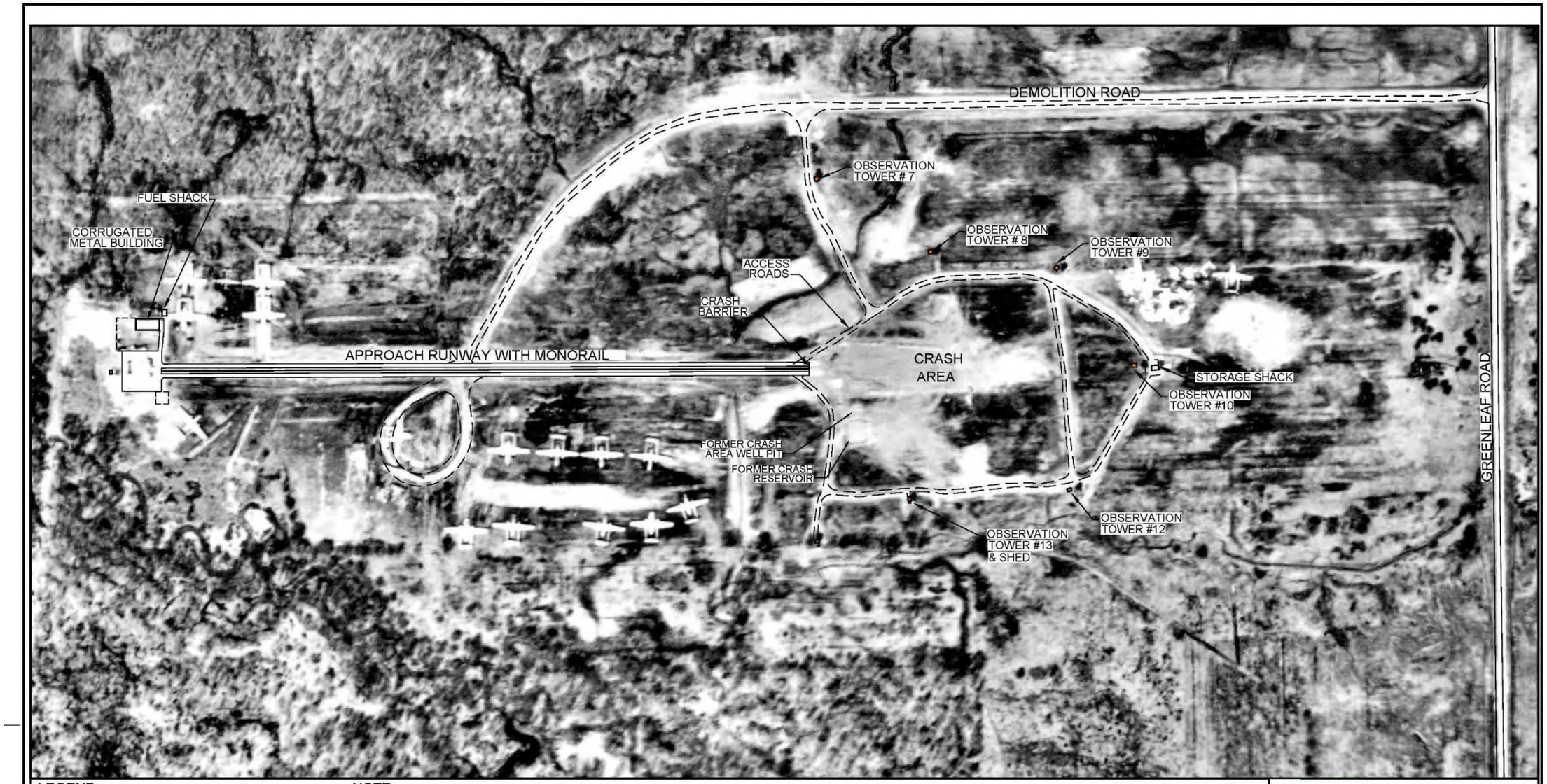
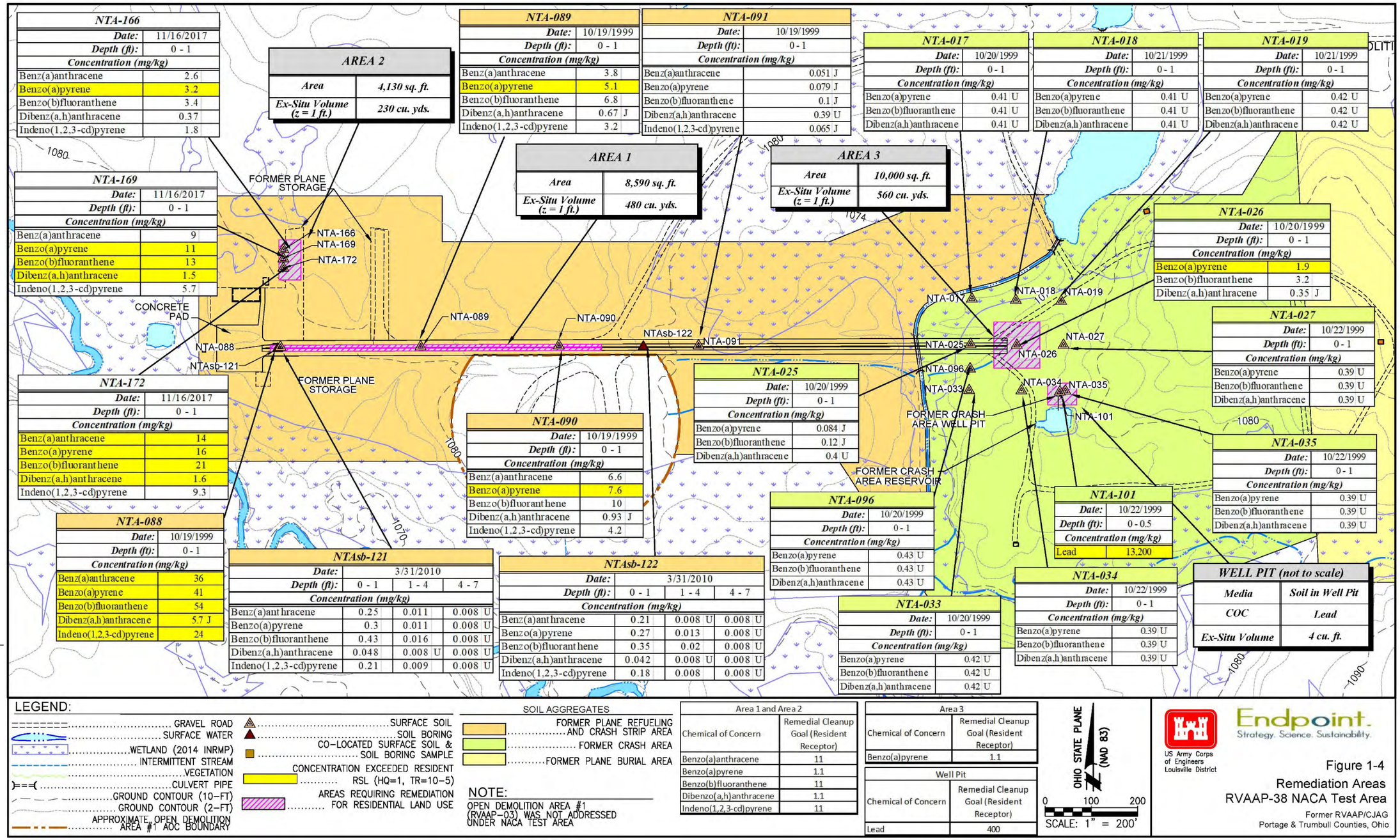
Figure 1-2
NACA Test Area
Location Map
RVAAP-38 NACA Test Area
Former RVAAP/Camp James A. Garfield

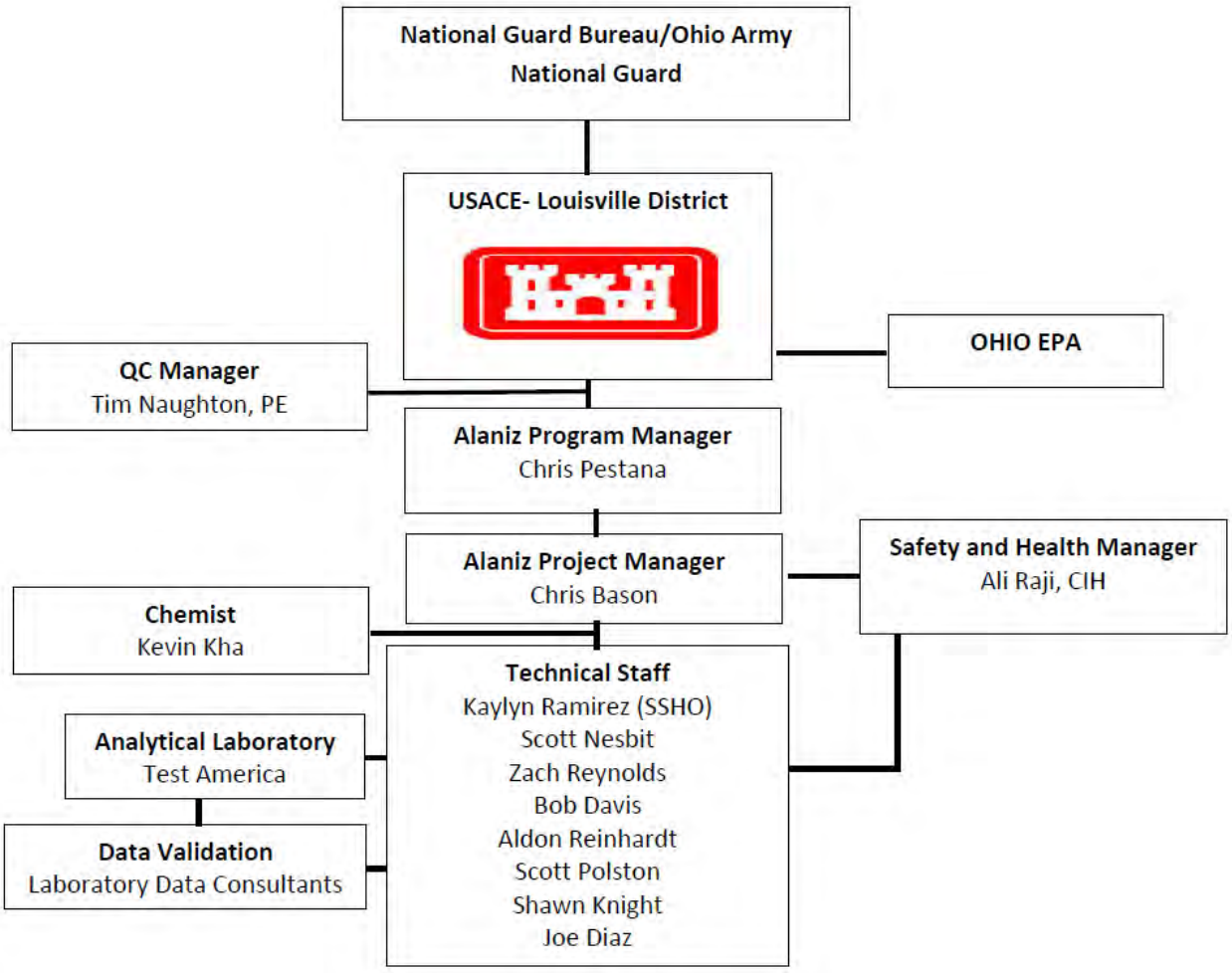


Basemap Source: Leidos, 2019. Proposed Plan for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area


NTA-166
Date: 11/16/2017
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 2.6
Benzo(a)pyrene 3.2
Benzo(b)fluoranthene 3.4
Dibenz(a,h)anthracene 0.37
Indeno(1,2,3-cd)pyrene 1.8
NTA-169
Date: 11/16/2017
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 9
Benzo(a)pyrene 11
Benzo(b)fluoranthene 13
Dibenz(a,h)anthracene 1.5
Indeno(1,2,3-cd)pyrene 5.7
NTA-172
Date: 11/16/2017
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 14
Benzo(a)pyrene 16
Benzo(b)fluoranthene 21
Dibenz(a,h)anthracene 1.6
Indeno(1,2,3-cd)pyrene 9.3
NTA-088
Date: 10/19/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 36
Benzo(a)pyrene 41
Benzo(b)fluoranthene 54
Dibenz(a,h)anthracene 5.7 J
Indeno(1,2,3-cd)pyrene 24
AREA 2
Area 4,130 sq. ft.
Ex-Situ Volume (z = 1 ft.) 230 cu. yds.
AREA 1
Area 8,590 sq. ft.
Ex-Situ Volume (z = 1 ft.) 480 cu. yds.
AREA 3
Area 10,000 sq. ft.
Ex-Situ Volume (z = 1 ft.) 560 cu. yds.
NTA-089
Date: 10/19/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 3.8
Benzo(a)pyrene 5.1
Benzo(b)fluoranthene 6.8
Dibenz(a,h)anthracene 0.67 J
Indeno(1,2,3-cd)pyrene 3.2
NTA-091
Date: 10/19/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 0.051 J
Benzo(a)pyrene 0.079 J
Benzo(b)fluoranthene 0.1 J
Dibenz(a,h)anthracene 0.39 U
Indeno(1,2,3-cd)pyrene 0.065 J
NTA-017
Date: 10/20/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.41 U
Benzo(b)fluoranthene 0.41 U
Dibenz(a,h)anthracene 0.41 U
NTA-018
Date: 10/21/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.41 U
Benzo(b)fluoranthene 0.41 U
Dibenz(a,h)anthracene 0.41 U
NTA-019
Date: 10/21/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.42 U
Benzo(b)fluoranthene 0.42 U
Dibenz(a,h)anthracene 0.42 U
NTA-026
Date: 10/20/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 1.9
Benzo(b)fluoranthene 3.2
Dibenz(a,h)anthracene 0.35 J
NTA-027
Date: 10/22/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.39 U
Benzo(b)fluoranthene 0.39 U
Dibenz(a,h)anthracene 0.39 U
NTA-025
Date: 10/20/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.084 J
Benzo(b)fluoranthene 0.12 J
Dibenz(a,h)anthracene 0.4 U
NTA-090
Date: 10/19/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benz(a)anthracene 6.6
Benzo(a)pyrene 7.6
Benzo(b)fluoranthene 10
Dibenz(a,h)anthracene 0.93 J
Indeno(1,2,3-cd)pyrene 4.2
NTA-096
Date: 10/20/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.43 U
Benzo(b)fluoranthene 0.43 U
Dibenz(a,h)anthracene 0.43 U
NTA-101
Date: 10/22/1999
Depth (ft): 0 - 0.5
Concentration (mg/kg)
Lead 13,200
NTA-035
Date: 10/22/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.39 U
Benzo(b)fluoranthene 0.39 U
Dibenz(a,h)anthracene 0.39 U
NTA-034
Date: 10/22/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.39 U
Benzo(b)fluoranthene 0.39 U
Dibenz(a,h)anthracene 0.39 U
NTA-033
Date: 10/20/1999
Depth (ft): 0 - 1
Concentration (mg/kg)
Benzo(a)pyrene 0.42 U
Benzo(b)fluoranthene 0.42 U
Dibenz(a,h)anthracene 0.42 U
NTAsb-121
Date: 3/31/2010
Depth (ft): 0 - 1 | 1 - 4 | 4 - 7
Concentration (mg/kg)
Benz(a)anthracene 0.25 | 0.011 | 0.008 U
Benzo(a)pyrene 0.3 | 0.011 | 0.008 U
Benzo(b)fluoranthene 0.43 | 0.016 | 0.008 U
Dibenz(a,h)anthracene 0.048 | 0.008 U | 0.008 U
Indeno(1,2,3-cd)pyrene 0.21 | 0.009 | 0.008 U
NTAsb-122
Date: 3/31/2010
Depth (ft): 0 - 1 | 1 - 4 | 4 - 7
Concentration (mg/kg)
Benz(a)anthracene 0.21 | 0.008 U | 0.008 U
Benzo(a)pyrene 0.27 | 0.013 | 0.008 U
Benzo(b)fluoranthene 0.35 | 0.02 | 0.008 U
Dibenz(a,h)anthracene 0.042 | 0.008 U | 0.008 U
Indeno(1,2,3-cd)pyrene 0.18 | 0.008 | 0.008 U
WELL PIT (not to scale)
Media Soil in Well Pit
COC Lead
Ex-Situ Volume 4 cu. ft.
FORMER PLANE STORAGE
CONCRETE PAD
FORMER PLANE STORAGE
FORMER CRASH AREA WELL PIT
FORMER CRASH AREA RESERVOIR
NTA-166
NTA-169
NTA-172
NTA-088
NTA-089
NTA-090
NTAsb-122
NTA-091
NTAsb-121
NTA-017
NTA-018
NTA-019
NTA-025
NTA-026
NTA-027
NTA-096
NTA-033
NTA-034
NTA-035
NTA-101
1080
1070
1074
1090
LEGEND:
GRAVEL ROAD
SURFACE WATER
WETLAND (2014 INRMP)
INTERMITTENT STREAM
VEGETATION
CULVERT PIPE
GROUND CONTOUR (10-FT)
GROUND CONTOUR (2-FT)
APPROXIMATE OPEN DEMOLITION AREA #1 AOC BOUNDARY
SURFACE SOIL
SOIL BORING
CO-LOCATED SURFACE SOIL & SOIL BORING SAMPLE
CONCENTRATION EXCEEDED RESIDENT RSL (HQ=1, TR=10-5)
AREAS REQUIRING REMEDIATION FOR RESIDENTIAL LAND USE
SOIL AGGREGATES
FORMER PLANE REFUELING AND CRASH STRIP AREA
FORMER CRASH AREA
FORMER PLANE BURIAL AREA
NOTE:
OPEN DEMOLITION AREA #1 (RVAAP-03) WAS NOT ADDRESSED UNDER NACA TEST AREA
Area 1 and Area 2
Chemical of Concern | Remedial Cleanup Goal (Resident Receptor)
Benzo(a)anthracene 11
Benzo(a)pyrene 1.1
Benzo(b)fluoranthene 11
Dibenzo(a,h)anthracene 1.1
Indeno(1,2,3-cd)pyrene 11
Area 3
Chemical of Concern | Remedial Cleanup Goal (Resident Receptor)
Benzo(a)pyrene 1.1
Well Pit
Chemical of Concern | Remedial Cleanup Goal (Resident Receptor)
Lead 400
OHIO STATE PLANE (NAD 83)
0 100 200
SCALE: 1" = 200'
US Army Corps of Engineers Louisville District
Endpoint. Strategy. Science. Sustainability.
Figure 1-4
Remediation Areas
RVAAP-38 NACA Test Area
Former RVAAP/CJAG
Portage & Trumbull Counties, Ohio

2.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

This section presents the project management structure and key personnel responsibilities that will be used to implement the activities covered in this RD. ARNG is the lead agency for remediation, decisions, and applicable cleanup within the former RVAAP facility. The Ohio EPA is the supporting state regulatory agency. The USACE-LRL is the contracting agency hired by the ARNG and OHARNG and is responsible for implementation and technical oversight of remedial activities. The Alaniz-Endpoint Team is the primary contractor responsible for implementing this RD. The organizational structure and key personnel for this project is summarized below.



2.1 USACE CONTRACTING OFFICER/CONTRACTING OFFICER'S REPRESENTATIVE

Mr. Aaron Sanford will serve as the Contracting Officer (KO). The KO will ensure performance of all necessary actions for effective contracting, ensure compliance with the contract terms, and will safeguard the interests of the United States in the contractual relationship. The KO is ultimately responsible for the final determination of the adequacy of the contractor's performance.

Dr. Nathaniel Peters II will serve as the Contracting Officer's Representative (COR). The COR is responsible for technical administration of the contract and will assure proper Government surveillance of the contractor's performance.

2.2 USACE PROJECT MANAGER

Mr. Steve Kvaal will serve as the project manager for USACE LRL and will coordinate and communicate with ARNG and OHARNG.

2.3 OHIO ENVIRONMENTAL PROTECTION AGENCY

The Ohio EPA is the regulatory agency for this project and will review project documents and ensure that the RD and remedial action are completed in accordance with RD and regulatory requirements.

2.4 CONTRACTOR PROGRAM MANAGER

Mr. Chris Pestana will serve as Program Manager for the Alaniz-Endpoint Team. He will ensure the Alaniz-Endpoint Team has access to necessary corporate resources that will exceed the quality objectives for this contract. As Program Manager, Mr. Pestana will be responsible for the overall management of the contract including cost and schedule.

2.5 CONTRACTOR PROJECT MANAGER

Mr. Chris Bason will serve as the Project Manager. Mr. Bason will be executing tasks to meet scope, schedule and budget constraints, working closely with Mr. Pestana and the quality assurance (QA) manager, Mr. Tim Naughton.

2.6 CONTRACTOR QUALITY ASSURANCE MANAGER

Mr. Tim Naughton, PE, will serve as Quality Assurance Manager for the Alaniz-Endpoint Team. In this capacity, Mr. Naughton is responsible for the overall technical quality of the contract work, and will also serve as the main point-of-contact for program coordination with USACE LRL and stakeholders, including supporting USACE LRL as Regulatory Specialist and liaison as deemed necessary by USACE LRL. Mr. Naughton will be supported by Endpoint Project Engineer, Kaylyn Ramirez, EIT.

2.7 FIELD TASK LEADER

Mr. Zach Reynolds will serve as the Field Task Leader (FTL), responsible for performing and/or overseeing soil sampling defined in the SAP (Endpoint, 2021). He has over 10 years of experience in performing soil sampling, including serving the same role on over 10 other USACE projects involving sampling in support of implementing the VEG Technology.

2.8 SITE SAFETY AND HEALTH OFFICER

Ms. Kaylyn Ramirez will serve as the Site Safety and Health Officer (SSHO), ensuring preparation and implementation, on a daily basis, of protocols and procedures in the site-specific Safety and Health Plan (SSHP) prepared as an addendum to the Facility Wide Safety and Health Plan (FWSHP) and implementation of related procedures on a daily basis during field activities. Ms. Ramirez is formally trained as an SSHO, serving the same role on other USACE contracts involving the use of the VEG Technology. She holds a certificate for 40-hour training under USACE's EM 385.1.1 program, in addition to 40-hr and related 8-hr refresher certificates for the Occupational Safety and Health Administration (OSHA) hazardous waste operator (Hazardous Waste Operations and Emergency Response [HAZWOPER]) program.

2.9 CORPORATE SAFETY OFFICER/CERTIFIED INDUSTRIAL HYGIENIST (CIH)

Mr. Ali Raji, CIH, of Endpoint will serve as the corporate safety officer for the Alaniz-Endpoint Team and will ensure the work performed is planned appropriately and executed in a safe manner. Mr. Raji has previously served in that capacity on several USACE contracts performed by Endpoint. Mr. Raji will also serve as risk assessor on the project.

2.10 DATA VALIDATION CHEMIST

Serving as the Data Validation Chemist, Kevin Kha will ensure data reported by the laboratory is usable for its intended purpose. In this capacity, Mr. Kha and Laboratory Data Consultants (LDC) will work closely with the Department of Defense- and National Environmental Laboratory Accreditation Program certified Eurofins/Test America Laboratories in Savanah, Georgia, to be used throughout the remediation process. Mr. Kha and LDC have served in this capacity on numerous USACE projects, including several projects involving soil remediation using the VEG Technology for USACE.

3.0 REMEDIAL ACTION OBJECTIVES AND CLEANUP GOALS

This section describes the RAO and cleanup goals for the selected remedial action. The RAO specifies requirements to be achieved by the remedial action in order to protect human health and the environment under current and reasonably anticipated future land use scenarios. Correspondingly, cleanup goals are the numerical concentrations required to achieve the RAO for each COC.

