

FINAL

WORK PLAN

**NON TIME-CRITICAL REMOVAL ACTION FOR
CC RVAAP-67 FACILITY-WIDE SEWERS AND
CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT
RAVENNA ARMY AMMUNITION PLANT RESTORATION
PROGRAM**

PORTAGE AND TRUMBULL COUNTIES, OHIO

**Contract No. W912QR-12-D-0006
Delivery Order No. W912QR18F0460**

Prepared for:



**US Army Corps of Engineers, Louisville District
600 Dr. Martin Luther King Boulevard
Louisville, Kentucky**

Prepared by:



Gannett Fleming

500 Horizon Drive, Suite 540
Robbinsville, New Jersey 08691

PARS Project No. 895-28

APRIL 11, 2019

REPORT DOCUMENTATION PAGE

*Form Approved
OMB No. 0704-0188*

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) 11-04-2019		2. REPORT TYPE Final Work Plan		3. DATES COVERED (From - To) Nov 2018 to April 2019	
4. TITLE AND SUBTITLE Final Work Plan Non Time Critical Removal Action for CC RVAAP-67 Facility-wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant Ravenna Army Ammunition Plant Restoration Program Portage and Trumbull Counties, Ohio				5a. CONTRACT NUMBER W912QR-12-D-0006	
				5b. GRANT NUMBER NA	
				5c. PROGRAM ELEMENT NUMBER NA	
				5d. PROJECT NUMBER NA	
6. AUTHOR(S) Blair, Hunter Cody Postlethwait				5e. TASK NUMBER NA	
				5f. WORK UNIT NUMBER NA	
				8. PERFORMING ORGANIZATION REPORT NUMBER 895-28	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) PARS-Gannett Fleming Joint Venture 500 Horizon Drive, Suite 540 Robbinsville, New Jersey 08691				10. SPONSOR/MONITOR'S ACRONYM(S) USACE	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) USACE - Louisville District U.S. Army Corps of Engineers 600 Martin Luther King Jr., Place PO Box 59 Louisville, Kentucky 40202-0059				11. SPONSOR/MONITOR'S REPORT NUMBER(S) NA	
				12. DISTRIBUTION/AVAILABILITY STATEMENT Reference Distribution Page	
13. SUPPLEMENTARY NOTES None					
14. ABSTRACT This Work Plan was developed to describe the JV's proposed field work and quality control activities for the Camp Ravenna Facility-Wide Sewers Non Time-Critical Removal Action (NTCRA) to be performed Load Line 2 and George Road, as described in the Engineering Evaluation/Cost Analysis (EE/CA) (Leidos, March 2018). A Site Safety and Health Plan (SSHP) is included as an appendix to the Work Plan.					
15. SUBJECT TERMS Work Plan, Removal Action, Site Safety and Health Plan					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 151	19a. NAME OF RESPONSIBLE PERSON Nathaniel Peters II
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (Include area code) 502-315-2624

Reset

This Page Intentionally Left Blank



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

April 22, 2019

RE: US Army Ravenna Ammunition Pit RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859257

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNG-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

Subject: Approval of Final Non-Time-Critical Removal Action Work Plan for CCRVAP-67 Facility-Wide Sewers and CC RVAAP-75, George Road Sewage Treatment Plant

Dear Mr. Connolly:

On April 17, 2019, the Ohio Environmental Protection Agency (Ohio EPA) received the Final Non-Time-Critical Removal Action Work Plan for CCRVAP-67 Facility-Wide Sewers and CC RVAAP-75, George Road Sewage Treatment Plant. The document was prepared by PARS Environmental/Gannett Fleming under contract No. W912QR-12-D-0006.

Ohio EPA has reviewed the document. All changes outlined in the Army's March 22, 2019 response to comments letter have been made. Ohio EPA approves the document.

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

Sincerely,

A handwritten signature in blue ink, appearing to read "Edward D'Amato", is written over a light blue horizontal line.

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

RECEIVED
APR 22 2019

ec: David Connolly, ARNG
Kevin Sedlak, ARNG, Camp James A. Garfield
Katie Tait, OHARNG, Camp James A. Garfield
Craig Coombs, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Mark Johnson, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Tom Schneider, Ohio EPA, SWDO, DERR

This Page Intentionally Left Blank

CONTRACTOR STATEMENT OF TECHNICAL REVIEW

The PARS-Gannett Fleming Joint Venture (JV) has completed the Final Work Plan (WP) for the Non Time-Critical Removal Action (NTCRA) for the facility-wide sewers as part of the Ravenna Army Ammunition Plant (RVAAP) Restoration Program at Camp James A. Garfield Joint Military Training Center (CJAGJMTC), Portage and Trumbull Counties, Ohio. Notice is hereby given that an independent technical review (ITR) has been conducted that is appropriate to the level of risk and complexity inherent in the project. All comments resulting from the ITR have been resolved and incorporated into the document. During the ITR, compliance with established policy principles and procedures was verified.



Eric White, PG, ITR Team Leader

4/11/19



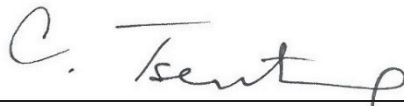
Cody Postlethwait, PMP, Project Manager

4/11/19

CONTRACTOR CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

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

No major technical concerns were identified during the ITR.



Constantine Tsentas, PG, Program Manager, Contractor

4/11/19

This Page Intentionally Left Blank

FINAL

WORK PLAN

**NON TIME-CRITICAL REMOVAL ACTION FOR
CC RVAAP-67 FACILITY-WIDE SEWERS AND
CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT
RAVENNA ARMY AMMUNITION PLANT RESTORATION
PROGRAM**

PORTAGE AND TRUMBULL COUNTIES, OHIO

Contract No. W912QR-12-D-0006
Delivery Order No. W912QR18F0460

Prepared for:
U.S. Army Corps of Engineers, Louisville District
600 Dr. Martin Luther King Boulevard
Louisville, Kentucky

Prepared by:
PARS-Gannett Fleming Joint Venture
500 Horizon Drive, Suite 540
Robbinsville, New Jersey 08691

APRIL 11, 2019

This Page Intentionally Left Blank

DOCUMENT DISTRIBUTION
Final Work Plan
Non Time-Critical Removal Action
Facility-Wide Sewers
Former RVAAP Restoration Program
Camp James A. Garfield, Portage and Trumbull Counties, Ohio

Name/Organization	Number of Printed Copies	Number of Electronic Copies
Ed D'Amato Project Coordinator, Ohio EPA NEDO, DERR	1	1
Tom Schneider, Ohio EPA SWDO	0	0
Robert Princic, Ohio EPA NEDO, DERR	Transmittal Letter Only	
Mark Johnson, Ohio EPA NEDO, DERR	Transmittal Letter Only	
David Connolly, ARNG Restoration Program Manager	0	1
Kevin Sedlak, ARNG – Camp James A. Garfield	0	1
Katie Tait, OHARNG – Camp James A. Garfield	1	0
Craig Coombs, USACE – Louisville District	Transmittal Letter Only	
Nathaniel Peters II, USACE – Louisville District	1	1
Gail Harris, Vista Sciences Corporation, RVAAP Administrative Record	2	2
Pat Ryan, Leidos-REIMS	Transmittal Letter Only	

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

This Page Intentionally Left Blank

TABLE OF CONTENTS

EXECUTIVE SUMMARY	IV
1.0 PROJECT DESCRIPTION	1
1.1 INTRODUCTION.....	1
1.2 PROJECT SCOPE AND OBJECTIVES	1
1.3 SITE HISTORY	1
1.3.1 Facility-Wide Sewers Load Line 2 FA (CC RVAAP-67).....	1
1.3.2 George Road STP Mercury Spill (CC RVAAP-75).....	2
1.4 ENVIRONMENTAL SETTING	3
1.4.1 Topography and Drainage.....	3
1.4.2 Geology.....	3
1.4.3 Hydrogeology.....	3
2.0 PREVIOUS INVESTIGATIONS	5
2.1 LOAD LINE 2 FA (RVAAP-67).....	5
2.2 GEORGE ROAD STP MERCURY SPILL (CC RVAAP-75).....	5
3.0 PROJECT ACTIVITIES	7
3.1 PREMOBILIZATION	7
3.2 MOBILIZATION AND SITE PREPARATION	8
3.3 LOAD LINE 2 FA NTCRA ACTIVITIES	8
3.3.1 Sampling Activities.....	9
3.3.2 Removal Activities.....	10
3.3.3 Load Line 2 FA Site Restoration.....	11
3.4 GEORGE ROAD STP MERCURY SPILL NTCRA ACTIVITIES	12
3.4.1 Removal Activities.....	12
3.4.2 Sampling Activities.....	13
3.4.3 Disposal	13
3.4.4 Site Restoration	14
3.5 DECONTAMINATION OF EQUIPMENT.....	14
3.5.1 Non-Dedicated Reusable Equipment	14
3.5.2 Disposable Sampling Equipment	14
4.0 SAMPLE HANDLING AND CUSTODY REQUIREMENTS	15
4.1 SAMPLE DOCUMENTATION.....	15
4.1.1 Field Logbook	15
4.1.2 Sample Labels	15
4.1.3 Chain of Custody Record.....	16
4.2 SAMPLE HANDLING AND SHIPMENT.....	16
5.0 QUALITY ASSURANCE/QUALITY CONTROL	17
6.0 HEALTH AND SAFETY CONCERNS	18
7.0 DELIVERABLES	19
8.0 REFERENCES	20

TABLE OF CONTENTS (cont'd)

FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Plan

Figure 3 – Load Line 2 FA Proposed NTCRA Activity Locations

Figure 4 – George Road STP Mercury Spill AOC Proposed NTCRA Activity Locations

Figure 5 – Transportation Route

APPENDIX

Appendix A – Site Safety and Health Plan

**Appendix B – Camp Ravenna Weekly Non-Hazardous & Hazardous Waste
Inspection/Inventory Sheet**

Appendix C – Comment Response Table

LIST OF ACRONYMS

AM	Action Memorandum
AOC	Area of Concern
ARNG	Army National Guard Directorate
bgs	Below Ground Surface
BMP	Best Management Practices
BOL	Bill of Lading
COR	Contracting Officer's Representative
DFFO	Director's Final Findings & Orders
DO	Delivery Order
DPW	Department of Public Works
EE/CA	Engineering Evaluation/Cost Analysis
FA	Functional Area
FWCUG	Facility-wide Cleanup Goal
HAZWOPER	Hazardous Waste Operations and Emergency Response
IDW	Investigation Derived Waste
ITR	Independent Technical Review
JV	PARS-Gannett Fleming Joint Venture
MEC	Munitions and Explosives of Concern
mg/kg	Milligrams per Kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NTCRA	Non Time-Critical Removal Action
O&M	Operation and Maintenance
OHARNG	Ohio Army National Guard
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
PWS	Performance Work Statement
QC	Quality Control
QCO	Quality Control Officer
RACR	Removal Action Completion Report
RD	Remedial Design
RVAAP	Ravenna Army Ammunition Plant
SI	Site Inspection
SSHP	Site Safety & Health Plan
STP	Sewage Treatment Plant
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leachate Procedure
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WP	Work Plan

EXECUTIVE SUMMARY

The United States Army Corps of Engineers (USACE) Louisville District has selected the PARS-Gannett Fleming Joint Venture (JV) to perform a non time-critical removal action (NTCRA) for the Facility-Wide Sewers and George Road Sewage Treatment Plant (STP) Mercury Spill at the former Ravenna Army Ammunition Plant (RVAAP) in Portage and Trumbull Counties, Ohio. The project tasks will be performed in accordance with the Performance Work Statement (PWS), Amendment 01, prepared by the USACE and dated August 27, 2018, Contract No. W912QR-12-D-0006, Delivery Order (DO) No. W912QR18F0460.

Lead contaminated sediment and storm sewer piping at the Load Line 2 Functional Area (FA) of the Facility-Wide Sewers (RVAAP-67) and mercury contaminated sediment and associated piping at the George Road Sewage Treatment Plant (STP) Mercury Spill (CC RVAAP-75) require removal to protect human health and the environment. The contamination is the result of historic operations performed at the former RVAAP. This Work Plan (WP) has been prepared to describe proposed activities in accordance with the project scope, objectives, organization, planned activities and sampling procedures.

An Engineering Evaluation/Cost Analysis (EE/CA) prepared by Leidos in 2017 indicates that the U.S. Department of the Army (Army), in cooperation with the Ohio Environmental Protection Agency (Ohio EPA), have agreed to proceed with a NTCRA that includes limited sediment characterization sampling of a drainage ditch and removal of lead-impacted storm drainage system-related sediment and piping at Load Line 2 FA and removal of mercury-impacted piping at George Road STP Mercury Spill. Per the EE/CA (Leidos, 2017) this WP is intended to fulfill the requirements of a Remedial Design (RD).

NTCRA activities prescribed in the EE/CA include:

At the Load Line 2 FA of the Facility-Wide Sewers

- Characterization sampling of drainage ditch sediment downstream of the portion of the ditch that has been previously characterized by Leidos in 2016 and SAIC in 2001 and 2010.
- Removal and off-site disposal of approximately 136.3 cubic yards of impacted sediment from the storm drainage line and ditch that has been previously characterized by Leidos in 2016 and SAIC in 2001 and 2010.
- Removal and off-site disposal of any additional drainage ditch sediment found to exceed the facility-wide cleanup goal (FWCUG) for lead of 400 milligrams per kilogram (mg/kg) during the proposed sediment characterization sampling described above.
- Removal and off-site disposal of approximately 250 linear feet of 10-inch storm sewer piping and 32 linear feet of 18-inch culvert vitrified clay piping, as described in the EE/CA.

At the George Road STP Mercury Spill

- Removal and off-site disposal of approximately 20 linear feet of 15-inch vitrified clay pipe and 18 linear feet of 4-inch cast iron pipe (and associated P-trap) that contain mercury-impacted material.

1.0 PROJECT DESCRIPTION

1.1 INTRODUCTION

The United States Army Corps of Engineers (USACE) Louisville District has selected the PARS-Gannett Fleming Joint Venture (JV) to perform a non time-critical removal action (NTCRA) for the Facility-Wide Sewers and George Road Treatment Plant Mercury Spill at the former Ravenna Army Ammunition Plant (RVAAP) in Portage and Trumbull Counties, Ohio (Figure 1). The project tasks will be performed in accordance with the Performance Work Statement (PWS), Amendment 01, prepared by the USACE and dated August 27, 2018, Contract No. W912QR-12-D-0006, Delivery Order (DO) No. W912QR18F0460.

Lead-contaminated sediment and storm sewer piping at CC RVAAP-67 Facility-Wide Sewers Load Line 2 Functional Area (FA) and mercury-contaminated piping at CC RVAAP-75 George Road Sewage Treatment Plant (STP) Mercury Spill require removal to protect human health and the environment. The contamination is the result of historic operations performed at the former RVAAP. This Work Plan (WP) has been prepared in accordance with the project scope, objectives, organization, planned activities and sampling procedures. A Site Location map and Site Plan are included as Figures 1 and 2, respectively.

1.2 PROJECT SCOPE AND OBJECTIVES

The primary objective of the project is to execute the recommended removal action alternatives identified in the *Engineering Evaluation/Cost Analysis (EE/CA)* (Leidos, 2017). The scope of work has two basic components:

- Implement EE/CA for Load Line 2 FA of the Facility-Wide Sewers
- Implement EE/CA for the George Road STP Mercury Spill

Other site-specific objectives/scope elements include:

- Achieve approved NTCRA WP and Site Safety and Health Plan (SSHP)
- Achieve approved Removal Action Completion Report (RACR)

The proposed tasks are described in further detail in Section 3.0 of this WP.

1.3 SITE HISTORY

The installation was formerly known as the RVAAP, which was utilized as a load, assemble and pack facility for munitions. Administrative control of the facility, which is approximately 21,683 acres, has been transferred to the U.S. Property and Fiscal Officer for Ohio and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site. Restoration program work at the facility is conducted by the Army National Guard Directorate (ARNG) and the OHARNG, encompasses investigation and cleanup of past activities over the entire footprint of the former RVAAP. RVAAP Restoration Program work at Camp James A. Garfield is conducted in accordance with the Ohio Environmental Protection Agency (Ohio EPA) Director's Final Findings and Orders (DFFO), for the former RVAAP.

1.3.1 Facility-Wide Sewers Load Line 2 FA (CC RVAAP-67)

The Facility-Wide Sewers AOC is comprised of approximately 26 miles of storm and sanitary sewers located throughout the former RVAAP and includes sewer lines containing residual

sediment and water, pipe bedding below the sewer lines and the sewer line discharge points. The storm sewer systems at the former RVAAP collected runoff from drainage areas along roads, rail beds and buildings and diverted it to ditches and drainage conveyances through outfalls. Historically, the storm and sanitary sewer systems may have received inadvertent discharges of contaminated wastewater related to the manufacturing of munitions or other industrial processes.

Due to the size and structure of the Facility-wide Sewers AOC, it was divided into 19 FAs based on the spatial distribution of the systems and their operational characteristics. The Load Line 2 FA is the portion of sewers within the Facility-wide Sewers AOC that resides within Load Line 2, as shown on Figure 2. The Load Line 2 FA includes any storm and sanitary sewers that exist in Load Line 2 and the corresponding sewer sediment, sewer water, outfall sediment, outfall water and pipe bedding material.

Load Line 2 is a former melt-pour load line located in the southeastern portion of the facility that was in operation from 1941 to 1971. During 1941 to 1945, 1951 to 1957 and 1969 to 1971, Load Line 2 was used to melt and load 2,4,6-trinitrotoluene and composition B (a combination of 2,4,6-trinitrotoluene and hexahydro-1,3,5-trinitro-1,3,5-triazine) explosives into large-caliber shells. The primary buildings used for assembling and disassembling munitions at Load Line 2 were DB-4 and DB-4A. All Load Line 2 buildings and some associated structures have since been demolished. Remnant structures from operational activities include asphalt and gravel access roads, man-made ditches, sewer lines, manholes and ballast from former railroad tracks. The former main process area is heavily vegetated with grass and scrub vegetation between the major structures of Load Line 2. The non-production areas around the main process area are characterized by scrub vegetation and immature hardwoods. The topography of Load Line 2 is characterized as moderately subdued on a reworked sandstone bedrock surface. Elevations are approximately 990 to 1,010 feet above mean sea level.

The Load Line 2 FA contains separated storm and sanitary sewer systems. The sanitary sewer system is part of the Sand Creek Treatment Plant Network. Sanitary effluent from the FA was pumped through a former ejector station located at the south end of the load line prior to exiting the central western portion of the Load Line 2 FA, headed to the Load Line 3 FA. The storm sewer network is unique to the Load Line 2 FA and discharged to a series of surface drainage conveyances throughout the load line. Available historical documents do not indicate any incidents or occurrences of intentional dumping or discharging contaminated wastewaters to the Load Line 2 FA storm sewer (SAIC 2012).

1.3.2 George Road STP Mercury Spill (CC RVAAP-75)

The George Road STP is located in the south-central portion of the former RVAAP, as shown on Figure 2. This inactive domestic sewage treatment plant was used to process domestic sewage from Load Line 6 (RVAAP-15) and Load Line 7 (RVAAP-30), including influent from the Administration Area, Hospital, Family Housing, Power House No. 6 and the vehicle maintenance garage. The plant also received sludge from the Depot Sewage Treatment Plant (RVAAP-21). The George Road STP was taken out of service in 1993 and was properly closed under Ohio National Pollutant Discharge Elimination System Permit Number 31000000BD. No records were discovered that document when plant operations began; however, a 1941 site schematic suggests that operations began circa 1941 (SAIC 2011).

The George Road STP consisted of the comminutor building, two Imhoff tanks, two trickling filters, sludge beds contained within greenhouses and a chlorine building. The Imhoff tanks were abandoned in place and filled with soil, the trickling filters were removed and sludge from the drying beds was removed. The small brick comminutor and chlorine buildings remain.

1.4 ENVIRONMENTAL SETTING

1.4.1 Topography and Drainage

The facility is located within the Southern New York Section of the Appalachian Plateaus physiographic province. This province is characterized by elevated uplands underlain primarily by Mississippian and Pennsylvanian age bedrock units that are horizontal or gently dipping. The province is characterized by its rolling topography with incised streams having dendritic drainage patterns. The Southern New York Section has been modified by glaciation that rounded ridges, filled major valleys and blanketed many areas with glacially derived unconsolidated deposits (sand, gravel, and finer-grained outwash deposits). As a result of glacial activity in this section, old stream drainage patterns were disrupted in many locales, and extensive wetland areas developed.

1.4.2 Geology

Bedrock at the former RVAAP is overlain by deposits of the Wisconsin-age Lavery Till in the western third of the facility and the younger Hiram Till and associated outwash deposits in the eastern two-thirds of the facility. Unconsolidated glacial deposits vary considerably in their character and thickness across the former RVAAP, ranging from absent to less than one foot in some of the eastern portions of the facility to an estimated 150 feet in the south-central portion (SAIC 2012).

Thin coverings of glacial material have been completely removed as a consequence of human activities at locations such as Ramsdell Quarry. Bedrock is present at or near the ground surface in locations such as at Load Line 1 and the Erie Burning Grounds. Where this glacial material is present, its distribution and character indicate its origin as ground moraine. These tills consist of laterally discontinuous assemblages of yellow-brown, brown and gray silty clays to clayey silts with sand and rock fragments. Lacustrine sediment from bodies of glacial-age standing water has also been encountered in the form of deposits of uniform light gray silt greater than 50 feet thick in some areas.

Soil at the former RVAAP is generally derived from the Wisconsin-age silty clay glacial till. Distributions of soil types are discussed and mapped in the U.S. Department of Agriculture's *Soil Survey of Portage County, Ohio*, which describes soil as nearly level to gently sloping and poor to moderately well drained. Much of the native soil at the former RVAAP was disturbed during construction activities in former production and operational areas of the facility.

The Sharon Member of the Pennsylvanian Pottsville Formation is the primary bedrock beneath the former RVAAP. In the western half of the facility, the upper members of the Pottsville Formation, including Massillon Sandstone, Mercer Shale and uppermost Homewood Sandstone, have been found. The regional dip of the Pottsville Formation measured in the western portion of the former RVAAP is 5.0 to 11.5 feet per mile to the south (SAIC 2012).

1.4.3 Hydrogeology

Sand and gravel aquifers are present in the buried-valley and outwash deposits in Portage County (SAIC 2012). Generally, these saturated zones are too thin and localized to provide large quantities

of water for industrial or public water supplies; however, yields are sufficient for residential water supplies.

Lateral continuity of these aquifers is unknown. Recharge of these units is derived from surface water infiltration of precipitation and surface streams. Specific groundwater recharge and discharge areas at the former RVAAP have not been delineated (SAIC 2012).

The thickness of the unconsolidated interval at the former RVAAP ranges from thin to absent in the eastern and northeastern portion of the former RVAAP to an estimated 150 feet in the central portion of the facility. The groundwater table occurs within the unconsolidated zone in many areas of the facility. Because of the heterogeneous nature of the unconsolidated glacial material, groundwater flow patterns are difficult to determine with a high degree of accuracy (SAIC 2012).