3.1 REMEDIAL ACTION OBJECTIVE

The RAO for the NACA Test Area AOC is to prevent Resident Receptor (adult and child) exposure to surface soil with concentrations above the residential soil RSLs for PAHs, specifically benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene at Areas 1 & 2 at sample locations NTA-088/089/090 and NTA-166/169/172, respectively, benzo(a)pyrene at Area 3 at sample location NTA-026, lead at the Well Pit sample location NTA-101, and abandonment of the production well.

As previously indicated, the selected remedial action for the NACA Test Area, as defined in the Final PP and ROD for this AOC, is Alternative 3: Ex-situ Thermal Treatment of Soil at Areas 1, 2, and 3 and Well Pit Removal – Attain Unrestricted (Residential) Land Use.

No remedial actions are required for sediment or surface water. Groundwater will be further evaluated under the RVAAP-66 Facility-wide Groundwater Monitoring Program.

3.2 REMEDIAL ACTION CLEANUP GOALS

The numerical criteria to be used for decision-making relative the COC established in the PP and ROD will correspond to the residential soil RSL for PAHs based on the USEPA's June 2017 RSL, with a target risk level of $1x10^{-5}$ and a hazard quotient of 1.0, and the FWCUGs for lead (USACE, 2010). Table 3-1 summarizes the RSL to be used as the cleanup goal for the relevant COCs at this AOC, further incorporating remediation depths, locations and volumes. As previously indicated, no COCs were identified in subsurface soil, sediment, or surface water for the resident receptor, thereby focusing remediation activities on surface soils (0 to 1-foot bgs) (Leidos, 2019).

It should be noted that despite the change in the USEPA's residential soil RSLs for PAHs between the RI/FS and PP/ROD phases, the anticipated volume of PAH-impacted soil requiring remediation at this AOC did not change, as the PAH concentrations remain elevated relative to both its historical FWCUG and the updated RSL at the sample locations within the NACA Test Area (see Figure 1-4). Estimated remediation volumes are discussed in Sections 5.2.1 and 5.2.3.

Table 3-1. Summary of Soil COCs, Cleanup Goals, and Remediation Volumes

Area	Chemical of Concern	Residential RSL (1x10-5 TRL, HQ=1.0) (mg/kg)	Depth (ft bgs)	Location	Excavated Disturbed Area (sq ft)	Volume (ex-situ) (cubic yards)
Area 1	benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene	11 1.1 11 1.1 and 11	0-1	NTA-088/089/090	8,590	480
Area 2	benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene,	11 1.1 11 and 1.1	0-1	NTA-166/169/172	4,130	230
Area 3	Benzo(a)pyrene	1.1	0-1	NTA-026	10,000	560
Well Pit	Lead	400	0-1	NTA-101	14.44	.15

ft bgs: feet below ground surface
mg/kg: milligram per kilogram
sq ft: square feet
HQ: Hazard Quotient
RSL: USEPA Residential Soil Regional Screening Level (June 2017)
TRL: Target Risk Level

4.0 CONSTRUCTION MOBILIZATION

This section describes site preparation and general construction activities required to implement this RD.

4.1 SITE PREPARATION

Site preparation activities consist of several elements designed to streamline workflow and prevent migration of contaminated soil during construction, including:

- Utility Clearance;
- Site Access and Site Control; and
- Vegetation and Debris Site Clearing.

Given that the implementation of remedial activities at the CJAG are being performed under the CERCLA process, no air discharge permits will be necessary from county-level jurisdiction. All work will be performed in compliance with current Ohio state air quality rules and regulations.

4.1.1 Utility Clearance

Prior to initiating excavation activities, the Alaniz-Endpoint Team will notify the CJAG Department of Public Works and Utilities to allow sufficient time for OHARNG concurrence of the absence of known utilities in the excavation areas. In addition, utility clearance will be performed by a private utility contractor to ensure no utilities exist within the footprint of the excavation areas. All field activities, including excavation activities, will be supported by a SSHP incorporating activity hazard analyses, to be prepared under separate cover.

In the event an unmarked utility is discovered during remedial activities, all work will stop immediately and the ARNG/OHARNG Representative, USACE COR, and the Alaniz-Endpoint Team Project Manager will be notified. The aforementioned parties will discuss and develop any required actions. Remedial activities will not resume until approval by the ARNG/OHARNG has been granted.

4.1.2 Site Access and Site Control

Facility Access and Control

All personnel and vehicles will enter CJAG through the main entrance at 8451 State Route 5, Ravenna, OH 44266. Entering personnel and vehicles are subject to search and inspection. Access rosters for all personnel entering the site will be submitted to the CJAG Environmental Office 48 hours in advance of scheduled field work for appropriate coordination with the CJAG Range Operations. Sample Contractor Access Request Forms are provided in Attachment A. All personnel with prior approval to enter CJAG must provide a government-issued identification (e.g., driver's license, passport) upon entering.

All field activities will be coordinated with CJAG Range Control on a daily basis (i.e., notification at the start and end of the workday, planned work locations and number of field personnel). Site work hours will

be from 0730-1630 on weekdays. Work occurring on holidays or weekends must receive prior approval.

All Alaniz-Endpoint Team personnel will comply with all Ohio and CJAG traffic rules, including not exceeding the posted speed limit of 35 miles per hour (mph) during daylight hours and 25 mph at night while on CJAG main roads, except for the area near the CJAG Main Gate and training areas where they will observe a of 20 mph limit. Project access roads will have a speed limit of 10 mph. At no time will the CJAG main roads be blocked by Alaniz-Endpoint Team personnel during remediation activities. Prior to initiating any activity that will obstruct traffic flow of CJAG main roads, approval will be obtained from CJAG Range Control, the ARNG/OHARNG Representative, and the Alaniz-Endpoint Team Project Manager.

Site Access

The NACA Test Area project site will be accessed from the unpaved Demolition Road connected to Greenleaf Road, as shown on Figure 4-1. The Alaniz-Endpoint Team will maintain hauling roads (keep free of excess mud/debris) to allow hauling trucks and heavy equipment to travel safely and efficiently.

All workers, supervisors, and site visitors must provide appropriate training records, as specified in the SSHP (to be submitted under separate cover), before entering the site. HAZWOPER certificates for all on site personnel will be provided to the ARNG and OHARNG representatives. Prior to entering the work area, site visitors/workers must receive a site-specific health and safety training from the SSHO.

Site Control

Prior to the start of work, the excavation boundaries within the AOC will be surveyed by a licensed surveyor and marked with white paint and flags, based on approximate excavation dimensions shown on Figure 1-4 and benchmarks (i.e., coordinates) used for historical sampling. Additional mobilization activities to be implemented include:

- Installation of temporary fencing to secure the excavation areas and temporary equipment/materials storage locations, site access/egress points, signs, barricades and warning tape for prohibited areas. The excavations will be fenced during off hours to ensure that all work areas remain safe and secure;
- Mobilization of equipment trailers, equipment/materials storage area, and connection to temporary utilities;
- Establishing equipment/personnel decontamination areas and work zones. Further detail regarding decontamination procedures is discussed in Section 5.4;
- Setup of equipment storage areas; and
- Mobilization of sanitary facilities for site workers and visitors.

Anticipated locations and boundaries for the above-referenced items are displayed on the Design Drawings included as Attachment B.

4.1.3 Vegetation and Debris Site Clearing

Herein, above-ground vegetation and debris refer to vegetation (i.e., trees, bushes, etc.) and debris or solid waste (i.e., large rocks, brick, concrete, metal debris, etc.) that have not been in contact with contaminated soil. Following coordination with the OHARNG and USACE LRL, the excavation areas will be surveyed to determine whether surrounding areas will require clearing of trees, bushes, other large vegetation and potential above-ground debris, to facilitate equipment access and surface soil removal activities. In addition, vegetation along Demolition Road (Figure 1-4) may require trimming to allow sufficient space for large haul trucks/equipment to travel along the access roads within this AOC. Any required vegetation clearing involving trees or branches with a 3-inch diameter will be removed between October 1st and March 31st. A vegetation removal plan will be submitted under separate cover to detail all vegetation clearing activities to be performed within all AOCs to be remediated under this contract. Vegetation clearing will be performed by the Alaniz-Endpoint Team prior to March 31, 2021.

The extent of anticipated vegetation clearing is provided on the Drawings in Attachment B. A power rake attached to a loader will be used to strip open areas covered in grass/weeds. A chainsaw and/or bush hog will be used to clear larger brush and trees. No removal of debris or solid waste is anticipated at this AOC; however, in the event that large debris or solid waste is discovered and requires disposal, 55-gallon drums or a roll-off bin will be utilized to temporarily store the waste prior to disposal. Prior to clearing vegetation, the approximate extent of the excavation areas will be marked in the field to determine the extent of vegetation clearing required. Above-ground vegetation that is removed from the AOC will be chipped/mulched onsite by the Alaniz-Endpoint team. The mulch will be temporarily stockpiled at the AOC and evenly spread across the site. Any removed vegetation that has been in contact with or is comingled with impacted soil (i.e., tree stumps or roots) shall be separated from above-ground vegetation and disposed or thermally treated.

4.2 STORMWATER POLLUTION PREVENTION

Planned excavations at the NACA Test Area AOC are being performed under the DFFO. The total area of construction, including staging, for the four excavation areas (Area 1, Area 2, Area 3, and lead contaminated soil) at the NACA Test Area AOC is approximately 0.7 acres. There are no other excavations or soil disturbances planned within ½ mile of this AOC under the DFFO. The total project area is below the 1-acre threshold requiring coverage with Ohio EPA Permit No. OHC000005 or the procurement of an individual National Pollutant Discharge Elimination System Permit for stormwater discharges. However, the project will be performed in accordance with the requirements for a Storm Water Pollution Prevention Plan per Ohio EPA Permit No. OHC000005, including the implementation of best management practices (BMPs) that are the minimum criteria for the overall control of soil and sediment erosion and storm water runoff during construction activities.

Erosion and sediment controls will be installed before beginning activities that have the potential to disturb soil and cause erosion and will be maintained for the duration of the excavation and restoration activities. These control features will be removed only after vegetation is established and disturbed areas are

stabilized. Erosion and the transportation of sediment from storm water upgradient of each excavation will be controlled using silt fencing

BMPs to be used during the remedial activities at the NACA Test Area are discussed in Section 5.3. Inspection of the stormwater, BMPs, and erosion and sedimentation controls will be conducted in accordance with Section 9.4.2 and documented on the Stormwater Control Inspection Form (see Attachment A).

To further minimize the potential for erosion and sediment run-off, work will be limited during periods of severe weather, as determined by the Alaniz-Endpoint Team Project Manager.

The treatment of PAH contaminated soil will be conducted at the NACA site. The stockpile area for temporary storage of the contaminated soil and treated soil is approximately 15,000 square feet and the staging area is approximately 5,000 square feet. The excavation area for Area 1, 2, 3, and the well pit are approximately 8,590, 4,130, 10,000 and 14 square feet, respectively, with a total combined remedial area of approximately 22,734 square feet. Transportation of lead contaminated soil will utilize existing roads and will not disturb additional areas.

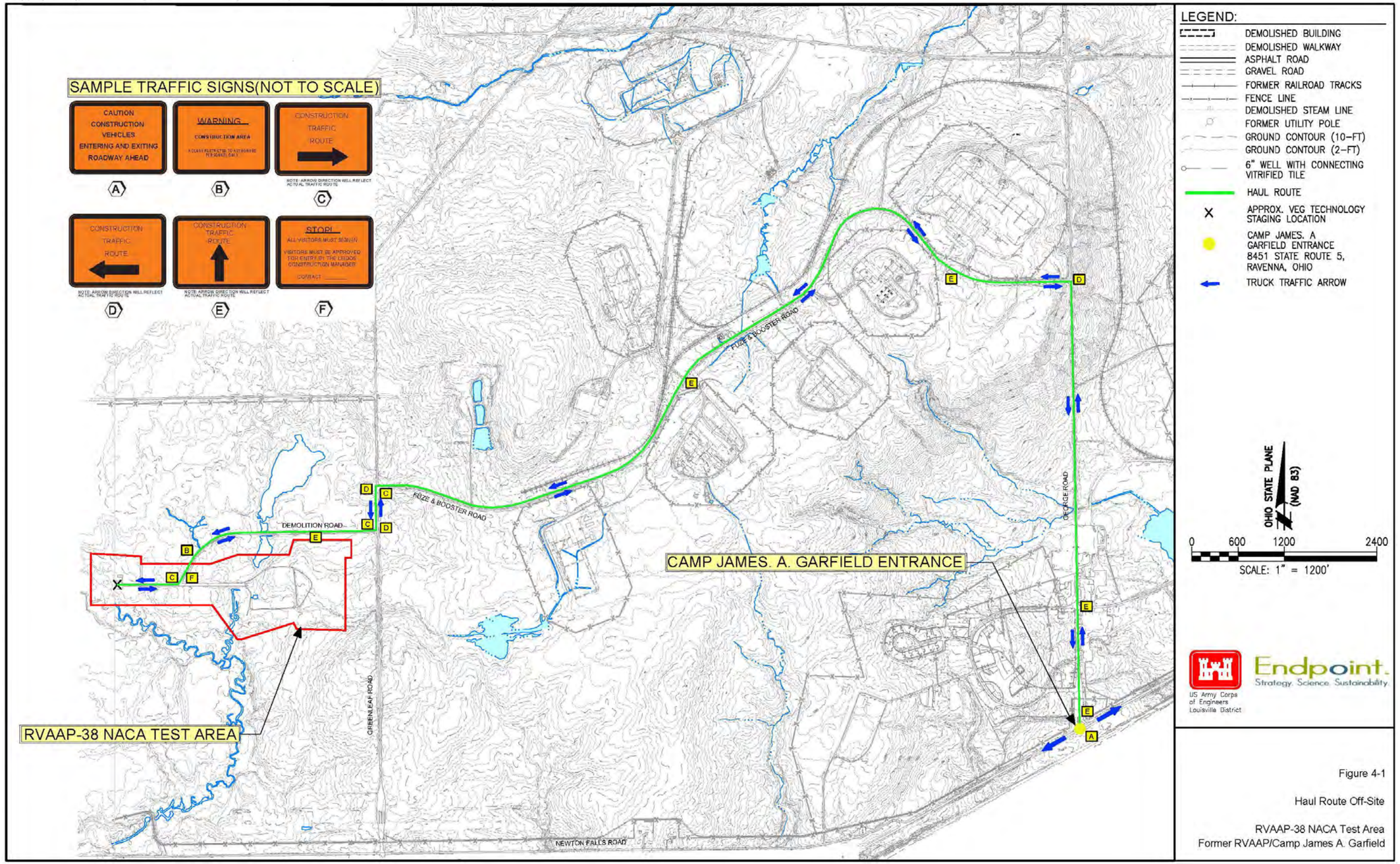

SAMPLE TRAFFIC SIGNS(NOT TO SCALE)
CAUTION CONSTRUCTION VEHICLES ENTERING AND EXITING ROADWAY AHEAD
A
WARNING
CONSTRUCTION AREA
B
CONSTRUCTION TRAFFIC ROUTE
C
CONSTRUCTION TRAFFIC ROUTE
D
CONSTRUCTION TRAFFIC ROUTE
E
STOP!
ALL VISITORS MUST SIGN IN
VISITORS MUST BE APPROVED FOR ENTRY BY THE LEIDOS CONSTRUCTION MANAGER
CONTACT _____
F
LEGEND:
DEMOLISHED BUILDING
DEMOLISHED WALKWAY
ASPHALT ROAD
GRAVEL ROAD
FORMER RAILROAD TRACKS
FENCE LINE
DEMOLISHED STEAM LINE
FORMER UTILITY POLE
GROUND CONTOUR (10-FT)
GROUND CONTOUR (2-FT)
6" WELL WITH CONNECTING VITRIFIED TILE
HAUL ROUTE
APPROX. VEG TECHNOLOGY STAGING LOCATION
CAMP JAMES. A GARFIELD ENTRANCE 8451 STATE ROUTE 5, RAVENNA, OHIO
TRUCK TRAFFIC ARROW
RVAAP-38 NACA TEST AREA
CAMP JAMES. A. GARFIELD ENTRANCE
FIZE & BOOSTER ROAD
DEMOLITION ROAD
GREENLEAF ROAD
NEWTON FALLS ROAD
GEORGE ROAD
OHIO STATE PLANE (NAD 83)
0 600 1200 2400
SCALE: 1" = 1200'
US Army Corps of Engineers Louisville District
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Figure 4-1
Haul Route Off-Site
RVAAP-38 NACA Test Area
Former RVAAP/Camp James A. Garfield

5.0 EXCAVATION ACTIVITIES

This section describes remedial activities to be performed, including:

- Land Survey;
- Excavation;
- Best Management Practices; and
- Equipment Decontamination.

5.1 LAND SURVEY

The Alaniz-Endpoint Team will have the initial and final excavation boundaries surveyed by a registered surveyor. The survey will establish initial and final horizontal and vertical limits of the excavation area.

5.2 EXCAVATION

The excavation process will be conducted in a manner that minimizes contaminated soil handling. Conventional earth moving equipment such as excavators, front-end loaders, and haul trucks will be utilized to reduce site workers' exposure to contaminated soil and increase efficiency. All excavation work will be performed with a track-mounted backhoe. Alaniz will serve as the excavation contractor, holding a Class A – General Engineering Contractor license, with OSHA HAZWOPER trained personnel. OSHA Excavation Safety Standards will be followed during the excavation activities. All activities will follow the requirements outlined in the SSHP.

The following excavation activities are discussed in more detail below:

- Excavation Limits and Volumes;
- Soil Stockpiling and Transportation;
- Ex-Situ Thermal Treatment of PAHs in Soils using the VEG Technology; and
- Unforeseen Material.

5.2.1 Lead-Impacted Soil

Excavation Limits, Volumes and Waste Profiling

The lead contaminated soil in the Well Pit encompasses an approximate surface area of 4 square feet, with an estimated 0.15 cubic yards (in-situ) of surface soil that exceed FWCUGs for lead (400 mg/kg). The Well Pit will initially be excavated to a depth of 1-foot surrounding sample location NTA-101 to the extents shown on Figure 1-4.

Lead-impacted soil removed from the Well Pit, along with any potential impacted topsoil vegetation (i.e.,

COC-impacted vegetation) or debris, will be loaded directly into a roll-off bin for transportation and disposal at an approved off-site disposal facility (based on the approved waste profile) in accordance with Sections 5.2.2 and 7.0 herein.

Waste profile soil samples will be collected in-situ prior to commencing excavation activities in the Well Pit and submitted to a fixed-based laboratory for analysis. The results of the analysis will be used to prepare the waste disposal profile of the metal impacted soil for disposal at an appropriate landfill ([non-hazardous for Waste Management American Landfill] or [hazardous soil for metals US Ecology of Ohio or US Ecology Michigan Disposal Inc]). Waste profile sampling and analysis will be in accordance with Section 6.1.1 and the SAP (Endpoint, 2021).

Soil Stockpiling and Transportation

As previously indicated, lead-impacted soil excavated from the Well Pit (and any co-mingled topsoil vegetation and/or debris) will be loaded directly into haul trucks or USACE approved containers which will transport the load directly to an approved off-site disposal facility (see Section 7.5). In the event that impacted soil needs to be stockpiled at the AOC (e.g., the haul truck is inoperable), the soil will be stockpiled within the limits of the excavation.

Care will be taken to avoid over filling the hauling trucks/containers or spilling contaminated surface soil over the sides of the truck. Additional precautions will be employed, such as positioning haul trucks/containers over plastic sheeting/tarps, to capture any surface soil that was spilled during loading. Haul trucks transporting the soil will be inspected per requirements discussed in Section 5.3.2.

Disposal of Lead-Impacted Soil

Approximately 0.15 cubic yards of lead-impacted surface soil from the Well Pit will be transported to an off-site permitted disposal facility under the appropriate manifest. If impacted soil is deemed hazardous waste, the soil will be transported by an approved Defense Reutilization Marking Office (DRMO) (or Defense Logistics Agency [DLA]) transporter to an approved DRMO hazardous waste disposal facility.

5.2.2 Production Well Abandonment

The Well Pit and Production Well will be properly abandoned and all concrete structures removed. The pit and well will be abandoned in accordance with Ohio Environmental Protection Agency Technical Guidance Manual (Technical Guidance Manual for Groundwater Investigations, Chapter 9, Sealing Abandoned Monitoring Wells and Boreholes, OEPA, 2016) and the well abandonment standard operating procedure (SOP) included in Attachment C. In general, the static water level and total well depth will be gauged and the well will be sanitized. The borehole will be sealed with bentonite grout. The grout will be placed under pressure using a tremie pipe filling the borehole from the bottom up as the tremie pipe is removed to approximately two to three feet from the surface. Water that comes out of the well during grouting operations will be collected and containerized. After 24 hours, the grout plug will be inspected and if needed, grout will be added to the boring.

Surface finishing will include removing all above ground structures, removing the well casing down to 3 ft below ground surface and backfilling with material appropriate for the site. The well casing and all above ground surface structures will be recycled at an appropriate scrap facility. Once abandoned, the well abandonment log for the well will be submitted to the Ohio EPA and Ohio Department of Natural Resources (ODNR) per Ohio Revised Code 1521.05(B)(9) within 30 days. The well sealing reports are eforms that are submitted following abandonment. Field use version can be obtained at https://apps.ohiodnr.gov/water/maptechs/sealing/eSealingLog_Field_Use.pdf

5.2.3 Soil Ex-Situ Thermal Treatment of PAHs in Soil using the VEG Technology

Excavation Limits and Volumes

As previously mentioned, and illustrated on Figure 1-4, there are three separate excavation areas targeted for remediation at this AOC. Areas 1, 2 and 3 contain the PAH COCs (benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene and will require the same remediation procedures.

Area 1 and Area 2 encompass an estimated surface area of 12,720 square feet, with an estimated 470 cubic yards (in-situ) of surface soils that exceed residential soil RSLs for benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Area 3 encompasses an estimated surface area of 10,000 square feet, with an estimated 370 cubic yards (in-situ) of surface soils that exceed residential soil RSLs for benzo(a)pyrene. The areas will be excavated to a depth of 1 foot near sample locations NTA-088/089/090 (Area 1), NTA-166/169/172 (Area 2), and NTA-026 (Area 3) and treated using the VEG Technology in accordance to procedures in Section 5.2.3 (see Figure 1-4).

Soil Stockpiling and Transportation

PAH-impacted soil from the NACA Test Area will be thermally treated using the VEG Technology. As previously mentioned in Section 1.0, the VEG remediation system will be staged at the RVAAP-38 NACA Test Area AOC for the duration of the project. PAH-impacted soil and any potential co-mingled topsoil vegetation/debris will be transported from each excavation to the NACA VEG treatment area. In the event that impacted soil requires stockpiling at each area, the soil will be stockpiled within the limits of the excavation.

At the NACA VEG Treatment Area, impacted soil will be stockpiled on top of impermeable plastic sheeting/tarps within the designated stockpiling area to minimize contact between impacted and native soil at the ground surface (see Drawings in Attachment B). Any large solid waste (brick, concrete, other metal waste) which may be easily separated from soil will be removed and temporarily disposed in a roll-off bin prior to separating the soil into 100 cubic yard stockpiles. To ensure native soil beneath the plastic sheeting/tarps are not impacted, soil sampling beneath the stockpiling area will be performed at the end of all remedial activities and compared to native soil samples collected prior to stockpiling contaminated soil (see Section 6.4). Sandbags will be used to secure tarps if necessary. In addition, all exposed surface soil

stockpiles in the NACA Test Area AOC will be covered at the end of each workday and during periods of severe weather.