2.0 PREVIOUS INVESTIGATIONS

The EE/CA (Leidos, 2017) evaluated the alternatives and the preferred remedy for removing lead contamination in storm sewer outfall sediment at the Load Line 2 FA and mercury contamination within sediment and associated subsurface piping at the George Road STP. The preferred remedy of sediment and associated piping removal with offsite disposal was selected for both locations.

The following sections summarize previous investigations at each location. The activities required to achieve the removal action at each location are detailed in Section 3.0.

2.1 LOAD LINE 2 FA (RVAAP-67)

Multiple investigations were performed at the Load Line 2 FA storm and sanitary sewers. These investigations are summarized in *Functional Area Evaluation-7 of the Draft Facility-wide Sewers RI/FS Report* (SAIC 2012) that concluded that elevated lead concentrations may pose a potential ecological risk within a section of the storm sewer system surrounding sample location LL2sd-308. This area included storm sewer lines immediately east of former Buildings DB-3 and DB-802, as shown in Figure 3.

In May 2016, Leidos conducted an investigation to evaluate the nature and extent of lead within the storm sewer lines immediately east of former Buildings DB-3 and DB-802 at the Load Line 2 FA. This investigation was executed in accordance with the *Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 FA* (Leidos, 2016) and methodology and findings are documented in the *EE/CA* (Leidos, 2017). Sample results and locations are depicted on Figure 3. The following conclusions were made based on this investigation:

- The high concentration of lead within drop inlet DB22 was confirmed; the drop inlet is a source of lead contamination to the downstream ditch line that can pose risk to ecological resources.
- There is no ecological risk in sediment within the ditch receiving sewer overflow from DB17 to DB20. The sediment was below railroad ballast, which reduces exposure to ecological resources. In addition, all concentrations in the ditch were below 400 mg/kg, which is the FWCUG for lead. No removal actions are necessary in this ditch line.
- The ditch line downstream of drop inlet DB22 [represented by sample locations LL2sd-654(st) to LL2sd-657(st)] had concentrations of lead that can pose risk to ecological resources. The lead concentration of 400 mg/kg is bound horizontally by the sample location furthest downstream (LL2sd-657); this concentration was present in one sample location [LL2sd-656(st)] at up to 2 feet below ground surface (bgs).

2.2 GEORGE ROAD STP MERCURY SPILL (CC RVAAP-75)

According to the *Historical Records Review Report for the 2010 Phase I RI Services at CR Sites (9 Areas of Concern)* (SAIC 2011), the trickling filters had mercury seals that tended to leak. The trickling filters had drains under them that drained into a collection box; mercury was periodically collected after heavy flows and placed in a pint-sized jar for storage. Interviewees indicated elemental mercury contained in a pint-sized jar reportedly spilled into a floor drain in the comminutor building.

Utility plans included in the historical records review indicated that liquids entering the comminutor building floor drain traveled through a 4-inch cast iron pipe to a 15-inch vitrified clay

pipe (drain line) located along the northeast corner of the building. This 15-inch drain line formerly discharged into manhole MH-P1 (ECC 2015).

Further investigation was recommended based on the findings of the historical records review, which recommended that the floor drain pipe and pipe trap within the comminutor be further inspected and soil samples be collected from soil immediately surrounding the floor drain pipeline.

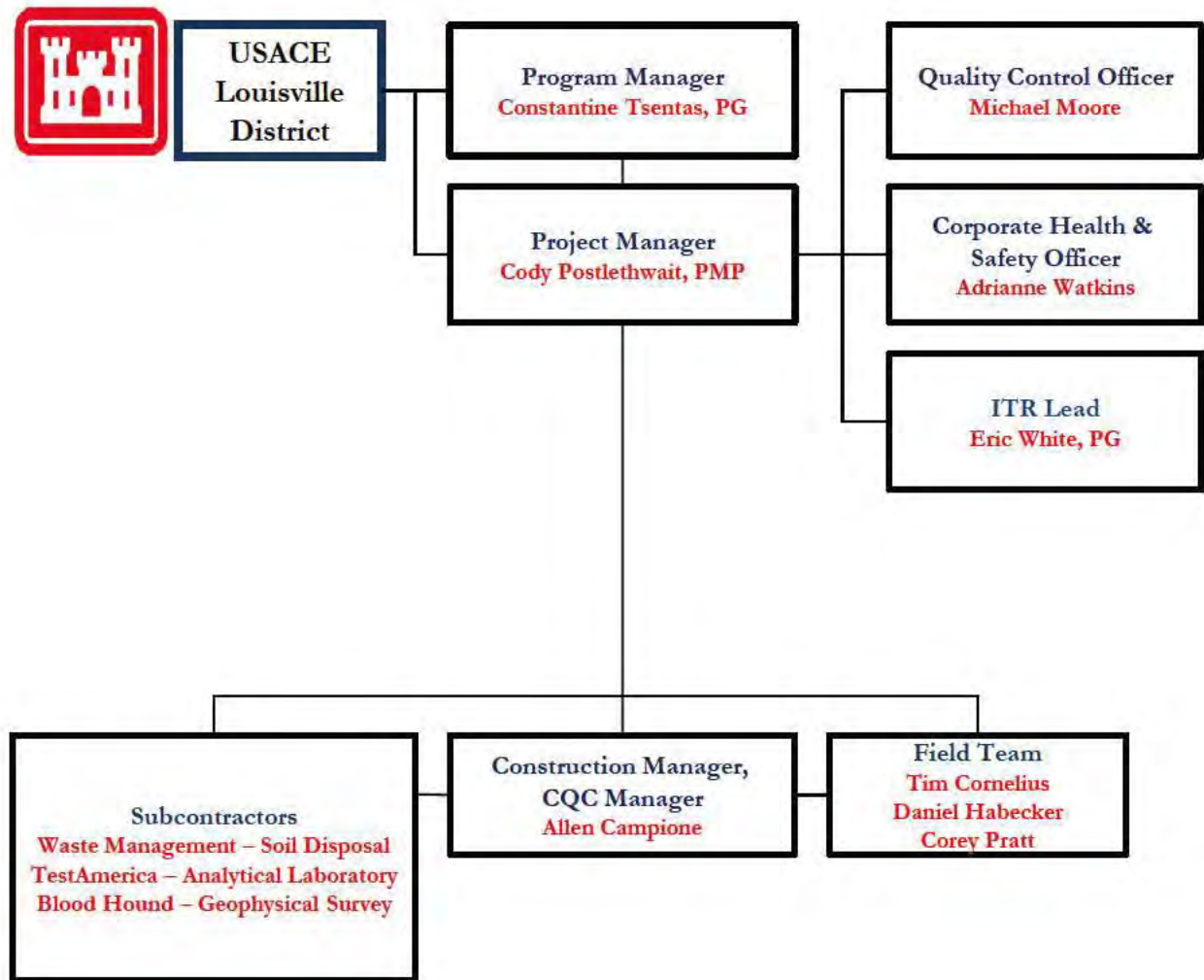
The historical records review indicated that potential contaminants in soil may represent a direct exposure pathway for human receptors under current and future land use. Surface and subsurface soil may represent a potential secondary source of contamination (SAIC 2011). Environmental sampling was recommended to confirm the presence or absence of any potential soil contamination.

In 2012, a site inspection (SI) was initiated to investigate the historic mercury spill within the comminutor building, as documented in the *Site Inspection Report CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill* (USACE 2016b). The field investigation associated with the SI included a video survey, subsurface soil sampling, a sediment sample and a drainage pipe deposit sample. Sample results indicated subsurface soil is not contaminated and that soil is not a source of groundwater contamination at the AOC. Mercury was detected at a concentration of 7.2 mg/kg in the drainage pipe sample collected from a section of 15-inch vitrified clay pipe. Due to the contamination detected within the pipe, the Army decided to implement an NTCRA to remove the mercury contamination within a 4-inch cast iron drain and 15-inch vitrified clay pipe at the George Road STP Mercury Spill AOC as depicted on Figure 4.

3.0 PROJECT ACTIVITIES

This WP includes descriptions of all project activities. A Site Safety and Health Plan (SSHP) for this project is included as Appendix A. A project organization chart is provided in Figure 1.

Figure 1 – Project Organization Chart



3.1 PREMOBILIZATION

Premobilization will consist of scheduling and coordination of the field team. All personnel entering Camp James A. Garfield must be on an access roster 48 hours in advance of required entry to Camp James A. Garfield. This includes deliveries, pickups and subcontractors. Work hours are 0730 – 1630 Monday through Friday, except on federal holidays. Extended work days and weekend work hours must be pre-approved by and requested through the Camp James A. Garfield Environmental Office. All contractors conducting cleanup activities as part of the

RVAAP Restoration Program are required to provide a 40-hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response (HAZWOPER) certificate and a current 8-hour refresher certificate prior to conducting field work within AOCs/MRSs at the former RVAAP. The HAZWOPER certificate for all field personnel will be sent to the Administrative Assistant of Vista Sciences/Chenega at least one week in advance of field work. The field team will inspect all equipment to be used during the sampling event. Prior to the commencement of field activities, all team members will review:

- Site activities to be performed
- Data obtained during previous site visits/investigations
- Approved field procedures as presented in this WP
- Potential hazards specific to the location
- Safe work practices.

In accordance with the DFFOs, a 15-day notification will be sent to the Ohio EPA prior to commencement of field activities. At least two weeks prior to the start of field work, utility clearance will be requested from the OHARNG restoration representative and the ARNG Project Manager. The facility's Department of Public Works (DPW) will provide the utility mark out as the Ohio Utility Protection Service one-call system is not currently active on-site. Additionally, a third-party locator company will be used as described in Section 3.2. Any utility lines that are damaged during intrusive activities will be repaired.

3.2 MOBILIZATION AND SITE PREPARATION

Photographs will be taken of pre-existing site conditions, all work and the restored site and compiled into a photo log that will be submitted as an appendix to the Completion Report. A third-party locator company will perform a geophysical survey to identify potential subsurface utilities at both AOCs, and to locate subsurface piping requiring removal as part of this NTCRA.

Following completion of the geophysical survey, erosion controls such as silt fences and straw bales will be installed, as needed, to minimize sediment runoff from the excavation area, and removal action equipment will be mobilized to the Site. Vegetation in the excavation area will be cleared using hand tools, brush trimmers and mowers, when required. Due to facility-wide seasonal cutting restrictions, no trees or vegetation greater than 3 inches in diameter shall be cut between April 1 and October 31.

3.3 LOAD LINE 2 FA NTCRA ACTIVITIES

The Load Line 2 FA NTCRA consists of: (1) conducting additional characterization sampling between LL2sd-657 and LL2-252 and downgradient of sample location LL2-252; and (2) excavating and removing the lead-contaminated sediment above FWCUGs, followed by transportation by truck to an off-site licensed disposal facility.

Figure 3 presents the extent of the characterization sampling scheme and sediment excavation. The depth of sediment excavation is approximately 2 feet bgs from immediately downstream of DB22 to sample location LL2sd-657(st), which is an estimated 325 feet long. The estimated total disposal volume is estimated to be 133 cubic yards. This extent and total disposal volume were determined in the EE/CA (Leidos, 2017) based on the delineation sampling performed by Leidos in May 2016. An estimated 3.3 cubic yards of sediment will also be removed for off-site disposal at DB-20. In addition, the storm sewer pipe between DB-20 and DB-21 (250 linear feet of 10-inch storm sewer) and the culvert pipe between DB-21 and DB-22 (32 linear feet of 18-inch culvert vitrified clay

pipe) will be removed for off-site disposal. Per facility-wide wetland delineation records, there are no existing wetlands within the defined project area of Load Line 2.

3.3.1 Sampling Activities

All samples will be collected using a stainless-steel hand auger or hand trowel. Each sample will be thoroughly mixed in a clean and sealed polyethylene bag before transfer to a laboratory grade sample container. The sample containers will be filled to the top and sealed with the appropriate cap. Sediment on the threads of each container will be removed prior to placing the cap on the sample container to assure an air-tight seal. Sediment samples scheduled for laboratory analyses will then be placed in a cooler with ice and delivered to the laboratory under proper chain of custody protocol.

The following sampling activities will be performed prior to mobilizing removal action equipment and personnel to the Site.

Sediment Characterization Sampling

Sediment characterization sampling will be performed to determine the nature and extent of lead impacts to sediment within the drainage ditch between the Leidos 2016 sample locations LL2sd-657(st) and LL2-252 and downstream of LL2-252 (see Figure 3), as described in the EE/CA. Seven borings will be installed to collect sediment samples from intervals of 0.0 to 0.5, 0.5 to 1.0 and 1.0 to 2.0 feet bgs at the proposed boring locations depicted on Figure 3.

Characterization samples will be analyzed for lead via United States Environmental Protection Agency (USEPA) method SW846-6020. Field duplicates will be collected for analysis at a rate of 10% (1 duplicate per up to 10 primary environmental samples) and matrix spikes/matrix spike duplicates (MS/MSD) will be collected for analysis at a rate of 5% (1 MS/MSD per 20 environmental samples). Additionally, if non-dedicated sampling equipment is used, a daily rinsate sample will be collected and analyzed for lead.

Evaluation of analytical results will include comparison of detected lead concentrations to the FWCUG of 400 mg/kg. Sediment characterization sampling results (Section 3.3.1) will only be used to add to, but not detract from the findings documented in the EE/CA (Leidos, 2017) and shown on Figure 3. The extent of the proposed drainage ditch excavation will be modified to include areas that are above the FWCUG prior to mobilizing for sediment and pipe removal activities.

Waste Classification Sampling

The OHARNG restoration representative will be notified prior to performing waste sampling activities. During characterization sampling activities, two five-point composite waste classification samples will be collected: one composite sample will be collected to represent the drainage ditch sediments and one composite sample will be collected to represent the pipe sediments. Each composite sample will be comprised of five sub-samples, and each sub-sample will be created by homogenizing proportional amounts of sediments from each interval.

A total of five sub-samples will be collected from the drainage ditch. Sub-samples will be collected approximately every 70 feet from the interval of 0 to 2 feet bgs using a stainless-steel hand auger or hand trowel. These five sub-samples will be placed into a dedicated polyethylene Ziploc bag and composited. The composited sample will be transferred to a laboratory grade jar and submitted to the laboratory for analysis.

A total of five sub-samples will be collected from the impacted pipeline sediments at pipe access points (i.e. clean-outs, manholes, etc.). If no pre-existing pipe clean-outs, outfalls or other access points are located at the time of sampling, soft digging methods will be used to excavate and expose the buried pipeline. Once exposed, a core drill will be used to cut through the top of the drainage pipe to allow sampling equipment access. Sub-samples will be collected using a decontaminated stainless-steel spoon. The pipe will be patched prior to backfilling to prevent additional sediments and rainwater from entering the pipe. It is anticipated that some of the soil surrounding the pipe and approximately 0.5 foot of soil beneath the pipe will also be removed and disposed of offsite during the removal of the pipe. Therefore, soil adjacent to the pipe will be collected at each sub-sample location from the 2-4 foot bgs interval and combined with the sediment from the pipe at a ratio of approximately 10:1, which represents the expected disposal quantities (e.g. the expected volume of soil around and beneath the pipe compared to the estimated 1-3 inch thickness of sediment in the pipe). Soils collected adjacent to or beneath the pipe will be collected using a stainless steel hand auger.

Composite samples will be analyzed for pH, ignitability, total sulfide, total cyanide and full Toxicity Characterization Leachate Procedure (TCLP), which includes TCLP analysis of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, pesticides and herbicides. As stipulated in the *Camp Ravenna Waste Management Guidelines*, waste classification results will be provided to the OHARNG restoration representative, USACE POC and ARNG Project Manager as soon as possible but no later than 30 days after collection. It has been assumed that all waste will be classified as non-hazardous. If the waste characterization results indicate hazardous characteristics, the USACE POC will be notified immediately to determine a path forward for disposal of sediments classified as hazardous.

Backfill Sampling

Backfill materials needed for restoration will be sourced from Oscar Brugmann Sand & Gravel, Inc. in Mantua, Ohio. One fill material sample is required for every 4,000 cubic yards of fill and will be analyzed for target compound list (TCL) VOCs, TCL SVOCs, TCL pesticides, polychlorinated biphenyls (PCBs), explosives, nitroglycerine, nitro-guanidine, nitrocellulose, target analyte list (TAL) metals and pH. Because only a small volume of fill material is needed (approximately 175 tons), one five-point composite sample will be collected to evaluate each type of fill material (sand and topsoil). The sampled fill material will be segregated from other material at the quarry and reserved for this project.

3.3.2 Removal Activities

Based on the sediment characterization sampling results (Section 3.3.1) and findings documented in the EE/CA (Leidos, 2017) and shown on Figure 3, a backhoe or excavator will be used to remove sediment and piping containing lead concentrations exceeding 400 mg/kg. The depth of the excavation will be approximately 2 feet bgs from immediately downstream of DB22 to sample location LL2sd-657(st). The depth of the excavation will be approximately 4 feet bgs near DB-20. The storm sewer pipe between DB-20 and DB-21 and the culvert pipe between DB-21 and DB-22 will be removed for off-site disposal. Overburden excavated during the pipe removal will be stockpiled adjacent to the excavation and used as backfill following removal activities prior to being brought to the facility.

To avoid the potential for contaminating groundwater and the hazard of collapse caused by digging into saturated material, excavations will not be extended below the local groundwater table.

Excavation activities will be stopped at the first indication of groundwater, and the excavation will be immediately backfilled with at least 2 feet of clean material.

An estimated total of 133 cubic yards of lead-contaminated sediment and 250 linear feet of 10-inch storm sewer piping and 32 linear feet of 18-inch culvert piping and any additional sediment requiring excavation based on sediment characterization sampling results (Section 3.1.1), will be removed and either directly loaded onto trucks or placed into roll-off containers for off-site disposal. Per the EE/CA (Leidos, 2017), wastes generated at Load Line 2 are anticipated to be non-hazardous and will be disposed at Waste Management's American Landfill located at 7916 Chapel Street SE in Waynesburg, Ohio. However, if the waste characterization analyses indicate the material is hazardous, a contract modification will be sought through USACE and waste will be transported through US Ecology (formerly EQ Industrial Services of Livonia, Michigan) and disposed at the US Ecology facility located at either 2050 Central Avenue in Canton, Ohio, 6520 Georgia Street in Detroit, Michigan, or 49350 North I-94 Service Drive in Belleville, Michigan.

Load Line 2 FA will be accessed by an unimproved access road located to the north of South Service Road. If required, crushed stone will be used to stabilize the access road. Loose soil/sediment will be removed from transportation vehicles prior to leaving the Site and the transportation route will be kept free of Site-generated debris. Transportation vehicles leaving Load Line 2 FA will turn right (westbound) onto South Service Road and follow appropriate signage south towards George Road to exit the installation. A map detailing the transportation route is included in Figure 5.

Trucks will be loaded using a loader and/or excavator. If needed, plastic sheeting may be utilized at the loading area during direct loading to prevent waste from migrating and contaminating the ground surface. During transport, the truck payloads will be covered. Proper traffic control will be maintained both on- and off-site, per State and local traffic regulations. Scale tickets will be reviewed to ensure loads remain within the legal limit; load sizes will be adjusted if necessary.

All waste profiles and manifests will be signed by the OHARNG restoration representative and ARNG Project Manager prior to the waste leaving the facility. The JV staff will notify the Restoration Program representative at least 24 hours in advance of the waste shipment. A draft manifest will be provided for review and approval by the OHARNG restoration representative prior to the first shipment of waste off-site. Transportation shall be by licensed trucks and drivers having current permits. All waste classification forms, waste manifests and Bills of Lading (BOLs) will be properly completed, signed and maintained. The JV field crew will provide daily reports, including tool box safety meeting forms, load tickets, approximate volumes and copies of all documents applicable to daily activities to the Contracting Officer's Representative (COR). All personal protective equipment (PPE), plastic sheeting and other solid waste generated as part of the project will be transported off-Site and properly disposed in accordance with the waste classification of the sediments located at Load Line 2 FA.

3.3.3 Load Line 2 FA Site Restoration

Site restoration at Load Line 2 FA will be completed as follows:

- Restoration between DB-20 and DB-21: The overburden from storm sewer pipe excavation will be used as backfill to create an open ditch that will be graded to convey storm water.

- Restoration between DB-21 and DB-22: A new corrugated plastic culvert pipe with the dimensions of the existing pipe will be installed and the overburden from excavating the existing culvert pipe will be used as backfill to ensure railroad bed and access roadway can be used. If it is discovered that the pre-existing culvert pipe is metal, the culvert pipe will be replaced with a similar metal storm sewer pipe during restoration activities.
- Restoration of Ditch: The ditch will be restored using backfill material obtained from a clean source that will be sampled and approved as described in Section 3.1.3. The ditch will be graded to convey storm water.

Backfill analytical results will be presented to the USACE COR and OHARNG restoration representative in a *Field Change Request* Form. Backfill material will not be brought onsite until analytical results are approved by the USACE COR and OHARNG restoration representative. Backfill will be placed into the open excavation, as needed, and compacted using either a vibratory compactor or the bucket of the excavator/backhoe. Topsoil will be placed over disturbed areas, as needed. One of the two permanent cover seed mixture types listed in *OHARNG Approved Grass Seed Mixes for Temporary Cover and Final Site Closures* dated July 29, 2014 will be applied at the Site using an erosion control germination blanket. If either of the two seed mixtures are unobtainable at the time of restoration, the JV will select a substitute and seek approval from the USACE POC and the OHARNG restoration representative for approval prior to use at the Site. The erosion control blanket will be properly staked to ensure it remains in place during germination to allow vegetation to establish.

3.4 GEORGE ROAD STP MERCURY SPILL NTCRA ACTIVITIES

The George Road STP Mercury Spill NTCRA consists of excavating and removing piping containing mercury-contaminated sediment, followed by transportation by truck to an off-site licensed disposal facility. As shown on Figure 4, approximately 20 linear feet of 15-inch vitrified clay pipe and 18 linear feet of 4-inch cast iron pipe will be removed from approximately 6 feet bgs. Photographs will be taken of pre-existing site conditions, all work activity and the restored site and compiled into a photo log that will be submitted as an appendix to the Completion Report.

3.4.1 Removal Activities

To achieve a scenario in which the AOC is protective for Unrestricted (Residential) Land Use, mercury-contaminated piping and sediment requiring removal will be removed from the proposed excavation extent shown on Figure 4. Approximately 20 linear feet of 15-inch vitrified clay pipe and 18 linear feet of 4-inch cast iron pipe (and associated P-trap) will be removed from approximately 6 feet bgs. The soil above the pipe will be removed from the excavation and segregated for reuse.