Each AOC, or individual excavation within each AOC, will be assigned a sub-area within the designated stockpiling area at the NACA VEG Treatment Area, as shown on the Drawings in Attachment B. Stockpiles will be placed in grid pattern that will generally follow the grid pattern below, oriented in the north-south direction with additional grid cells added should additional soil stockpiles be necessary:

R1C1	R1C2	R1C3	R1C4
R2C1	R2C2	R2C3	R2C4
R3C1	R3C2	R3C3	R3C4

Each stockpile will be labeled and covered prior to and after thermal treatment to minimize dust generation and cross-contamination between treated and un-treated stockpiles. Contaminated tarps previously in contact with pre-treated soil will be disposed of (in accordance with Section 7.0 herein) and replaced with new, clean tarps prior to covering treated soil stockpiles, minimizing potential cross-contamination. The ultimate fate of each treated stockpile (e.g., returned to the AOC and used as clean backfill or subjected to another round of thermal treatment) will be determined based on the results of post-treatment soil sampling. Detailed sampling procedures are specified in Section 4.2.2 of the SAP (Endpoint, 2021) and summarized briefly in Section 6.3 herein.

VEG Thermal Treatment Process

As previously implemented at a pilot-test scale at the RVAAP-50 Atlas Scrap Yard Site (Endpoint, 2015), the VEG Technology employs a low-temperature, indirect-fire (i.e., no incineration) approach to thermal treatment of PAHs in soil. At the core of the VEG treatment system is a highly efficient, patented mobile vapor energy generator, which initially utilizes propane, air, and water to generate steam at temperatures upward of 1,800 degrees (^{o}) Fahrenheit (F). A 4,000-gallon tank for storing water from a municipal source, a propane tank and a portable 100-kilowatt diesel generator will be maintained onsite (see Drawings in Attachment B) in support of steam generation, with ambient atmospheric air provided as the necessary air source.

The steam created through the VEG's vapor generator is in turn placed into contact with the impacted soil within a fully enclosed and sealed treatment chamber. Over time and as the steam comes into full contact with the soil, the steam serves to eliminate the soil moisture, thereby raising soil temperatures from ambient levels to the target temperature range of 500 to 700^{o}F, shown to be adequate for desorption of PAHs (and other fuels) from soil. Soil temperatures within the enclosed treatment chamber will be continuously monitored throughout the treatment process using thermocouples, demonstrating that soil have reached target treatment temperatures. It should be noted that the input steam temperature, target soil treatment temperature, and duration of treatment at the target soil treatment temperature to achieve the desired

treatment for a similar soil types were previously identified during the pilot test performed at the RVAAP-50 Atlas Scrap Yard Site (Endpoint, 2015). During this pilot test the aforementioned parameters were determined to be approximately 1,400^{o}F (input steam temperature), 650^{o}F (target soil treatment temperature), and a treatment duration of 22 minutes; these parameters will be refined for the NACA Test Area AOC treatment as part of the first few days of thermal treatment of soil from this AOC.

Upon reaching target soil temperatures and as PAHs transition from solid phase adsorbed to soil to vapor phase, PAH concentrations remaining adsorbed to soil are significantly reduced or fully eliminated, rendering the soil adequate for reuse pending the results of post-treatment sampling outlined in Section 6.0 herein. Concurrent to the desorption process, a vacuum system internal to the sealed treatment chamber extracts and captures the PAH-laden vapors removed from the soil, where they are subjected to thermal oxidation for elimination of PAHs within a temperature range of 1300 ^{o}F to 1500 ^{o}F. The destruction efficiency of semi-volatile organic compounds within this range is 99.9%. It should be noted that prior to thermal oxidation, the PAH-laden vapors are routed through a designated enclosed filtration chamber, where the interaction between the carbon inherent to the PAH-laden vapors, steam, and hydrogen combine to form a synthetic gas (syngas), comprised largely of hydrogen, which is routed to the thermal oxidizer to supplement propane as a renewable source of fuel for ongoing treatment operations. Following treatment, thermally oxidized vapors will be discharged to the atmosphere.

Thermally oxidized vapors will be subject to routine sampling (hourly sampling using a photoionization detector [PID] to sample the influent (pre-oxidation) and effluent (post-oxidation) PAH concentrations, and bi-weekly sampling via polyurethane foam sorbent samples sent to the laboratory for analysis using USEPA Method Toxics Organics 13 (TO-13) to demonstrate a target destruction efficiency of 99%. The PID will be calibrated to isobutylene, which is close to the midpoint ionization point for most organic compounds and is not flammable or toxic at low concentrations used in calibration. In order to adapt the results for PAH readings, a response factor of 0.4 will be multiplied to the PID reading to obtain the corrected value for PAHs. In addition to the system controls gathering operating information via continuous automated datalogging, PID and thermocouple measurements will be recorded by an Alaniz-Endpoint Technician hourly during operation to confirm that the system is operating properly.

Additional information regarding the VEG technology can be found in the "*Implementation Report for Bench- and Pilot-Scale Testing Ex-Situ Thermal Treatment of Polycyclic Aromatic Hydrocarbons in Soils," (Endpoint, 2015) and* at http://www.endpoint-inc.com/wp-content/uploads/2012/06/VEG-Soil-Remediation-Technology-2015.pdf.

Thermal Treatment of Surface Soils

As previously indicated, the NACA Test Area is characterized by three remediation areas (Area 1, Area 2, and Area 3) totaling 840 cubic yards of PAH contaminated soil near locations NTA-088/089/090 (Area 1), NTA-166/169/172 (Area 2), and NTA-026 (Area 3) (see Figure 1-4) targeted for treatment using the VEG Technology. The ex-situ VEG system will be staged at the western end of the NACA VEG Treatment Area (Figure 4-1 and Attachment B), where excavated soil will be stockpiled in accordance with Section 5.2.2.

Anticipated staging areas for the VEG system and related equipment are shown on the Drawings in Attachment B. In the case that staging areas require modification, all changes will be coordinated with and approved by OHARNG and USACE LRL.

Soil treatment and VEG operation will be performed using the following procedure:

- Stockpiles containing impacted soil, along with any co-mingled topsoil vegetation, will be uncovered and placed into the sealed VEG treatment chamber using a front-end loader, with thermal treatment occurring per the procedures outlined above.
- After sealing the chamber, the system operator will turn on the system, initiating the flow of water, followed by the flow of propane to the igniter.
- Heated steam will be injected to the VEG treatment chamber through a manifold to distribute heat to all soil within the chamber. Vapors will be captured from the chamber via a collector manifold.
- The pile temperature will be monitored utilizing thermocouples within the chamber recording their data to a datalogger. The VEG system will be monitored by an operator who will record operating parameters of the system (e.g., temperature and PID readings) hourly during operation, and logged on the VEG monitoring log included in Attachment A.
- Soil treatment will be complete once the soil has been heated at the target temperature range (500 ^{o}F to 700 ^{o}F) for a minimum of 22 minutes.
- Following treatment, the system will be turned off. The treatment chamber will be unsealed after a brief cool down period and the soil will be transported to the stockpile area to be stored in 100 CY stockpiles pending confirmation sampling. Dry soil may require wetting to reduce fugitive dust emissions.

Each stockpile of treated soil will be sampled as described above and in Section 6.3, to demonstrate efficacy of treatment. Upon demonstration of compliance with the residential soil RSLs, soils will be used at the NACA Test Area AOC for backfilling and compaction in accordance with procedures in Section 8.0. Any treated soil stockpiles not meeting the residential soil RSLs will be subject to retreatment and resampling per the procedures referenced above, until such time that the post-treatment stockpile concentrations meet the residential soil RSLs for all COCs.

5.2.4 Unforeseen Material

In the event that an unsafe or unexpected material (e.g., explosive components, drums, cylinders, abandoned pipelines or utilities) is encountered during any phase of excavation, treatment, or disposal activities, work will cease immediately and the Alaniz-Endpoint Team Project Manager, USACE COR, and ARNG/OHARNG Representative will be notified. A plan of action will be established and agreed upon by the appropriate parties. Excavation work will not resume until the approved plan has been implemented and approval has been granted by the USACE COR. If the discovery results in a change to the scope, objectives, or schedule of this RD, the Alaniz-Endpoint Team will notify the USACE COR. Additional revisions and/or corrective actions may be requested by the Alaniz-Endpoint Team to account for these unexpected changes.

With any ground disturbing activity, there is always the potential for an inadvertent discovery of human remains, funerary objects, or other potential historical or archaeological items. If such items are encountered during excavation activities, excavation will immediately stop and the OHARNG Cultural Resources Manager (CRM), Alaniz-Endpoint Project Manager, USACE COR, and ARNG/OHARNG Representative will be notified. If the CRM is not available, the discovery will be reported to the CJAG Range Control.

The CRM or CJAG Range Control will collect and retain any artifacts or remains, as appropriate. In the event that human remains are discovered, precautions will be taken to ensure that the remains are not removed or further disturbed. The OHARNG Standard Operation Procedures for inadvertent discovery of cultural material will be followed. Excavation activities will not resume until the project site has been released by the OHARNG CRM.

5.3 BEST MANAGEMENT PRACTICES

Best management practices are activities that will be conducted to prevent the migration of contaminated soils during excavation, transportation, and thermal treatment activities. BMPs also prevent erosion of uncontaminated soil from disturbed areas and prevent uncontaminated run-on from entering excavations. The following BMPs will be conducted within each excavation area:

- Dust Control and Maintaining Roadways/Haul Routes;
- Haul Truck Inspection;
- Excavation Water, Stormwater and Sediment Management; and
- Good Housekeeping.

5.3.1 Dust Control and Maintaining Roadways/Haul Routes

Dust may be generated during initial site clearing, excavation activities, and during soil handling and transportation. Unnecessary dust will be minimized by maintaining vehicle traffic to within the posted speed limits and by applying water to dirt roads. A 4,000-gallon water truck will be available onsite for dust control and for further use by the VEG Technology for generation of steam necessary for thermal treatment. The project site and roadways will be maintained free of mud throughout construction activities by performing haul truck inspections per Section 5.3.2 and requiring trucks to drive through designated egress locations with track-out grates to collect excess dirt and mud prior to entering paved roadways. In addition, street sweepers will be used, if necessary, to clear any excess mud from CJAG roadways.

The presence of nuisance dust will be monitored throughout construction activities using a dust meter (mini-ram) by Alaniz-Endpoint Team personnel in compliance with Akron Air requirements. Dust measurements will be collected following continuous visible dust generation that lasts for a duration of 20 minutes. If dust readings exceed 1 milligram per cubic meter (mg/m^3) at a distance of 200 feet downwind of construction activities, water will be applied to the soil to mitigate dust generation.

All soil piles created as a result of the remedial action described in this work plan are temporary and are associated with this remedial action. Stockpiled soil will be covered when not in use. In the event of fugitive dust releases being observed during transfer to and from the treatment system, water will be applied to suppress dust. Soil will be covered during treatment; thus, no dust is anticipated during this step.

During instances of high-velocity wind, additional dust measures may be implemented including covering soil stockpiles with tarps and temporarily suspending excavation or transportation activities. Visual dust monitoring will be conducted in accordance with the SSHP to be submitted under separate cover.

5.3.2 Haul Truck Inspection

The Alaniz-Endpoint Team will inspect haul trucks and fill out a Truck Inspection Form (Attachment A) prior to leaving the excavation area workspaces or entering paved roads. If necessary, mud will be cleaned off tires with hand tools (e.g., shovel, broom, brush). Trucks will also be inspected for surface soil on the exterior of the truck bed as a result from the loading process. Prior to exiting the loading area, any adhered contaminated surface soil will be brushed off of the haul truck onto the plastic sheeting beneath the truck loading area, collected and either added to the haul truck's load or to the corresponding untreated surface soil stockpiles slated for thermal treatment.

5.3.3 Excavation Water, Stormwater and Sediment Management

Excavation Water

Excavation water is considered any water that accumulates during excavation activities that has come into contact with contaminated soil (e.g., rainwater that collects within excavation areas or water from equipment decontamination, see Section 5.4). During severe weather (rain, high-velocity wind), measures will be taken to avoid generating excavation water. Such measures will be determined onsite and may include covering the open excavation areas with tarps weighted down with sandbags to prevent accumulation of excavation water and soil migration and diversion of off-site run-off away from the excavation.

In the event that excavation water is generated, the Alaniz-Endpoint Team will have a temporary water storage tank on standby at the NACA Test Area AOC, ready to mobilize to the appropriate excavation site when necessary. The Alaniz-Endpoint Team will be responsible for pumping excavation water to the temporary storage tank and ensuring that no leaks are present. Excavation water collected from the NACA Test Area AOC (PAH-impacted), will not require disposal as it will be recycled within the VEG Technology's vapor generator for complete oxidation and transformation into a hot, clean steam to be used as the heat source in support of ongoing thermal treatment of soil (see Section 5.2.2).

If confirmation sample results indicate additional soil requires excavation, any potential storm water that collects in the excavations will be pumped into the temporary water storage tank and recycled within the VEG Technology's vapor generator as described above.

Stormwater

Stormwater is considered any water that accumulates that has not come in contact with contaminated soil, such as water that collects on top of tarps covering open excavations. Stormwater that accumulates in low areas of the AOC will be discharged onsite over the ground surface in a manner that will avoid creating excess ponding and mud (e.g., discharged at a slow to moderate rate though a filter bag and on top of plywood in a well vegetated area). The Alaniz-Endpoint Team will track any non-contaminated stormwater releases on daily Quality Control (QC) forms and on an OHARNG Stormwater Release Form (Attachment A). Anticipated stormwater discharge locations are provided in Attachment B.

Stormwater run-on to the excavation areas will be controlled to prevent the transportation of sediment and mud to the excavation. Silt Fence will be used to reduce and/or divert the flow of stormwater into the excavation area, and capture sediment transported by stormwater. The installation of silt fence is described in further detail in the following section.

If confirmation samples results indicate the extent of the contaminated soil excavation is complete, any storm water collected within open excavations will be considered “clean” and can be pumped out of the excavation in accordance with the OHARNG Stormwater Release Form.

Sediment Management

Silt fence will be installed to prevent sediment from entering each excavation, and to divert upgradient stormwater away from the excavation. Silt fence will also be installed between working areas and surveyed wetlands to prevent potentially impacted soil migration. All silt fence will be maintained until post-construction vegetation is reestablished. The approximate location of silt fencing is provided in the design drawings included in Attachment B.

Silt fence will be installed by partially burying the fence material to prevent water from flowing under the fence and help anchor the fence. The fence will be installed in a trench 6 inches deep and secured to posts 10 feet apart. The fence will be installed on the side of stakes facing where water flow will come from. Fence material will be secured to posts using 3 to 5 staples from a heavy-duty staple gun, or equivalent. Once the silt fence is attached to the posts, the trench will be filled with the soil removed from the trench and tamped to compact the soil and secure the posts. Details of silt fence installation are provided on Figure B-3 in Attachment B.

5.3.4 Good Housekeeping

Good housekeeping practices are designed to maintain a clean and orderly work environment. Measures will include at a minimum:

- Regularly pick up and dispose of any garbage or construction waste;
- Maintain clear and organized work areas;

- Conduct daily equipment inspections; and
- Perform preventative maintenance on equipment to ensure it is in proper working condition.

The first equipment inspection shall be documented on a Safety Checklist for Machinery Form provided in Attachment A. Subsequent daily inspections will involve double-checking all items on the Safety Checklist, with any deviations immediately reported to the SSHO and the Alaniz-Endpoint Team Project Manager, followed by corrective action. Any implemented corrective actions will be noted on the Daily QC Report.

5.4 EQUIPMENT DECONTAMINATION

To further prevent migration of contaminated soil, measures will be implemented to minimize contact with impacted surface soil. In addition, disposable sampling equipment (e.g., foil pans and zip lock bags) and a step-probe sampler will be used for soil sampling, reducing the need to decontaminate sampling equipment. The step-probe sampler will be decontaminated after all aliquots have been collected for ISM/composite samples.

Near the location of each excavation, a decontamination pad will be installed and utilized as necessary for decontamination of equipment. Equipment used to excavate, load, or haul contaminated surface soil will be thoroughly decontaminated prior to contact with native sediments or treated surface soil, and prior to demobilization from the site or AOCs. Equipment, including the backhoe bucket and other parts of equipment that come in contact with contaminated soil (e.g., tracks, wheels, and undercarriage of equipment, etc.), will be decontaminated by manual wiping or brushing off surfaces, followed by rinsing either by direct steam from the VEG system (if located at the NACA Test Area AOC) or rinsed using clean water (i.e., water obtained from an approved off-site source that has been previously sampled; the same water used for dust control). At the conclusion of all operations at the AOC, all equipment will be decontaminated, and the decontamination pad will be dismantled and placed, along with any fluids or collected soil, in the next load of waste to be hauled for disposal.

Decontamination of equipment will be performed over a designated decontamination area (see Drawings in Attachment B) lined with impermeable plastic sheeting/tarps. The generated liquid investigation derived waste (IDW) will be collected and temporarily stored in the same tank used to store any generated PAH-impacted excavation water, and transported to the NACA Test Area AOC, where the liquid IDW will be recycled within the VEG Technology's vapor generator. If the volume of PAH-impacted decontamination/excavation water exceeds the temporary storage tank's capacity or the capacity of the VEG units, the water will be drummed, profiled in accordance with the SAP (Endpoint, 2021) and disposed under the appropriate manifest.

In the event of a release of untreated or untested decontamination water, the area of the release shall be investigated to measures, such as collecting soil or sediment samples and analyzing for project COCs, to quantify any impacts. Following any release (soil or liquid), the root cause of the release will be determined and steps taken to eliminate any future releases. Corrective measures that may be taken include an increase

in the size of the stormwater control and/or a reduction in the volume of soil being stockpiled onsite for treatment.

6.0 ENVIRONMENTAL SAMPLING

This section describes the sampling process to be implemented in support of remediation activities at the NACA Test Area AOC. Specifically, the following types of sampling will be performed:

- Excavation sampling: excavation confirmation sampling will be performed to confirm soil remaining in place following excavation at Area 1, Area 2, and Area 3 meet USEPA RSLs;
- Well Pit (lead) profile sampling and excavation confirmation sampling: profile sampling will be performed to determine the waste profile and identify the appropriate disposal facility for off-site transport and disposal. Excavation sampling will be performed to confirm soil remaining in place following excavation in the Well Pit meet FWCUGs for lead;
- Thermally treated soil stockpiles: post-treatment soil stockpile sampling will be performed to confirm benzo(a)pyrene concentrations in treated soil are protective of the RSL and may be reused as backfill for the excavation;
- Native Soil Confirmation Sampling: surface soil beneath impacted-soil stockpiling locations will be sampled and confirmed to be protected of RSLs for site related COCs; and
- Imported soil to be used as backfill (potential backfill source is Patrick Excavating and Trucking in Ravenna, Ohio): if additional soil is required for backfilling, imported soil sampling will be performed to ensure no impacted material are introduced to the site. Results from the imported soil analysis must be at or below respective FWCUGs or residential RSLs and approved for use by the ARNG/OHARNG Representatives prior to being brought to CJAG.

6.1 LEAD-IMPACTED SOIL WASTE PROFILE SAMPLING

Following excavation of lead-impacted soil at the Well Pit in the NACA Test Area AOC, one discrete waste profile sample will be collected from excavated soil stored in a drum near the excavation. The estimated volume of soil to be excavated is 4 cubic feet. The profile sample collected will be used to classify the lead-impacted soil for disposal. Collecting a profile sample will ensure impacted soil and waste are handled by the appropriate transporter (DRMO if hazardous) and disposed at the appropriate disposal facility. The results of the waste profile sample will be reviewed, approved and signed by the OHARNG, prior to disposing of waste. All waste will be transported and disposed of in accordance with Section 7.5 herein.

The profile sample will be analyzed for toxicity characteristic leaching potential (TCLP) metals, TCLP semi-volatile organic compounds (SVOCs), TCLP pesticides, TCLP herbicides, total cyanide, PCBs, TCLP volatile organic compounds (VOCs), total sulfide, pH and flashpoint. A summary of analytical requirements and testing methods is provided in Table 6-1. The profile sample will be collected in accordance with the procedures outlined in Section 4.2.2.3 of the SAP (Endpoint, 2021) and labeled in accordance with the nomenclature for Category 3 soil provided in Section 4.2.1 of the SAP. Any additional analyses required by the disposal facility will also be performed.

Table 6-1. Waste Profile Sampling Analytical Requirements

Parameters [1]	Analytical Methods
TCLP (Metals, Pesticides, Herbicides, SVOCs)	SW-846 7470/8081/8270/1311/6010
TCLP (VOCs)	SW-846 1311/8260
Total Cyanide	SW-846 9012/9034
Total Sulfide	SW-846 9012/9034
PCBs	SW-846 8082
pH	SW-846 9040, 9045
Flashpoint	SW-846 1010

[1] Additional parameters may be required by the waste disposal facility. The waste disposal facility has not been selected at the time of this design.

PCB = Polychlorinated biphenyl
SVOC = Semi-volatile organic compound
TCLP = Toxic characteristic leaching procedure
VOC = Volatile organic compound

6.2 LEAD-IMPACTED SOIL EXCAVATION CONFIRMATION SAMPLING

The preliminary dimensions of the Well Pit, as shown on Figure 1-4, are anticipated to approximate 3.8 feet (length) x 3.8 feet (width) x 3.5 feet (depth). Soil to be excavated is at the base of the current pit in an area approximately 2 feet (length) x 2 feet (width) x 1 foot (depth). Based on this initial excavation configuration, confirmation soil sampling of the Well Pit excavation will consist of collecting four discrete sidewall samples (one discrete sample per sidewall), as shown on Figure 6-1. In addition, one discrete excavation bottom sample will be collected (see Figure 6-1). Confirmation sampling will be conducted in accordance with procedures outlined in Section 4.2.2 of the SAP (Endpoint, 2021) and samples will be labeled in accordance with the nomenclature for Category 1 soil provided in Section 4.2.1 of the SAP and further specified in Table 6-2 herein. Based on the aforementioned anticipated dimensions and specified sampling intervals, a minimum of 5 discrete samples are proposed. These samples will be analyzed for lead as indicated in the SAP (Endpoint, 2021).

Based on excavation confirmation sampling results and related comparison to the FWCUGs, further excavation in a given direction may be warranted. Subsequent step-out sampling will be used to determine whether excavation may be ceased or whether an additional excavation step out is necessary. If soil analytical results exceed FWCUGs along the northern, southern, eastern, or western side of the Well Pit excavation sidewall, as shown on Figure 6-1, the excavation pit will be laterally extended out 1-foot, with the step-out area vertically extended 6-inches in depth, until sampling confirms that lead COCs in exceedance of FWCUGs have been removed.

6.3 PAH-IMPACTED SOIL EXCAVATION CONFIRMATION SAMPLING

The dimensions for the excavation at Area 1 are anticipated to approximate 8,590 square feet x 1-foot (depth). The dimensions for the excavation at Area 2 are anticipated to approximate 4,130 square feet x 1-foot (depth). The dimensions for the excavation at Area 3 are anticipated to approximate 10,000 square feet

x 1-foot (depth). Based on this initial excavation configuration, confirmation sampling at each location will consist of collecting incremental sampling methodology (ISM) ISM sidewall samples at intervals shown on Figure 6-1. In addition, ISM excavation bottom samples will be collected from each excavation (see Figure 6-1). Sampling will be conducted in accordance with procedures outlined in Section 4.2.2.1 of the SAP (Endpoint, 2021) and will be labeled in accordance with the nomenclature for Category 1 soil provided in Section 4.2.1 of the SAP and specified in Table 6-2 herein. Based on the aforementioned anticipated dimensions and sampling intervals, approximately four sidewall and two bottom samples (total of six ISM samples) are proposed for each excavation, totaling 32 proposed confirmation samples for the NACA Test Area AOC.

Based on excavation confirmation sampling results and related comparison to the USEPA Residential RSLs, further excavation in a given direction may be warranted. Subsequent step-out sampling will be used to determine whether excavation may be ceased or whether an additional excavation step out is necessary. If sidewall sample results from any side of either excavation area exceed RSLs, a lateral step-out of five feet will be implemented, whereas if an excavation bottom sample results exceed RSLs, the depth of the excavation sub-area, from which the ISM sample was collected, will be expanded downward in 6-inch intervals until PAH concentrations are confirmed to be below respective RSLs.

6.4 THERMALLY TREATED SOIL STOCKPILE CONFIRMATION SAMPLING

Following VEG thermal treatment activities, treated soil stockpiles will be sampled per the procedures outlined in Section 4.2.2.2 of the SAP (Endpoint, 2021), including collection of one 8-point composite sample per each 100-cubic yard treated stockpile. Based on the anticipated in-situ dimensions of Area 1, 2, and 3 defined in the PP and ROD, approximately 840 cubic yards of treated soil is anticipated, yielding approximately 9 composite post-treatment soil stockpile samples. As previously indicated in Section 5.2.3, any treated stockpiles reporting post-treatment concentrations above the RSL will be retreated and accordingly resampled until the RSL is met. Samples will be labeled in accordance with the nomenclature defined for thermally treated soil stockpile samples (Category 2) in Section 4.2.1 of the SAP (Endpoint, 2021). Treated soil stockpiles with confirmation sample results below the residential soil RSL will be used as backfill for site restoration activities.

6.5 NATIVE SOIL CONFIRMATION SAMPLING

As mentioned in Section 5.2.2, before and after all remediation treatment activities at the NACA Test Area AOC, confirmation soil sampling will be performed within the footprint of the impacted-soil stockpile location to confirm that native soil beneath the tarps underlying impacted-soil stockpiles are not affected. One ISM sample (with aliquots from the 0-1 ft bgs range) will be collected prior to stockpiling contaminated soil and one ISM sample will be collected once the soil stockpiling areas are no longer in use toward the end of the remedial action. The ISM soil sample will be collected in accordance with procedures specified in the SAP (Endpoint, 2021) and analyzed for all site-related COCs. In the event that soil beneath the tarps are found to be in exceedance of respective RSLs, one foot of soil beneath the former stockpiling area will be removed and treated or disposed, followed by an additional ISM confirmation sample.

Table 6-2. Sample Identification for Confirmation Sampling

Area	Station Location	Sample ID	Sample Description
Area 3	NTAcs-199M	NTAcs-199M-####-SO	Area 3 West Sidewall (Point 15 to 17)
	NTAcs-200M	NTAcs-200M-####-SO	Area 3 North Sidewall (Point 15 to 16)
	NTAcs-201M	NTAcs-201M-####-SO	Area 3 East Sidewall (Point 16 to 18)
	NTAcs-202M	NTAcs-202M-####-SO	Area 3 South Sidewall (Point 17 to 18)
	NTAcs-203M	NTAcs-203M-####-SO	Area 3 Excavation Bottom Northwest Corner
	NTAcs-204M	NTAcs-204M-####-SO	Area 3 Excavation Bottom North - Middle
	NTAcs-205M	NTAcs-205M-####-SO	Area 3 Excavation Bottom Northeast Corner
	NTAcs-206M	NTAcs-206M-####-SO	Area 3 Excavation Bottom West
	NTAcs-207M	NTAcs-207M-####-SO	Area 3 Excavation Bottom Center of Pit
	NTAcs-208M	NTAcs-208M-####-SO	Area 3 Excavation Bottom East
	NTAcs-209M	NTAcs-209M-####-SO	Area 3 Excavation Bottom Southwest Corner
	NTAcs-210M	NTAcs-210M-####-SO	Area 3 Excavation Bottom South - Middle
	NTAcs-211M	NTAcs-211M-####-SO	Area 3 Excavation Bottom Southeast Corner
Well Pit	NTAcs-212D	NTAcs-212D-####-SO	West Sidewall (Point 19 to 22)
	NTAcs-213D	NTAcs-213D-####-SO	North Sidewall (Point 19 to 20)
	NTAcs-214D	NTAcs-214D-####-SO	East Sidewall (Point 20 to 21)
	NTAcs-215D	NTAcs-215D-####-SO	South Sidewall (Point 21 to 22)
	NTAcs-216D	NTAcs-216D-####-SO	Well Pit Excavation Bottom

Table 6-2. Sample Identification for Confirmation Sampling (Continued)

Area	Station Location	Sample ID	Sample Description
Area 2	NTAcs-180M	NTAcs-180M-####-SO	Area 2 North Sidewall (Point 1 to 2)
	NTAcs-181M	NTAcs-181M-####-SO	Area 2 West Sidewall (Point 1 to 3)
	NTAcs-182M	NTAcs-182M-####-SO	Area 2 South Sidewall (Point 3 to 4)
	NTAcs-183M	NTAcs-183M-####-SO	Area 2 East Sidewall (Point 2 to 4)
	NTAcs-184M	NTAcs-184M-####-SO	Area 2 Excavation Bottom (Points 1, 2, 3 & 4)
Area 1	NTAcs-185M	NTAcs-185M-####-SO	Area 1 Sidewall (Point 5 to 6)
	NTAcs-186M	NTAcs-186M-####-SO	Area 1 Sidewall (Point 6 to 7)
	NTAcs-187M	NTAcs-187M-####-SO	Area 1 Sidewall (Point 7 to 8)
	NTAcs-188M	NTAcs-188M-####-SO	Area 1 Sidewall (Point 8 to 9)
	NTAcs-189M	NTAcs-189M-####-SO	Area 1 Sidewall (Point 13 to 14)
	NTAcs-190M	NTAcs-190M-####-SO	Area 1 Sidewall (Point 12 to 13)
	NTAcs-191M	NTAcs-191M-####-SO	Area 1 Sidewall (Point 11 to 12)
	NTAcs-192M	NTAcs-192M-####-SO	Area 1 Sidewall (Point 10 to 11)
	NTAcs-193M	NTAcs-193M-####-SO	Area 1 West Sidewall (Point 5 to 10)
	NTAcs-194M	NTAcs-194M-####-SO	Area 1 East Sidewall (Point 9 to 14)
	NTAcs-195M	NTAcs-195M-####-SO	Area 1 Excavation Bottom (Points 8, 9, 13 & 14)
	NTAcs-196M	NTAcs-196M-####-SO	Area 1 Excavation Bottom (Points 7, 8, 12 & 13)
	NTAcs-197M	NTAcs-197M-####-SO	Area 1 Excavation Bottom (Points 6, 7, 11 & 12)
	NTAcs-198M	NTAcs-198M-####-SO	Area 1 Excavation Bottom (Points 5, 6, 10 & 11)

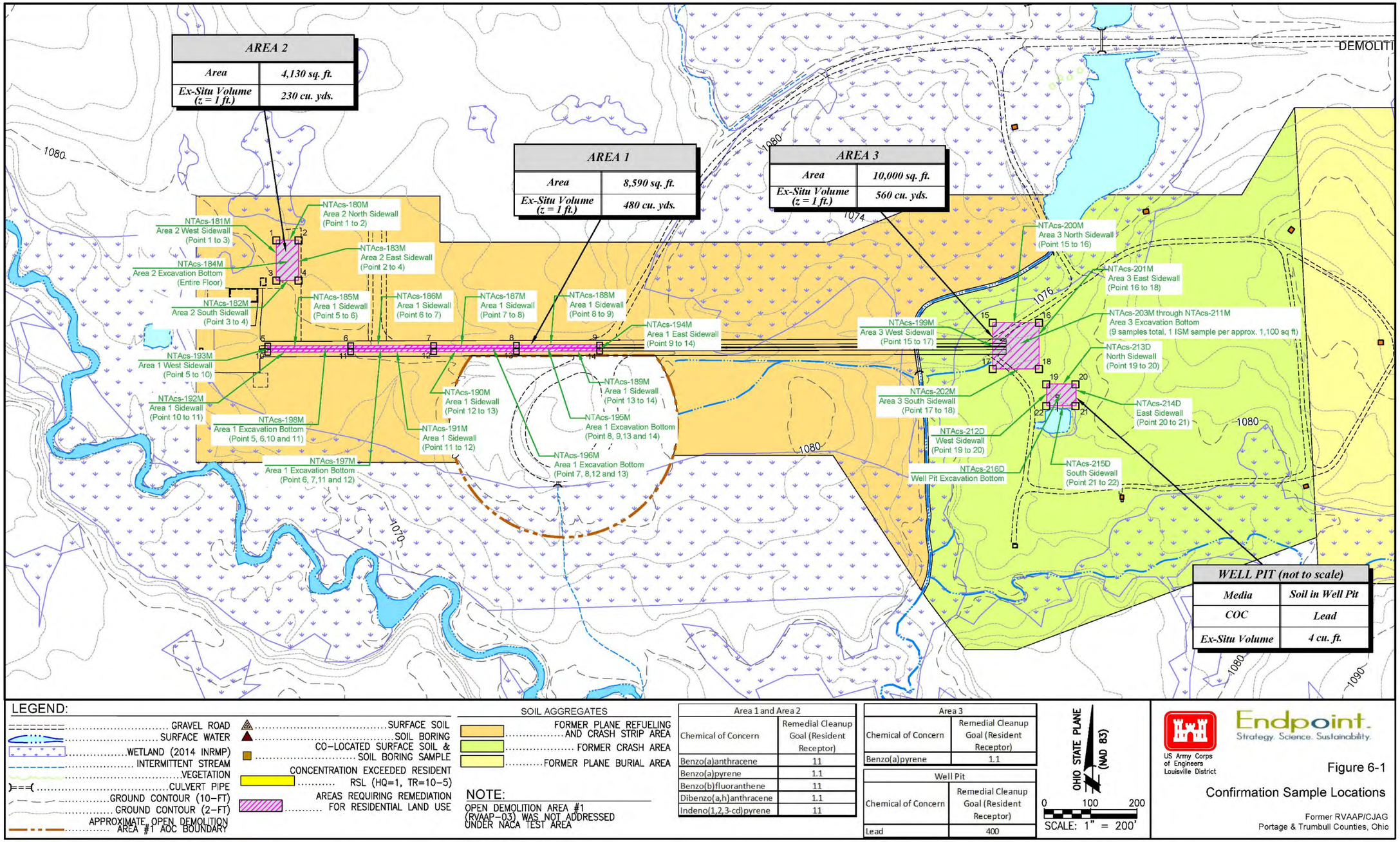
cs: confirmation sample
M: Incremental Sampling Methodology
D: Discrete Sample
NTA: NACA Test Area
SO: Soil Sample
Sample Identifier #### will be chosen during field implementation to ensure a duplicate number is not used.

6.6 QA/QC SAMPLES

In addition to the samples referenced above, QC samples (including duplicate, matrix spike/matrix spike duplicate and USACE QA split samples) will be collected for each aforementioned location in accordance with the frequency, procedures, and analysis outlined in Section 4.2.2.4 of the SAP (Endpoint, 2021). Data Quality Objectives and procedures for collecting excavation sidewall, excavation bottom, treated soil stockpile sampling, and native soil confirmation sampling are also provided in the SAP (Endpoint, 2021).

6.7 SAMPLE ANALYSIS

All confirmation and profiling samples will be preserved and transported to Eurofins/Test America Laboratories in Savannah, Georgia, in accordance with Section 6.0 of the SAP (Endpoint, 2021). Confirmation sample results will be provided within 24-hours following receipt of samples. The Alaniz-Endpoint Team QA Manager will use laboratory results to confirm confirmation samples meet the established RSL and to properly profile soil or any encountered vegetation/debris/solid waste slated for offsite disposal. The USACE COR and ARNG/OHARNG Representative will be notified of the evaluations and results. If any sample does not meet the RSL, the evaluation will include a description of the additional excavation based on the approach described in Sections 6.1 and 6.2. Sampling results will be included in the Remedial Action Completion Report (see Section 9.6.2).


AREA 2
Area 4,130 sq. ft.
Ex-Situ Volume (z = 1 ft.) 230 cu. yds.
AREA 1
Area 8,590 sq. ft.
Ex-Situ Volume (z = 1 ft.) 480 cu. yds.
AREA 3
Area 10,000 sq. ft.
Ex-Situ Volume (z = 1 ft.) 560 cu. yds.
DEMOLITI
NTAcs-180M Area 2 North Sidewall (Point 1 to 2)
NTAcs-181M Area 2 West Sidewall (Point 1 to 3)
NTAcs-183M Area 2 East Sidewall (Point 2 to 4)
NTAcs-184M Area 2 Excavation Bottom (Entire Floor)
NTAcs-182M Area 2 South Sidewall (Point 3 to 4)
NTAcs-185M Area 1 Sidewall (Point 5 to 6)
NTAcs-186M Area 1 Sidewall (Point 6 to 7)
NTAcs-187M Area 1 Sidewall (Point 7 to 8)
NTAcs-188M Area 1 Sidewall (Point 8 to 9)
NTAcs-194M Area 1 East Sidewall (Point 9 to 14)
NTAcs-193M Area 1 West Sidewall (Point 5 to 10)
NTAcs-192M Area 1 Sidewall (Point 10 to 11)
NTAcs-198M Area 1 Excavation Bottom (Point 5, 6,10 and 11)
NTAcs-197M Area 1 Excavation Bottom (Point 6, 7,11 and 12)
NTAcs-190M Area 1 Sidewall (Point 12 to 13)
NTAcs-191M Area 1 Sidewall (Point 11 to 12)
NTAcs-189M Area 1 Sidewall (Point 13 to 14)
NTAcs-195M Area 1 Excavation Bottom (Point 8, 9,13 and 14)
NTAcs-196M Area 1 Excavation Bottom (Point 7, 8,12 and 13)
NTAcs-200M Area 3 North Sidewall (Point 15 to 16)
NTAcs-201M Area 3 East Sidewall (Point 16 to 18)
NTAcs-199M Area 3 West Sidewall (Point 15 to 17)
NTAcs-203M through NTAcs-211M Area 3 Excavation Bottom (9 samples total, 1 ISM sample per approx. 1,100 sq ft)
NTAcs-213D North Sidewall (Point 19 to 20)
NTAcs-202M Area 3 South Sidewall (Point 17 to 18)
NTAcs-214D East Sidewall (Point 20 to 21)
NTAcs-212D West Sidewall (Point 19 to 20)
NTAcs-215D South Sidewall (Point 21 to 22)
NTAcs-216D Well Pit Excavation Bottom
1080
1074
1076
1070
1090
WELL PIT (not to scale)
Media Soil in Well Pit
COC Lead
Ex-Situ Volume 4 cu. ft.
LEGEND:
GRAVEL ROAD
SURFACE WATER
WETLAND (2014 INRMP)
INTERMITTENT STREAM
VEGETATION
CULVERT PIPE
GROUND CONTOUR (10-FT)
GROUND CONTOUR (2-FT)
APPROXIMATE OPEN DEMOLITION AREA #1 AOC BOUNDARY
SURFACE SOIL
SOIL BORING
CO-LOCATED SURFACE SOIL & SOIL BORING SAMPLE
CONCENTRATION EXCEEDED RESIDENT RSL (HQ=1, TR=10-5)
AREAS REQUIRING REMEDIATION FOR RESIDENTIAL LAND USE
SOIL AGGREGATES
FORMER PLANE REFUELING AND CRASH STRIP AREA
FORMER CRASH AREA
FORMER PLANE BURIAL AREA
NOTE:
OPEN DEMOLITION AREA #1 (RVAAP-03) WAS NOT ADDRESSED UNDER NACA TEST AREA
Area 1 and Area 2
Chemical of Concern | Remedial Cleanup Goal (Resident Receptor)
Benzo(a)anthracene 11
Benzo(a)pyrene 1.1
Benzo(b)fluoranthene 11
Dibenzo(a,h)anthracene 1.1
Indeno(1,2,3-cd)pyrene 11
Area 3
Chemical of Concern | Remedial Cleanup Goal (Resident Receptor)
Benzo(a)pyrene 1.1
Well Pit
Chemical of Concern | Remedial Cleanup Goal (Resident Receptor)
Lead 400
OHIO STATE PLANE (NAD 83)
0 100 200
SCALE: 1" = 200'
US Army Corps of Engineers Louisville District
Endpoint. Strategy. Science. Sustainability.
Figure 6-1
Confirmation Sample Locations
Former RVAAP/CJAG
Portage & Trumbull Counties, Ohio

7.0 WASTE MANAGEMENT

This section describes waste profiling, transportation, and waste disposal activities that will be performed during the completion of the remedial activities described in this RD. Waste is considered any indigenous IDW (e.g., excavation water or buried debris) or non-indigenous IDW generated as part of remedial or sampling activities. All waste will be properly segregated, handled, characterized, managed, transported and disposed of in accordance with the federal, state and local laws, and in accordance with Section 7.0 and SOP-7 of the SAP (Endpoint, 2021), federal requirements, and the CJAG Waste Management Guidelines. All waste will be profiled and handled accordingly prior to project completion. Any transportation of solid or hazardous waste off-site will comply with all appropriate federal and state laws. Waste generated during the remedial action, including trees/vegetation that are mulched onsite, will be tracked using the Waste Tracking Form provided in Attachment A. This waste tracker will be submitted to the OHARNG at the completion of the remedial action. Table 7-1 presents each potential waste stream for this RD.

7.1 WASTE STREAM IDENTIFICATION

Waste generated within each AOC will be managed, such that the waste does not pose any threat of contamination (e.g., in liquid or solid form) to areas/media that is otherwise not contaminated. Waste is generally categorized as either indigenous or non-indigenous IDW. As mentioned in Section 6.1.1, in-situ profile samples will be collected from lead-impacted area prior to initiating excavation work. The results of the profile sample will be used to identify the correct transporter/disposal facility for any indigenous and/or non-indigenous IDW from the NACA AOC. No waste profile samples will be collected from Areas 1, 2, and 3 as the PAH contaminated soil will be treated by the VEG Technology. Profile sample will be collected and analyzed in accordance with the procedures outlined in Sections 4.2.2.2 and 4.2.2.3 of the SAP (Endpoint, 2021).

- Lead-impacted soil removed from the Well Pit
- Excavation water, if any;
- Impacted topsoil vegetation or debris discovered during excavation, if any.

Whereas, non-indigenous IDW includes, but is not limited to the following:

- Disposable sampling equipment (e.g., foil pans and zip lock bags);
- Sanitary waste and trash, or solid waste (concrete, bricks, metal waste, well casing materials, etc.);
- Contact waste (e.g., personal protective equipment, plastic tarps/sheeting); and
- Decontamination fluids.

Non-indigenous and indigenous liquid IDW will be managed in accordance with Sections 5.3.3 and 5.4. To this extent, liquid IDW requiring off-site disposal is not anticipated. However, in the event that sufficient volume of impacted liquid IDW is generated (e.g., such a volume of PAH- or lead-impacted water that is

not capable of being recycled within the VEG vapor generator or added to the trucks containing lead-impacted soil for disposal), the liquid waste will be drummed and disposed off-site based on the profile sampling results collected.

In general, waste management minimization procedures will be implemented to limit the volume of waste produced, including reusing materials when appropriate, minimizing contact with contaminated materials, minimizing foot and vehicular traffic through potentially contaminated areas and employing general good housekeeping practices, such as those previously discussed in Section 5.3.4.

7.2 WASTE STREAM MANAGEMENT

Characteristics for each waste stream include: the point of generation, staging and processing, characterization, and waste handling. All waste streams will be sampled and characterized in accordance with Section 7.0 of the SAP (Endpoint, 2021). Table 7-1 presents each potential waste stream for this RD.

7.3 IDW FIELD STAGING

An IDW Field Staging Area (FSA) to temporarily store 55-gallon drums containing solid and liquid IDW will be designated at each AOC (see Drawings in Attachment B) at the beginning of field activities, with the final location approved by the ARNG/OHARNG Representative. The FSA will be constructed using impermeable plastic lining with raised edges for secondary containment to prevent any potential spilled liquid from escaping. In addition, the FSA will have an orange construction fence surrounding it and it will be managed in accordance with Section 7.0 of the SAP (Endpoint, 2021) and the CJAG Waste Management Guidelines. Solid and liquid IDW drums stored at each AOC FSA will be removed within 30 days of generation. If non-hazardous IDW drums are not expected to be disposed off-site within 30 days of generation, they will be relocated and temporarily stored at Building 1036. While the generation of hazardous waste is not anticipated for the remedial action at the NACA Test Area AOC, in the event that hazardous IDW is encountered and requires storage, all hazardous IDW drums not expected to be disposed off-site within 30 days of generation, will be relocated and temporarily stored at Building 1047 and managed in accordance with Section 7.0 of the SAP (Endpoint, 2021).

Upon completion of excavation activities at the NACA Test Area AOC, any solid/liquid IDW drums will be transported to Building 1036 (non-hazardous)/1047 (hazardous), where the waste will be temporarily stored. The location of the temporary IDW storage location at Building 1036/1047 will be specified by the OHARNG Representative and a containment area similar to the FSAs at each AOC will be constructed. Once all remedial work at each AOC has been completed and prior to final demobilization from the CJAG facility, the IDW stored at Building 1036/1047 will be transported and disposed off-site at the appropriate disposal facility.

Final inventories, in addition to container logs for IDW, will be taken and provided to the ARNG/OHARNG/USACE LRL Representative by the Alaniz-Endpoint Team Project Manager. Any identified hazardous waste containers will be disposed off-site within 90 days of the classification as hazardous waste. All non-hazardous liquid waste will have proper secondary containment and will be

transported off the facility before project completion (i.e., prior to demobilization from CJAG). As mentioned in Section 9.4.1, hazardous waste storage areas will be inspected on a weekly basis to confirm spill equipment is maintained and no spills have occurred.

7.4 WASTE STORAGE CONTAINERS AND LABELING

Indigenous solid IDW (e.g., PAH-impacted surface soil, including any topsoil vegetation) will not require storage as these impacted media will remain at the NACA Test AOC where the media will be thermally treated and reused for site restoration. All solid non-indigenous IDW (e.g., disposable sampling equipment, contact waste including tarps, and trash) will be segregated as non-contaminated and potentially contaminated material by visual inspection. Potentially contaminated material will be temporarily stored in open-top 55-gallon drums equipped with plastic drum liners and sealed with bung-top lids, as necessary. Non-contaminated sanitary waste will be temporarily stored in plastic lined trash cans with lids. IDW containers will be temporarily stored at each AOC during remedial activities for up to 30 days and non-hazardous IDW containers will be transported to the temporary storage location at Building 1036 upon completion of work at the AOC. Hazardous IDW containers will be transported to the temporary storage location at Building 1047 upon completion of work at the AOC. The IDW containers will be covered with a weatherproof tarp (weather permitting) and inspected on a weekly basis to ensure no leaks or releases occur during use. IDW storage containers will be properly labeled in accordance with Section 7.0 and SOP-7 of the SAP (Endpoint, 2021). Visually contaminated solid waste will be disposed prior to project completion using the profile sampling results. Non-contaminated solid IDW (sanitary trash) will be disposed off-site through a commercial municipal waste service.

The Alaniz-Endpoint Team will be responsible for providing new Department of Transportation (DOT)-approved drums. The Alaniz-Endpoint Team Project Manager will be responsible for labeling IDW containers and coordinating transportation and final disposal at a state of Ohio or federal approved treatment, storage, or disposal facility (possibly located outside of the state of Ohio). In accordance with Section 7.5 herein, if any waste is deemed hazardous, the transporter and disposal facility will be DRMO approved. The OHARNG Representative (or alternatively the ARNG Representative if waste is deemed non-hazardous) will sign all waste profiles and waste manifests for disposing project IDW at the approved location.

7.5 TRANSPORTATION, STORAGE AND DISPOSAL

The management, transportation, and disposal of all waste streams will be coordinated by the Alaniz-Endpoint Team Project Manager with the CJAG Environmental Office and performed in accordance with the CJAG Waste Management Guidelines and Section 7.0 of the SAP (Endpoint, 2021). All transportation paperwork for soil or possible liquid IDW (manifests or shipping papers) and on-road haul truck placards will be prepared by the Alaniz-Endpoint Team Project Manager in accordance with federal, state, and local regulatory requirements, and disposal facility requirements. The CJAG Environmental Office will be responsible for custody of manifest copies.