An approximate 7.5-ft section of the 4-inch cast iron pipe requiring removal is located beneath the floor of the comminutor building. During the investigation documented in the EE/CA (Leidos, 2017), an approximate 4-foot by 3-foot section of the 6-inch thick concrete floor was removed. Following completion of investigation, the pieces of concrete floor were then replaced in their original locations. Additional saw cutting of the concrete floor prior to excavation of the pipe will be performed to access the piping, as needed.

To avoid the potential for contaminating groundwater and the hazard of collapse caused by digging into saturated material, excavations will not be extended below the local groundwater table. Excavation activities will be stopped at the first indication of groundwater, and the excavation will

be immediately backfilled with at least 2 feet of clean material.

The excavated piping and sediment will be removed and placed into appropriately lined and covered water-tight roll-off containers and staged at the Site. In accordance with the Ohio EPA and facility-wide requirements for the storage of potentially hazardous wastes, roll-off containers will be inspected weekly by onsite personnel until the waste is analytically determined non-hazardous, at which point a monthly inspection will be performed until the roll-off is appropriately disposed. The *Camp Ravenna Weekly Non-Hazardous and Hazardous Waste Inspection/Inventory Sheet* will be used during weekly and, if required, subsequent monthly inspections of the roll-off container. A copy of the *Camp Ravenna Weekly Non-Hazardous and Hazardous Waste Inspection/Inventory Sheet* is provided in Appendix B.

3.4.2 Sampling Activities

The OHARNG restoration representative will be notified prior to performing waste sampling activities. The waste sample will be collected from the containerized stockpile described in Section 3.4.1 using a stainless-steel spoon. The sample will be thoroughly mixed in a clean and sealed polyethylene bag before transfer to a laboratory grade sample container. The sample containers will be filled to the top and sealed with the appropriate cap. Sediment on the threads of each container will be removed prior to placing the cap on the sample container to assure an air-tight seal. Sediment samples scheduled for laboratory analyses will then be placed in a cooler with ice and delivered to the laboratory under proper chain of custody protocol.

The waste sample will be analyzed for pH, ignitability, total sulfide, total cyanide and TCLP analysis of VOCs, SVOCs, metals, pesticides and herbicides. As stipulated in the *Camp Ravenna Waste Management Guidelines*, waste classification results will be provided to the OHARNG restoration representative, USACE POC and ARNG Project Manager as soon as possible but no later than 30 days after collection. It has been assumed that waste will be classified as non-hazardous. If the waste characterization results indicate hazardous characteristics, the USACE POC will be notified immediately to determine a path forward.

3.4.3 Disposal

Per the EE/CA (Leidos, 2017) wastes generated at George Road are anticipated to be non-hazardous and will be disposed at Waste Management's American Landfill located at 7916 Chapel Street SE in Waynesburg, Ohio. However, if waste profiles indicate the material is hazardous a contract modification will be sought through USACE and waste will be transported through US Ecology (formerly EQ Industrial Services of Livonia, Michigan) and disposed at the US Ecology facility located at either 2050 Central Ave in Canton, Ohio, 6520 Georgia Street in Detroit, Michigan, or 49350 North I-94 Service Drive in Belleville, Michigan.

George Road STP will be accessed by an unimproved access road located to the south of South Service Road. If required, crushed stone will be used to stabilize the access road. Loose soil/sediment will be removed from transportation vehicles prior to leaving the Site and the transportation route will be kept free of Site-generated debris. Transportation vehicles leaving the George Road STP will turn left (westbound) onto South Service Road and follow appropriate signage south towards George Road to exit the installation. A map detailing the transportation route is included in Figure 5.

During transport, the truck payloads will be covered. Proper traffic control will be maintained both on- and off-site, per State and local traffic regulations. Scale tickets will be reviewed to ensure

loads remain within the legal limit; load sizes will be adjusted accordingly if necessary.

All waste profiles and manifests will be signed by the OHARNG restoration representative prior to waste leaving the facility. The JV will notify the Restoration Program representative at least 24 hours in advance of the waste shipment. A draft manifest will be provided for review and approval by the Restoration Program representative prior to the first shipment of waste off-site. Transportation will be by licensed trucks and drivers having current permits. All waste classification forms, waste manifests and BOLs will be properly completed, signed and maintained. The JV field crew will provide daily reports, including tool box safety meeting forms, load tickets, approximate volumes and copies of all documents applicable to daily activities to the COR. All PPE, plastic sheeting and other solid waste generated as part of the project will be transported off-Site and properly disposed in accordance with the waste profile of the material they were contaminated by.

3.4.4 Site Restoration

Upon completing the excavation, disturbed areas will be backfilled with overburden from the pipe excavation and clean soil will be used if needed to assist in grading to neighboring contours. Should imported fill material be required, the off-site material sampled as described in Sections 3.3.1 and 3.3.3 will be used. Surface restoration of concrete surfaces inside the comminutor building is not required. After the exterior area is backfilled and graded, a seed mixture approved by OHARNG as listed in the *OHARNG Approved Grass Seed Mixes for Temporary Cover and Final Site Closures* dated July 29, 2014, and mulch will be applied.

3.5 DECONTAMINATION OF EQUIPMENT

To avoid cross contamination, sampling equipment will be decontaminated according to the following procedures outlined below.

3.5.1 Non-Dedicated Reusable Equipment

Heavy equipment, tools, etc. will be cleaned before arriving at and leaving the Site and additionally between excavation and backfilling activities. Investigation derived waste (IDW) will be consolidated with excavated wastes prior to being shipped offsite. All non-dedicated reusable equipment coming into direct contact with the sediment or groundwater, such as stainless-steel trowels will require field decontamination between each sampling point. Sampling devices will be cleaned manually with a non-phosphate detergent (i.e., Alconox) wash followed by a potable water rinse. Additionally, if non-dedicated sampling equipment is used, equipment blank samples will be collected and analyzed for the contaminants of concern. Negligible quantities (i.e. less than 20 gallons) of liquid IDW are expected to result from decontamination activities and will be consolidated with excavated wastes prior to being shipped offsite.

3.5.2 Disposable Sampling Equipment

Disposable sampling equipment includes nitrile gloves, paper towels, etc. Disposable equipment will not be field-decontaminated. After its dedicated use, the equipment will be properly disposed.

The sampling methods and equipment have been selected to limit both the need for decontamination and to reduce the volume of waste material to be generated. Rinse water generated during decontamination activities will be properly disposed of off-site. Personal protective equipment and disposable sampling equipment generated as part of the investigation will be placed in plastic garbage bags and properly disposed. Impacted sediments generated during decontamination activities will be properly disposed at the selected landfill.

4.0 SAMPLE HANDLING AND CUSTODY REQUIREMENTS

4.1 SAMPLE DOCUMENTATION

Sample documents will be legible and written in ink. Corrections or revisions to sample documentation shall be made by striking through the original entry and initialing any changes. To elaborate on these requirements, the following sub-sections are provided to outline sample documentation procedures that will be employed when conducting the removal action.

4.1.1 Field Logbook

A field logbook will be maintained detailing site activities and observations. The field logbook will be bound and have consecutively numbered pages. Entries will be signed by the individuals who are making them. The field logbook entries will document the following specific information:

- Site name and project number
- Contractor name and address
- Names of personnel at the Site
- Dates and times of entries
- Descriptions of Site activities, including entry and exit times
- Noteworthy events and discussions
- Weather conditions
- Site observations
- Identification and description of samples and locations
- Subcontractor information and names of on-site personnel
- Dates and times of sample collections and chain of custody information
- Records of daily photographs
- Site sketches and excavation progress
- Truck arrivals, departures and tonnage
- Relevant and appropriate information delineated in field data sheets and sample labels
- Equipment calibration and maintenance activities

4.1.2 Sample Labels

Sample labels will be used to identify samples and document field sampling conditions and activities. Sample labels will be securely affixed to the sample container. They will clearly identify the particular sample and will include the following information:

- Site name and designated project number
- Sample identification number (pre-approved by the REIMS administrator (Leidos))
- Date and time the sample was collected
- Sample preservation method
- Analysis requested
- Sampling location
- Sampler's initials

4.1.3 Chain of Custody Record

A chain-of-custody record will be maintained from the time of sample collection until final deposition. The chain-of-custody record will include the following information:

- Contractor name and address
- Sample identification number
- Sample location
- Sample collection date and time
- Sample information (matrix type, number of bottles collected, container type, etc.)
- Parameters to be tested
- Names and signatures of samplers
- Signatures of all individuals who have had custody of the samples

4.2 SAMPLE HANDLING AND SHIPMENT

Sample containers prepared for shipment will be securely closed with a custody seal affixed to each cap. Sample containers will be labeled as described in Section 4.1.2. Subsequently, the sample containers will be placed in an appropriate transport container or cooler. Transport containers (e.g., coolers) will be packed with ice to maintain a temperature of $4^{\circ}\text{C} \pm 2^{\circ}$. Sample documentation will then be placed inside each transport container. When transferring possession of samples, the individual receiving the samples will sign and date the chain of custody. The transport container lid will then be closed and affixed with nylon strapping tape and a custody seal accordingly.

Custody seals will be used to demonstrate that a transport container has not been opened or tampered with in transit to the laboratory. The individual who has sample custody will sign, date, and affix the custody seal to the transport container so it cannot be removed.

Environmental samples will be shipped daily via overnight delivery to the laboratory or will be picked-up daily at the Site by an employee of the laboratory.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

The JV will ensure that the quality of all work performed under this contract meets USACE approval, through the COR. The PWS (dated July 10, 2018; Amended August 27, 2018) prepared by the USACE sets forth the procedures and guidance that the COR will use to evaluate the technical performance of the JV in accordance with the terms and conditions of the PWS and serves to provide guidelines to ensure that QA is maintained throughout all aspects of the project.

The JV utilizes an established Corporate Quality Control (QC) Program on all projects. The basic elements of the program include:

- The assignment of an experienced Program Manager and Project Manager (PM), who are responsible for all technical, financial and scheduling aspects of the project.
- The assignment of experienced staff to implement all project tasks.
- The implementation of an ITR process, which consists of periodic reviews of the work in progress and a detailed review of each deliverable.
- The designation of an experienced Senior Manager or Principal as the QC Specialist for the project, who has the appropriate level of authority to ensure that project deliverables are subject to major elements of the QC process.

As part of the ITR process, peer reviews will be conducted first by staff members who have expertise in the subject technical area, but have not significantly contributed to the project documentation or work products. A qualified peer reviewer, who will be identified by the PM and the Quality Control Officer (QCO), will be dedicated to each project task/deliverable. Comments from the peer reviewer will be addressed by the document author, and additional peer review of the revised document will be performed by the PM and QCO to ensure all required changes have been incorporated.

6.0 HEALTH AND SAFETY CONCERNS

An SSHP has been developed for the proposed removal action activities and is included as Appendix A. The SSHP has been prepared in accordance with OSHA, US Department of Labor and USACE requirements.

All personnel performing work at the Site have received initial OSHA HAZWOPER training (40 hour), as well as annual 8-hour refresher courses.

It is anticipated that all work will be completed using Level D personal protective equipment. Should health and safety monitoring during field activities indicate a threat to field personnel or warrant an upgrade to Level C protection, work will stop, site conditions will be re-evaluated, and the SSHP will be updated prior to further removal activities.

During field work, the JV and its subcontractors will be alert for conditions that warrant immediate or emergency action beyond that required throughout the course of routine Site activities. Types of conditions that may lead to such immediate or emergency action include, but are not limited to, threats of fire and/or explosion, direct contact with hazardous substances, or a continuing release of hazardous substances due to sources other than that described in this WP, such as abandoned drums, munitions or explosives of concern (MEC), or other improperly disposed wastes. Upon discovery of such conditions, the JV will immediately stop work and notify the USACE COR and CJAG Range Control. If MEC is encountered it will not be disturbed and best effort will be made to note its location before immediately leaving the Site.

7.0 DELIVERABLES

A RACR will be prepared following Site activities. The RACR will document all work performed and will include confirmation sampling results and quantities of material removed and replaced. Figures, analytical result tables, photographs, laboratory reports and other applicable documents will be included in the RACR.

A schedule outlining the order and timeframe of deliverables is included in the *Draft Project Management Plan* (the JV, October 2018). Preliminary draft, draft, and final versions of deliverables will be prepared, as discussed in the PWS. The preliminary draft will be submitted to the Army only, while the draft RACR will be submitted to the USACE and Ohio EPA for review and comments. The final RACR will be submitted to the USACE and Ohio EPA for their records.

8.0 REFERENCES

ECC (Environmental Chemical Corporation) 2015. *Draft Site Inspection Report, CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill, Revision 0, Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio*. March 2015.

Leidos 2016. *Letter Work Plan for Pre-Delineation Sampling of Lead-Contaminated Sediment in the Load Line 2 Functional Area of the Ravenna Army Ammunition Plant, Facility-wide Sewers Area of Concern*. May 2016.

Leidos 2017. *Final Engineering Evaluation/Cost Analysis for RVAAP-67 Facility-wide Sewers: Load Line 2 Functional Area and CC RVAAP-75 George Road Sewage Treatment Plant Mercury Spill at the Former Ravenna Army Ammunition Plant Portage and Trumbull Counties, Ohio*. March 2017.

Ohio EPA (Ohio Environmental Protection Agency) 2004. *Director's Final Findings and Orders for RVAAP*. June 2004.

SAIC (Science Applications International Corporation) 2011. *Historical Records Review Report for the 2010 Phase I RI Services at CR Sites (9 Areas of Concern) Revision 0, at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. December 2011.

SAIC 2012. *Draft Remedial Investigation/Feasibility Study Report for RVAAP-67 Facility-Wide Sewers at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. September 2012.

United States Army Corps of Engineers (USACE), Louisville District. 2018. *Performance Work Statement (PWS) Non Time-Critical Removal Action, Facility-Wide Sewers at the Former Ravenna Army Ammunition Plant Restoration Program, Camp Ravenna, Portage and Trumbull Counties, Ohio, Amendment 01*. August 2018.

FIGURES

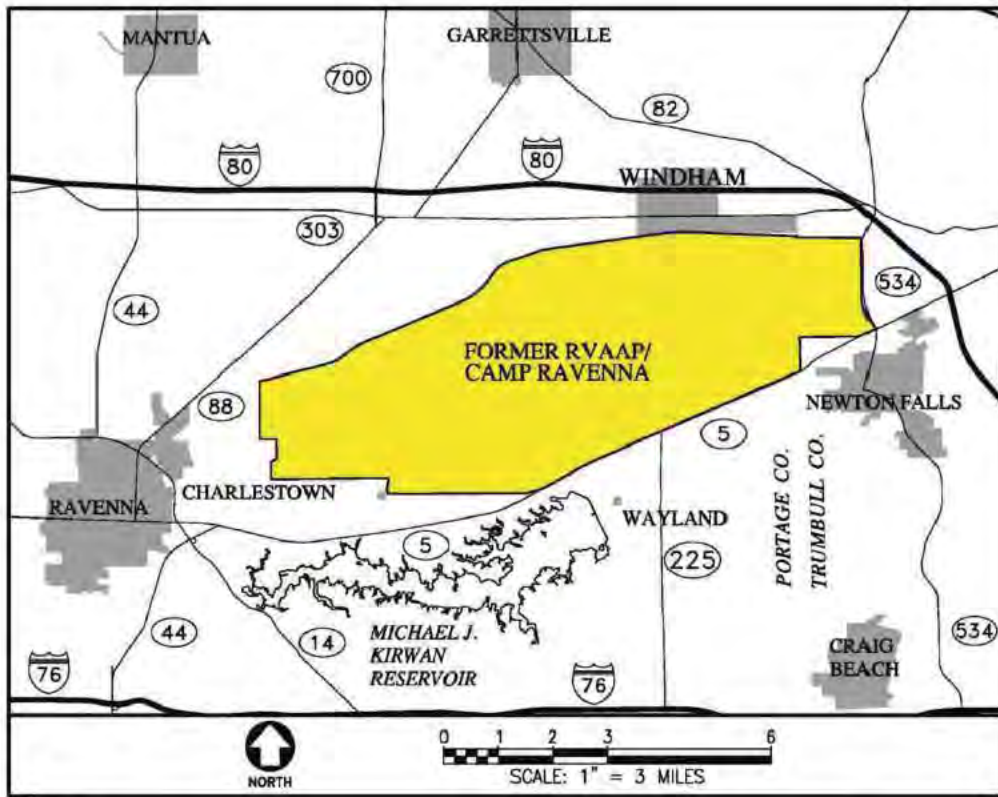
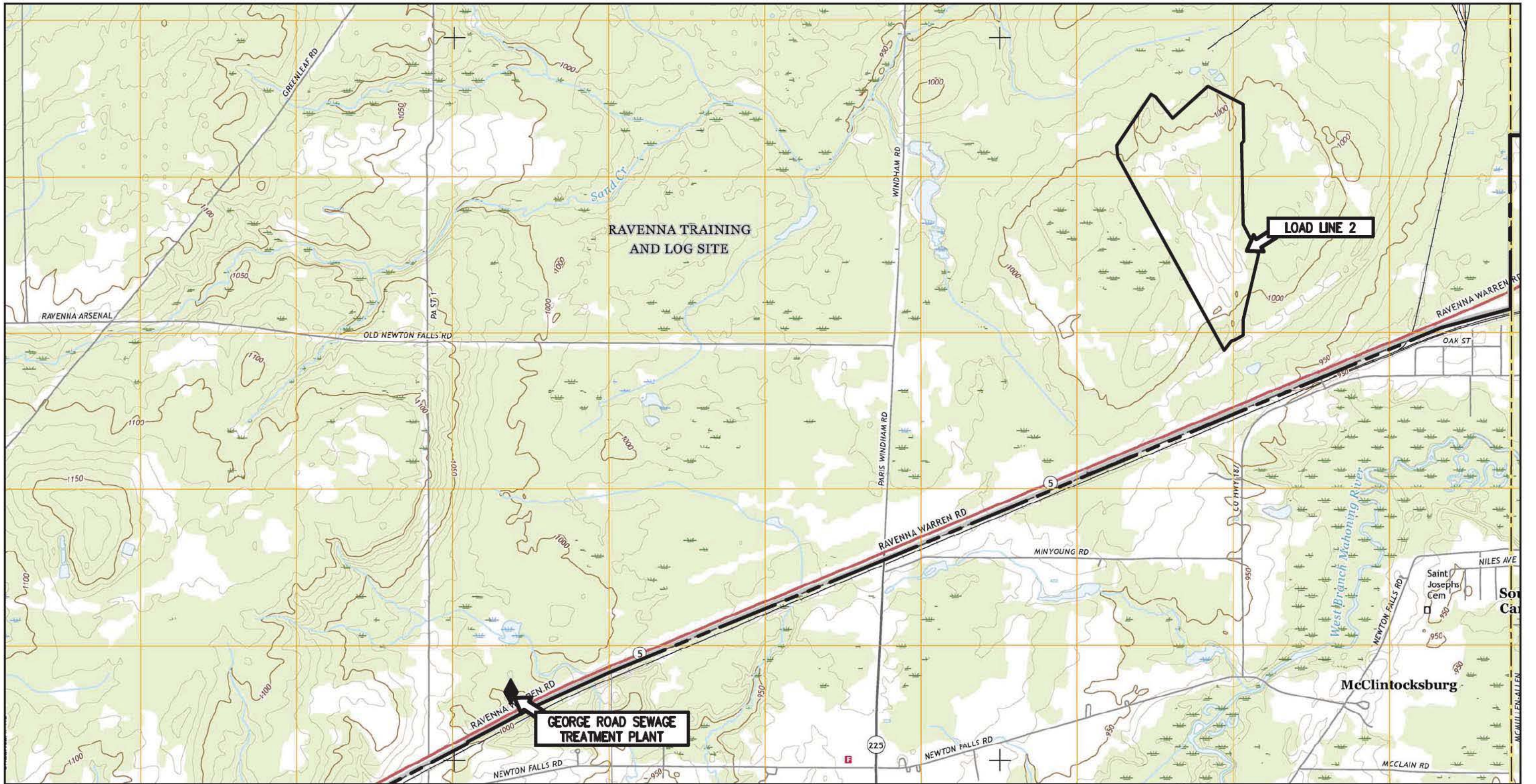


FIGURE 1
 SITE LOCATION MAP
 FORMER RVAAP/CAMP JAMES A. GARFIELD
 PORTAGE & TRUMBULL COUNTIES, OHIO

PARS ENVIRONMENTAL, INC.
 500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY: MN	JOB NUMBER: 895-28
CHECKED BY: CP	DATE: 1/22/19

NOTES:
 SOURCE OF DRAWING IS THE FINAL ENGINEERING
 EVALUATION / COST ANALYSIS FOR RVAAP-67 &
 CC-RVAAP-75 (LEIDOS, 2017)