Contaminated IDW will be covered and transported by an appropriate licensed waste hauler to a licensed

off-site disposal facility that has previously approved the profile of waste for disposal. Truck beds will be lined as required by state, DOT, or disposal facility requirements. As previously mentioned, if any waste is classified as hazardous waste, it will be transported by an approved DRMO or DLA transporter to an approved DRMO hazardous waste disposal facility, per the CJAG Waste Management Guidelines. Additional analysis may be performed based on disposal facility requirements. All manifests, shipping documents, and disposal facility approval letters will be provided to the Alaniz-Endpoint Team Project Manager and incorporated into the Remedial Action Completion Report (Section 9.6.2).

Table 7-1. Waste Stream Identification and Handling

Waste Stream	Point of Generation	Staging/Processing	Characterization	Waste Handling
Above-Ground Vegetation/Debris (i.e., not in contacted with contaminated soil)	Large vegetation (trees/bushes) or debris (large rocks/boulders) generated within the excavation footprint and surrounding areas required to facilitate equipment access, haul routes and loading areas.	Trees/branches greater than 3-inches in diameter and other large woody vegetation shall be cut between Oct 1st and March 30th and chipped/mulched at the AOC. Mulch and any non-contaminated debris shall be temporarily stockpiled at the AOC.	None	Mulched vegetation and any non-contaminated debris (e.g., rocks/boulders) will be evenly spread across the AOC or disposed of by the Alaniz-Endpoint Team if too large to chip/mulch.
Topsoil Vegetation/Debris (i.e., COC-impacted vegetation)	Vegetation or debris (rocks, boulders) encountered below ground surface within the excavation footprint or other vegetation/debris that may have been in contact with impacted soil.	Topsoil vegetation/debris will not be separated from PAH-impacted soil. Soil and any topsoil vegetation/debris shall be loaded directly into haul trucks.	No additional characterization Soil profile samples shall be used to characterize all waste disposed off-site from this AOC.	After direct loading to haul trucks, PAH-impacted soil and topsoil vegetation/debris shall be transported to the NACA Test Area AOC, thermally treated and reused as backfill for site restoration at the AOCs.
Solid Waste (e.g., bricks, concrete, asphalt, rebar, other metal/solid waste, well casing)	Contaminated waste encountered below ground surface within the excavation footprint or non-contaminated waste that is removed during site clearing activities.	Solid waste will be separated from PAH-impacted soil to the extent practical and temporarily staged for disposal in a roll-off bin or in 55-gallon drums, along with any other non-contaminated solid waste.	No additional characterization Soil profile samples shall be used to characterize all waste disposed off-site from this AOC.	Any solid waste containers will be transported and disposed at an approved off-site disposal facility.
Excavated PAH-Impacted Surface Soil	Generated from excavation areas containing PAH impacted soil.	PAH-impacted soil will be thermally treated and reused onsite; thus, these soils are not considered waste.	None	Contaminated soil will be excavated and treated by the VEG Technology system. Following receipt of analytical results confirming treated soil meets Residential RSLs, the treated soil will be transported back to the site and will be used to backfill the excavation.

Table 7-1. Waste Stream Identification and Handling (continued)

Waste Stream	Point of Generation	Staging/Processing	Characterization	Waste Handling
Excavated Lead-Impacted Surface Soil	Generated from Well Pit containing lead- impacted soil.	Lead-impacted soil including co-mingled topsoil vegetation/debris will be loaded into a drum for disposal off-site, in addition to any material associated with destruction of the well box	One discrete profile sample will be collected and used to profile the waste for off-site disposal. Profile sample will be TCLP analyzed to determine the classification of waste (hazardous, nonhazardous)	If TCLP results indicate the waste as hazardous, a DRMO or DLA approved waste transporter will transport and dispose at an approved DRMO hazardous waste facility
Contact Waste / Disposable Sampling Equipment (e.g., PPE, gloves, boot covers, plastic sheeting/tarps, foil pans and zip lock bags)	Generated by remedial activities/site personnel which come in contact with contaminated soil.	PPE and disposable sampling equipment will be identified based on a visual inspection (e.g., soiled versus non-soiled). Potentially contaminated contact waste will be containerized in accordance with Section 7.0 of the SAP (Endpoint, 2021) and stored in approved DOT open-top 55-gallon drums equipped with plastic liners and sealed with bung-top lids. Waste drums will be temporarily stored at the AOCs and transported to the temporary storage location at Building 1036/1047 upon completion of work at the AOC.	If sufficient volume of contaminated contact waste and disposable sampling equipment is generated, waste profile samples shall be collected to characterize all waste for off-site disposal.	Contact waste will be disposed in accordance with Section 7.0 of the SAP (Endpoint, 2021). It will be disposed as either sanitary waste, non-hazardous or hazardous waste at a permitted waste facility based on the profile results.
Sanitary Waste / Trash Non-Contaminated (e.g., garbage, paper or plastic waste, PPE not in contact with contaminated soil)	Generated by site activities/personnel in which disposable equipment does not come in contact with contaminated soil.	Contact waste/disposable sampling equipment will be collected daily in plastic lined trash cans and stored in accordance with Section 7.0 of the SAP (Endpoint, 2021).	None	Sanitary waste/trash will be disposed off-site through a commercial municipal waste service.

Table 7-1. Waste Stream Identification and Handling (continued)

Waste Stream	Point of Generation	Staging/Processing	Characterization	Waste Handling
Well Abandonment Water	Water displaced and collected from the municipal well during well sealing.	Water will be collected and drummed in a closed-top 55-gallon DOT-approved drum.	Water will be sampled and analyzed for contaminants previously detected in the well. Additionally, field pH strips will be utilized to determine if the water will require neutralization prior to disposal.	Waste water will be will be transported and disposed at an approved off-site disposal facility.
Excavation Water (i.e., water that has come in contact with contaminated soil/equipment)	Water collected within excavations /boundaries during rainfall events or decontamination water.	PAH-impacted excavation water will be pumped into a temporary water storage tank. Decontamination of excavation equipment will be conducted over a designated decontamination area lined with impermeable plastic sheeting, and the decontamination water will be added to the same temporary storage tank. Minimal excavation water is anticipated based on the depths/extents of excavation areas and the use of disposable sampling equipment and a step-probe sampler; however, in the event that the volume of excavation water from either remediation areas proves to be greater than what is manageable for reuse by the VEG unit, the water will be stored in closed-top 55-gallon DOT-approved drums.	No additional characterization	Excavation water from PAH-impacted areas will be transferred from the temporary storage tank into the VEG system to be recycled within the VEG's vapor generator for complete oxidation and transformation into a hot, clean steam used at a heat source for the VEG's treatment chamber.

8.0 SITE RESTORATION

Site restoration will commence following analysis of confirmation sample analytical results and confirmation that AOC-related COC concentrations are at or below RSLs. Site restoration activities will not begin until confirmation sample results have been provided to the USACE Representative, and approval to proceed has been granted. The Alaniz-Endpoint Team will restore the project sites to pre-construction conditions. At a minimum, site restoration activities will include:

- Re-grading and backfilling excavations and surrounding areas; and
- Re-vegetation of the disturbed area.

8.1 RE-GRADING AND BACKFILL

Upon confirmation that the thermally treated soil concentrations are below the respective RSLs, the treated soils will be backfilled into the Areas 1, 2, and 3 excavations. Due to the disposal of lead-impacted surface soils from the Well Pit and abandonment of the production well and above ground structures, soils will be imported from a local off-site source, such as Patrick Excavating and Trucking in Ravenna, Ohio (a source used in prior remediation efforts at the RVAAP facility). Imported soil will be sampled and analyzed for the RVAAP full-suite of chemicals as outlined in the SAP (Endpoint, 2021) prior to backfilling. Sample results will be reviewed and approved by the ARNG/OHARNG Representatives, the USACE COR and the Ohio EPA prior to use. Where necessary, ruts and depressions within the project sites (e.g., unpaved access roads, truck loading area, equipment movement areas, and construction support area) will also be re-graded. Soil shall be compacted in place using successive horizontal layers of eight (8) inches (in areas where the excavation or rut is at least 8 inches deep) in loose depth for the full width of the excavation and compacted. Each layer shall be compacted before the overlying lift is placed. Compaction of the soil will be accomplished by a minimum of three passes of a roller or other approved compacting equipment routed over the entire surface of each layer in such a manner as to obtain a firm, dense, and uniform compaction across the entire width of the work area.

Final grading will be performed to match surrounding elevations and provide positive drainage to prevent future ponding or erosion. The final grade of each project site will be inspected and approved by the USACE COR or authorized designee prior to demobilization.

8.2 RE-VEGETATION

Disturbed work areas where remediation activities have temporarily ceased will be stabilized with temporary seed or mulch as described on Table 8-1 unless activities are to recommence within 21 days. Permanent cover for the disturbed areas will be seeded within seven days following excavation, backfilling, and final grading activities. Re-vegetation seeding will consist of the OHARNG approved seed mixes specified in Table 8-1. Seed mixes will be approved by the OHARNG Environmental Office and prepared for application at the site by the Ohio Prairie Nursery in Hiram, Ohio. The seed mix will be sown into the treated soil and covered with mulch. Restored areas will be inspected on a weekly basis and reported on a Site Restoration Inspection Form (Attachment A) until 70% vegetative cover is achieved. Although soil

treated using the VEG Technology has not historically required fertilizers or other soil amendments prior to seeding for plant growth, following construction, the Alaniz-Endpoint Team will assess the need for soil amendments (i.e., adding fertilizers, etc.) to facilitate successful growth.

Table 8-1. Revegetation Guidance

	NEED	SPECIES AND PROPORTION	APPLICATION
Temporary Cover for Ongoing Projects	Areas left idle for greater than 21 days, but scheduled for disturbance within the same summer growing season	100% Annual Ryegrass *(Lolium multiflorum)*	Broadcast at 40 pounds per acre. Drill at 30 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Areas left idle for greater than 21 days, but scheduled for disturbance within the same fall growing season	100% Winter rye *(Secale cereal)*	Broadcast at 112 pounds per acre. Drill at 80 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Areas left idle for greater than 21 days, but scheduled for disturbance within the same spring growing season	100% Oats *(Aveva sativa)*	Broadcast at 80 pounds per acre. Drill at 65 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Areas that will remain unfinished indefinitely	40% Nodding Wild Rye (*Elymus Canadensis*) 40% Virginia wild rye (*Elymus virginicus*) 15% Partridge Pea (*Chamaecrista fasciculate*) 5% Black-eyed Susan (*Rudbeckia hirta*) Add 10 lbs/ac Annual Ryegrass *(Lolium multiflorum)*/acre	Broadcast at 35 pounds per acre. Drill at 25 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Late Season (after 15 September) quick, temporary cover	23.5% Nodding Wild Rye (*Elymus Canadensis*) 25% Virginia wild rye (*Elymus virginicus*) 18.75% Partridge Pea (*Chamaecrista fasciculate*) 1.5% Black-eyed Susan (*Rudbeckia hirta*) 31.25% Little Bluestem (*Schizachyrium scoparium*) Add Annual Ryegrass *(Lolium multiflorum)*/acre: 20 lbs/ac for broadcast or 15 lbs/ac for drill	Broadcast at 25 pounds per acre. Drill at 18 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
Permanent Cover for Site Closure	Open Areas	23.5% Nodding Wild Rye (*Elymus Canadensis*) 25% Virginia wild rye (*Elymus virginicus*) 22% Little Bluestem (*Schizachyrium scoparium*) 18.75% Partridge Pea (*Chamaecrista fasciculate*) 7.75% Thin-leaved Coneflower (*Rudbeckia triloba*) 1.5% Brown fox sedge (*Carex vulpinoidea*) 1.5% Black-eyed Susan (*Rudbeckia hirta*) Add Annual Ryegrass *(Lolium multiflorum)*/acre: 20 lbs/ac for broadcast or 15 lbs/ac for drill	Broadcast at 18 pounds per acre. Drill at 12 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.
	Shaded, Partial Sun, Openings In Woods	31% Deertongue (*Panicum clandestinum*) 25% Virginia wild rye (*Elymus virginicus*) 25% Nodding Wild Rye (*Elymus Canadensis*) 10% Big Bluestem (*Andropogon gerardii*) 9% Side-Oats Grama (*Bouteloua curtipendula*) Add Annual Ryegrass *(Lolium multiflorum)*/acre: 20 lbs/ac for broadcast or 15 lbs/ac for drill	Broadcast at 30 pounds per acre. Drill at 20 pounds per acre. Mulch with a minimum of 3 bales of straw per 1000 ft^2 Use mulch netting instead of straw on slopes > 6%.

9.0 CONSTRUCTION QUALITY ASSURANCE PLAN

This section presents the Alaniz-Endpoint Team Construction Quality Assurance Plan, which describes inspection procedures and documentation to ensure all remedial activities are implemented according to the requirements set forth in this RD.

In addition to the QA/QC procedures provided in the SAP (Endpoint, 2021), the following will be discussed:

- Responsibility and Authority;
- Personnel Qualifications;
- Daily Planned Briefings;
- Inspection Activities;
- Confirmation Requirements; and
- Documentation.

9.1 RESPONSIBILITY AND AUTHORITY

9.1.1 Responsibility

The organizational chart presented in Section 2.0 outlines the management structure that will be used to implement the excavation and remedial activities in accordance with this RD. The functional responsibilities of key personnel were described in Section 2.1. Personnel assignments to each position were based on the following:

- Qualifications;
- Experience; and
- Training.

The Alaniz-Endpoint Team QA Manager and Project Manager, in coordination with the USACE COR, will ensure that completed remedial activities conform to the RD. The Alaniz-Endpoint Team Project Manager will verify completion of these activities.

The Alaniz-Endpoint Team Project Manager will monitor excavation, thermal treatment, disposal, and site restoration activities. The Alaniz-Endpoint Team Project Manager or designee will be on site during work activities to ensure that all components of this RD are fulfilled.

9.1.2 Administration

The QA/QC organization is administered by the Alaniz-Endpoint Team QA Manager in concert with the Alaniz-Endpoint Team Project Manager. The Alaniz-Endpoint Team Project Manager will be supported by the FTL and technical staff (engineers, scientists, and technicians) as necessary.

All vendors supplying materials used for any aspect of the remediation or site restoration activities will supply such materials from manufacturing facilities with established QC programs. Results of the manufacturer QC procedures will be submitted to the Alaniz-Endpoint Team QA Manager for review, evaluation, and documentation prior to beginning field activities.

9.2 PERSONNEL QUALIFICATIONS

All QA/QC personnel will be properly trained for their job and hold HAZWOPER certifications. The Alaniz-Endpoint Team Project Manager will ensure that completed remedial activities conform to this RD and any necessary permit conditions. The Alaniz-Endpoint Team Project Manager will have demonstrated knowledge of specific construction practices relating to excavation procedures, observation and testing procedures, and documentation procedures. The Alaniz-Endpoint Team Project Manager will also be experienced in performing similar duties on previous jobs where comparable construction activities took place.

9.3 DAILY PLANNING BRIEFINGS

At the start of the project, the Alaniz-Endpoint Team will participate in a pre-construction briefing on objectives, health and safety, proposed deviations from this RD, and project schedule.

In addition, all onsite personnel will participate in daily tailgate safety meetings led by the Alaniz-Endpoint Team Project Manager, or designee, to determine the plan of action for the workday and remind workers of health and safety topics. Topics discussed during these meetings will be recorded on Tailgate Safety Meeting Forms (Attachment A) and will include the following:

- A discussion of the planned activities for the workday, including the extent of planned excavation;
- Weather considerations;
- Safety reminders;
- Transportation and delivery schedule;
- Project Schedule; and
- Any issues that may arise and how to resolve those issues.

The USACE COR and ARNG/OHARNG Representative, or authorized designees are invited to attend the pre-work briefing and any daily safety meetings. As previously mentioned, all field activities will be coordinated with CJAG Range Control on a daily basis (i.e., notification at the start and end of the workday, and number of field personnel). In the event that a deviation from the methods provided in this RD is required, the deviation will be documented on a Field Change Form (included in Attachment A), submitted and approved by the USACE COR and Ohio EPA prior to implementation.

9.4 INSPECTION ACTIVITIES

Inspections will be completed to verify acceptability of materials, prevent spills, assess effectiveness of storm water and dust generation controls, and confirm VEG system equipment is operating within design limits. The scope and frequency of each type of inspection is described below.

9.4.1 Spill Control

The Alaniz-Endpoint Team Project Manager will conduct weekly inspections of hazardous wastes storage and monthly inspections of non-hazardous waste storage to verify spill equipment is maintained and no spills have occurred. The Alaniz-Endpoint Team Project Manager will be notified if any visual or olfactory indicators of equipment leaks or spills are encountered during remediation activities. The Alaniz-Endpoint Team will provide all necessary onsite spill equipment (e.g., granulated clay, absorbent blankets, personal protective equipment, shovels, containers). The onsite spill kit will be utilized to clean up the spill or outside resources will be utilized in the event of a large or reportable quantity spill. All onsite workers will maintain good housekeeping practices (as discussed in Section 5.3.4). Spills will be responded to as presented in Section 12.1.2 of the FWSHP and the CJAG Spill Contingency Plan. In the event of a spill or leak, the employee making the discovery will immediately notify the Alaniz-Endpoint Team SSHO and the Alaniz-Endpoint Team Project Manager. These spills can include, but are not limited to, releases of fuels, lubricants, and hydraulic fluids.

The Alaniz-Endpoint Team Project Manager will ensure the spill is immediately reported via phone to the OHARNG and CJAG Range Control. The Alaniz-Endpoint Team Project Manager will ensure the incident is documented on a CJAG Spill Incident Reporting Form and a First Responder Reporting Form (provided in Attachment A), and reported in accordance with the procedures noted on the Incident Reporting Form and CJAG Waste Management Guidelines.

9.4.2 Stormwater/Excavation Water Controls

Site work will be planned using the weather forecast, with work being limited during severe storm events. In addition, all excavated soils, both treated and untreated, shall be managed in lined and covered stockpiles within the treatment area. The tarps covering each stockpile will be maintained in good condition and secured prior to the end of each workday and when rain events occur. In the event which weather conditions require stormwater/excavation water management, the Alaniz-Endpoint Team will install, inspect and document all storm water controls (e.g., covering excavation areas with tarps, installing/inspecting silt fencing, divert off-site run-off away from the excavation) prior to and during remedial activities, per Section 5.3.3. Stormwater controls will be inspected on a weekly basis and following any rain event resulting in one-half inch of rain or more, and documented on a Stormwater Control Inspection Form (see Attachment A). Collected stormwater not in contact with impacted soil shall be discharged onsite in accordance with Section 5.3.3 and reported on a Stormwater Release Form. Any water collected from within the excavation or in contact with impacted-soil (i.e., excavation water) shall be either recycled or disposed in accordance with Section 5.3.3 herein.

All employees will practice due diligence to prevent any damage to the stormwater control measures. The Alaniz-Endpoint team will conduct daily inspections to evaluate the integrity of the storm water controls. Any deficiencies will be immediately corrected and documented in the daily report.

During rain events, minimal runoff of contact water is anticipated within the VEG treatment area located at the NACA Test Area and will be limited by tarps covering stockpiles and treatment equipment. BMPs installed around the perimeter of the NACA-VEG soil treatment area will prevent sediment and contaminated soil from entering adjacent wetland areas.

In the event of a release of soil (contaminated or treated) beyond the silt fence, the soil will be excavated immediately and returned to the appropriate soil stockpile. If the release is from a contaminated soil stockpile, native soil and/or sediment sampling will be performed and samples analyzed for project COCs to ensure that native soils are not in excess of a residential land use criteria.

Temporary stabilization will be made to any impacted areas, while final restoration of any area requiring cleanup will be conducted at project completion. If impacts to wetlands have occurred, restoration plans will be developed for review and approval by USACE COR, ARNG/OHARNG Representative and Ohio EPA.

9.4.3 VEG System Operation

An Alaniz-Endpoint Team technician will be responsible for performing periodic system equipment tests to confirm that the system is operating within the design limits. The technician will also review the data gathered hourly during system operation, as described in Section 5.2.3, to confirm the system is operating within the normal range of parameters (e.g. temperature, propane flow, and water flow). The technician will notify the Alaniz-Endpoint Team Project Manager if any tests indicate equipment may not be operating as designed.

VEG System Thermocouples, used to measure the temperature of VEG system effluent and soil during treatment are calibrated at the beginning and end of each project. The pre-project calibration will be recorded by the calibrating technician on the Contractor's Quality Control Daily Report and stored on-site for the duration of the project.

During the project, daily inspections will be performed to verify the water and propane control valves are functioning properly and do not have leaks. The test will consist of closing valves manually to confirm that system effluent temperature declines following valve closure. These tests will be documented in the Contractor's Quality Control Daily Report, included in Attachment A.

In addition to daily valve tests, the system emergency shut off switch will be tested weekly by engaging the switch while the system is in operation. These tests will be recorded on the Contractor's Quality Control Daily Report.

9.4.4 Dust Control

Dust generation may occur during excavation, soil transportation, equipment movement on paved and unpaved roads, and site restoration. Generation of dust will be eliminated by implementing construction procedures discussed in Section 5.3.1 and by keeping vehicles on improved roads, limiting speeds to a maximum of 10 mph on access roads, and applying water for dust suppression purposes as required. Water used for dust control will be clean (i.e., obtained from the Newton Falls Municipal Water Department). Engineering controls will be implemented to minimize the potential for dust generation. An Alaniz-Endpoint Team member will conduct and report daily dust inspections on Daily QC reports, as described in the SSHP (to be prepared under separate cover).

9.4.5 Survey

As mentioned in Section 5.1, the initial and final excavation boundaries will be surveyed by a registered surveyor to document the vertical and horizontal extents of the remedial activities. Coordinates for the excavation extents will be included in the Remedial Action Completion Report (Section 9.6.2). The horizontal and vertical survey tolerance will be ±0.1 ft. The excavation coordinates will be reported in Ohio State North American Datum 83.

9.4.6 Site Restoration

Once remedial activities have been completed and approved by the USACE COR, excavations will be backfilled and graded to match adjacent contours. Imported soil will be sampled by the Alaniz-Endpoint Team in accordance with the procedures in Section 3.1 of the SAP (Endpoint, 2021) prior to being delivered to the site. Sample results will be provided to the Army for approval, a minimum of seven days prior to placing materials. Backfilling and re-vegetation procedures will comply with Section 8.0 herein and will be overseen by the Alaniz-Endpoint Team. In addition, restored areas will be inspected on a weekly basis and reported on a Site Restoration Inspection Form until 70% vegetation cover is achieved, after which any existing erosion control measures will be removed.

9.5 CONFIRMATION REQUIREMENTS

9.5.1 Confirmation Sampling

Confirmation sampling will be performed in accordance with Section 6.0 of this RD and the Section 4.2 of the SAP (Endpoint, 2021) to demonstrate achievement of RSLs. Confirmation samples from the Well Pit will be analyzed for lead, and confirmation samples for the NACA Test Areas 1, 2, and 3 will be analyzed for site-specific PAHs. Analyses will be conducted by Eurofins/Test America Laboratories in Savannah, Georgia.

9.5.2 Verification of Achievement of Performance Criteria

The Alaniz-Endpoint QA Manager will confirm that confirmation sample results meet the RSL for benzo(a)pyrene, both relative to excavation/bottom sampling and post-treatment soil sampling results. The

USACE COR and ARNG/OHARNG Representative will be notified of the evaluations and results. If any sample does not meet the RSL, the evaluation will include a description of the additional excavation and/or treatment based on the approaches described in Section 6.0. Confirmation sampling results will be included in the Remedial Action Completion Report (Section 9.6.2).

9.6 DOCUMENTATION

9.6.1 Field Documentation

Daily inspection and quality control reports will be completed, signed, and dated by the Alaniz-Endpoint Team Project Manager, or designee.

Daily quality control reports may include:

- Summary of activities performed at the project site;
- Daily inspection activities;
- Weather information and ground conditions;
- Materials delivered or visitors to the site;
- Deviations from the approved RD (e.g., verbal instruction received from government);
- Problems encountered during field activities;
- Copies of Chain of Custody and summary of sampling performed; and
- Summary of confirmation or profiling sample results.