LEGEND

= SITE BOUNDARY



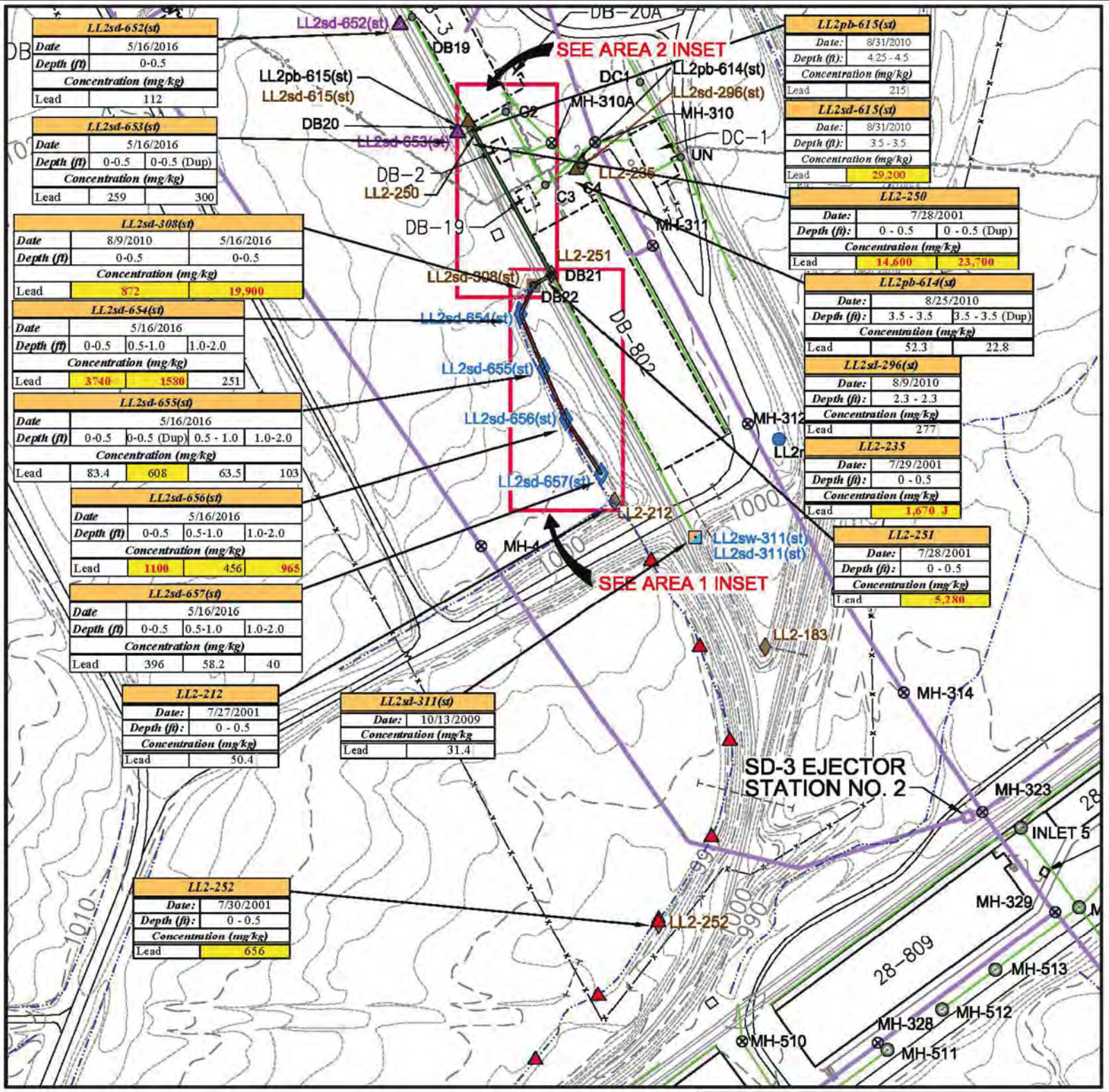
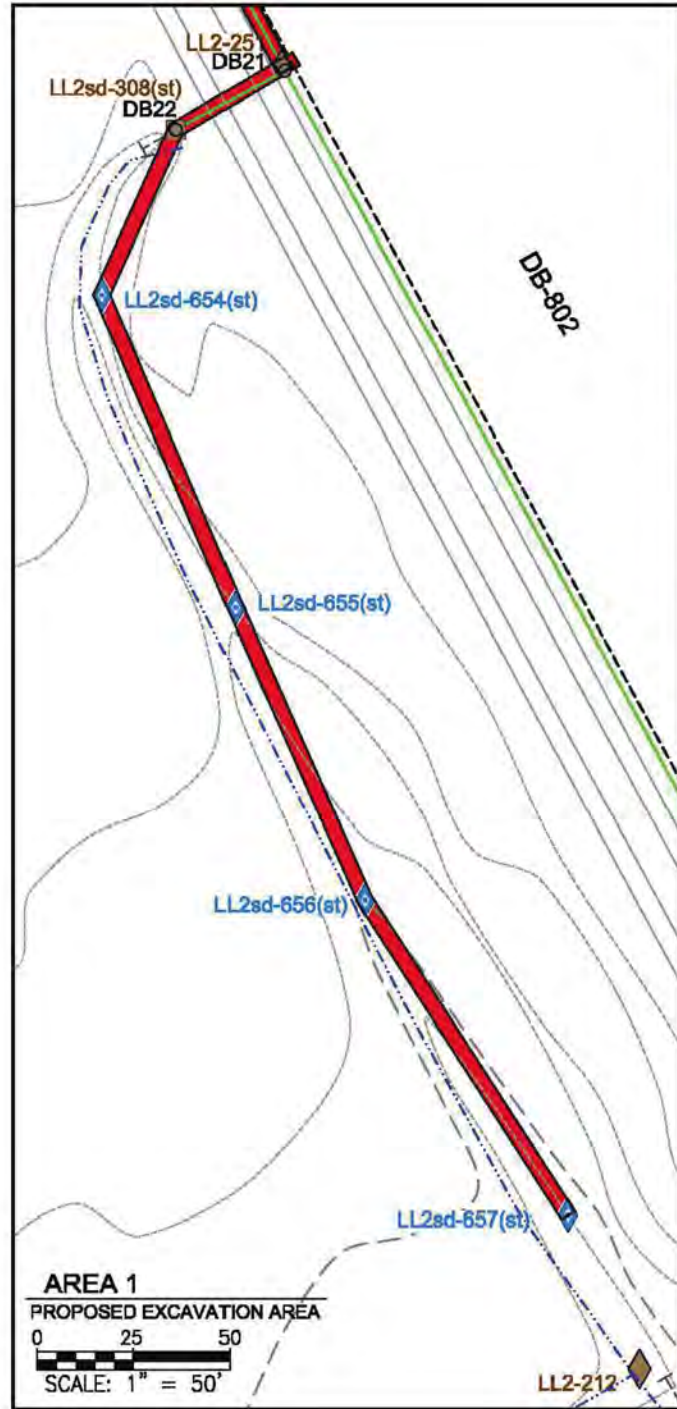
WINDHAM, OH
USGS Quadrangle 2016
Contour Interval: 10 Feet



FIGURE 2
SITE LOCATION MAP
FORMER RVAAP/CAMP JAMES A. GARFIELD
PORTAGE & TRUMBULL COUNTIES, OHIO

PARS ENVIRONMENTAL, INC.
500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY: MN	JOB NUMBER: 895-28
CHECKED BY: HB	DATE: 11/8/18



LEGEND:

	DEMOLISHED BUILDING		MH-220		2016 OUTFALL SEDIMENT SAMPLE
	ASPHALT ROAD		MANHOLE		2016 DITCH SEDIMENT SAMPLE
	GRAVEL ROAD		STORM LINE		PROPOSED SOIL BORING
	RAILROAD TRACKS		SANITARY LINE		PROPOSED EXCAVATION AREA
	FENCE LINE		STORM FLOW DIRECTION		RESULTS SEE NOTES
	GROUND CONTOUR (10-FT INTERVAL)		PIPE BEDDING SAMPLE		SOIL/SEDIMENT SAMPLE ID
	GROUND CONTOUR (2-FT INTERVAL)		SEWER SEDIMENT SAMPLE		RESULTS SEE NOTES
	SURFACE WATER DRAINAGE		OUTFALL SEDIMENT SAMPLE		RESULTS SEE NOTES
	GROUNDWATER MONITORING WELL		SEWER WATER/SEDIMENT SAMPLE		RESULTS SEE NOTES
	CATCH BASIN/DROP INLET		OUTFALL WATER/SEDIMENT SAMPLE		

NOTES:

- SEDIMENT RESULTS ARE HIGHLIGHTED IN YELLOW IF THEY EXCEED THE EPA RESIDENTIAL RSL OF 400 MG/KG.
- BOLD RED TEXT IF THEY EXCEED THE EPA INDUSTRIAL RSL OF 800 MG/KG.
- RESULTS ARE SHADED GRAY IF THEY WERE BELOW THE BACKGROUND CRITERIA OF 19.1 mg/kg.
- PROPOSED SOIL BORINGS WILL BE COLLECTED FROM 0-0.5, 0.5-1, 1-2 ft bgs.
- SOURCE OF DRAWING IS THE FINAL ENGINEERING EVALUATION / COST ANALYSIS FOR RVAAP-67 CC-RVAAP-75 (LEIDOS, 2017)

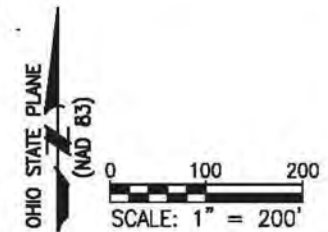
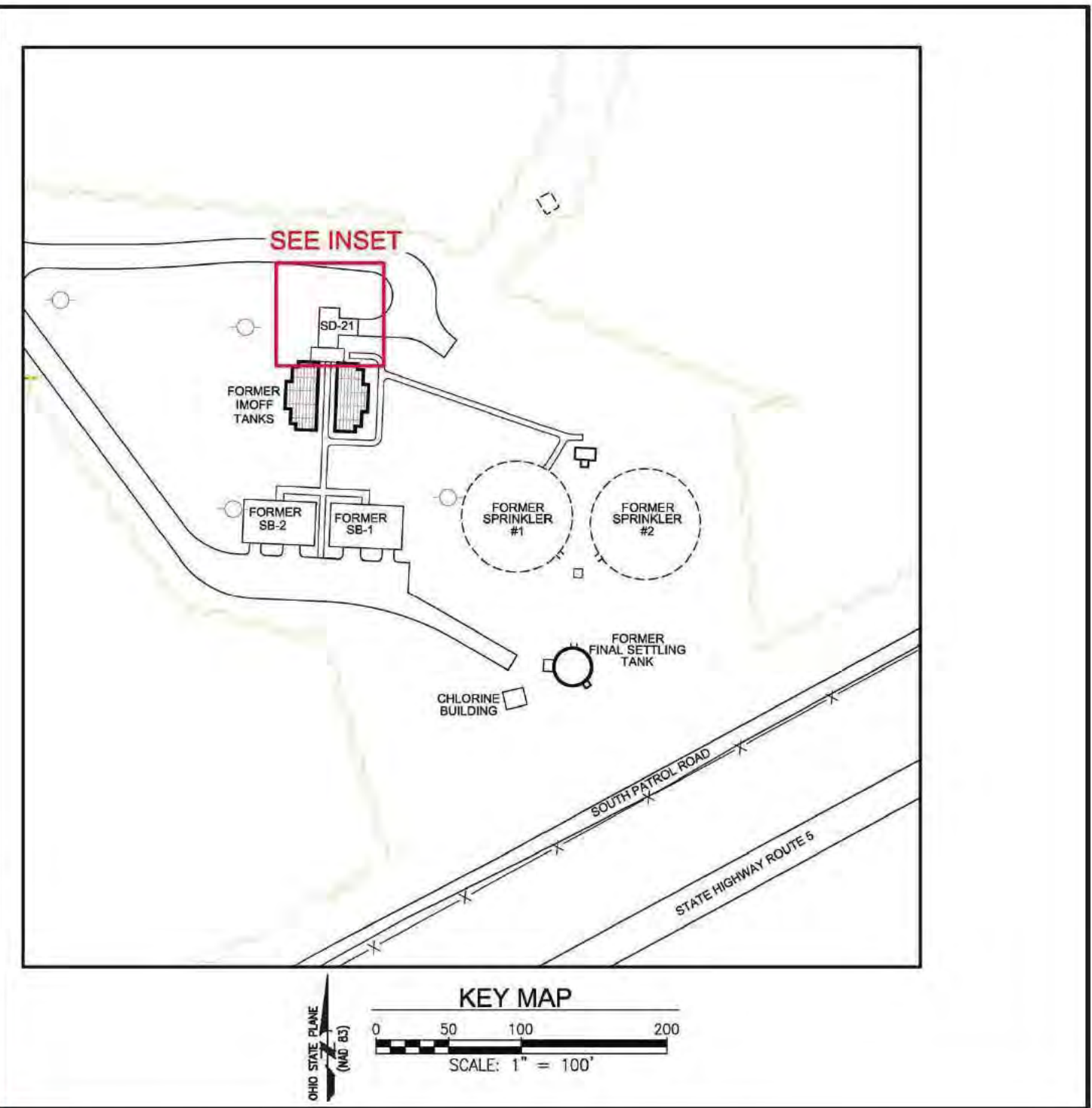
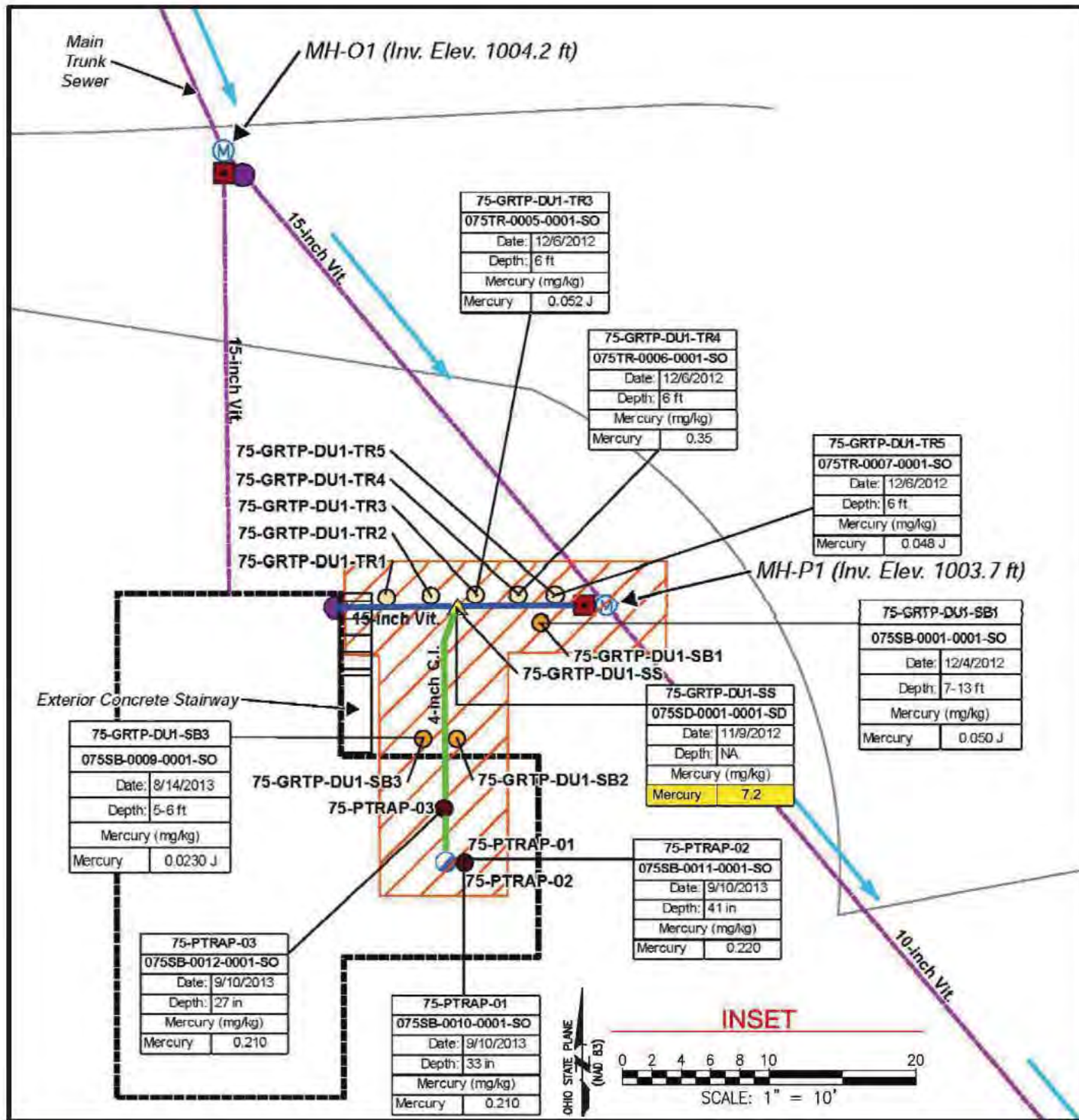


FIGURE 3
PROPOSED NTCRA ACTIVITY LOCATIONS
FORMER RVAAP/CAMP JAMES A. GARFIELD
PORTAGE & TRUMBULL COUNTIES, OHIO

PARS ENVIRONMENTAL, INC.
 500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY: MN	JOB NUMBER: 895-28
CHECKED BY: HB	DATE: 11/8/18



LEGEND:

- Direct-Push Boring Location
- Subsurface Soil Sample Location
- Trench Sample Location
- ▲ Drainage Pipe Deposit Sample Location (in 15-inch Vit. Clay Pipe)
- Decision Unit
- Ⓜ Manhole
- Ⓜ Floor Drain with P-Trap
- Brick and Mortar Plug
- Blocked During Site Operations
- Current Flow Direction
- Vitrified Clay Pipe
- Road
- Comminutor Building
- Concentration Exceeds FWCUG (HQ=0.1/Target Risk of 10%)
- 4-inch Cast Iron Pipe to be Removed
- 15-inch Vitrified Clay Pipe to be Removed

NOTE:

SOURCE OF INSET, IS FROM FIGURE 5-1, GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL, ECC, DEC. 2014.

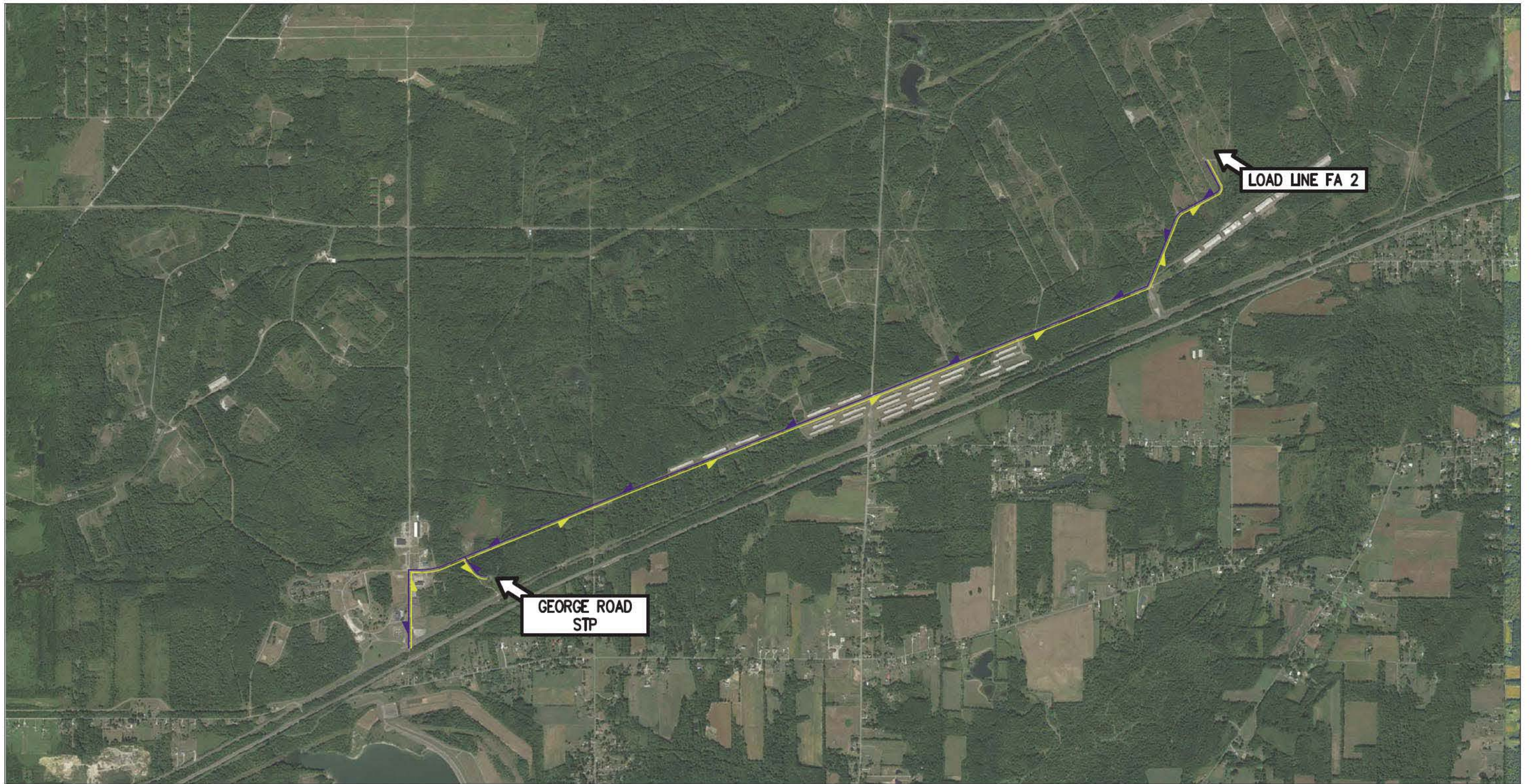
NOTE:

- SOURCE OF INSET, IS FROM FIGURE 5-1, GEORGE ROAD SEWAGE TREATMENT PLANT MERCURY SPILL, ECC, DEC. 2014.
- SOURCE OF DRAWING IS THE FINAL ENGINEERING EVALUATION / COST ANALYSIS FOR RVAAP-67 & CC-RVAAP-75 (LEIDOS, 2017)



FIGURE 4
PROPOSED NTRCA ACTIVITY LOCATIONS
FORMER RVAAP/CAMP JAMES A. GARFIELD
PORTAGE & TRUMBULL COUNTIES, OHIO

PARS ENVIRONMENTAL, INC.
500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY: MN JOB NUMBER: 895-28
CHECKED BY: HB DATE: 11/8/18



LEGEND

-  = TRANSPORTATION ENTERING SITE
-  = TRANSPORTATION EXITING SITE

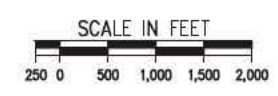


FIGURE 5
 TRANSPORTATION ROUTE
 FORMER RVAAP/CAMP JAMES A. GARFIELD
 PORTAGE & TRUMBULL COUNTIES, OHIO

 **PARS ENVIRONMENTAL, INC.**
 500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY:	MN	JOB NUMBER:	895-28
CHECKED BY:	CP	DATE:	3/21/19

APPENDIX A
Site Safety and Health Plan

FINAL

SITE SAFETY AND HEALTH PROGRAM

**NON TIME-CRITICAL REMOVAL ACTION FOR
CC RVAAP-67 FACILITY-WIDE SEWERS AND
CC RVAAP-75 GEORGE ROAD SEWAGE TREATMENT PLANT
RAVENNA ARMY AMMUNITION PLANT RESTORATION PROGRAM**

PORTAGE AND TRUMBULL COUNTIES, OHIO

Contract No. W912QR-12-D-0006
Delivery Order No. W912QR18F0460

Prepared for:



US Army Corps of Engineers, Louisville District
600 Dr. Martin Luther King Boulevard
Louisville, Kentucky

Prepared by:



500 Horizon Drive, Suite 540
Robbinsville, New Jersey 08691

Project No. 895-28

FEBRUARY 14, 2019

TABLE OF CONTENTS

1.0	SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION.....	1
1.1	SITE DESCRIPTION	1
1.2	CONTAMINANT CHARACTERIZATION	2
1.3	CHEMICAL HAZARDS.....	2
1.4	CHEMICALS BROUGHT ON-SITE.....	2
2.0	HAZARD/RISK ANALYSIS	3
2.1	GENERAL.....	3
2.2	PHYSICAL HAZARDS	3
2.2.1	<i>Cold Stress and Heat Stress.....</i>	<i>3</i>
2.2.2	<i>Contact with Energized Sources.....</i>	<i>5</i>
2.2.3	<i>Drum, Container, and Material Handling.....</i>	<i>6</i>
2.2.4	<i>Hand Tool and Power Tool Use.....</i>	<i>6</i>
2.2.5	<i>Illumination.....</i>	<i>7</i>
2.2.6	<i>Motor Vehicle Use and Construction Operating Equipment.....</i>	<i>7</i>
2.2.7	<i>Noise.....</i>	<i>8</i>
2.2.8	<i>Slip, Trip, and Fall Hazards.....</i>	<i>8</i>
2.2.9	<i>Weather-Related Hazards.....</i>	<i>8</i>
2.2.10	<i>Silica.....</i>	<i>9</i>
2.3	BIOLOGICAL HAZARDS	9
2.3.1	<i>Biting and Stinging Insects.....</i>	<i>9</i>
2.3.2	<i>Bird and Rat Droppings.....</i>	<i>11</i>
2.3.3	<i>Venomous Snakes.....</i>	<i>11</i>
2.3.4	<i>Poisonous Plants.....</i>	<i>13</i>
2.4	MUNITIONS AND EXPLOSIVES OF CONCERN	14
2.5	ASBESTOS PIPE WRAPPING	15
2.6	ACTIVITY-HAZARD ANALYSES.....	15
3.0	STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES	16
3.1	PROJECT MANAGER	16
3.2	PROJECT SAFETY AND HEALTH MANAGER.....	16
3.3	SITE MANAGER.....	16
3.4	SITE SAFETY AND HEALTH OFFICER.....	17
3.5	WORK CREW.....	17
3.6	STOP WORK AUTHORITY	18
4.0	GENERAL AND PROJECT-SPECIFIC TRAINING.....	19
4.1	INITIAL SITE-SPECIFIC HEALTH AND SAFETY TRAINING.....	19
4.2	ON-SITE HEALTH AND SAFETY BRIEFINGS.....	19
4.3	EMERGENCY RESPONSE TRAINING	19
4.3.1	<i>First Aid and Cardiopulmonary Resuscitation (CPR) Training.....</i>	<i>19</i>
4.3.2	<i>Spill Response Training.....</i>	<i>19</i>
4.3.3	<i>Fire Response Training.....</i>	<i>20</i>
4.4	HAZARD COMMUNICATION TRAINING.....	20
4.5	PPE TRAINING	20
4.6	ADDITIONAL TRAINING	20
4.7	OSHA 1910.120 HAZWOPER TRAINING	20

4.7.1	General Health and Safety Training.....	20
4.7.2	40-Hour Initial Training.....	21
4.7.3	Annual Eight-Hour Refresher Training.....	21
4.7.4	Supervisory Training.....	21
5.0	PERSONAL PROTECTIVE EQUIPMENT.....	22
5.1	GENERAL.....	22
5.2	LEVELS OF PROTECTION.....	22
5.2.1	Level D Protection.....	22
5.2.2	Modified Level D Protection.....	22
5.2.3	Level C Protection.....	22
6.0	MEDICAL SURVEILLANCE.....	24
7.0	EXPOSURE MONITORING / AIR SAMPLING PROGRAM.....	25
7.1	GENERAL.....	25
7.2	REAL-TIME MONITORING.....	25
7.3	CALIBRATION OF REAL-TIME MONITORING EQUIPMENT.....	25
7.4	ACTION LEVELS.....	25
8.0	HEAT AND COLD STRESS.....	27
8.1	HEAT STRESS MONITORING.....	27
8.2	COLD STRESS MONITORING.....	27
9.0	STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES.....	28
9.1	GENERAL SITE RULES.....	28
9.2	TRAFFIC SAFETY REQUIREMENTS.....	28
10.0	SITE CONTROL MEASURES.....	29
10.1	SITE ZONES.....	29
10.1.1	Support Zone.....	29
10.1.2	Contamination Reduction Zone.....	29
10.1.3	Exclusion Zone.....	29
10.2	COMMUNICATIONS.....	29
10.3	SITE ACCESS AND SECURITY.....	29
11.0	PERSONAL HYGIENE AND DECONTAMINATION.....	30
11.1	CONTAMINATION PREVENTION.....	30
11.2	PERSONNEL DECONTAMINATION.....	30
11.3	EQUIPMENT DECONTAMINATION.....	30
12.0	EMERGENCY EQUIPMENT AND FIRST AID.....	31
12.1	EMERGENCY EQUIPMENT.....	31
12.2	EMERGENCY MEDICAL TREATMENT AND FIRST AID.....	31
12.3	INSECT BITES/STINGS FIRST AID.....	31
12.4	CHEMICAL BURN FIRST AID.....	32
13.0	EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES.....	33
13.1	PRE-EMERGENCY PLANNING.....	33

13.2	RESPONSE PRIORITIES AND PROCEDURES	33
13.3	EVACUATION ROUTES AND PROCEDURES	33
13.4	EMERGENCY COMMUNICATIONS.....	33
13.5	SITE SECURITY AND CONTROL	33
13.6	DECONTAMINATION DURING A MEDICAL EMERGENCY	34
13.7	ADVERSE WEATHER CONDITIONS	34
13.8	EMERGENCY TELEPHONE NUMBERS	34
13.9	ROUTE TO HOSPITAL.....	34

FIGURES

APPENDIX A

Safety Data Sheets

APPENDIX B

Qualifications of Health & Safety Personnel and Training

APPENDIX C

SSHP Acknowledgement Form

APPENDIX D

Map – Emergency Transfer Points

APPENDIX E

Hospital Route

APPENDIX F

Activity Hazard Analyses

List of Acronyms

AOC	Area of Concern
ARNGD	Army National Guard Directorate
COR	Contracting Officer's Representative
DFFO	Director's Final Findings & Orders
DO	Delivery Order
DPW	Department of Public Works
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency
FA	Functional Area
FWCUG	Facility-wide Cleanup Goal
ITR	Independent Technical Review
JV	PARS-Gannett Fleming Joint Venture
MEC	Munitions and Explosives of Concern
mg/kg	Milligrams per Kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NTCRA	Non Time-Critical Removal Action
OHARNG	Ohio Army National Guard
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PM	Project Manager
POC	Point of Contact
PPE	Personal Protective Equipment
PWS	Performance Work Statement
QC	Quality Control
QCO	Quality Control Officer
RACR	Removal Action Completion Report
RVAAP	Ravenna Army Ammunition Plant
SI	Site Inspection
SSHP	Site Safety & Health Plan
STP	Sewage Treatment Plant
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
US	United States
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WP	Work Plan

SIGNATURE APPROVAL

By their signature, the undersigned certify this Accident Prevention Plan and attached Site Safety and Health Plan will be used for the protection of the health and safety of the PARS-Gannett Fleming Joint-Venture (JV), subcontractors, and visitors during the remedial action being performed under Contract No. W912QR-12-D-0006 at Camp James A. Garfield at the Former Ravenna Army Ammunition Plant in Portage and Trumbull Counties, Ohio.

Signature

Date

Ms. Lela Stratton
Staff Industrial Hygienist
Plan Preparer
PARS-Gannett Fleming Joint Venture
609-890-7277

Mr. Kevin McMahon, CIH
Project Health and Safety Manager
Plan Approver
PARS-Gannett Fleming Joint Venture
609-890-7277

Ms. Adrienne Watkins, M.S.
Corporate Health and Safety Manager
Concurrence
Plan Concurrence
PARS-Gannett Fleming Joint Venture
609-890-7277

Mr. Cody Postlethwait, PMP
Project Manager
Concurrence
Plan Concurrence
PARS-Gannett Fleming Joint Venture
609-890-7277

1.0 SITE DESCRIPTION AND CONTAMINANT CHARACTERIZATION

All field activities will be conducted in compliance with this Site Safety and Health Plan (SSHP). Changes and modifications to the SSHP will be made in writing with the knowledge and concurrence of the Project Safety and Health Manager (PSHM) and accepted by the USACE. A Site Location Map is provided in Figure 1 and a Site Plan is provided in Figure 2.

1.1 Site Description

Camp James A. Garfield is located in Northeastern Ohio within Portage and Trumbull counties, approximately 1.6 kilometers (km) (1 mile) northwest of the City of Newtown Falls and 4.8 km (3 miles) east-northeast of the City of Ravenna. The facility is a parcel of property approximately 17.7 km (11 miles) long and 5.6 km (3.5 miles) wide bounded by State Route 5, the Michael J. Kirwan Reservoir, and the CSX System Railroad on the south; Garret, McCormick, and Berry Roads on the west; The Norfolk Southern Railroad on the north; and State Route 534 on the east.

The installation was formerly known as the RVAAP which was utilized as a load, assemble and pack facility for munitions. Administrative control of the facility (21,683 acres) has been transferred to the U.S. Property and Fiscal Officer for Ohio and subsequently licensed to the Ohio Army National Guard (OHARNG) for use as a military training site. The RVAAP Restoration Program, managed by the Army National Guard Directorate (ARNGD) and the OHARNG, encompasses investigation and cleanup of past activities over the entire 21,683 acres of the former RVAAP. The RVAAP Restoration Program work at Camp James A. Garfield is conducted in accordance with the Ohio EPA Director's Final Findings and Orders (DFFO), for the RVAAP, dated June 10, 2004. The Facility-wide Sewers Area of Concern (AOC) is comprised of approximately 26 miles of storm and sanitary sewers located throughout the former RVAAP. The Facility-wide Sewers AOC includes sewer lines containing residual sediment and water, pipe bedding below the sewer lines, and the sewer line discharge points. The storm sewer systems at the former RVAAP collected runoff from drainage areas along roads, rail beds, and buildings and diverted it to ditches and drainage conveyances through outfalls. Historically, the storm and sanitary sewer systems may have received inadvertent discharges of contaminated wastewater related to manufacturing munitions or other industrial processes.

Field work will be performed at the following sites:

TASK	ACTIVITY	DESCRIPTION
Task 1	Mobilization and Demobilization	All activities associated with the arrival to, and departure from, the above-referenced Site.
Task 2	Soil Sampling	Soil sampling to further delineate impacts and collect waste classification data to be used to determine the appropriate waste management disposal options for the removal action.
Task 3	Soil Excavation	Includes sloping benching or any shoring necessary to safely excavate and remove soils.
Task 4	Post-Excavation Sampling	Confirmatory sampling will include the excavation floor and sidewalls.
Task 5	Backfilling and Site Restoration	Backfilling of entire excavation area to as close to the original grade as practicable.

1.2 CONTAMINANT CHARACTERIZATION

Based on results of previous sampling, the following are the principal contaminants which may be encountered during this project:

- Lead
- Mercury

1.3 CHEMICAL HAZARDS

Primary contaminants include lead and mercury. Other chemicals of concern that could potentially be present include explosive compounds, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), and metals.

Chemical Hazards			
CHEMICAL	EXPOSURE ROUTES	PEL/TLV*	HEALTH HAZARDS / PHYSICAL HAZARDS
Lead	Skin, eye, inhalation, ingestion	0.050 mg/m ³	Lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension Reacts with strong oxidizers, hydrogen peroxide, and acids
Mercury	Skin, eye, inhalation, ingestion, skin absorption	0.1 mg/m ³	Irritation eyes, skin; cough, dyspnea (breathing difficulty), bronchitis, pneumonitis, tremor, insomnia, irritability, indecision, headache, lassitude (weakness exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria Reacts with acetylene, ammonia, chlorine dioxide, azides, calcium, sodium carbide, lithium, rubidium, copper

*Listing shows the OSHA PEL or the ACGIH TLV indicating the lower value where they differ.

** Occupational exposure limits have not been established. NIOSH recommends that exposure be limited to the lowest feasible concentration.

1.4 CHEMICALS BROUGHT ON-SITE

No hazardous substances will be brought on Site apart from diesel fuel and incidental chemicals used for sample preservation. Copies of Safety Data Sheets (SDSs) are included in Appendix A. On-Site storage of diesel is not anticipated during this project. The Project Manager (PM) will ensure the Site files include a corresponding SDS.

Chemicals that may be used for General Use include:

- Oils and lubricants for operating equipment maintenance.
- Compressed gas for calibration of the Photoionization Detector (PID).
- Fire extinguisher, dry chemical powder, for small/incipient firefighting.
- Spray Paint or paint for marking pile and sampling locations.

2.0 HAZARD/RISK ANALYSIS

2.1 General

Chemicals noted in Chemical Hazards Table Section 1.3 may be present during the sampling activities associated with the Site. Chemical hazards are discussed in Section 1.0. The potential for encountering physical hazards will depend on work activities and location. Physical hazards are similar to any construction-type project, and are reviewed throughout this document.

Physical hazards are discussed in Section 2.2, and biological hazards are discussed in Section 2.3.

2.2 Physical Hazards

2.2.1 Cold Stress and Heat Stress

Camp James A. Garfield project activities are scheduled for year-round, so both heat stress and cold stress may be concerns.

Heat stress - is a significant potential hazard during the warmer months. Heat stress may manifest itself as: heat rash (prickly heat), transient heat fatigue, heat cramps, fainting (heat syncope), heat exhaustion, or heat stroke.

Heat rash (prickly heat) may occur in hot and humid or other environments where sweat is not easily removed from the surface of the skin by evaporation. It occurs in skin that is persistently wetted by unevaporated sweat. It appears as red papules (elevated skin lesions), usually in areas where the clothing is restrictive. Heat rash gives rise to a prickly sensation, particularly as sweating increases. The papules may become infected if left untreated.

Transient heat fatigue is a loss of concentration, difficulty focusing on a task, irritability, nausea, and loss of the desire to drink.

Fainting (heat syncope) may be a problem for employees not acclimatized to a hot environment who stand still in the heat.

Heat cramps are brought about by a prolonged exposure to heat. As an individual sweats, water and salts are lost by the body, eventually triggering painful muscle cramps. The signs and symptoms of heat cramps include:

- Severe muscle cramps, usually in the legs and abdomen;
- Exhaustion, often to the point of collapse; and
- Dizziness or periods of faintness.

Heat exhaustion usually occurs in a healthy individual who has been exposed to excessive heat while working or exercising. Blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion include:

- Rapid and shallow breathing;
- Weak pulse;
- Cold and clammy skin, with heavy perspiration;
- Skin appears pale;
- Fatigue, weakness, and/or dizziness, and
- Elevated body temperature.

Heat stroke occurs when an individual is exposed to excessive heat and their body systems become overwhelmed by heat and begin to stop functioning. The signs and symptoms of heat stroke include:

- Victim has stopped sweating;
- Dry, hot, red skin;
- Body temperature approaching or above 105°F;
- Dilated (large) pupils; and
- Loss of consciousness; victim may lapse into a coma.

Heat stroke is a *medical emergency*, requiring the immediate cooling of the individual and immediate medical attention. Heat stroke may cause brain damage and death if the individual is not cooled quickly by bathing in cool water and vigorous fanning. Immediately contact emergency medical services or transport individual to the hospital.

Local work conditions and the use of protective clothing may produce an environment that will require restricted work schedules in order to protect employees. The Site Manager (SM/SSHO) will be observing workers for any potential symptoms of heat stress. Adaptation of work schedules and training on recognition of heat stress conditions should help prevent heat-related illnesses from occurring. Heat stress prevention controls include:

- Allow workers to become acclimatized to the heat – three (3) to six (6) days.
- Provide cool-off break areas.
- Provide drinking water and electrolyte-replenishing fluids.
- To prevent heat rash, shower after work, dry off thoroughly, and put on clean, dry underwear and clothes.
- Establish a buddy system to watch for signs of heat stress and adequate fluid intake.

In situations where heat stress may impact employee safety and health, employee acclimatization and workloads shall be assessed and work/rest regimens shall be established. The JV shall adhere to EM385-1-1 Subsection 06.I.04.

Cold stress - is a danger at low temperatures and when the wind chill factor is high. Cold stress is generally described as a local cooling (frost nip, frostbite, and freezing) or a general cooling (hypothermia). Personnel working outdoors in temperatures at or below freezing may be subject to local cooling. Areas of the body that have a high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. The three categories of local cooling include:

- *Frost nip* - characterized by a blanching or whitening of the skin;
- *Frostbite* - the skin has a waxy or white appearance and is firm to the touch, but the tissue beneath is resilient; and
- *Freezing* - skin tissue is cold, pale, and solid.

Frozen tissue is a *medical emergency* and the individual must be transported to the hospital immediately.

Trench foot is caused by long, continuous exposure to a wet, cold environment, or actual immersion in water. Symptoms include a tingling and/or itching sensation, burning, pain, and swelling; sometimes blisters form in extreme cases.

General cooling (hypothermia) occurs when exposure to cold reduces body temperature. With prolonged exposure, the body becomes unable to maintain its proper internal temperature. Without treatment, hypothermia will lead to stupor, collapse, and death. The signs and symptoms of mild hypothermia include shivering, numbness, and drowsiness. The signs and symptoms of severe hypothermia include:

- Unconsciousness;
- Slowed respiration or respiratory arrest;
- Slowed pulse or cardiac arrest;
- Irrational or stuporous state; and
- Muscular rigidity.

First aid for severe hypothermia includes handling the individual very gently; rough handling may set off an irregular heartbeat. Do *not* attempt to re-warm the severely hypothermic individual; re-warming may cause the development of an irregular heartbeat. Severe hypothermia is a *medical emergency*; immediately contact emergency medical services or transport the individual to the hospital immediately.

Prevention of cold stress is a function of whole body protection. Adequate insulated clothing will be worn when the air temperature drops below 40°F. Reduced work periods may be necessary in extreme conditions to allow adequate rest periods in a warm area. Other cold stress prevention controls include:

- Change clothes when work clothes become wet with sweat.
- Avoid caffeine, which has diuretic and circulatory effects.
- Ensure workers drink warm, sweet drinks or soups to increase their caloric intake and reduce the possibility of cold weather dehydration.
- Monitor all workers for cold stress.
- Establish a buddy system to watch for signs of cold stress.

2.2.2 Contact with Energized Sources

During any Site activities that involve work with or around live overhead and/or underground utilities, a potential exists for personnel or equipment to come in contact with energized sources. Additionally, personnel could come in contact with energized parts of machinery or power tools. Contact with energized sources may result in fire, explosion, and/or electrocution. All work performed near electrical sources must be performed consistent with the OSHA and USACE electrical safety requirements. Site work involving electrical installation or energized equipment must be performed by a qualified person. Energized work may never be performed without prior authorization.

Ground fault circuit interrupters (GFCIs) are required on all 120-volt, single phase, 15- and 20-amp outlets in work areas that are not part of the permanent wiring of a building or structure. A GFCI is required when using an extension cord. All tools will have either a grounding plug or will be double insulated. Double insulated tools must be labeled.

Hard-duty (HD) or extra-hard-duty (EHD) extension cords will be used; flat-type extension cords are prohibited. Electrical wire or cords passing through work areas must be protected from water and damage. Worn, frayed, or damaged cords and cables will not be used. Walkways and workspaces will be kept clear of cords and cables to prevent a tripping hazard. Extension cords and cables may not be secured with staples, hung from nails, or suspended by bare wire. Bushings or fittings will protect cords or cables passing through holes in covers, outlet boxes, etc. All circuits will be protected against an overload.

2.2.3 Drum, Container, and Material Handling

Back injuries are among the leading occupational injuries reported by industrial workers. Using proper manual lifting techniques can reduce back injuries such as pulls and disc impairments. Leg muscles are stronger than back muscles, so workers should lift with their legs and not with their back. Manual lifting will be performed in accordance with the USACE EM 385-1-1 Section 14.A. Additional guidelines for safe lifting include:

- If the load is too heavy, then do not lift it alone. Lifting is always easier when performed with another person. Assistance should always be used when it is available.
- Use a pushcart or other material-handling device whenever possible.
- Pushing a load is easier on the back than pulling a load.
- Do not lift objects over your head.
- Pace yourself to avoid fatigue when doing heavy work for a long period of time. Rotate the task among workers to share the heavy work.

2.2.4 Hand Tool and Power Tool Use

All hand and power tools will be maintained in a safe condition and in good repair. Hand and power tools will be used in accordance with 29 CFR 1926 Subpart I-1926.300 through 1926.307 and Section 13 of USACE EM-385-1-1. Neither the JV nor its subcontractors will issue unsafe tools, nor are workers permitted to bring unsafe tools on-Site. All tools will be used, inspected, and maintained in accordance with the manufacturer's instructions. Throwing tools or dropping tools to lower levels is prohibited. Hand and power tools will be inspected, tested, and determined to be in safe operating condition prior to each use. Any tool that fails an inspection will be immediately removed from service and either discarded or tagged with a "Do Not Use" sign until repairs are made.

Workers using hand and power tools who are exposed to falling, flying, abrasive, or splashing hazards will be required to wear PPE; eye protection must always be worn when working on-Site. Additional eye and face protection, such as safety goggles or face shields, may also be required when working with specific hand and power tools. Workers using tools in areas where there is a head injury hazard will wear approved head protection. Hearing protection will always be worn when working with power tools. Workers using tools that may subject their hands to an injury, such as cuts, abrasions, punctures, or burns, will wear protective gloves. Loose or frayed clothing, dangling jewelry, or loose long hair will not be worn when working with power tools. Electric power-operated tools will be double insulated or grounded, and equipped with an on/off switch. Guards must be provided to protect the operator and other nearby workers from hazards such as in-going nip points, rotating parts, flying chips, and sparks. All reciprocating, rotating, and moving parts of tools will be guarded if contact is possible. Removing machine guards is prohibited.

Chain saw activities will be kept to a minimum. Workers will don proper PPE when using chain saw, including a screen mesh face shield, hearing protection, chain saw chaps or similar leg protective equipment, safety toe boots, and hearing protection. Workers will review the operators' manual and follow all required safety practices. Saws will be inspected daily, cutting above shoulder height is prohibited, and the saw will be allowed to cool before re-fueling.

2.2.5 Illumination

Guidelines provided in OSHA 1926.56 and in Section 07 of USACE EM 385-1-1 will be followed in determining minimum lighting requirements. No work at this site will be performed except during daylight hours.

2.2.6 Motor Vehicle Use and Construction Operating Equipment

The JV will operate all heavy equipment during this project. Only qualified personnel will operate motor vehicles. Each person operating a motor vehicle must possess a license/permit valid for operation of the vehicle. All motor vehicles will be operated in accordance with EM 385-1-1 Sections 16 and 18. Operators will follow these rules:

- Seat belts will be worn when operating motor vehicles.
- Unless otherwise posted, the on-Site speed limit is no more than 25 miles per hour (mph) for all vehicles.
- Whenever vehicles are parked, the parking brake will be set.
- Vehicles will not be operated in a careless or unsafe manner.
- Usage of cell phones is not permitted while operating a vehicle. Vehicles will be stopped/parked or work operations temporarily suspended if cell phone usage is necessary.

Required equipment features:

- All vehicles will have an audible backup alarm and an audible warning device (i.e., horn, audible back-up alarm). Commercial cargo vehicles (e.g., pick-up trucks, utility tool trucks, flat bed cargo trucks) with a normally clear rear view will not be required to have a back-up alarm. If the rear view will be temporarily obstructed by a load or permanently obstructed by a vehicle modification, then a back-up signal person / observer must be used or a back-up alarm must be installed. Removal or disabling of a back-up alarm is not permitted.
- Each vehicle and piece of equipment will have a portable fire extinguisher rated not less than 5-B:C.

Only qualified personnel will operate excavation equipment. Each person operating excavation equipment will be designated by their employer as qualified to operate that equipment. All operators will perform the required daily inspections of their equipment and maintain those inspections with the equipment.

Required equipment features:

- All operating equipment will have an audible backup alarm or appropriate warning device (i.e., horn, audible back-up alarm) which will sound when the vehicle moves in reverse. If the rear view (or other operating view) is obstructed by a load or permanently obstructed by a vehicle modification (e.g., off-road haul vehicle), then a back-up signal person / observer must be used, if the back-up alarm is non-operational. Removal or disabling of a back-up alarm is prohibited.

- Each vehicle and piece of equipment will have a portable fire extinguisher rated not less than 5-B:C.

All Site personnel entering and working within the work area will be required to wear high-visibility "traffic" vests when motor vehicles are in use.

2.2.7 Noise

Noise is a potential hazard associated with the operation of heavy equipment, drilling rigs, power tools, pumps, or generators. High noise operations will be evaluated by the SM/SSHO, noise monitoring may be performed, and the PSHM will determine the appropriate hearing protection for Site workers in accordance with OSHA regulations and USACE EM 385-1-1. Employees with an estimated noise exposure exceeding 85 decibels (dBA; A-scale, slow response) will be required to wear hearing protection. As a general practice, hearing protection (e.g., aural inserts, ear muffs) will always be worn when in close proximity to operations involving heavy equipment, drill rigs, power tools, or other machinery producing high noise levels.

2.2.8 Slip, Trip, and Fall Hazards

As with any field operation, uneven work surfaces and other slip, trip, or fall hazards may be present. These hazards may increase when walking/working surfaces become muddy or wet. Personal Protective Equipment (PPE) worn on-Site may reduce dexterity, narrow field of vision, and diminish communication and hearing capabilities, which may increase the possibility of slips, trips, and falls. Site personnel should remain aware of conditions that may present slipping or tripping hazards. As much as possible, Site workers will keep walking/working surfaces free from ice, snow, excessive water and mud, and avoid climbing on uneven terrain. High traction footwear should be used if the work area becomes slippery.

Proper housekeeping, containerization, regular removal of trash, and orderly stacking and removal of materials will also reduce these hazards, including:

- Site housekeeping will be performed on a daily basis, work areas will be inspected daily, and any housekeeping deficiencies will be noted in a daily report.
- Stairways and passageways will be kept free of obstructions.
- Do not allow tools, materials, extension cords, hoses, or debris to become tripping hazards.
- Any nails protruding from wood will be removed or hammered in.
- Do not allow combustible materials to accumulate on-Site. Immediately clean-up any spills, especially flammable and combustible liquid spills.
- Keep weeds and grass from becoming overgrown.
- Personnel should take extra precautions, such as establishing firm hand holds, wearing suitable footwear, and walking carefully during wet, snowy, or icy weather.

2.2.9 Weather-Related Hazards

Weather-related hazards include the potential for heat or cold stress, electrical storms, ice/snow storms, hurricanes, tornadoes, limited visibility, and various weather-related working conditions. Outside work will be suspended during storms producing lightning. In the event of adverse weather conditions, the PSHM and SM/SSHO will determine if work can continue on-Site without endangering the health and safety of Site personnel. When there are warnings or indications of impending severe weather, the SM/SSHO will monitor weather conditions using a weather station that is part of the National Oceanic and Atmospheric Administration (NOAA) weather radio or similar notification system. Refer to Section 13.7, "Adverse Weather Conditions," and Section 06.I of USACE EM 385-1-1.

Thunderstorm and lightening activity – the safest shelter location during a thunderstorm and lightening activity is a large, substantial, enclosed building. Once inside a safe building, stay away from the plumbing and electronic equipment. The second safest shelter location is in an enclosed vehicle with all the doors and windows closed. Do not touch any metal surfaces, and do not use any electronic devices, including cell phones. The identified area of retreat in the event of severe weather at the Site: A site work vehicle (rubber tire equipment).

Site personnel will seek shelter when dark threatening clouds are seen developing overhead, lightening is seen, or thunder is heard. As a guideline – count the seconds between seeing lightening and hearing thunder. If your count is less than 15 seconds, it is time to seek shelter. Stay within the shelter at least 30 minutes after the last lightening is seen. There is no safe place to be outside in a thunderstorm. If you cannot get to a safe shelter:

- Do **not** seek shelter under tall isolated trees.
- Do **not** seek shelter under partially enclosed buildings.
- Stay away from tall, isolated objects; lightening typically strikes the tallest object.
- Stay away from metal objects (e.g., fences, poles); metal is an excellent conductor.
- Stay at least 10 feet apart from other people.
- Keep your feet together and sit or crouch on the ground out in the open.

2.2.10 Silica

OSHA began enforcement of a new Respirable crystalline silica standard (29 CFR 1926.1153) for the construction industry in September 2017, which regulates exposure to materials which contain crystalline silica. According to *Table 1: Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica*, the use of heavy equipment and/or utility vehicles for tasks such as grading and excavating, but *not including* demolishing, abrading, or fracturing silica-containment materials, indicate the use of appropriate engineering and work practice control methods. The application of water and/or a dust suppressant is required to minimize dust emissions. Respiratory protection is not required for the currently anticipated work activities, however, should construction activities deviate beyond what has been anticipated, appropriate engineering controls and respiratory protection will be re-evaluated by the PSHM.

2.3 BIOLOGICAL HAZARDS

Section 06.D of USACE EM 385-1-1 provides information on protection from disease-carrying insects, and poisonous plants.

2.3.1 Biting and Stinging Insects

Site personnel may encounter a number of biting and stinging insects, such as the brown recluse spider, ticks, mosquitoes, bees, and wasps during Site activities. The SM/SSHO will inform Site workers about the potential insect hazards and preventative measures, such as the use of insect repellent. Site workers who have a history of allergic reactions to bee stings should inform the SM/SSHO. The SM/SSHO will provide first aid treatment in the event of an insect bite or sting. If there is an insect bite/sting emergency, the individual will be transported to the hospital for treatment.

Spider Bites – Brown Recluse spiders, Mediterranean Recluse spiders, Black Widow spiders and Northern Widow spiders may be encountered in Ohio. The Brown Recluse and the Black Widow's venom could be life threatening if left untreated. Black Widow and Brown Recluse are very timid and are not known to aggressively bite humans. The venom of Black Widow's is a neurotoxin, and it may interfere with the nerve impulses to muscle tissue. Soon after a bite an immediate strong

pain is felt and the affected limb starts sweating. Systemic symptoms may develop if the bite is not treated immediately, including nausea, vomiting, abdominal pain, fever, and in severe reaction cases paralysis may occur. Death is uncommon (less than 1% of the reported cases). If a spider bite occurs, personnel trained in first aid procedures will administer first aid refer to Table A-6, “Insect Bites/Stings First Aid”, and the injured person will be transported to the hospital for treatment. Without medical attention the symptoms can last five (5) days and a complete recovery may take weeks. **Table A-1** shows an example of this spider.

Lyme Disease – Deer tick bites may result in the transmission of Lyme Disease. A characteristic rash may develop a few days to a few weeks after the bite of an infected tick. The rash generally looks like an expanding red ring with a clear center, but it can vary from a blotchy appearance to red throughout the rash. However, it is important to note that some victims *never* exhibit a rash. Lyme Disease symptoms include flu-like symptoms such as a headache, stiff neck, fever, muscle aches, and/or general malaise. If Lyme Disease is not treated early with antibiotics, the early symptoms may disappear, but more serious problems may follow. Long-term effects of Lyme Disease may include arthritis of the large joints, meningitis, neurological complications (such as numbness or tingling of the extremities, loss of concentration and memory retention, Bell’s Palsy), withdrawal and lethargy, or cardiac symptoms. Site workers should use the following prevention tactics:

- Avoid walking through brush, woods, or grassy areas; try and avoid contact with plants if you must walk through these areas.
- Dress in light-colored clothing to make adhering ticks more visible. Wear long-sleeved shirts and tuck pants into socks.
- Use a tick repellent containing permethrin or dimethyl-m-toluamide (DEET). However, you should never use tick repellent containing more than 30% DEET, and all tick repellent should be sprayed on clothing (and allowed to dry) and not directly on your skin.
- Perform self-searches each day to check for ticks.

Rocky Mountain Spotted Fever – In 2017 there were 34 reported cases of Rocky Mountain spotted fever (RMSF) in Ohio. Although RMSF can be successfully treated with antibiotics, medical experts estimate that without treatment, 3-5% of those infected could die. In Ohio, the primary vectors of RMSF are the American dog tick and Brown dog tick, although Lone Star ticks may also transmit the pathogen (a rickettsia). Symptoms of RMSF are flu-like, accompanied by headaches and a very high fever (104-106 °F) two to twelve days after being bitten by a tick. The most characteristic symptom of RMSF is a rash that appears on about the second to fifth day on the wrists and ankles, later spreading to other parts of the body. In most cases, the tick must be attached for at least a day for infection to occur.

Site workers should use the following prevention tactics:

- Avoid walking through brush, woods, or grassy areas; try to avoid contact with plants if you must walk through these areas.
- Dress in light-colored clothing to make adhering ticks more visible. Wear long-sleeved shirts and tuck pants into socks.
- Use a tick repellent containing permethrin or dimethyl-m-toluamide (DEET). However, you should never use tick repellent containing more than 30% DEET, and all tick repellent should be sprayed on clothing (and allowed to dry) and not directly on your skin. If allergic to DEET, seek an alternative.
- Perform self-searches each day to check for ticks.

West Nile Virus (WNV) can be contracted by being bitten by an infected mosquito. It is not transferable from human to human, or by contact with an infected animal. Symptoms of WNV include: fever, headache, body aches, and occasionally a skin rash or swollen lymph glands. Contact the SM/SSHO if you develop these symptoms. In temperate zones, cases of WNV occur primarily in the late summer or early fall. The risk of being bitten by a mosquito is greatest at dawn and dusk. All Site personnel should take the following precautions:

- Wear protective clothing (e.g., long sleeves, long pants, and cover arms, neck, and hands).
- Use an insect repellent containing permethrin or DEET.
- Avoid walking through or working where mosquitoes habitat.
- Be aware that mosquitoes can breed in a small amount of standing water – such as rainwater in a discarded paper cup.

2.3.2 Bird and Rat Droppings

Histoplasmosis is an infectious disease caused by inhaling the spores of a fungus called *Histoplasma capsulatum*. Histoplasmosis is not contagious; it cannot be transmitted from an infected person or animal to someone else. Histoplasmosis primarily affects a person's lungs, and its symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects) or experience symptoms so mild they do not seek medical attention and may not even realize that their illness was histoplasmosis. If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days. Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or non-productive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. Chronic lung disease due to histoplasmosis resembles tuberculosis and can worsen over months or years. Special antifungal medications are needed to arrest the disease. All Site personnel should take the following precautions:

- Workers who will disturb collections of bird or bat droppings must be trained in the potential hazard and control measures.
- Avoid disturbing collections of bird or bat droppings in any way that causes airborne dust.
- If collections of bird or bat droppings will be disturbed, wet droppings with water and surfactant before disturbing and continuously during disturbance.
- Stop work and take additional corrective action if visible airborne dust is observed.
- Use particulate respirators and disposable coveralls for work that may involve potentially significant or uncontrolled exposure to collections of droppings.

2.3.3 Venomous Snakes

Three native Ohio snake species are venomous: the northern copperhead (*Agkistrodon contortrix mokasen*), the timber rattlesnake (*Crotalus horridus*), and the eastern massasauga (*Sistrurus catenatus*). Venom is a toxin for subduing prey. It is delivered through a pair of hollow fangs in the front, upper mouth that fold up when the mouth is closed and drop into place when the snake bites. The fangs are shed and replaced periodically. Venomous snakes strike, inject venom, then pull away. They find and eat the prey after it dies. Illinois' venomous snakes produce venom that affects the blood of the prey. Juvenile snakes have venom equal in potency to that of the adult, but they produce lesser amounts.

Venomous snakes tend to be restricted to specific habitats. Northern Copperheads range from Hamilton County all the way into eastern Ohio. They are usually found in rocky or wooded areas. They are active during the day in spring and summer, but come out at night during summer months. Timber rattlesnakes range from Adams County to the east. These snakes prefer heavy timber with

rock outcrops and bluffs. Eastern Massasaugas live in scattered locations within the counties of Preble, Montgomery, Greene and Fayette counties to the north and east. Their habitats are prairie wetlands and river floodplains.

While venomous snakes are not aggressive and tend to bite people only when stepped on, picked up, or cornered, their bite is a serious matter. Even freshly killed snakes can bite. These snakes should be avoided and precautions taken (wear leather boots, do not reach under rocks or logs, do not step over rocks or logs, look around before you sit) if you are entering an area possibly inhabited by venomous snakes. Although usually not deadly, the bite is painful and can cause swelling, nausea, and the risk of infection. If you are bitten, go to a hospital for treatment immediately. **Table A-2** shows an example of each snake.




TABLE A-1 Example of Ohio Venomous Spider	
	
Black Widow	Brown Recluse
	
Mediterranean Recluse	

TABLE A-2
Examples of Ohio Venomous Snakes



Copperhead









Timber Rattlesnake



Eastern Massasauga

2.3.4 Poisonous Plants

Poison ivy, oak, and sumac may be present on-site. Poison ivy can be found as vines on tree trunks or as upright bushes. Poison ivy consists of three leaflets with notched edges. The leaves of poison oak may be serrated, round, or oak-like, depending on what other foliage is around the poison oak plants. For both poison ivy and poison oak, two leaflets form a pair on opposite sides of a stalk, and the third leaflet stands by itself at the tip - forming a distinct “T” pattern. Poison ivy is red in the early spring and turns shiny green later in the spring. Poison sumac has leaves made up of 5 to 13 leaflets; while the exact number varies, it is always an odd number, and there is always one lone leaflet at the tip of the compound leaf, which gives it the shape of a feather. The berry of poison sumac starts out green in spring, and then matures to a whitish color. The poison sumac berry cluster is very distinct from the berry cluster of non-poisonous sumacs, which grow in red, fuzzy, seed tufts. **Table A-3** shows a picture of each poisonous plant.

TABLE A-3 Examples of Poisonous Plants		
		
Poison Ivy - Fall	Poison Ivy - Berries	Poison Ivy Leaf
		
Poison Sumac	Poison Sumac - Berries	Poison Oak

Contact with poison ivy, oak, or sumac may lead to a skin rash, characterized by reddened, itchy, blistering skin that needs first aid treatment. If you believe you have contacted one of these plants, *immediately* (within five minutes) wash your skin thoroughly with soap and water, taking care not to touch your face or other parts of your body before washing. The Food and Drug Administration (FDA) recommends using rubbing alcohol immediately to wipe the affected area; alcohol will get the oil off the skin, and then washing with soap and water. A serious case of poison ivy/oak/sumac rash should be examined by a physician.

2.4 MUNITIONS AND EXPLOSIVES OF CONCERN

Camp James A. Garfield, formerly known as the Ravenna Army Ammunition Plant or “Ravenna Arsenal” produced ammunition for the US military during World War II, the Korean War and the Vietnam War. As a result, some munitions and explosives of concern (MEC) has been discovered by contracted service personnel at the facility. Although unlikely, any individual who finds any item resembling artillery projectiles, fuses, casings or other ordnance on post must immediately consider it as MEC. Do not touch or move the suspected MEC and report the incident immediately to the CJAG Range Control by telephone at (614) 336-6041 and the JV Project Manager who will then inform the USACE POC. CJAG Range Control will take immediate action to secure the area and ensure proper disposal of the suspected MEC.

2.5 ASBESTOS PIPE WRAPPING

Although unlikely, former investigations have found black asbestos-wrapped piping on the facility. If black-wrapped piping is discovered during removal activities work will be immediately stopped and the USACE POC, OHARNG restoration representative and ARNG Project Manager will be notified of the discovery.

2.6 ACTIVITY-HAZARD ANALYSES

The JV certifies that a hazard assessment has been completed for the tasks currently scheduled for the O&M project. The project AHAs include Principal Steps, Potential Hazards, Recommended Controls (including PPE requirements), Equipment to be Used, Training Requirements, and Inspection Requirements. AHAs for the Site can be found in Appendix B.

3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

The following sections briefly describe the health and safety responsibilities of the personnel assigned to this project. All on-Site personnel will be responsible for complying with the requirements of this SSHP. The PM will be responsible for implementing the SSHP and ensuring that its requirements are enforced. Managers will be assisted in this effort by health and safety staff. Staff Qualifications of Health & Safety Personnel and Training are included in Appendix C.

3.1 PROJECT MANAGER

The PM will be responsible for the overall direction, implementation, and enforcement of health and safety requirements. Mr. Cody Postlethwait will serve as the PM for this project. Other PM responsibilities will include:

- Ensure the project is performed in a manner consistent with the Corporate Health and Safety Program.
- Provide the health and safety staff with project information for the development of an SSHP.
- Ensure that an SSHP is prepared and approved.
- Monitor compliance with the SSHP.
- Maintain communication with the Contracting Officer Representative (COR).
- Determine personnel assignments on this project.
- Stop Site activities if an imminently dangerous situation exists. Emergency situation will be reviewed immediately with the PSHM and SM/SSHO.

3.2 PROJECT SAFETY AND HEALTH MANAGER

Mr. Kevin McMahan, CIH, will serve as the PSHM for this project. The PSHM will have the following responsibilities:

- Interface with the Project SM/SSHO about project health and safety-related issues.
- Develop / approve the SSHP and any amendments.
- Evaluate exposure monitoring / air sampling data and updating SSHP requirements as necessary.
- Provide signature approval to the SSHP.
- Provide health and safety technical support.
- Approve new or revised health and safety protocols for Site activities.
- Visit the project as needed to audit the effectiveness of the SSHP.
- Serve as Quality Control staff member.
- Determine and implement personnel disciplinary actions for health and safety violations.

3.3 SITE MANAGER

Implementation of this SSHP during site activities will be directed by the SM. Mr. Allen Campione will serve as SM for this work and responsibilities will include:

- Ensure site activities are scheduled with adequate personnel and equipment resources to perform the project safely.
- Ensure adequate communication is available between field personnel and emergency response personnel.

- The SM will have the authority to stop Site activities if an “imminently dangerous” situation exists. The emergency situation will be immediately reviewed with the PM and PSHM.

3.4 SITE SAFETY AND HEALTH OFFICER

The SSHO will serve as an on-site advisor to the PM in matters regarding health and safety. The SSHO will be primarily responsible for the technical and administrative functions relative to health and safety during Site activities. Mr. Allen Campione will assume the responsibilities of the SSHO, which are:

- In conjunction with the Project PSHM, ensure Site activities are performed in a manner consistent with the SSHP, any Site-specific addendums, and the PARS Corporate Health and Safety Program.
- Interface with the PSHM about on-Site implementation of the SSHP and Site-specific addendums, and report to the PSHM about health and safety-related issues.
- In conjunction with the PSHM, ensure all PARS personnel and subcontractors designated to work on this project are qualified for their job assignment in accordance with OSHA 29 CFR 1910.120 training and medical surveillance requirements.
- Arrange the availability of on-Site emergency medical care and first aid, and make emergency telephone numbers available to all team members.
- Provide locations and routes to medical facilities, and arrange emergency transportation to medical facilities.
- Notify local public emergency officers (i.e., police, fire department, etc.) of the nature of the team’s operations.
- Conduct initial Site-specific safety training and regular on-Site health and safety briefings for Site personnel.
- Direct daily health and safety activities and maintain health and safety equipment on-Site.
- Inspect on-going activities and report any health and safety deficiencies to the SM or PM.
- Perform Site monitoring to assure Site personnel are adequately protected.
- Accompany or maintain communication with each work crew.
- Report incidents and near misses to the PM and PSHM.
- Stop Site activities if an imminently dangerous situation exists. The emergency situation will be reviewed immediately with the PM and PSHM.
- Temporarily suspend an individual from site activities for infractions of the SSHP, pending discussion with the PM and PSHM.

3.5 WORK CREW

The work crew will have the following responsibilities:

- Immediately report any unsafe or potentially hazardous conditions to the SM/SSHO.
- Report all incidents, accidents, and near misses, no matter how minor they may seem, immediately to the SM/SSHO.
- Maintain knowledge of the information, instructions, and emergency response procedures contained in this SSHP.
- Comply with the requirements and procedures set forth in this SSHP, and with any addendums.

All project personnel performing work on-Site will be provided with a copy of this SSHP for review. All Site workers must indicate agreement with the SSHP.

3.6 STOP WORK AUTHORITY

The PM and the SM/SSHO will have the authority to stop Site activities if an "imminently dangerous" situation exists. The emergency situation will be immediately reviewed with the other JV project team members. Personnel authorized by the COR will also have the authority to stop work immediately if the work is considered to be a serious threat to the health or safety of workers, other personnel, or to the environment. When work is stopped due to a hazard or threat to worker health or safety or the environment, the situation and resolution must be documented and submitted to the COR.

4.0 GENERAL AND PROJECT-SPECIFIC TRAINING

The following sections describe the mandatory training and certifications applicable to the project.

4.1 INITIAL SITE-SPECIFIC HEALTH AND SAFETY TRAINING

Personnel working on-site shall be trained as specified in OSHA Regulations 29 CFR 1910.120(e). This training will include an initial 40-hour basic health and safety training course and an 8-hour annual refresher. Managers and supervisors also receive 8-hours of site supervisor training.

Haulers and related subcontract personnel who do not have the above training are not permitted to exit their vehicles while on site.

The JV provides safety and health orientation training at the time of initial hire of each new employee as applicable to the job description. The orientation is provided by the PSHM. Prior to the commencement of site activities, all personnel assigned to the Site will attend initial Site-specific health and safety training. The PM will conduct the initial Site-specific health and safety training, which will address the activities, procedures, and equipment applicable to the Site's activities. This training will include the Site layout, potential hazards, monitoring protocols, safety procedures, and emergency response services, as outlined in this SSHP. This initial training session will allow Site personnel to clarify any issues they do not understand, and will reinforce individual responsibilities regarding health and safety during Site work. Site workers will sign the SSHP acknowledgement in Appendix D. Initial Site-specific health and safety training will also include training Site personnel on the use of Site PPE.

4.2 ON-SITE HEALTH AND SAFETY BRIEFINGS

Site personnel will attend on-Site health and safety briefings given by the SM/SSHO prior to each scheduled work activity. The briefings will include weather-related information and instructions for new operations and their potential hazards, associated risks, operating procedures, emergency response, and control methods to be employed. The SM/SSHO will be responsible for informing Site personnel of the anticipated route of evacuation during the on-Site health and safety briefing. The briefings may also provide an opportunity to identify safety-related performance deficiencies noted during daily activities or during a health and safety audit.

4.3 EMERGENCY RESPONSE TRAINING

4.3.1 First Aid and Cardiopulmonary Resuscitation (CPR) Training

The PSHM will identify Site personnel requiring first aid and CPR training to ensure that medical treatment is available during Site activities. A minimum of two persons trained in first-aid and CPR will be present on Site during work activities.