Copies of the Contractor's Quality Control Daily Report and Tailgate Safety Meeting Form are included in Attachment A. Sampling field forms are included in Attachment II of the SAP (Endpoint, 2021). Daily reports may be combined to form monthly reports for submittal to the Ohio EPA, by the Army, as required per Section 5.4 of the SAP (Endpoint, 2021).

9.6.2 Remedial Action Completion Report

Upon completion of remedial activities, a Remedial Action Completion Report (RACR) will be prepared by the Alaniz-Endpoint Team. The RACR will document:

- Activities conducted to implement the remedial action;
- Summary of sampling results, copies of field forms, waste trackers and waste manifests;
- Verification that the project was performed in accordance with this RD;
- Any approved field variances from this RD (e.g., unforeseen site conditions, change in scope);
- Corrective actions; and
- Achievement of RSLs.

10.0 REFERENCES

Endpoint, 2015. *Implementation Report for Bench- and Pilot-Scale Testing Ex-Situ Thermal Treatment of Polycyclic Aromatic Hydrocarbons in Soils.* RVAAP-50 Atlas Scrap Yard Site. Former Ravenna Army Ammunition Plant, Ravenna OH. December.

Endpoint, 2021. *Final Remedial Design for Soil, Sediment, And Surface Water At RVAAP-42 Load Line 9,* March 2021.

Leidos, 2018. *Phase II Remedial Investigation Report and Feasibility for Soil, Sediment, and Surface Water at RVAAP-38 NACA Test Area,* Portage and Trumbull Counties, Ohio. July 2018.

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SAIC 2001. *Phase I Remedial Investigation Report for the NACA Test Area at the Ravenna Army Ammunition Plant,* Ravenna, Ohio. December 2001.

MKM, 2007. *Characterization of 14 AOCs at Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*. March 2007.

OHARNG, 2006. *Wetlands and Other Waters Delineation Report, Approximately 390 Acres at the Ravenna training and Logistics Site, Portage County, Ohio*.

USACE, 2010. *Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant, Ravenna, Ohio*. March 2010.

USACE, 2011a. *Facility-Wide Sampling and Analysis Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. February 2011.

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USACHPPM, 1998. *Hazardous and Medical Waste Study No. 37-EF-5360-99 Relative Risk Site Evaluation for Newly Added Sites at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. October 1998.

USATHAMA, 1978. *Installation Assessment of Ravenna Army Ammunition Plant,* Records Evaluation Report No. 132. November 1978.

Attachment A
Field Forms

CAMP JAMES A. GARFIELD

Joint Military Training Center
8455 State Route 5
Ravenna, Ohio 44266-9244
(614) 336-6041

CONTRACTOR ACCESS REQUEST FORM

COMPANY NAME:	
Project POC Name:	
ADDRESS:	
PHONE:	[COMPANY PHONE NUMBER]

PROJECT NAME/AREA OF WORK:	
CJAG JMTC PROJECT POC/PHONE:	

PERSONNEL REQUIRING ACCESS TO FACILITY

LAST NAME	FIRST NAME	CELL PHONE #	LIC. PLATE #

START DATE:		**END DATE:**	

APPROVED BY: _____

SIGNATURE *PRINT NAME* *RANK* *DATE*

MAIN GATE _____ **EAST GATE** _____ **(# OF PAGES)** _____

ESCORT REQUIRED? **YES** **NO**

ESCORT POC: _____

NAME *PHONE #*

CAMP JAMES A. GARFIELD

PERSONNEL REQUIRING ACCESS TO FACILITY: CONT.	
COMPANY NAME:	
PROJECT NAME/AREA OF WORK:	

LAST NAME	FIRST NAME	CELL PHONE #	LIC. PLATE #

Construction Site Inspection Checklist for OHC000005

By making use of some simple Best Management Practices (BMPs) a construction site operator can do his or her share to protect Ohio's water resources from the harmful effects of sediment. The topography of the site and the extent of the construction activities will determine which of these practices are applicable to any given site, but the BMPs listed here are applicable to most construction sites. For details on the installation and maintenance of these BMPs, please refer to the current ***Rainwater and Land Development****, Ohio EPA's Standards for Storm Water Management Land Development and Urban Stream Protection*. The manual is available at http://epa.ohio.gov/dsw/storm/technical_guidance.

Temporary Stabilization

This is the most effective BMP. All disturbed areas that will lie dormant for over 14 days must be stabilized within 7 days of the date the area becomes inactive. The goal of temporary stabilization is to provide cover, quickly. Areas within 50 feet of a stream must be stabilized within 2 days of inactivity. This is accomplished by seeding with fast-growing grasses then covering with straw mulch. Apply only mulch between November 1 and March 31. To minimize your costs of temporary stabilization, leave natural cover in place for as long as possible. Only disturb areas you intend to work within the next 14 days.

Construction Entrances

Construction entrances are installed to minimize off-site tracking of sediments. A stone access drive should be installed at every point where vehicles enter or exit the site. Every individual lot should also have its own drive once construction on the lot begins.

Sediment Ponds

Sediment ponds are required for construction areas with concentrated runoff or when the design capacity of silt fence or inlet protection is exceeded. There are two types of sediment ponds: sediment basins and sediment traps. A sediment trap is appropriate where the contributing drainage area is 5 acres or less. The outlet is an earthen embankment with a simple stone spillway. A sediment basin is appropriate for drainage areas larger than 10 acres. The outlet is an engineered riser pipe with a skimmer or similar device used to dewater the pond at the surface. Often a permanent storm water management pond, such as a retention or detention basin, can be modified to act as a sediment basin during construction. All sediment ponds must be installed within 7 days of first grubbing the area they control, provide a minimum dewatering zone of 67 cubic yards per acre of total contributing drainage area and a sediment settling zone of 34 cubic yards per disturbed acre below the level of the outlet. Sediment basins must be designed to drain the dewatering zone over a 48-hour period.

Sediment Barriers

This is typically used at the perimeter of a disturbed area. It's only for small drainage areas on relatively flat slopes or around small soil storage piles. Not suitable where runoff is concentrated in a ditch, pipe or through streams. For large drainage areas where flow is concentrated, collect runoff in diversion berms or channels and pass it through a sediment pond prior to discharging it from the site. Combination barriers constructed of silt fence supported by straw bales or silt fence embedded within rock check dams may be effective within small channels. As with all sediment controls, sediment barriers must be capable of pooling runoff so that sediment can settle out of suspension. Sediment barriers must be installed within 7 days of first grubbing the area it controls.

Inlet Protection

This must be installed on all yard drains and curb drains when these inlets do not drain to a sediment trap or basin. Even if there is a sediment trap or basin, inlet protection is still recommended, as it will increase the overall sediment removal efficiency. These are best used on roads with little or no traffic. If working properly, inlet protection will cause water to pond. If used on curb inlets, streets will flood temporarily during heavy storms. Check with your municipality before installing curb inlet protection. They may prefer an alternate means of sediment control such as silt fence or ponds.

Permanent Stabilization

All areas at final grade must be permanently stabilized within 7 days of reaching final grade. This is usually accomplished by using seed and mulch, but special measures are sometimes required. This is particularly true in drainage ditches or on steep slopes. These measures include the addition of topsoil, erosion control matting, rock rip-rap or retaining walls. Permanent seeding should be done March 1 to May 31 and August 1 to September 30. Dormant seeding can be done from November 20 to March 15. At all other times of the year, the area should be temporarily stabilized until a permanent seeding can be applied.

Non-Sediment Pollution Control

Although sediment is the pollutant of greatest concern on most construction sites, there are other sources of pollution. Most of these BMPs are easy to implement with a little bit of planning and go a long way toward keeping your site clean and organized. Please be sure to inform all contractors how these BMPs affect their operations on the site, particularly those that will be working near a stream.

Inspection Sheet

INSPECTIONS MUST BE CONDUCTED ONCE EVERY 7 DAYS AND WITHIN 24 HOURS OF A 0.5" OR GREATER RAINFALL. ALL SEDIMENT CONTROLS MUST BE INSTALLED PRIOR TO GRADING AND WITHIN 7 DAYS OF FIRST GRUBBING

GENERAL INSPECTION INFORMATION

Construction Site Inspection Date: _____ Inspector Name: _____

Inspector Title: _____ Qualifications/Certifications: _____

Storm Events of the Last 7 Days

Storm Event Date	Storm Event Time	Storm Event Duration	Total Rainfall Amount	Discharge Occur? (Y/N)
_____	_____	_____	_____(inches)	_____
_____	_____	_____	_____(inches)	_____
_____	_____	_____	_____(inches)	_____
_____	_____	_____	_____(inches)	_____

Weather Information at the Time of Inspection

Temperature _____ Climate (Sunny, Cloudy, Rain)? _____ Is Storm Water Being Discharged? _____

Sketch or Small Site Map

Along with a narrative inspection log, Ohio EPA recommends the inspector use a sketch or a reduced photocopy of the site plan showing the location of storm water outfalls and storm drain inlets as well as the location and types of control measures. Problems observed at these locations, or at other locations on the construction site, should be highlighted and any corrective measures undertaken should be drawn in and noted in detail on the front side of the sketch. This method will also be helpful as the permittee is required to update the SWP3 to reflect current site conditions.

CONSTRUCTION ENTRANCES

Key things to look for ...

	Yes	No
1. Has the drive been constructed by placing geotextile fabric under the stone?	☐	☐
2. Is the stone 2-inch diameter?	☐	☐
3. Has the stone been placed to a depth of 6 inches, with a width of 10 feet and a length of at least 50 feet (30 feet for entrances onto individual sublots)?	☐	☐
4. If the drive is placed on a slope, has a diversion berm been constructed across the drive to divert runoff away from the street or water resource?	☐	☐
5. If drive is placed across a ditch, was a culvert pipe used to allow runoff to flow across the drive?	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

SEDIMENT PONDS

Key things to look for ...

		Yes	No
1.	Are concentrated flows of runoff directed to a sediment pond?	☐	☐
2.	Is sheet-flow runoff from drainage areas that exceed the design capacity of silt fence (generally 0.25 acre or larger) directed to a sediment pond?	☐	☐
3.	Is runoff being collected and directed to the sediment pond via the storm sewer system or via a network of diversion berms and channels?	☐	☐
4.	Is the sediment pond dewatering zone appropriately sized (67 cubic yards per acre of total drainage area)?	☐	☐
5.	Is the sediment pond sediment settling zone appropriately sized (34 cubic yards per acre of disturbed area)?	☐	☐
6.	Is the sediment basin designed to be dewatered at the surface through the use of a skimmer or another similar surface water dewatering device?	☐	☐
7.	Is the sediment basin designed so that the dewatering zone will drain in no less time than 48 hours?	☐	☐
8.	Have the embankments of the sediment pond and the areas that lie downstream of the pond been stabilized?	☐	☐
9.	For sediment traps, is there geotextile under the stone spillway and is the spillway saddle-shaped?	☐	☐
10.	For sediment traps, which dewater 100% between storms, is the dewatering pipe end-capped, no larger than 6 inches in diameter, perforated and double-wrapped in geotextile?	☐	☐
11.	Is the length-to-width ratio between inlet(s) and outlet at least 2:1? **NOTE**: If not, a baffle should be added to lengthen the distance.	☐	☐
12.	Is the depth from the bottom of the basin to the top of the primary spillway no more than 3 to 5 feet?	☐	☐
13.	For a modified storm water pond being used as a sediment pond, is the connection between the riser pipe and the permanent outlet water-tight?	☐	☐
14.	Was the basin installed prior to grading the site?	☐	☐
15.	Is it time to clean-out the sediment pond to restore its original capacity? Generally, sediment should be removed from the sediment settling zone once it's half-full. Stabilize the dredged sediments with seed and mulch.	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

SEDIMENT BARRIERS

Key things to look for ...

	Yes	No
1. Is the silt fence at least 4" to 6" into the ground?	☐	☐
2. Is the silt fence trench backfilled to prevent runoff from cutting underneath the fence?	☐	☐
3. Is the silt fence pulled tight so it won't sag when water builds up behind it?	☐	☐
4. Are the ends brought upslope of the rest of the silt fence so as to prevent runoff from going around the ends?	☐	☐
5. Is the silt fence placed on a level contour? If not, the fence will only act as a diversion.	☐	☐
6. Have all the gaps and tears in the silt fence been eliminated.	☐	☐
7. Is the sediment barrier controlling an appropriate drainage area? Refer to Chapter 6 of ***Rainwater*** manual. **RULE OF THUMB**: Design capacity for 100 linear feet of sediment barrier is 0.5 acres for slopes < 2%, 0.25 acres for slopes 2% to 20%, & 0.125 acres for slopes 20% or more. Generally, no more than 0.25 acres should lie behind 100 feet of sediment barrier at 2% to 20% slope, i.e., the distance between the barrier and the top of the slope behind it should be no more than 125 feet. The allowable distance increases on flatter slopes and decreases for steeper slopes. **All non-silt fence sediment barriers must be at least 12-inches in diameter.**	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

INLET PROTECTION

Key things to look for ...

	Yes	No
1. Does water pond around the inlet when it rains?	☐	☐
2. Has the fabric been replaced when it develops tears or sags?	☐	☐
3. For curb inlet protection, does the fabric cover the entire grate, including the curb window?	☐	☐
4. For yard inlet protection, does the structure encircle the entire grate?	☐	☐
5. Is the fabric properly entrenched or anchored so that water passes through it and not under it?	☐	☐
6. For yard inlet protection, is the fabric properly supported to withstand the weight of water and prevent sagging? The fabric should be supported by a wood frame with cross braces, or straw bales.	☐	☐
7. Is sediment that has accumulated around the inlet removed on a regular basis?	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

TEMPORARY STABILIZATION

Key things to look for ...

	Yes	No
1. Are there any areas of the site that are disturbed, but will likely lie dormant for over 14 days?	☐	☐
2. Have all dormant, disturbed areas been temporarily stabilized in their entireties?	☐	☐
3. Have disturbed areas outside the silt fence been seeded or mulched?	☐	☐
4. Have soil stockpiles that will sit for over 14 days been stabilized?	☐	☐
5. Has seed and mulch been applied at the proper rate? In general, seed is applied at 3 to 5 lbs per 1000 sq ft and straw mulch is applied at 2-3 bales per 1000 sq ft.	☐	☐
6. Has seed or mulch blown away? If so, repair.	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

PERMANENT STABILIZATION

Key things to look for ...

	Yes	No
1. Are any areas at final grade?	☐	☐
2. Has the soil been properly prepared to accept permanent seeding?	☐	☐
3. Has seed and mulch been applied at the appropriate rate (see Chapter 7 of the ***Rainwater*** manual)?	☐	☐
4. If rainfall has been inadequate, are seeded areas being watered?	☐	☐
5. For drainage ditches where flow velocity exceeds 3.5 ft/s from a 10-year, 24-hour storm has matting been applied to the ditch bottom?	☐	☐
6. If the flow velocity exceeds 5.0 ft/s, has the ditch bottom been stabilized with rock rip-rap? **NOTE**: Rock check dams may be needed to slow the flow of runoff.	☐	☐
7. Has rock rip-rap been placed under all storm water outfall pipes to prevent scouring in the receiving stream or erosion of the receiving channel?	☐	☐
8. For sites with steep slopes or fill areas, is runoff from the top of the site conveyed to the bottom of the slope or fill area in a controlled manner so as not to cause erosion?	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

NON-SEDIMENT POLLUTION CONTROL

Key things to look for ...

	Yes	No
1. Has an area been designated for washing out concrete trucks? Washings must be contained on site within a bermed area until they harden. The washings should never be directed toward a watercourse, ditch or storm drain.	☐	☐
2. Is waste and packaging disposed of in a dumpster? Do not burn them on site.	☐	☐
3. Are fuel tanks and drums of toxic and hazardous materials stored within a diked area or trailer and away from any watercourse, ditch or storm drain?	☐	☐
4. Are streets swept as often as necessary to keep them clean and free from sediment? NOTE: Sediment should be swept back onto the lot - not down the storm sewers.	☐	☐
5. Are stockpiles of soil or other materials stored away from any watercourse, ditch or storm drain?	☐	☐
6. Have stream crossings been constructed entirely of non-erodible material?	☐	☐
7. If an area of the site is being dewatered, is it being pumped from a sump pit or is the discharge directed to a sediment pond? **NOTE**: if you must lower ground water, the water may be discharged to the receiving stream as long as the water remains clean. Be sure not to co-mingle the clean ground water with sediment-laden water or to discharge it off-site by passing it over disturbed ground.	☐	☐

Note areas where repairs or maintenance is needed or where this practice needs to be applied:

Site Name: _____ Date: _____

Name (print)	Company	Time	
		In	Out

Comments: _____

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CONTRACTOR'S QUALITY CONTROL DAILY REPORT

REPORT NO. 1 SHEET 1 OF 1

PROJECT	CONTRACT NO.	DATE
CONTRACTOR'S REPRESENTATIVE ON THE JOB		
WEATHER (Rain, Snow, Cloudy, Windy, etc.)	GROUND CONDITIONS (Dry, Damp, Wet, Frozen, etc.)	

1. PRIME CONTRACTOR:

NO. EMPLOYEES BY JOB CATEGORIES (Arrival and Departure)	Hours	HEAVY EQUIPMENT ON JOB (Arrival and Departure)	NO. UNITS	HRS. WORKING		
				YES	NO	Comments

WORK PERFORMED BY PRIME CONTRACTOR:

MATERIALS DELIVERED (Arrival/MSDS)	OFFICIAL VISITORS TO SITE (Arrival and Departure)

2A. SUBCONTRACTOR,

NO. EMPLOYEES BY JOB CATEGORIES (Arrival and Departure)	Hours	HEAVY EQUIPMENT ON JOB (Arrival and Departure)	NO. UNITS	HRS. WORKING		
				YES	NO	Comments

WORK PERFORMED BY SUBCONTRACTOR:

3. SPECIFIC INSPECTIONS: (Inspections performed, results, and corrective actions)

4. TESTING: ☐1 Check if any testing was performed today. (Complete and attach Test Report Information Sheets.)

Type and Location of Testing:

5. CONSTRUCTION DEFICIENCIES OR RE-TESTING REQUIRED. AS A RESULT OF GOVERNMENT ONSITE QA:

6. HEALTH AND SAFETY OBSERVATIONS OR ACTIONS TAKEN:

7. CONTRACTOR DELAYS/PROBLEMS/DEFICIENCIES/CORRECTIVE ACTIONS:

8. REMARKS:

9. CERTIFICATION:

I certify that the above report is complete and correct and that I, or my authorized representative, have inspected all work performed this day by the prime contractor and each subcontractor and determined that all materials, equipment, and workmanship are in strict compliance with the RD, SAP/QAPP, and USACE requirements.

Contractor's Quality Control Representative

_____

FIELD CHANGE REQUEST

FCR NO. _____ DATE INITIATED _____
PROJECT _____
CONTRACT NO. _____

REQUESTOR IDENTIFICATION
NAME_____ ORGANIZATION _____ PHONE _____

TITLE _____ SIGNATURE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☐ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION)

DESCRIPTION OF CHANGE:

JUSTIFICATION:

IMPACT OF NOT IMPLEMENTING REQUEST:

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:

COST ESTIMATE ($) __0__ ESTIMATOR SIGNATURE _____
PHONE_____ DATE _____

PREVIOUS FCR AFFECTED ☐ YES ☐ NO; IF YES, FCR NO. ___

USACE COR: _____ DATE: _____

OHIO EPA PROJECT MANAGER: _____ DATE: _____

ENDPOINT H&S MANGER: _____ DATE: _____

QRG 2.2 FIRST RESPONDER REPORTING FORM

Collect as much of the information on the top half of this form as possible before making initial notification. Complete the top and bottom of the form before turning in to Range Operations.

Name of individual reporting spill:_____

When did the spill occur (Date and Time)? _____

Spill Location (Building or area name / number, indoors or out; if vehicle involved, type and bumper number):

_____

What was spilled?_____**How much was spilled?** _____

Rate at which material is currently spilling. _____

Extent of spill travel? _____

Did the spill reach water (ditch, creek, stream, pond, well head)? _____

Number of injured personnel and type injuries, if applicable. _____

Do you need the Fire Department to respond to protect life, property, and environment? _____

Unit:_____**State:**_____**Report Date & Time:**_____

On Scene Coordinator Name and Grade:_____**Phone:** _____

How did the spill occur (be specific)? _____

_____

What remedial action was taken? _____

_____

Was soil and absorbent material generated?_____**How much?** _____

What is the location of the soil and absorbents? _____

Was the Environmental Office contacted (yes or No, date and time)? _____

Who did you talk to in the Environmental Office? _____

Was the site cleared by the Env. Office (Yes or No, date and time)? _____

Who cleared the site (name and grade, date and time)? _____

Initial information is critical. Get as much information as you can, but don't hesitate to make the initial notification if a spill is moving or worsening rapidly!

This form must be completed for all releases and turned-in to CJAG Range Operations within 24 hours.

FIRST RESPONDER SPILL/RELEASE RESPONSE ACTIONS

Units or contractors performing training or other operations at Camp James A. Garfield shall be responsible for adhering to the provisions identified in the Integrated Environmental Contingency Plans (IECP). A copy of the IECP may be obtained from the Camp James A. Garfield Environmental Supervisor. Following discovery of a spill (any size), the procedures outlined below shall be executed where applicable:

1. **If necessary, initiate evacuation of the immediate area.**
2. **Notify Camp James A. Garfield Range Operations via two-way radio or by calling (614) 336-6041, and report information contained on the "First Responder Reporting Form" if it is known or can reasonably be determined. This form has been copied on the opposite side of this page. If Range Operations cannot be reached, contact a Camp James A. Garfield OSC (listed below).**
3. **Stop spill flow when possible without undue risk of personal injury.**
4. **If trained, contain the spill using available spill response equipment or techniques.**
5. **Make spill scene OFF LIMITS to unauthorized personnel.**
6. **Restrict all sources of ignition when flammable substances are involved.**
7. **Report to the OSC upon his/her arrival to the scene. Turn in a completed copy of the Camp James A. Garfield First Responder Form to Range Operations for ALL releases, even ones cleaned up by the reporter.**

TELEPHONE NUMBER

When Camp James A. Garfield Range Operations is *not available*, the OSC *must be contacted* by the discoverer/first responder following a release if it is in water, at or above a reportable quantity (25 gallons or more of POL), a hazardous or extremely hazardous substance, a hazardous waste, or involves fire, explosion, or is otherwise a major incident.

NAME	JOB TITLE	OFFICE	24 HOUR
Camp James A Garfield Range Operations	Operations and Training	(614)336-6041	(614) 202-5783
Tim Morgan (Primary OSC)	Environmental Supervisor	(614)336-6568	(330)322-7098
Brad Kline (Alternate OSC)	Environmental Specialist	(614)336-4918	Contact Alternate
Katie Tait (Alternate OSC)	Environmental Specialist	(614)336-6136	Contact Alternate
Joint Forces Command (Alternate POC)	OHARNG Emergency Center	(888)637-9053	(888)637-9053

Off-site (from Camp James A. Garfield area code 614 phones)

Ravenna Dispatch 9-1-330 296-6486

SEE REVERSE FOR FIRST RESPONDER REPORTING FORM

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SAFETY CHECKLIST FOR MACHINERY, MECHANIZED EQUIPMENT, AND OTHER MOBILE EQUIPMENT

Project Name:
Contract Number:

Equipment Name and Number:
Owned or Leased?