4.3.2 Spill Response Training

All spills will be immediately reported to CJAG Range Control, and assistance will be provided for appropriate clean-up response. JV Site personnel will be trained to respond to an incidental spill/release and a spill kit will remain onsite for use for the duration of the project. In the event of an emergency response spill/release, the JV personnel will evacuate the work area, notify CJAG Range Control and report the incident to the appropriate project personnel listed in Table A-8. See section 12.4 for chemical burn first aid measures. JV personnel will complete the CJAG Range Control Spill Form and return it to either CJAG Range Control or the Environmental Office within 24 hours of the release.

4.3.3 Fire Response Training

The JV Site personnel will be trained to respond to a small/incipient fire. A large fire or explosion which cannot be easily extinguished is beyond the capabilities of the JV personnel. In the event that a large fire or explosion occurs the JV will immediately contract CJAG Range Control for emergency assistance.

4.4 HAZARD COMMUNICATION TRAINING

The person responsible for the Site-Specific Hazard Communication Program is the PM.

Appendix A of this SSHP contains SDSs, which provide information on the characteristics of hazardous substances brought on-Site for general use by the JV and its subcontractors. Employee training will be initially provided to all employees and for all new employees. This training will cover the following areas:

- The basic requirements of the OSHA Hazard Communication Standard (29 Code of Federal Regulations (CFR) 1910.1200) and their right to information on chemical hazards.
- The PARS Corporate Health and Safety Program, which complies with the standard.
- Procedures employees need to follow in order to review a copy of the OSHA Hazard Communication Standard, the PARS Corporate Health and Safety Program, or SDSs.
- How to interpret and use the labels on containers of hazardous materials.
- The potential physical hazards and health effects of the hazardous substances and how to use SDSs for more information.
- How to handle the hazardous substances safely and other protective measures in place, including the specific PPE required when working with a hazardous substance.
- What to do in an emergency, spill, or overexposure to a hazardous substance.
- How the presence of hazardous chemicals can be detected in the work area.
- Review the contents of SDSs that are relevant to Site work.

4.5 PPE TRAINING

Initial Site-specific health and safety training will include training Site personnel on the use of site PPE. Site Specific PPE requirements are discussed in Section 5.0.

4.6 ADDITIONAL TRAINING

Additional training requirements for the Site include:

- The SSHP will be reviewed by all employees and subcontractors prior to Site mobilization.
- Task-specific training requirements are outlined in each AHA.
- OSHA 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER) training.

4.7 OSHA 1910.120 HAZWOPER Training

4.7.1 General Health and Safety Training

Site personnel who will be engaged in work activities that may expose them to hazardous substances or health hazards must comply with the training requirements outlined in OSHA Standard 29 CFR 1910.120(e), USACE Safety and Health Requirements Engineering Manual (EM) 385-1-1, and the PARS Corporate Health and Safety Program. The PM will verify and document that all Site personnel meet the applicable training requirements prior to the start of Site work. Documentation regarding training certification will be kept in the Site files. The Project PSHM will be responsible for ensuring the required documentation is available.

4.7.2 40-Hour Initial Training

Employees must have received, at the time of project assignment, a minimum of 40-hours of initial OSHA health and safety training for hazardous waste site operations. Personnel who have not met the requirements for initial training will not be allowed in the Exclusion Zone (EZ) or Contamination Reduction Zone (CRZ). A copy of each subcontractor's OSHA site worker 40-hour training certificate must be sent to the PM for review prior to the start of Site work.

In addition to the 40 hours of initial health and safety training, each new employee will receive three (3) days of directly supervised on-the-job training. This training will address the duties the employee is expected to perform.

4.7.3 Annual Eight-Hour Refresher Training

Eight-hour OSHA refresher training courses will be taken at a minimum of once per year. At the time of job assignment, all site workers must have received eight (8) hours of refresher training within the past year. This course is required of all field personnel to maintain their qualification for hazardous waste field work. A copy of each subcontractor site worker's most recent eight-hour OSHA refresher training certificate must be sent to the PM for review prior to the start of Site work.

4.7.4 Supervisory Training

In accordance with OSHA 29 CFR 1910.120(e)(3), on-Site management and supervisors directly responsible for Site workers, or who supervise employees engaged in hazardous waste operations, will have received 40 hours initial training, and at least eight (8) additional hours of specialized training on managing hazardous waste operations at the time of job assignment. A copy of each subcontractor supervisor's eight-hour OSHA supervisory training certificate must be sent to the PM for review prior to the start of Site work.

5.0 PERSONAL PROTECTIVE EQUIPMENT

5.1 GENERAL

Refer to **Table A-4**, PPE Requirements and Control Measures.

5.2 LEVELS OF PROTECTION

Levels of protection are based on United States Environmental Protection Agency (USEPA) Levels A, B, C, and D.

5.2.1 Level D Protection

Level D PPE provides minimal protection against chemical hazards, and will not be worn/permitted in any area with respiratory or skin hazards. A respirator is not required. Level D PPE includes:

- Cotton coveralls or long pants and a shirt with sleeves;
- Hard hat;
- Safety glasses;
- Steel-toe/steel-shank work boots;
- Work gloves;
- Hearing protection, as required when noise level is 85 dBA or higher; and
- High visible vest, as required.

5.2.2 Modified Level D Protection

Modified Level D PPE provides additional protection against chemical hazards, and will be worn/permitted in any area with skin hazards. A respirator is not required. Modified Level D includes Level D PPE in addition to:

- Hooded chemical-resistant clothing/coveralls;
- Gloves, outer, chemical-resistant;
- Gloves, inner, chemical-resistant; and
- Boot-covers, outer, chemical-resistant;

5.2.3 Level C Protection

Level C PPE provides additional protection against chemical hazards, and will be worn/permitted in any area with respiratory and skin hazards. Level C includes Modified Level D PPE plus a half-face respirator.

TABLE A-4 Site-Specific PPE Requirements and Control Measures

Activities	Action
1. Mobilization/Demobilization 2. Soil Sampling 3. Soil Excavation 4. Post-Excavation Soil Sampling 5. Backfilling and Site Restoration	<ul style="list-style-type: none">• Wear Level D PPE including high visibility traffic safety vests when working around moving equipment/ motor vehicles.• Use hearing protection when working near heavy equipment.• Use mesh face shield, chain saw chaps, if involved in chain saw operation.• Be aware of and keep hands and feet out of potential pinch points; wear heavy work gloves.• If insects are a problem, use insect repellent with $\leq 30\%$ DEET. Wear protective clothing (e.g., long sleeves, long pants; cover arms, neck, and hands).

6.0 MEDICAL SURVEILLANCE

All personnel who will be performing Site work where potential exposure to hazardous material exists must comply with medical surveillance requirements outlined in OSHA Standard 29 CFR 1910.120(f), USACE EM 385-1-1 requirements, and the PARS Corporate Health and Safety Program. The PM will verify that all Site personnel meet OSHA medical surveillance requirements prior to the start of Site work.

7.0 EXPOSURE MONITORING / AIR SAMPLING PROGRAM

7.1 GENERAL

This section describes the elements of the exposure monitoring program for the Site. Monitoring will be conducted as a part of the Site required activities. The primary objective of the monitoring program will be to identify and quantify potential volatile organic compound (VOC) levels, respirable dust levels and mercury vapor levels. The data obtained will be used to establish criteria for use of engineering controls and safe work practices. Based on site historical information, the following types of monitoring have been evaluated:

- Work area and/or employee breathing zone real-time monitoring for VOCs will be required.
- Work area and/ or real-time monitoring for respirable dust will be required.
- Work area and/ or real-time monitoring for mercury vapor will be required.

7.2 REAL-TIME MONITORING

VOC Levels – A Mini-Rae/Multi-Rae photoionization detector (PID or equivalent) will be used to monitor work areas. Real-time monitoring will be conducted during designated soil sampling activities. Refer to Table A-4, for Air Monitoring Action Levels.

Respirable Dust Levels – A DataRAM or equivalent will be used to monitor work areas. Real-time monitoring of respirable dust will be conducted during all excavation and removal activities. Refer to table A-5, for Air Monitoring Action Levels.

Mercury Vapor Levels – A Mercury Vapor Analyzer will be used to monitor work areas. Real-time monitoring of mercury vapors will be conducted during all excavation and removal activities. Refer to table A-5, for Air Monitoring Action.

7.3 CALIBRATION OF REAL-TIME MONITORING EQUIPMENT

Monitoring and calibration protocols will be performed in accordance with the manufacturer's guidelines. Calibration will be performed, at a minimum, prior to each day's use. A copy of each instrument's operating manual will be kept in the Support Zone (SZ). Colorimetric tubes will be used to test for benzene in a worker's breathing zone if real-time monitoring indicates elevated levels of VOCs. If there is any indication of benzene present in the worker's breathing zone, work activity will be suspended.

7.4 ACTION LEVELS

Table A-4 lists the action levels and action requirements for the PID. Implementing the "Action Required" is based on readings in the worker's breathing zone lasting for at least 15 seconds (i.e., a non-transient reading), or at the discretion of the SM/SSHO. **Table A-5** lists the action levels and action requirements for respirable dust and mercury vapor.

TABLE A-4 Photoionization Detector Action Levels	
Meter Response	Action Required
Soil sample location: PID response: < 10 ppm (duration < 15 seconds)	<ul style="list-style-type: none"> Continue normal operations and monitor sample location, six inches above soil surface, continuously (until PID < 1 ppm)
≥ 10 ppm (duration ≥ 15 seconds)	<ul style="list-style-type: none"> Monitor Worker breathing zone
Worker breathing zone: < 1 ppm (duration ≥ 15 seconds)	<ul style="list-style-type: none"> Continue normal operations; and monitor soil sample location (noted above) continuously (until PID < 1 ppm)
≥ 1 ppm (duration ≥ 15 seconds)	<ul style="list-style-type: none"> Evacuate work area temporarily (approximately 10 minutes; upon return immediately check breathing zone with PID; if reading is still ≥ 1 ppm, leave area and contact PM, PSHM.

TABLE A-5 Respirable Dust and Mercury Vapor Action Levels		
Action Level	Required PPE	Action Required
Respirable Dust <5 mg/m ³	Level D	<ul style="list-style-type: none"> Continue working, keep soil moist
≥5 - ≤15 mg/m ³	Level C	<ul style="list-style-type: none"> Apply water, conduct air sampling for lead if dust levels remain above 5 mg/m³ for 15 continuous minutes
>15 mg/m ³	Stop Work	<ul style="list-style-type: none"> Stop work contact Project CIH
Action Level	Required PPE	Action Required
Mercury Vapor <50 µg/m ³	Modified Level D	<ul style="list-style-type: none"> Continue working
≥50 - ≤500 µg/m ³	Level C with mercury vapor cartridges	<ul style="list-style-type: none"> Continue monitoring for mercury vapor
>500 µg/m ³	Stop Work	<ul style="list-style-type: none"> Stop work contact Project CIH

8.0 HEAT AND COLD STRESS

Project activities for the Site could occur year-round, and so both heat stress and cold stress may be concerns.

8.1 HEAT STRESS MONITORING

Wearing PPE increases the potential for workers to developing heat stress. Heat stress can produce effects ranging from transient heat fatigue and heat cramps, to serious heat stroke illness and death. Heat stress is caused by a number of interacting factors including environmental conditions, clothing, workload, and the individuals' physical characteristics and conditioning. Whenever the air temperature exceeds 70°F, the SM/SSHO, in consultation with the PSHM, will assess the conditions that may cause heat stress in Site workers. Work-rest schedules for activities conducted in permeable clothing will be based on published American Conference of Government Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) and Biological Exposure Indices (latest edition).

Physiological monitoring for heat stress includes body temperature monitoring and heart rate monitoring. Work/rest regimen and fluid replacement schedules will be established based on the PSHM's assessment of the condition of Site employees, weather conditions, work tasks, and any other pertinent environmental factors and conditions to determine when to begin monitoring.

8.2 COLD STRESS MONITORING

Whenever the air temperature falls between 45°F to 30°F, the temperature and wind speed will be measured and recorded at least every four hours to assess conditions that may cause cold stress in Site workers. At air temperatures below 30°F, the temperature and wind speed should be measured and recorded more frequently.

9.0 STANDARD OPERATING SAFETY PROCEDURES, ENGINEERING CONTROLS AND WORK PRACTICES

9.1 GENERAL SITE RULES

1. Site personnel will wear approved head protection, eye/face protection, and foot protection at all times.
2. The buddy system will be observed. Due to the nature of this work, one individual will be collecting data on Site. The Site worker will have immediate access to a cellular phone and will follow a direct contact procedure with an off-site buddy. Prior to starting work, the on-Site person will make contact with the off-Site person and establish a routine for check-in. Contact calls will be made between these persons during on Site activities. Should the on Site person miss a contact, the off-Site person will attempt to call them. If a connection cannot be made promptly, the off-Site person will alert the on the Camp James A. Garfield Point of Contact (POC) to report a loss of contact. Communication efforts will continue until the on-Site person is contacted.
3. Personnel entering a work area must wear the required PPE and exit through the personnel decontamination station.
4. No eating, drinking, smoking, or any other activity involving hand-to-mouth contact will be allowed in any work area.
5. Facial hair that interferes with a respirator-to-face seal will not be permitted while working in the EZ or CRZ if respiratory protection is required.
6. All Site personnel who wear corrective lenses will provide their own prescription safety glasses and respirator optical inserts.
7. Horseplay will not be tolerated.
8. Matches, lighters, and any other flammable/combustible, or spark-producing materials are not permitted in any work area.
9. Proper Site housekeeping, including removal of trash and orderly stacking and removal of materials will reduce slip and, trip hazards, and eliminate fire hazards. Housekeeping is the responsibility of all Site personnel.
10. The JV and its subcontractors shall have eye flush on-hand during all field activities.
11. Fieldwork will be conducted during daylight hours (no earlier than 15 min after sunrise and no later than 15 min before sunset).

9.2 TRAFFIC SAFETY REQUIREMENTS

1. Personnel working on-Site will obey all posted speed limits. The maximum speed limit is 25 mph for any roads that are not posted.
2. Seatbelts are required for drivers and passengers. The driver will assume responsibility for all passengers wearing seatbelts. No passengers in truck beds.
3. Proof of insurance will be required for personal vehicles.
4. Driving under the influence of alcohol or drugs is prohibited and a violation of the law.
5. Yield to pedestrians; people may walk in the street to avoid uneven sidewalks, and children may ride bicycles in the street.
6. Traffic accidents will be reported immediately to the SSHO.
7. Cell phone usage will not be permitted moving vehicles/equipment. Vehicles must be stopped/parked or equipment operation suspended for cell phone use.

10.0 SITE CONTROL MEASURES

10.1 SITE ZONES

The Site will use the work zone system to control the potential spread of contamination. The EZ and CRZ will be established prior to the start of work. All work activities will be conducted following the established buddy system.

10.1.1 Support Zone

The SZ, which is the non-contaminated areas of the Site, will be separate from the EZ via the CRZ. The SZ will be the on-Site person's work vehicle and/or specific areas outside locations marked with barrier tape. Site operations will be controlled from this location. Meteorological conditions should be observed and noted from this zone, including those factors pertinent to heat and cold stress.

10.1.2 Contamination Reduction Zone

A CRZ will be established adjacent to the various EZ(s). The CRZ provides for equipment decontamination. The CRZ will be used for EZ entry and exit, and for donning/removing any PPE. The CRZ may also contain any safety and emergency equipment, including a fire extinguisher and first aid kit. It will also include decontamination materials and tools.

10.1.3 Exclusion Zone

The EZ will be the boring/sampling locations at the Site. The work area will be clearly identified using caution flagging tape, traffic cones, or other visible barriers. The size of the EZ will depend on the task.

10.2 COMMUNICATIONS

Successful communication between Site personnel in the EZ/CRZ and the SZ and between Site personnel and local emergency response agencies is essential. A telephone will be available on-Site for emergency use. Work will not be conducted on-Site without access to a telephone, and Site personnel will be informed of the nearest available telephone. Emergency numbers will be maintained in the work vehicle. Cell phones will be used to communicate between on Site and off Site persons and for emergency alerting purposes.

10.3 SITE ACCESS AND SECURITY

The Site is a military installation and all the JV and subcontractor employees will have to meet the entry requirements. Personnel not meeting these requirements will not be permitted to work on-Site. All personnel will be pre-screened using the E-Verify Program before being permitted to work at the site. Access to the Site by both staff and sub-contractors must be coordinated through Vista/Chenega at least 48 hours prior to access. Work at the Site will be conducted Monday through Friday between the hours of 0730 and 1630. Pre-approval from the COR will be required for any work scheduled outside of normal operating hours. Work will not be permitted during federally observed holidays.

11.0 PERSONAL HYGIENE AND DECONTAMINATION

11.1 CONTAMINATION PREVENTION

One of the most important aspects of decontamination is the prevention of contamination. Good contamination control will minimize worker exposure and help ensure valid sample results precluding cross-contamination. Procedures for contamination prevention for personnel include:

- Do not walk through areas of obvious or known contamination.
- Do not handle or touch contaminated materials, if possible.
- Inspect all PPE to ensure it is free from cuts and tears prior to donning.
- Fasten all closures on suits, covering with tape if necessary.
- Particular care should be taken to protect any skin injuries. If open wounds exist on hands or forearms, handling contaminated materials or samples should not be attempted.
- Stay upwind of airborne contaminants.
- Do not carry cigarettes, gum, chewing tobacco, cosmetics, etc. into potentially contaminated areas.
- If contaminated tools are to be placed on non-contaminated equipment for transport, use plastic to keep non-contaminated surfaces clean.
- Keep waste material in closed containers.

11.2 PERSONNEL DECONTAMINATION

All Site personnel exiting the EZ will perform personal and dry equipment decontamination. To reduce the volume of decontamination water generated, protective clothing will be discarded.

11.3 EQUIPMENT DECONTAMINATION

All trucks exiting the EZ will receive dry decontamination. Workers will brush down the trucks prior to exiting the site and loads will be covered.

12.0 EMERGENCY EQUIPMENT AND FIRST AID

12.1 EMERGENCY EQUIPMENT

Health and safety equipment, PPE, and emergency equipment will be maintained on-Site for Site activities and emergency response. Emergency equipment will be readily accessible. The following health and safety equipment, PPE, and emergency equipment will be available on-Site:

- Industrial first-aid kit (meets the requirements of ANSI Z308.1);
- Blood borne Pathogens (BBP) kit (latex gloves, mask, face shield, CPR mouth shield, apron, "red" waste disposal bag, and disinfectant wipes)
- Emergency eye wash
- Fire extinguishers
- Safety goggles, safety glasses
- Heavy work gloves
- Tyvek® coveralls
- Cellular telephone(s)
- Wet wipes
- Weather information derived from the NOAA weather radio or similar notification system
- Photoionization detector and calibration supplies
- Water and electrolyte replenishment powder/fluid
- Insect repellent ($\leq 30\%$ DEET)
- Full-face respirator

12.2 EMERGENCY MEDICAL TREATMENT AND FIRST AID

All emergency medical treatment, other than first aid, will be coordinated by local emergency response personnel. The SSHO will provide immediate first aid. The SSHO will keep a record of all first aid treatment. Table A-6 lists Site emergency telephone numbers and hospital directions; these tables will be maintained in the Site work vehicle. First aid will be self-administered by the on-Site person. First aid supplies will be kept in the Site work vehicle.

The on-Site personnel will notify the PM and PSHM, who will notify the COR. The SM/SSHO will complete an incident report. Prior to returning to work after a disabling injury/illness or loss of consciousness, the employee must present a medical release from the attending physician to the PSHM.

12.3 INSECT BITES/STINGS FIRST AID

If a site worker is bitten/stung by an insect; follow the actions outlined in Table A-6.

TABLE A-6	
First Aid Guidelines for an Insect Bite / Sting	
Step	Action
1.	Remove the stinger. Scrape the stinger away from the skin with a fingernail, or use tweezers. If tweezers are used, be sure to grasp the stinger and not the venom sac.
2.	Wash the bite/sting area with soap and water.
3.	Cover the bite/sting area to keep it clean.
4.	Apply an ice pack to the bite/sting area to reduce any pain and swelling.
5.	Watch the victim for signals of an allergic reaction.

Emergency response personnel should be contacted in the event of an insect bite/sting:

- If the individual does not know what bit/stung them;
- If the individual has a history of allergic reactions to insect bites/stings;
- If the individual is bitten/stung on the face or neck; or
- If the individual begins to have difficulty breathing.

If a Site worker finds a tick attached to their skin the SM/SSHO will take action outlined in **Table A-7:**

TABLE A-7	
First Aid Guidelines for Tick Removal	
Step	Action
1.	To minimize the chance you contract a tick-borne illness, remove the tick as soon as possible. Use blunt tweezers, grasp the tick firmly and close to the skin, and then pull up. Avoid squeezing the tick's body.
2.	Wash the bite area with soap and water.
3.	Cover the bite/sting area to keep it clean.
4.	Instruct individual to report to SSHO if they experience redness or swelling at the site of the tick bite, or if the individual experiences symptoms of Lyme Disease.

12.4 CHEMICAL BURN FIRST AID

In the event of an acid/base spill coming in contact with the skin of on-Site personnel, the following actions will be implemented:

1. Flush burn area with water.
2. Cover the burn area to keep it clean.
3. Apply an ice pack to the burn area to reduce any pain.
4. Watch the victim for signals of distress.

Emergency response personnel should be contacted in the event of a chemical burn to a significant portion of the body and/or to the face/head of the victim.

13.0 EMERGENCY RESPONSE AND CONTINGENCY PROCEDURES

13.1 PRE-EMERGENCY PLANNING

Pre-emergency planning for the Site includes the following tasks:

- Development and approval of this Emergency Response Procedures (ERP) section;
- Coordination of the ERP with local emergency response personnel, including (but not limited to):
 - Identify and stage on-Site emergency equipment, including fire extinguisher and first aid kit, as necessary.
- Identify operations requiring the use of a hazardous substance;
- Training of the on-Site personnel in emergency procedures prior to the start of Site work. Pre-emergency training will include:
 - Evacuation route and assembly points
 - Potential emergency events

Maintaining emergency response equipment on-Site (refer to Section 12.1).

13.2 RESPONSE PRIORITIES AND PROCEDURES

The following outline provides guidance in prioritizing emergency response action and provides general response procedures to be followed. It is expected that the JV personnel would only provide minimal or first line response to all emergencies:

First Priority: Prevent further injury or illness by:

- Notifying emergency response personnel;
- Isolating the scene to authorized personnel only; and
- Protecting emergency response personnel.

Second Priority: Provide first aid to those persons with life-threatening injuries or illnesses.

Third Priority: Alleviate the immediate hazards by:

- Extinguishing incipient stage fire; and
- Containing any minor spill.

13.3 EVACUATION ROUTES AND PROCEDURES

In a severe emergency, such as a large fire or explosion, Site evacuation may become necessary. The evacuation route and assembly area will correlate to the wind direction, topography, and the nature of the incident. If moving upwind is not possible without encountering the incident, personnel should move cross wind or downwind to a distance necessary to be out of the path of vapor releases, smoke, odors, or spills.