Contractor:	Subcontractor:
Contractor Inspector:	Date Inspected:

CHECKLIST	Yes	No	N/A
1. Are initial and daily/shift inspection records available?			
2. Are only qualified operators assigned to operate equipment?			
3 Are sufficient lights provided for night operations?			
4. Does the unit have at minimum a 5-B:C fire extinguisher?			
5. Is there an effective working reverse alarm?			
6. Is the unit shut down for refueling?			
7. Are moving parts, shafts, sprockets, belts, etc., guarded?			
8. Is protection against hot surfaces, exhausts, etc., provided?			
9. Are fuel tanks located in a manner to prevent spills or overflow from running onto the engine exhaust or electrical equipment?			
10. Are exhaust discharges directed so they do not endanger persons or obstruct operator vision?			
11. Are seat belts provided for each person required to ride on the equipment?			
12. Is protection (grills, canopies, screens) provided to shield operators from falling or flying objects?			
13. Is roll-over protection provided (ROPS)?			

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SAFETY CHECKLIST FOR MACHINERY, MECHANIZED EQUIPMENT, AND OTHER MOBILE EQUIPMENT

CHECKLIST	Yes	No	N/A
14. Is a safe means of access to the cab provided (steps, grab bars, non-slip surfaces)?			
15. Are adequate head and taillights provided?			
16. Have the brakes been tested and found satisfactory?			
17. Does the unit have an emergency brake which will automatically stop the equipment upon brake failure? Is the system manually operable from the driver's position?			
18. Is all equipment with windshields equipped with powered wipers and defogging or defrosting system?			
19. Are all vehicles that will be parked or moving slower than normal traffic on haul roads equipped with a yellow flashing light or flashers visible from all directions?			
20. Is the slow moving emblem used on all vehicles which by design move at 25 MPH or less on public roads?			
21. Have air tanks been tested and certified?			
22. Is an air pressure gauge in working condition installed on the unit?			
23. Does the air tank have an accessible drain valve?			
24. Have the hydraulic/operating systems been checked for leaks?			
25. Remarks: (Enter action taken for all "No" answers)			

SSHO Signature:
Date:

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RVAAP-38 NACA Test Area
Site and Silt Fence Inspection Form

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Date:_____ Time: _____

Weather: (include days since last rainfall and amount in inches of last rainfall)

_____

_____

_____

SILT FENCE INSPECTION

Are silt fences intact? Yes ☐ No ☐

If no, describe status when arrived at site and maintenance required for silt fences:

_____

_____

_____

_____

_____

_____

Percentage of grass coverage_____%

Where photos taken at the site? Yes ☐ No ☐

SITE INSPECTION

Is the site in good shape (e.g., no debris)?

If no, describe status when arrived at site and maintenance required to improve site condition: Yes ☐ No ☐

_____

_____

_____

_____

_____

_____

If site requires additional actions beyond what can be done during the inspection, please contact the Project Manager immediately to coordinate site improvements.

ADDITIONAL COMMENTS

_____

_____

_____

_____

Recorded By:_____ **Date:**_____

QC Checked By:_____ **Date:**_____

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RVAAP-38 NACA Test Area
Site Restoration Inspection Form

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Date/Time:_____ Completed by: _____

SITE RESTORATION INSPECTION

Final grading completed?	Yes ☐ No ☐ N/A ☐
Has seeding been sown into soil?	Yes ☐ No ☐ N/A ☐
Has all equipment been removed from the site?	Yes ☐ No ☐ N/A ☐
Has all non-impacted vegetation been mulched?	Yes ☐ No ☐ N/A ☐
Have all vegetation mulch/rock been evenly spread across site?	Yes ☐ No ☐ N/A ☐
Temporary stormwater/erosion controls removed?	Yes ☐ No ☐ N/A ☐
Were all disturbed areas seeded within 7 days of excavation, backfilling/final grading?	Yes ☐ No ☐ N/A ☐
Is seed established? (70% coverage is required)	Yes ☐ No ☐ N/A ☐
Is silt fencing intact?	Yes ☐ No ☐ N/A ☐
Are there signs of erosion (cracks/ruts/gullies/minimal grass coverage/slope failure)?	Yes ☐ No ☐ N/A ☐
Have disturbed areas outside the silt fence been seeded or mulched?	Yes ☐ No ☐ N/A ☐
Has seed or mulch blown away? If so, repair.	Yes ☐ No ☐ N/A ☐

Maintenance required for above issues:

_____

_____

_____

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RVAAP-38 NACA Test Area

Initial Installation Inspection for Storm Water Controls

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Date/Time:_____ Completed by: _____

Initial Installation Inspection for Storm Water Controls

Is the silt fence at least 4 inches to 6 inches into the ground?	Yes ☐ No ☐
Is the trench backfilled to prevent runoff from cutting underneath the silt fence?	Yes ☐ No ☐
Is the silt fence pulled tight so it will not sag when water builds up behind it?	Yes ☐ No ☐
Are the ends brought upslope of the rest of the silt fence so as to prevent runoff from going under the ends?	Yes ☐ No ☐
Is the silt fence on a level contour?	Yes ☐ No ☐
Have all gaps and tears in the silt fence been eliminated?	Yes ☐ No ☐

Maintenance required for above issues:

_____

_____

_____

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TAILGATE SAFETY MEETING FORM

Instructions
To be competed by supervisor prior to beginning of new job, when changes in work procedures occur, or when additional hazards are present.

NAME ,TYPE, LOCATION OF PROJECT OR WORK ACTIVITY:

TOPICS/HAZARDS DISCUSSED:

INFORMAL TRAINING CONDUCTED (Name, topics):

NAMES OF EMPLOYEES:

Supervisors Signature/Date: _____

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RVAAP-38 NACA Test Area
Truck Inspection Form

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Date/Time:_____ **Completed by:**_____

Truck/License Number:_____ ***Trucking Company***:_____

Type of Load Hazardous Waste Soil or Non-hazardous Waste Soil (circle one)

Is the truck lined (if required by disposal facility)? Yes ☐ No☐

Are all sides of truck and its wheels cleaned of all debris? Yes ☐ No☐
If no, describe actions taken.

_____

_____

_____

_____

Is the truck covered? Yes ☐ No☐

Is waste manifest (or shipping papers) completed and in the truck? Yes ☐ No☐

Comments:

_____

_____

_____

_____

CAMP RAVENNA WASTE MANAGEMENT GUIDELINES

PURPOSE: Guidelines to be followed by contractors working at Camp Ravenna Joint Military Training Center who are generating/shipping Hazardous, Non-Hazardous, Special or Universal Waste.

POLICY: The policy at Camp Ravenna is to comply with all local, state, federal and installation requirements. Contractor is responsible for waste minimization and is required to recycle materials if possible.

Restoration Program POC: Katie Tait (614) 336-6136 Military & Non-Restoration POC: Brad Kline (614) 336-4918

Coordination:

- Coordinate all waste generation and shipments with the appropriate Camp Ravenna POC listed above or the Environmental Supervisor in their absence at (614) 336-6568.
- Notify Camp Ravenna POC prior to waste sampling for characterization. Details about sampling activities must be included (i.e., number of sample, analyticals, etc.).
- All Hazardous and Non-Hazardous waste management storage locations must be pre-approved prior to generation.
- Ensure all labels include: Date, Contractor, and Waste Type.
- When contractors have waste onsite, a weekly Inspection inventory must be completed and submitted to the appropriate POC in the Camp Ravenna environmental office.
- All wastes shall be tracked and logged throughout the duration of the project. Contractor will provide Camp Ravenna POC with a monthly rollup report of all waste and recycled streams generated by no later than the 10th day of the following month.

Hazardous Waste Treatment, Storage and Disposal Facilities and Waste Haulers: Contractors are required to utilize hazardous waste haulers and Treatment, Storage, and Disposal Facilities on the latest Defense Reutilization Marketing Office (DRMO) approved list. The current qualified waste hauler and TSDF list can be viewed by following the "Qualified Facilities" and "Qualified Transporters" links found on the DLA Hazardous Waste Disposal Homepage, http://www.dla.mil/DispositionServices/Offers/Disposal/HazardousWaste/HazWasteDisposal.aspx.

Hazardous or Non-Hazardous manifest form, the following must be included:

- Military and non-restoration operations waste Site Name = Camp Ravenna Joint Military Training Center. Mailing and Site address: Camp Ravenna ENV, 1438 State Route 534 SW, Newton Falls, Ohio 44444, (614) 336-4918. Ohio EPA ID # – OHD981192925.
- Restoration Program waste Site Name = Former Ravenna Army Ammunition Plant. Mailing address is same as address above. Site address: 8451 State Route 5, Ravenna, Ohio 44266, (614) 336-6136. Ohio EPA ID # – OH5210020736.
- Contractor's shipping Hazardous Waste must provide a Land Disposal Restriction (LDR) in accordance with 40 CFR Part 268.
- Profiling:
  - The required shipping documentation (i.e. waste profile and executive summary of lab reports (if available)) need to be submitted to appropriate Camp Ravenna POC or designee(s) for approval and signature prior to shipping.
  - Results of characterization must be submitted to appropriate Camp Ravenna POC within 30 days after collecting sample.
- Manifests - Hazardous and Non-Hazardous:
  - The waste carrier/transporter provides appropriate manifest to the contractor.
  - The contractor is required to:
    - Ensure that Camp Ravenna POC or designee(s) is available to sign the manifest on the scheduled day of shipment;
    - Verify that each manifest is properly completed and signed by Camp Ravenna POC or designee(s);
    - Provide the Generator copy of the manifest to Camp Ravenna POC or designee(s); and
    - Ensure that the original Generator copy of the manifest signed by the treatment storage disposal facility is returned to Camp Ravenna within 30 days of the shipping date for Hazardous and Non-Hazardous Waste.
    - The use of a Bill of Lading, in lieu of a waste manifest, must be approved by the Camp Ravenna environmental office.

All satellite accumulation storage sites and containers will comply with 40CFR 262.34(c)(1):

- Any material that is subject to Hazardous Waste Manifest Requirements of the US Environmental Protection Agency must comply with 40 CFR Part 262.
- From the time any waste is placed in a satellite storage container, proper labeling must be on the container (proper labeling includes date, contractors name and product type).
- Pending analysis label is to be used from the time the sample is taken until the results are received.
- In no case will waste labeled pending analysis exceed 45 days.

All Camp Ravenna Hazardous and Non-Hazardous records are maintained at the Camp Ravenna environmental office, point of contacts are Katie Tait at (614) 336-6136 and Brad Kline at (614) 336-4918.

CAMP RAVENNA WEEKLY NON-HAZARDOUS & HAZARDOUS WASTE INSPECTION/INVENTORY SHEET

Contractor: _____ Month: _____ Year: _____ Waste Description: _____

Container Nos. _____

	WEEK 1	WEEK 2	WEEK 3	WEEK 4
	Date: **Time:**	**Date:** **Time:**	**Date:** **Time:**	**Date:** **Time:**
Point of Contact (Name / Number)				
Project Name:				
Contracting Agency and POC:				
Waste Determination: Pending Analysis, Hazardous, Non-Hazardous, etc.				
*Location on installation:				
Date Generated:				
Projected date of disposal:				
Non-Haz, Satellite, 90 day storage area				
Waste generation site:				
Number of Containers (size / type):				
Condition of Container:				
Containers closed, no loose lids, no loose bungs?	yes / no	yes / no	yes / no	yes / no
Waste labeled properly and visible (40 CFR 262.34 (c) (1):	yes / no	yes / no	yes / no	yes / no
Secondary containment	yes / no	yes / no	yes / no	yes / no
Incompatibles stored together?	yes / no	yes / no	yes / no	yes / no
Any spills?	yes / no	yes / no	yes / no	yes / no
Spill kit available?	yes / no	yes / no	yes / no	yes / no
Fire extinguisher present and charged?	yes / no	yes / no	yes / no	yes / no
Containers grounded if ignitables?	yes / no / na	yes / no / na	yes / no / na	yes / no / na
Emergency notification form/info present?	yes / no	yes / no	yes / no	yes / no
Container log binder present?	yes / no	yes / no	yes / no	yes / no
Signs posted if required?	yes / no	yes / no	yes / no	yes / no
Photo's submitted	yes / no	yes / no	yes / no	yes / no
Printed Name:				
Signature:				

This form is required for Non-Hazardous and Hazardous waste including PCB and special waste.

CONTRACTORS ARE REQUIRED TO SUBMIT THIS FORM WEEKLY TO THE CAMP RAVENNA ENV OFFFICE WHEN WASTE IS STORED ON SITE.

CONTRACTORS ARE ENCOURAGED TO INCLUDE PHOTOS WITH EACH WEEKLY INSPECTION SHEET WHEN WASTE IS STORED ON SITE.

*Draw detailed map showing location of waste within the site.

Construction/Demolition Diversion and Waste Disposal Form

Project Title **Multiple AOCs at Camp James A. Garfield**

Date	Area of Concern	Material Type*	Material Description**	Total Quantity of Material	Tons/lbs/CY/each	Disposal Facility Name/City/State	Total Number of Manifest/Disposal Tickets Attached

***Material Type:** Debris, Recyclable/Reutilized Material, Universal Waste,

****Material Description:** Debris (wood, glass, asphalt, concrete, soil, plastic etc…)
Recyclable Material (scrap metal and concrete etc….)
Universal Waste (Sampling Equipment, PPE, sanitary trash)

DUST MONITORING RECORD
RAM/MiniRAM MEASUREMENTS

Time	Date	LOCATION (upwind/ downwind, reference figure for station location)	INSTRUMENT RAM/MiniRAM	Concentration (mg/ m^3)	Recorded by

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VEG MONITORING LOG

Time	Date	VEG Temperature (°F)	VEG Flow (cfm)	ThermOx Temperature (°F)	ThermOx Flow (cfm)	ThermOx Influent PID (ppm)	ThermOx Effluent PID (ppm)	Recorded by

°F = degrees Farenheit
cfm = cubic feet per minute
ppm = parts per million

FIELD USE ONLY
WELL SEALING REPORT
DO NOT FILE. NOT AN OFFICIAL RECORD.

DNR 7810.12e-f Page____ of____ for this record.

Job Number:

Notes:

LOCATION

County _____ Township _____ Section No. _____ Lot No. _____

Owner _____

Address of Well Location _____

City _____ Zip Code _____

Well Location Description (120 Characters) _____

Location of Well in either: State Plane N ☐ S ☐ X |_|_|_|_|_|_|_|.|_|_| +/- _____ ft. Y |_|_|_|_|_|_|_|.|_|_| +/- _____ ft.
OR
Latitude/Longitude Latitude _____ Longitude _____

Elevation of Well |_|_|_|_|.|_|_| +/- _____ ft. Datum Plane: ☐ NAD27 ☐ NAD83

Source of Coordinates: ☐ GPS ☐ Survey ☐ Other _____

Source of Elevation: ☐ GPS ☐ Survey ☐ Other _____

WELL IDENTIFICATION ODNR Well Log Number _____ Project Well ID _____

MEASURED CONSTRUCTION DETAILS

Date of measurements _____

Depth of Well _____ ft. Static Water Level _____ ft.

Borehole Depth _____ ft. Borehole Diameter _____ in.

Casing Diameter _____ in. Casing Length _____ ft. Casing Type _____

SEALING PROCEDURE

Placement:	Sealing Material	Volume/Weight Used (Units Required)	Placement Method
From _____ ft. To _____ ft.			
From _____ ft. To _____ ft.			
From _____ ft. To _____ ft.			
From _____ ft. To _____ ft.			

Condition of Casing _____ Was Casing Removed? ☐ Yes or ☐ No (check one)

If casing **Not Removed**, was it Perforated? ☐ Yes or ☐ No (check one) Perforations: From _____ ft. To _____ ft.

Date Sealing Performed _____

Comments/Reason for Sealing

CONTRACTOR

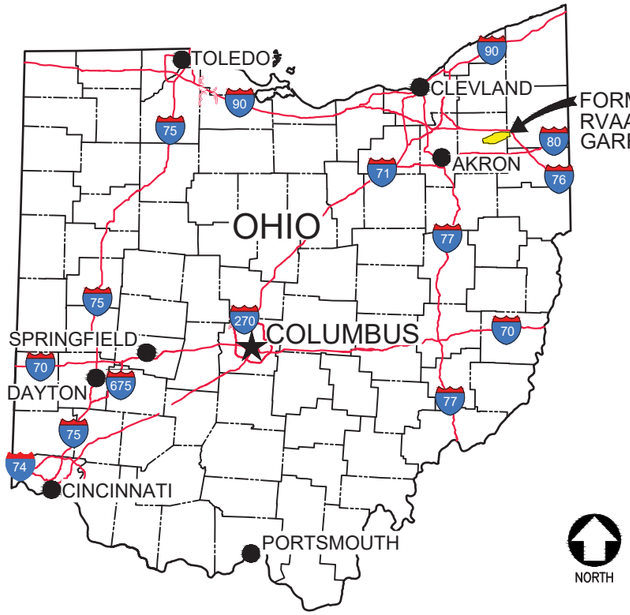
Name _____ ODH Registration # _____

Address _____

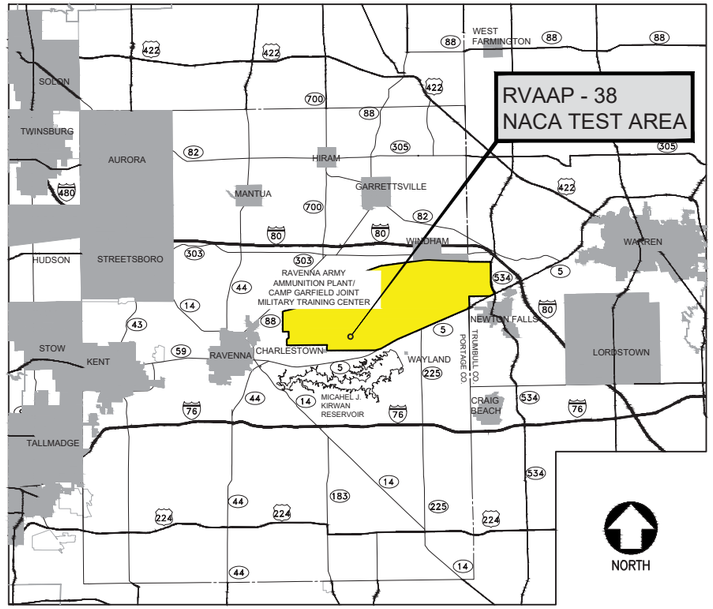
City/State/Zip _____

Attachment B
Design Drawings

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
FORMER RAVENNA ARMY AMMUNITION PLANT - CAMP JAMES A.GARFIELD (CJAG)
RVAAP-38 NACA TEST AREA



LOCATION MAP
NOT TO SCALE



VICINITY MAP

THIS REMEDIAL DESIGN ADDRESSES THE EXCAVATION AND TREATMENT OR OFF-SITE DISPOSAL OF CONTAMINATED SOILS FROM THE RVAAP-38 NACA TEST AREA AREA OF CONCERN AT THE FORMER RAVENNA ARMY AMMUNITION PLANT (RVAAP)/CAMP GARFIELD JOINT MILITARY TRAINING CENTER IN RAVENNA, OHIO.

APPROXIMATELY 1,270 CUBIC YARDS (EX SITU) OF POLYCYCLIC AROMATIC HYDROCARBON (PAH) IMPACTED SOIL WILL BE EXCAVATED AND THERMALLY TREATED USING ENDPOINT'S PATENTED VAPOR ENERGY GENERATOR (VEG) TECHNOLOGY. APPROXIMATELY 4 CUBIC FEET (EX SITU) OF METALS IMPACTED SOILS WILL BE EXCAVATED AND DISPOSED OFFSITE.

SCOPE OF WORK

US Army Corps
of Engineers
Louisville District

U.S. Army Engineer District
Corps of Engineers
Louisville, Kentucky

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
DATE: 04/24/2019
SCALE: NOT TO SCALE
PROJECT/CONTRACT NO. W912QR-17-D-0045
REV. DATE DESCRIPTIONS DRAWN BY CHECKED BY

PROJECT: REMEDIAL DESIGN
RVAAP-38 NACA TEST AREA

DRAWING TITLE: TITLE SHEET

US Army Corps of Engineers
Louisville District

CLIENT:
US Army Corps of Engineers
Former Ravenna Army
Ammunition Plant/CJAG
Portage and Trumbull Counties, Ohio

Endpoint.
Strategy. Science. Sustainability.

B-1
DRAWING NUMBER

Basemap Source: Leidos, 2014. Remedial Design for Soil, Sediment and Surface Water at RVAAP–13 Building 1200 and RVAAP–48 Anchor Test Area. Drawn by P. Holm

GENERAL NOTES

1. HEREINAFTER, THE TERM "ALANIZ-ENPOINT TEAM" IN THESE DRAWINGS SHALL REFER TO ALL ALANIZ-ENDPOINT TEAM PERSONNEL AND/OR ITS SUBCONTRACTORS IMPLEMENTING THE RVAAP-38 NACA TEST AREA REMEDIAL DESIGN (RD), UNLESS OTHERWISE NOTED.
2. THE ALANIZ-ENDPOINT TEAM SHALL COMPLETE ALL ACTIVITIES ASSOCIATED WITH THE PROJECT IN COMPLIANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS AND REQUIREMENTS.
3. THE ALANIZ-ENDPOINT TEAM SHALL PERFORM ALL REMEDIAL ACTIVITIES IN COMPLIANCE WITH THE RD, DESIGN DRAWINGS, SPECIFICATIONS AND ATTACHMENTS.
4. THE ALANIZ-ENDPOINT TEAM SHALL SUPPLY ALL EQUIPMENT, MATERIALS AND LABOR TO PERFORM THE CONTRACT REQUIREMENTS INCLUDING WORKER SAFETY EQUIPMENT.
5. THE ALANIZ-ENDPOINT TEAM SHALL COMPLY WITH SITE ACCESS PROTOCOLS.
6. ALL ALANIZ-ENDPOINT TEAM PERSONNEL AND ANY VISITORS TO THE SITE SHALL SIGN IN AND SIGN OUT ON THE DAILY SITE LOG UPON ARRIVAL AND DEPARTURE FROM THE PROJECT AREA.
7. THE ALANIZ-ENDPOINT TEAM AND ANY VISITORS TO THE SITE MUST ATTEND A DAILY HEALTH AND SAFETY TAILGATE MEETING PRIOR TO THE START OF THE DAY'S CONSTRUCTION ACTIVITIES OR PRIOR TO ENTERING THE PROJECT AREA. THESE TAILGATE MEETINGS WILL BE RUN BY THE ALANIZ-ENDPOINT TEAM CONSTRUCTION MANAGER, WHO WILL DISCUSS THE EXPECTED ACTIVITIES FOR THE DAY, POTENTIAL HAZARDS, ANTICIPATED WEATHER CONDITIONS AND ANY ADDITIONAL SAFETY TIPS OR REMINDERS. THE ALANIZ-ENDPOINT TEAM CONSTRUCTION MANAGER IS RESPONSIBLE FOR DOCUMENTING THE TAILGATE MEETING AND OBTAINING SIGNATURES FROM ALL PERSONNEL WHO HAVE BEEN BRIEFED.
8. ACCESS TO THE FORMER RVAAP/CAMP JAMES A. GARFIELD JOINT MILITARY TRAINING CENTER SHALL BE THROUGH THE MAIN GATE LOCATED OFF STATE ROUTE 5. THIS GATE IS GUARDED AND SHALL REQUIRE ADDITIONAL TIME TO GAIN ACCESS. THE ALANIZ-ENDPOINT TEAM SHALL BE REQUIRED TO ALLOW FOR DELAYS WITHOUT ADDITIONAL CHARGES.
9. TOPOGRAPHIC MAPPING DATA IS BASED ON SURVEY AND AERIAL PHOTOGRAPH INFORMATION PROVIDED IN PRIOR SITE-RELATED DOCUMENTS PREPARED BY LEIDOS. MINOR DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS MAY BE ENCOUNTERED AND SHALL NOT CAUSE FOR ADDITIONAL CHARGES. THE ALANIZ-ENDPOINT TEAM SHALL VERIFY EXISTING CONDITIONS, ELEVATIONS AND DIMENSIONS PRIOR TO THE START OF CONSTRUCTION.
10. THE ALANIZ-ENDPOINT TEAM SHALL CONTACT OHARNG PRIOR TO COORDINATING AND CONDUCTING UTILITY SURVEY AND CLEARANCES.
11. STORMWATER CONTROLS SHALL BE INSTALLED PRIOR TO INITIATION OF ANY CONSTRUCTION ACTIVITY THAT MAY CAUSE EROSION OR SEDIMENTATION. STORMWATER CONTROL MEASURES SHALL BE MAINTAINED AND REINSTALLED AS NECESSARY FOR THE DURATION OF CONSTRUCTION AND RESTORATION ACTIVITIES. STORMWATER CONTROLS SHALL BE INSPECTED WEEKLY AND FOLLOWING RAIN EVENTS WITH RAINFALL TOTALING ½ INCH OR MORE.
12. EROSION CONTROL MEASURES SHALL BE PLACED WHERE INDICATED ON THE DRAWINGS, UNLESS FIELD OBSERVATIONS RESULT IN A MODIFICATION (ADDITIONAL LOCATIONS OR ELIMINATING THE NEED FOR ALTOGETHER) OF STORMWATER CONTROLS. EROSION CONTROL MEASURES SHALL MEET ALL FEDERAL AND STATE REQUIREMENTS.
13. IF UNEXPECTED MATERIALS, SUCH AS EXPLOSIVE COMPONENTS, DRUMS, CYLINDERS, ABANDONED PIPELINES, UTILITIES, ARCHEOLOGICAL ARTIFACTS OR HUMAN REMAINS ARE DISCOVERED DURING THE REMEDIAL ACTIVITIES, WORK SHALL CEASE IMMEDIATELY AND THE ALANIZ-ENDPOINT TEAM SHALL NOT RESUME WORK UNTIL APPROVAL IS GRANTED BY USACE,OHARNG OR THE OHARNG CULTURAL RESOURCE MANAGER AND THE ALANIZ-ENDPOINT TEAM CONSTRUCTION MANAGER.
14. NO WORK SHALL TAKE PLACE DURING INCLEMENT WEATHER (AS DETERMINED BY THE ALANIZ-ENDPOINT JV CONSTRUCTION MANAGER) TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT RUNOFF.
15. DURING PERIODS OF HIGH WINDS, WHICH MAY RESULT UN EXCESSIVE DUST, ADDITIONAL DUST CONTROLS OR CEASING WORK MAY BE REQUIRED AS DETERMINED BY THE ALANIZ-ENDPOINT TEAM CONSTRUCTION MANAGER.
16. ALL ON-ROAD HAUL TRUCKS WILL ADHERE TO OHIO DOT TRANSPORTATION GUIDELINES. THE ALANIZ-ENDPOINT TEAM SHALL ENSURE TRUCKS DO NOT LEAVE THE PROJECT SITE IN EXCESS OF 80,000 LBS GROSS WEIGHT.
17. THE ALANIZ-ENDPOINT TEAM SHALL INSPECT HAUL TRUCKS WITHIN THE INSPECTION AREA PRIOR TO LEAVING EXCAVATION/PROJECT AREAS TO ENSURE NO SOIL/MUD IS TRACKED ONTO PUBLIC OR OHARNG ROADWAYS. ALL HAUL TRUCKS LOADS SHALL BE COVERED PRIOR TO DEPARTING PROJECT AREAS.
18. THE ALANIZ-ENDPOINT TEAM IS RESPONSIBLE FOR REMOVING ANY MATERIAL/MUD SPILLED OR TRACKED ON ROADWAYS.
19. ALL METALS-IMPACTED SOILS SHALL BE DISPOSED AT AN APPROVED OFFSITE DISPOSAL FACILITY.
20. THE ALANIZ-ENDPOINT TEAM SHALL BE RESPONSIBLE FOR FOLLOWING ALL OHARNG, FEDERAL, STATE AND LOCAL SAFETY REQUIREMENTS FOR THE PROTECTION OF ALL PERSONS AND PROPERTY. THE ALANIZ-ENDPOINT TEAM SHALL ALSO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS AND PRECAUTIONS IN ACCORDANCE WITH THE SITE SAFETY AND HEALTH PLAN (SSHP).
21. A FIRST AID KIT AND HOSPITAL ROUTE MAP SHALL BE MAINTAINED ON-SITE BY THE ALANIZ-ENDPOINT TEAM DURING CONSTRUCTION ACTIVITIES.
22. THE ALANIZ-ENDPOINT TEAM SHALL ENSURE THIS RD AND THE SSHP IS PRESENT ON-SITE AT ALL TIMES DURING CONSTRUCTION ACTIVITIES.
23. ALL EXCAVATION AREAS SHALL BE BACKFILLED WITH EITHER TREATED SOIL OR CLEAN SOIL IMPORTED FROM AN OFF-SITE APPROVED SOURCE AND GRADED TO MATCH EXISTING SITE CONTOURS. ALL DISTURBED AREAS SHALL BE RE-SEEDED ACCORDING TO TABLE 8-1 OF THE RVAAP-38 NACA TEST AREA REMEDIAL DESIGN.

MATERIAL NOTES

1. EROSION AND SEDIMENTATION CONTROL PLACEMENT AND ANCHORING SHALL BE COMPLETED IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS AND ANY RELEVANT STATE OF OHIO REQUIREMENTS.

LEGEND FOR ALL DRAWINGS

- GRAVEL ROAD
- SURFACE WATER
- GROUND CONTOUR (10-FT)
- GROUND CONTOUR (2-FT)
- WETLAND
- INTERMITTENT STREAM
- PROJECT SITE
- SILT FENCE
- HAUL ROUTE
- SOIL EXCAVATION AREA
- 1 / B-3 DETAIL WITH DRAWING SHEET NUMBER

DRAWING INDEX

DRAWING NO. DRAWING TITLE

B-1	TITLE SHEET
B-2	GENERAL NOTES
B-3	RVAAP-38 NACA TEST AREA SITE PREPARATION AND EXCAVATION PLAN

LIST OF SUBMITTALS

1. SITE SAFETY AND HEALTH PLAN (SSHP)
2. ACCIDENT PREVENTION PLAN (APP)
3. WASTE PROFILES

MEDIA AND CHEMICALS OF CONCERN

AREA	MEDIA	CHEMICALS OF CONCERN
1	SURFACE SOIL (0-1 ft. bgs)	PAHs
2	SURFACE SOIL (0-1 ft. bgs)	PAHs
3	SURFACE SOIL (0-1 ft. bgs)	PAHs
WELL PIT	SOIL (0-3.5 ft. bgs)	LEAD

NOTE:
CHEMICALS OF CONCERN WERE NOT IDENTIFIED FOR SUBSURFACE SOIL (1-13 FT BGS), SEDIMENT, OR SURFACE WATER.

ESTIMATED SOIL TREATMENT/WASTE QUANTITIES

AREA	APPROXIMATE EXCAVATION AREA SQ. FT.	ESTIMATED TREATMENT VOLUME CU. YD.	ESTIMATED WASTE VOLUME CU. YD.	ESTIMATED IMPORTED CLEAN FILL CU. YD.
1 - PAHs	8,590	480 (ex-situ)	NA	NA
2 - PAHs	4,130	230 (ex-situ)	NA	NA
3 - PAHs	10,000	560 (ex-situ)	NA	NA
WELL PIT	15	0.15 (ex-situ)	0.15 (ex-situ)	0.15 (ex-situ)

NOTES:
1. ESTIMATED QUANTITIES MAY CHANGE DUE TO CONFIRMATION SAMPLING.
2. THE ALANIZ-ENDPOINT TEAM SHALL VERIFY QUANTITIES.

DESIGNED BY: | APPROVED BY:
DRAWN BY: | CHECKED BY:
SCALE: NOT TO SCALE | W8YXDR17DX45
DATE: 04/24/2019 | PROJECT/CONTRACT NO.

REV.	DATE	DESCRIPTIONS	DRAWN BY	CHECKED BY

PROJECT: REMEDIAL DESIGN RVAAP-38 NACA TEST AREA

DRAWING TITLE: GENERAL NOTES

US -rmy Corps of Engineers Louisville District

CLIENT: US Army Corps of Engineers
Former Ravenna Army Ammunition Plant/CJAG
Portage and Trumbull Counties, Ohio

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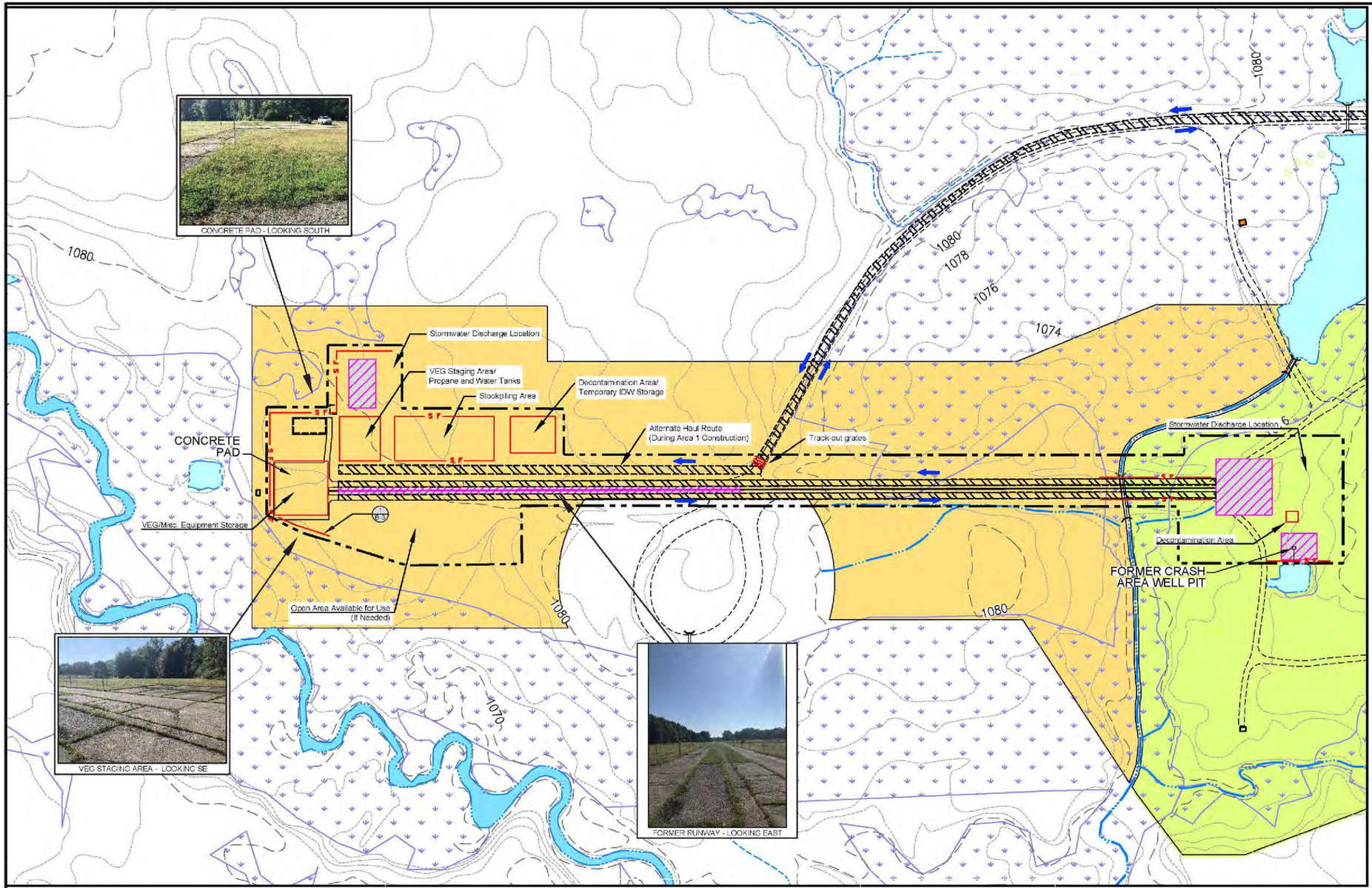
B-2
DRAWING NUMBER

Basemap Source: Leidos, 2014. Remedial Design for Soil, Sediment and Surface Water at RV -P–13 Building 1200 and RV -P–48 -nchor Test -rea. Drawn by P. Holm and Leidos, 2017. Final Proposed Plan for Soil, Sediment and Surface Water at RV -P–42 Load Line 9. Drawn by P. Holm



SITE PREPARATION

1. DRAWINGS AND NOTES SERVE ONLY AS GUIDLINES. ALL STORMWATER CONTROLS SHALL MEET OHIO'S "RAINWATER AND LAND DEVELOPMENT" STANDARDS.

2. THE ALANIZ-ENDPOINT TEAM WILL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL STORMWATER CONTROLS. WEEKLY INSPECTIONS AND INSPECTIONS WITHIN 24 HOURS OF A STORM EVENT GREATER THAN 0.5 INCHES SHALL BE CONDUCTED BY THE ALANIZ-ENDPOINT TEAM.

3. SILT FENCING LOCATIONS MAY BE REVISED AT THE DISCRETION OF THE ALANIZ-ENDPOINT TEAM CONSTRUCTION MANAGER BASED ON SITE CONDITIONS AND REMEDIAL DESIGN SAMPLING RESULTS.

4. ACCESS IMPROVEMENTS TO PREVENT EXCESS DUST, TIRE RUTTING, AND MUD SHALL BE REQUIRED AS NEEDED TO SUPPORT CONSTRUCTION ACTIVITIES.

5. THE ALANIZ-ENDPOINT TEAM SHALL CLEAR TREES AND VEGETATION ALONG POTENTIAL HAUL ROUTES AND SURROUNDING EXCAVATION AREAS AS NEEDED. ALL TREES GREATER THAN 3 IN. IN DIAMETER THAT REQUIRE REMOVAL SHALL BE CUT BETWEEN THE MONTHS OF OCTOBER AND MARCH.

6. TREES LESS THAN 4 IN. IN DIAMETER AND OTHER VEGETATION NOT IN CONTACT WITH IMPACTED SOILS SHALL BE CHIPPED/MULCHED AND SPREAD ACROSS THE SITE AND SURROUNDING AREAS FOLLOWING CONSTRUCTION ACTIVITIES. TREES GREATER THAN 4 IN. IN DIAMETER SHALL BE TEMPORARILY STORED IN THE DESIGNATED LOCATION AND DISPOSED OFFSITE WITH IMPACTED SOILS.

7. ALL TREE/VEGETATION STAGING AND REMOVAL SHALL BE COORDINATED WITH OHARNG.

8. THE ALANIZ-ENDPOINT TEAM SHALL TAKE CARE TO PROTECT THE EXISTING MONITORING WELL AND WILL BE RESPONSIBLE TO REPAIR ANY DAMAGE TO THE WELL AS A RESULT OF CONSTRUCTION ACTIVITIES.

SOIL REMOVAL ACTIVITIES

1. UTILITY CLEARANCE WILL BE CONDUCTED WITHIN THE EXCAVATION BOUNDARIES.

2. EXCAVATION BOUNDARIES WILL BE SURVEYED PRIOR TO SOIL REMOVAL.

3. WASTE PROFILE SAMPLES WILL BE COLLECTED FROM THE EXCAVATION AREAS PRIOR TO EXCAVATION ACTIVITIES.

4. METALS IMPACTED SOIL WILL BE LOADED DIRECTLY INTO HAULING TRUCKS FOR OFFSITE DISPOSAL.

SITE RESTORATION ACTIVITIES

1. FINAL EXCAVATION BOUNDARIES WILL BE SURVEYED.

2. EXCAVATION PITS WILL BE BACKFILLED USING CLEAN IMPORTED SOIL AND/OR TREATED SOIL. BACKFILLING AREAS WILL BE RE-GRADED TO MATCH SURROUNDING ELEVATIONS.

3. PERFORM BACKFILLING/RE-VEGETATION IN ACCORDANCE WITH RD.

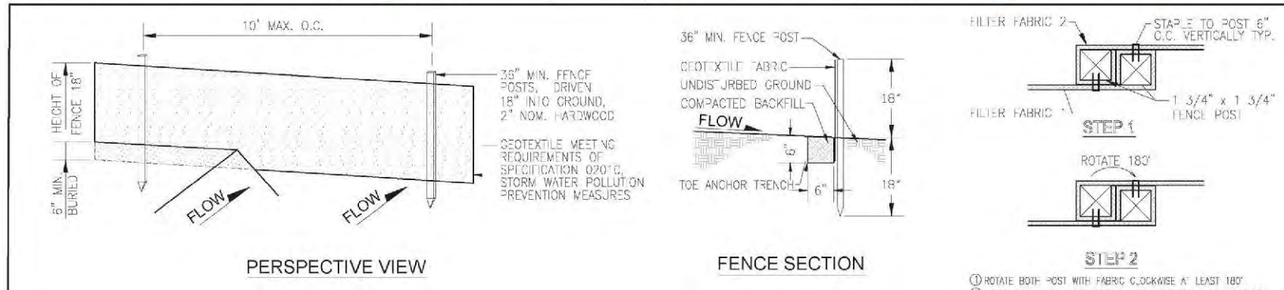
4. OHARNG WILL APPROVE FINAL SITE RESTORATION.

LEGEND:

- GRAVEL ROAD
- SURFACE WATER
- WETLAND (2014 INRMP)
- INTERMITTENT STREAM
- GROUND CONTOUR (10-FT)
- GROUND CONTOUR (2-FT)
- PROJECT SITE BOUNDARY
- SILT FENCING
- TRUCK TRAFFIC ARROW
- REMEDIATION AREAS

SOIL AGGREGATES

- FORMER PLANE REFUELING AND CRASH STRIP AREA
- FORMER CRASH AREA



1 / B-3 SILT FENCE DETAILS
NOT TO SCALE

OHIO STATE PLANE (NAD 83)

0 100 200
SCALE: 1" = 200'

DATE: 04/02/2019
PROJECT CONTRACT NO.
SCALE: NOT TO SCALE
WEB JOB NUMBER
DRAWN BY:
CHECKED BY
DESIGNED BY:
APPROVED BY:

REV	DATE	DESCRIPTIONS	DRAWN BY	CHECKED BY

PROJECT:
REMEDIAL DESIGN
RVAAP-38 NACA TEST AREA

DRAWING TITLE:
SITE PREPARATION
AND EXCAVATION PLAN

US Army Corps of Engineers
Former Ravenna Army
Ammunition Plant/CJAG
Portage and Trumbull Counties, Ohio

US Army Corps of Engineers Louisville District

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B-3
DRAWING NUMBER

C.B.N.T.

Attachment C
Well Abandonment SOP

SOP-1 Well Abandonment

Abandonment, also termed decommissioning, of the former production well at RVAAP-38 NACA Test Area AOC will be conducted in a manner that follows Ohio EPA-approved procedures and work plans. The scope of work (SOW) will be completed by an experienced, Ohio registered driller.

WELL SEALING, ABANDONMENT REQUIREMENTS & SUMMARY

Wells to be decommissioned will be sealed and abandoned according to the procedures described in this SOP. Well sealing and abandonment will be consistent with OEPA guidance (*Technical Guidance Manual for Groundwater Investigations, Chapter 9, Sealing Abandoned Monitoring Wells and Boreholes, OEPA, 2016 and State of Ohio Technical Guidance for Sealing Unused Wells, SCCGW, 1996*).

General well abandonment procedures to be followed by the Driller will include:

- Any down-hole pumps, samplers, and/or tubing and debris will be removed from the wells.
- The well casing will be over-drilled or drilled through (split) to the base of the well screen.
- The drill bit or splitting tool used to over drill the well the bit must be a minimum of 2 inches larger than the outside diameter of the casing being removed.
- Debris from the interior of the borehole will be cleaned out and the casing removal equipment extracted.
- The entire depth occupied by the casing will be sealed with bentonite grout using a tremie pipe from the bottom of the well bore to the top in as much of a continuous operation as practicable to prevent segregation, dilution, and bridging. The tremie pipe will be in constant contact with the grout to prevent air pockets from forming.
- After the well has been sealed, the grout will cure for approximately 24 hours. After this time, if any settling has occurred, the casing will be topped off with additional grout to within approximately 3 feet of ground surface.
- After sealing the well casing with Grout, the well riser pipe will be cut off 3 feet below ground surface.
- A concrete plug will be installed to within 0.5 foot from ground surface. All sealed and abandoned wells will be marked with a piece of metal set in the concrete plug just below land surface and large enough to allow for future location by a metal detector or magnetometer (e.g., threaded bolt with 2-inch washer).
- The area above the well seal will be completed in a manner that is compatible with the site (e.g., grass, concrete, asphalt, etc.).
- Water displaced from the well will be collected, drummed, and properly disposed based on existing information about local aquifer contaminants.
- Excess grout will be collected, drummed, and properly disposed.
- Well pad debris and any casing materials will be collected and properly disposed.
- Once abandoned, the well abandonment log will be submitted to the Ohio EPA and Ohio Department of Natural Resources (ODNR) per Ohio Revised Code 1521.05(B)(9).

Attachment D
Ohio EPA Correspondence

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

December 22, 2020

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch
IPA Designation
1438 State Route 534 SW259
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859259

Subject: Draft Remedial Design for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area Dated September 18, 2020

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled, "Draft Remedial Design for RVAAP-38 NACA Test Area." This document was prepared for the U.S. Army Corps of Engineers Louisville District by Endpoint Consulting, Inc., 5 South Linden St., Suite 2, South San Francisco, CA 94080 and Alaniz Associates Corp., 21334 East Cloverton St., Covina, CA 91724.

Ohio EPA has no further comments regarding the draft Remedial Design for RVAAP-38 NACA Test Area. Ohio EPA continues to work with you on revisions to the Endpoint 2020 Sampling and Analysis Plan (SAP).

The Alaniz-Endpoint Team is contracted to conduct remediation work at a total of five areas of concern (AOCs). Ohio EPA has reviewed and commented on the remedial design (RD) for AOC Load Line 9 (LL9) and Wet Storage Area. We have also received the draft RDs for the NACA Test Area, Depot Area and Sand Creek Disposal Road Landfill.

In Ohio EPA's October 9, 2020 "Response to Comments of the Draft Remedial Design Work Plan for RVAAP Load Line 9," Ohio EPA commented on the Endpoint 2020 SAP, specifically Appendix I, regarding quality assurance and quality control.

Ohio EPA commented, "Specifically, the relative percent difference (RPD) should not be used and removed from the document. The relative standard deviation (RSD) of 30-35% should replace the RPD as the criteria for DQO objectives."

Ohio EPA is working with you on revising the SAP. Once revisions are made to the Endpoint 2020 SAP, the Endpoint 2020 SAP, as revised, applies to the other Alaniz-Endpoint contracted remediation work noted above.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Mark Leeper, ARNG
Nat Peters, USACE
Steve Kvaal, USACE
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Susan Netzly-Watkins, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

March 26, 2021

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment
Cleanup Branch IPA Designation
1438 State Route 534 SW259
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859259

Subject: Final Remedial Design for Soil, Sediment and Surface Water at RVAAP-38 NACA Test Area Dated March 19, 2021

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document titled "Final Remedial Design for Soil, Sediment and Surface Water RVAAP-38 NACA Test Area." This document was prepared for the U.S. Army Corps of Engineers Louisville District, by Endpoint Consulting, Inc., 5 South Linden St., Suite 2, South San Francisco, CA 94080 and Alaniz Associates Corp., 21334 East Cloverton St., Covina, CA 91724.

Ohio EPA approves the document.

The Alaniz-Endpoint Team is contracted to conduct remediation work at a total of five areas of concern (AOCs). Ohio EPA is working with you on revisions to the sampling and analysis plan (SAP), which is contained in the Final RD for Load Line 9. Once revisions are made to the Endpoint 2020 SAP, it will apply to the RVAAP-38 NACA Test Area AOC and the other four AOCs.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

If you have any questions concerning this letter, please contact Edward D'Amato at (330) 963-1170, or via email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/sc

ec: Katie Tait, OHARNG RTLS
Nat Peters, USACE
Steven Kvaal, USACE
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Megan Oravec, Ohio EPA, NEDO, DERR
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