13.4 EMERGENCY COMMUNICATIONS

Communications during site emergencies will include the following methods:

- On-Site communications with Site personnel using cellular telephones;
- Off-Site communications using the telephone; **Table A-8** provides a list of Site emergency telephone numbers and hospital directions.

13.5 SITE SECURITY AND CONTROL

Site security will be the responsibility of the SM/SSHO. The SM/SSHO will coordinate the arrival of any emergency response personnel at their location.

13.6 DECONTAMINATION DURING A MEDICAL EMERGENCY

For minor medical problems or injuries, regular decontamination procedures will be followed. Any major medical emergency will require on-Site or off-Site emergency medical personnel assistance.

13.7 ADVERSE WEATHER CONDITIONS

In the event of adverse weather conditions, the SM/SSHO will consult with the PM and PSHM to determine if work can continue. Threatening weather conditions will be monitored by the PSHM via radio, television, Internet, or calls to the National Weather Service for storm conditions:

- Potential for heat or cold stress
- Limited visibility;
- Thunderstorms - refer to Section 2.2.9; and
- Severe weather-related working conditions (e.g., heavy rainfall, high winds, icy conditions causing slippery footing hazards).

13.8 EMERGENCY TELEPHONE NUMBERS

Camp James A. Garfield Range Control	(614) 336-6041
Medical Facility: University Hospital Portage Medical Center	(330) 297-0811 In Emergency: 911
Ambulance – North East Ambulance	(330) 296-4541
Poison Control Center	(800) 222-1222
Federal OSHA Hotline	(800) 321-6742
National Weather Service Forecast Office	(703) 260-0107 www.erh.noaa.gov/lwx
USACE POC – Nathaniel Peters II	o: (502) 315-2624 Nathaniel.Peters.II@usace.army.mil
PSHM – Kevin McMahon, CIH	c: (609) 503-1284 kmcmahon@haztekinc.com
SM/ SSHO – Allen Campione	o: (609) 890-7277 c: (856) 701-7216 acampione@parsenviro.com
PM – Cody Postlethwait	o: (609) 890-7277 c: (609) 947-2557 cpostlethwait@parsenviro.com

All emergencies, spills and dangerous situations will be reported to Camp James A. Garfield Range Control as they will arrange appropriate responses to emergencies. The SM/SSHO must be notified immediately after calling Range Control for emergency response personnel, or the PM may be called first if the emergency is not life threatening. The SM/SSHO will then notify the PM and the USACE COR and complete an Incident Report. A map of the emergency transfer points is included in Appendix E.

13.9 ROUTE TO HOSPITAL

The route to the hospital is included as Appendix F.

FIGURES

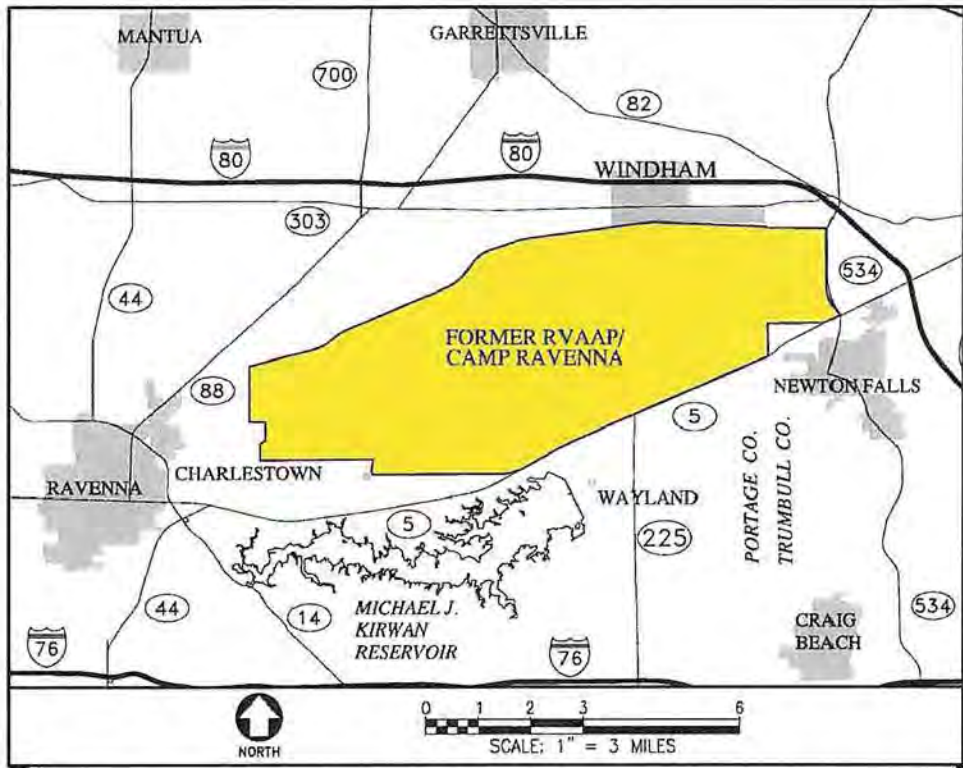


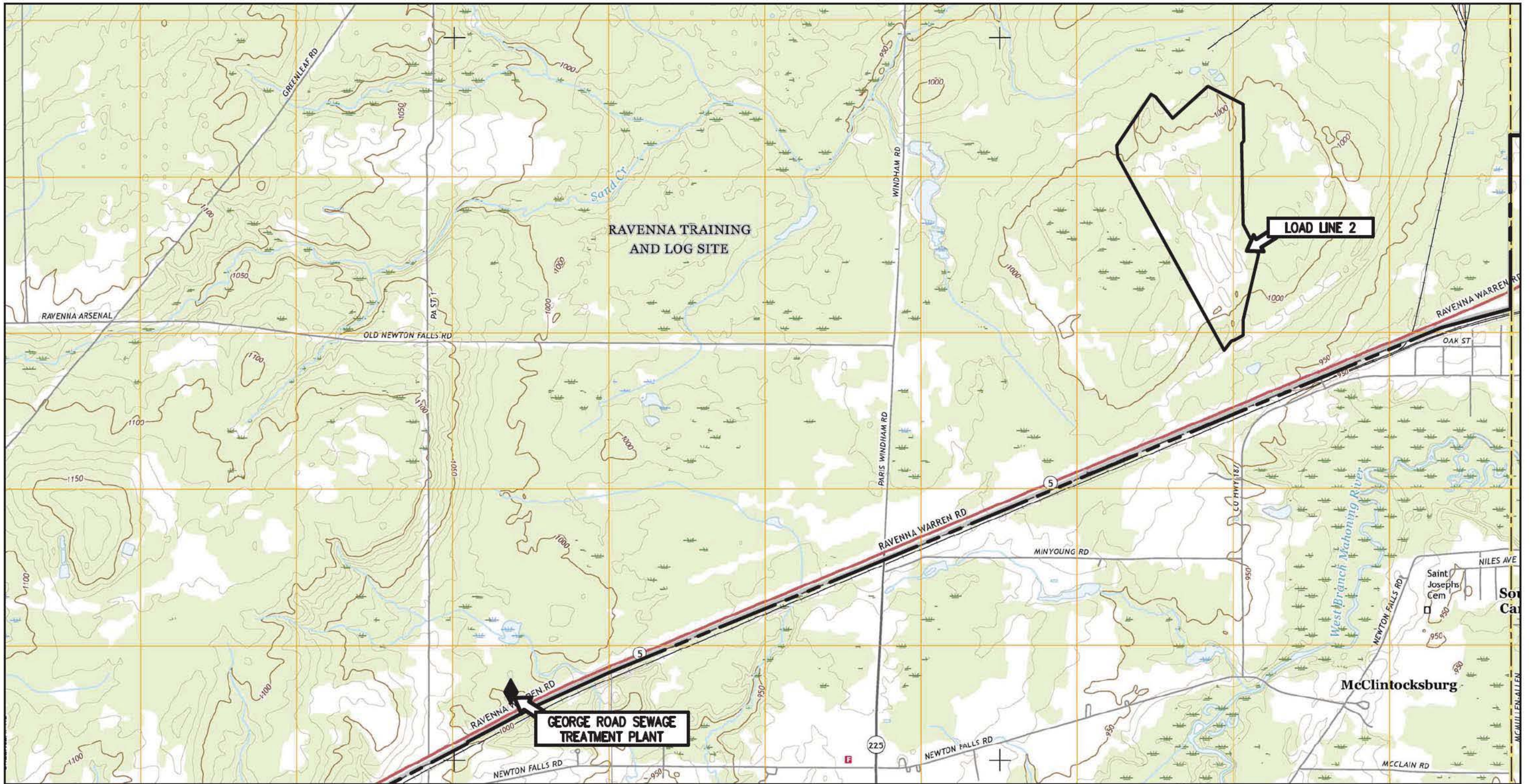
FIGURE 1
 SITE LOCATION MAP
 FORMER RVAAP/CAMP JAMES A. GARFIELD
 PORTAGE & TRUMBULL COUNTIES, OHIO

PARS ENVIRONMENTAL, INC.
 500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY: MN
 CHECKED BY: CP

JOB NUMBER: 895-28
 DATE: 1/22/19

NOTES:
 SOURCE OF DRAWING IS THE FINAL ENGINEERING
 EVALUATION / COST ANALYSIS FOR RVAAP-67 &
 CC-RVAAP-75 (LEIDOS, 2017)



LEGEND
 --- = SITE BOUNDARY



WINDHAM, OH
 USGS Quadrangle 2016
 Contour Interval: 10 Feet

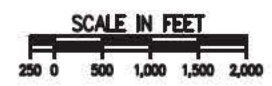


FIGURE 2
 SITE LOCATION MAP
 FORMER RVAAP/CAMP JAMES A. GARFIELD
 PORTAGE & TRUMBULL COUNTIES, OHIO

PARS ENVIRONMENTAL, INC.
 500 HORIZON DRIVE SUITE 540 ROBBINSVILLE, NEW JERSEY

DRAWN BY: MN	JOB NUMBER: 895-28
CHECKED BY: HB	DATE: 11/8/18

APPENDIX A
SAFETY DATA SHEETS

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Alconox

Synonyms:

Product number: Alconox

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer	Supplier
Alconox, Inc. 30 Glenn Street White Plains, NY 10603 1-914-948-4040	Not Applicable

Emergency telephone number:

ChemTel Inc

North America: 1-800-255-3924

International: 01-813-248-0585

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:

Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Skin irritation, category 2.

Eye irritation, category 2A.

Hazard pictograms:



Signal word: Warning

Hazard statements:

H315 Causes skin irritation.

H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 If on skin: Wash with soap and water.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P321 Specific treatment (see supplemental first aid instructions on this label).

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	2-16

3.4 Additional Information : None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

4.2 Most important symptoms and effects, both acute and delayed

None

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.

Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.

Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.

Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.

Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.

Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

8 Exposure controls/personal protection



8.1 Control parameters :

7722-88-5, Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3.

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.

Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	Explosion limit lower: Explosion limit upper:	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	Vapor pressure at 20°C:	Not determined or not available.
Odor threshold:	Not determined or not available.	Vapor density:	Not determined or not available.
pH-value:	9.5 (aqueous solution)	Relative density:	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	Solubilities:	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	Partition coefficient (n-octanol/water):	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	Auto/Self-ignition temperature:	Not determined or not available.
Evaporation rate:	Not determined or not available.	Decomposition temperature:	Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox			
Flammability (solid, gaseous):	Not determined or not available.	Viscosity:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

- 10.1 Reactivity : None
- 10.2 Chemical stability : None
- 10.3 Possibility hazardous reactions : None
- 10.4 Conditions to avoid : None
- 10.5 Incompatible materials : None
- 10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

Tetrasodium Pyrophosphate: Rabbit - Risk of serious damage to eyes .

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.
Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: None
ADR, ADN, DOT, IMDG, IATA

14.2 UN Proper shipping name: None
ADR, ADN, DOT, IMDG, IATA

14.3 Transport hazard classes:
ADR, ADN, DOT, IMDG, IATA

Class:	None
Label:	None
LTD. QTY:	None

US DOT

Limited Quantity Exception: None

Bulk:

RQ (if applicable): None

Proper shipping Name: None

Hazard Class: None

Packing Group: None

Marine Pollutant (if applicable): No additional information.

Non Bulk:

RQ (if applicable): None

Proper shipping Name: None

Hazard Class: None

Packing Group: None

Marine Pollutant (if applicable): No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox	
Comments: None	Comments: None
14.4 Packing group: ADR, ADN, DOT, IMDG, IATA	None
14.5 Environmental hazards :	None
14.6 Special precautions for user:	None
Danger code (Kemler):	None
EMS number:	None
Segregation groups:	None
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.	
14.8 Transport/Additional information:	
Transport category:	None
Tunnel restriction code:	None
UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture. North American

<p>SARA</p> <p>Section 313 (specific toxic chemical listings): None of the ingredients are listed. Section 302 (extremely hazardous substances): None of the ingredients are listed.</p>
<p>CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable</p> <p>Spill Quantity: None of the ingredients are listed.</p>
<p>TSCA (Toxic Substances Control Act):</p> <p>Inventory: All ingredients are listed. Rules and Orders: Not applicable.</p>
<p>Proposition 65 (California):</p> <p>Chemicals known to cause cancer: None of the ingredients are listed. Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed. Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed. Chemicals known to cause developmental toxicity: None of the ingredients are listed.</p>
<p>Canadian</p> <p>Canadian Domestic Substances List (DSL): All ingredients are listed.</p>

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

Germany MAK: Not classified.

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.

H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 If on skin: Wash with soap and water.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P321 Specific treatment (see supplemental first aid instructions on this label).

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NFPA: 1-0-0

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

HMIS: 1-0-0

Product Name: NO. 1 DIESEL FUEL
Revision Date: 19 Nov 2015
Page 1 of 14

SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: NO. 1 DIESEL FUEL
Product Description: Hydrocarbons and Additives
Product Code: 708118-00, 978585, 979118, 979485, 97AC22, 97AJ11, 97AJ19, 97AJ21, 97AJ22, 97AJ23, 97AJ34, 97AJ35, 97BQ86, 97BR49, 97BR50, 97BR51, 97BR52, 97BR53, 97BR54, 97U646, EMGF24
Intended Use: Fuel

COMPANY IDENTIFICATION

Supplier: EXXON MOBIL CORPORATION
22777 Springwoods Village Parkway
Spring, TX. 77253 USA
24 Hour Health Emergency 609-737-4411
Transportation Emergency Phone 800-424-9300 or 703-527-3887 CHEMTREC
Product Technical Information 800-662-4525
MSDS Internet Address <http://www.exxon.com>, <http://www.mobil.com>

SECTION 2 HAZARDS IDENTIFICATION

This material is hazardous according to regulatory guidelines (see (M)SDS Section 15).

CLASSIFICATION:

Flammable liquid: Category 3.
Skin irritation: Category 2. Specific target organ toxicant (central nervous system): Category 3. Aspiration toxicant: Category 1.

LABEL:

Pictogram:



Signal Word: Danger

Hazard Statements:

Product Name: NO. 1 DIESEL FUEL
Revision Date: 19 Nov 2015
Page 2 of 14

H226: Flammable liquid and vapor. H304: May be fatal if swallowed and enters airways. H315: Causes skin irritation. H336: May cause drowsiness or dizziness.

Precautionary Statements:

P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking. P233: Keep container tightly closed. P240: Ground / bond container and receiving equipment. P241: Use explosion-proof electrical, ventilating, and lighting equipment. P242: Use only non-sparking tools. P243: Take precautionary measures against static discharge. P261: Avoid breathing mist / vapours. P264: Wash skin thoroughly after handling. P271: Use only outdoors or in a well-ventilated area. P273: Avoid release to the environment. P280: Wear protective gloves and eye / face protection. P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P302 + P352: IF ON SKIN: Wash with plenty of soap and water. P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P331: Do NOT induce vomiting. P332 + P313: If skin irritation occurs: Get medical advice/attention. P362 + P364: Take off contaminated clothing and wash it before reuse. P370 + P378: In case of fire: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish. P391: Collect spillage. P403 + P235: Store in a well-ventilated place. Keep cool. P405: Store locked up. P501: Dispose of contents and container in accordance with local regulations.

Other hazard information:

HAZARD NOT OTHERWISE CLASSIFIED (HNOC): None as defined under 29 CFR 1910.1200.

PHYSICAL / CHEMICAL HAZARDS

Material can accumulate static charges which may cause an ignition. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. May be irritating to the eyes, nose, throat, and lungs. Breathing of high vapor concentrations may cause dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness.

ENVIRONMENTAL HAZARDS

Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health: 2	Flammability: 2	Reactivity: 0
HMIS Hazard ID:	Health: 2	Flammability: 2	Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a complex substance.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
------	------	----------------	------------------

Product Name: NO. 1 DIESEL FUEL
 Revision Date: 19 Nov 2015
 Page 3 of 14

KEROSENE	8008-20-6	> 95 %	H226, H304, H336, H315, H401, H411
----------	-----------	--------	---------------------------------------

Hazardous Constituent(s) Contained in Complex Substance(s) required for disclosure

Name	CAS#	Concentration*	GHS Hazard Codes
ETHYL BENZENE	100-41-4	0.1 - 1%	H225, H332, H373, H401, H412
NAPHTHALENE	91-20-3	< 1%	H302, H351, H400(M factor 1), H410(M factor 1)

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

NOTE: Composition may contain up to 0.5% performance additives and / or dyes.

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with applicable provisions of paragraph (i).

SECTION 4	FIRST AID MEASURES
------------------	---------------------------

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Contains hydrocarbon solvent/petroleum hydrocarbons; skin contact may aggravate an existing dermatitis.

SECTION 5	FIRE FIGHTING MEASURES
------------------	-------------------------------

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Flammable. Hazardous material. Firefighters should consider protective equipment indicated in Section 8. Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger.

Hazardous Combustion Products: Aldehydes, Incomplete combustion products, Oxides of carbon, Smoke, Fume, Sulfur oxides

FLAMMABILITY PROPERTIES

Flash Point [Method]: >38°C (100°F) [ASTM D-93]

Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 5.0

Autoignition Temperature: 250°C (482°F) [ASTM E659]

SECTION 6

ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. US regulations require reporting releases of this material to the environment which exceed the applicable reportable quantity or oil spills which could reach any waterway including intermittent dry creeks. The National Response Center can be reached at (800)424-8802.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor and, when applicable, H₂S, or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that are resistant to aromatic hydrocarbons are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Chemical goggles are recommended if splashes or contact with eyes is possible. Small spills: normal antistatic work clothes are usually adequate. Large spills: full body suit of chemical resistant, antistatic material is recommended.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large

Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces.

Water Spill: Stop leak if you can do it without risk. Eliminate sources of ignition. Warn other shipping. If the Flash Point exceeds the Ambient Temperature by 10 degrees C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid all personal contact. Do not siphon by mouth. It is dangerous and/or unlawful to put fuel into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapors and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100x10E-12 Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be grounded and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

Substance Name	Form	Limit / Standard			NOTE	Source
ETHYL BENZENE		TWA	435 mg/m ³	100 ppm	N/A	OSHA Z1
ETHYL BENZENE		TWA	20 ppm		N/A	ACGIH
KEROSENE	Stable Aerosol.	TWA	5 mg/m ³		N/A	ExxonMobil
KEROSENE	Vapor.	TWA	200 mg/m ³		N/A	ExxonMobil
KEROSENE [as total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m ³		Skin	ACGIH
NAPHTHALENE		TWA	50 mg/m ³	10 ppm	N/A	OSHA Z1
NAPHTHALENE		TWA	10 ppm		Skin	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

Biological limits

Substance	Specimen	Sampling Time	Limit	Determinant	Source
ETHYL BENZENE	Creatinine in urine	End of shift	0.15 g/g	Sum of mandelic acid and phenylglyoxylic acid	ACGIH BELs (BEIs)
NAPHTHALENE	No Biological Specimen provided	End of shift	Not Assigned	1-Naphthol, with hydrolysis + 2-Naphthol, with hydrolysis	ACGIH BELs (BEIs)

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Half-face filter respirator

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material

include:

Chemical resistant gloves are recommended. If contact with forearms is likely wear gauntlet style gloves.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES
------------------	---

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Clear (May Be Dyed)
Odor: Petroleum/Solvent
Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.775 - 0.83
Density (at 15 °C): 750 kg/m³ (6.26 lbs/gal, 0.75 kg/dm³) - 860 kg/m³ (7.18 lbs/gal, 0.86 kg/dm³) [ASTM D4052]
Flammability (Solid, Gas): N/A
Flash Point [Method]: >38°C (100°F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 5.0
Autoignition Temperature: 250°C (482°F) [ASTM E659]
Boiling Point / Range: > 200°C (392°F) [EN ISO 3405]
Decomposition Temperature: N/D
Vapor Density (Air = 1): N/D
Vapor Pressure: < 0.133 kPa (1 mm Hg) at 20 °C [EN 13016-1]
Evaporation Rate (n-butyl acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: 1.1 cSt (1.1 mm²/sec) at 40 °C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Product Name: NO. 1 DIESEL FUEL
 Revision Date: 19 Nov 2015
 Page 8 of 14

Freezing Point: N/D
Melting Point: N/D

SECTION 10	STABILITY AND REACTIVITY
-------------------	---------------------------------

REACTIVITY: See sub-sections below.

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Alkalies, Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
-------------------	----------------------------------

INFORMATION ON TOXICOLOGICAL EFFECTS

<u>Hazard Class</u>	<u>Conclusion / Remarks</u>
Inhalation	
Acute Toxicity: (Rat) 4 hour(s) LC50 > 5000 mg/m ³ (Vapor)	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Elevated temperatures or mechanical action may form vapors, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs.
Ingestion	
Acute Toxicity (Rat): LD50 > 5000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 420
Skin	
Acute Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 402
Skin Corrosion/Irritation (Rabbit): Data available.	Irritating to the skin. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 404
Eye	
Serious Eye Damage/Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 405
Sensitization	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: Data available.	Not expected to be a skin sensitizer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 406
Aspiration: Data available.	May be fatal if swallowed and enters airways. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 475 476 478 479
Carcinogenicity: Data available.	Not expected to cause cancer. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline

Product Name: NO. 1 DIESEL FUEL
 Revision Date: 19 Nov 2015
 Page 9 of 14

	451
Reproductive Toxicity: Data available.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 414 421
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	May cause drowsiness or dizziness.
Repeated Exposure: Data available.	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 410 412

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
ETHYL BENZENE	Inhalation Lethality: 4 hour(s) LC50 17.8 mg/l (Vapor) (Rat); Oral Lethality: LD50 3.5 g/kg (Rat)
NAPHTHALENE	Inhalation Lethality: 4 hour(s) LC50 > 0.4 mg/l (Max attainable vapor conc.) (Rat); Oral Lethality: LD50 533 mg/kg (Mouse)

OTHER INFORMATION

For the product itself:

Vapor/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness and other central nervous system effects including death.

Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Contains:

Kerosene: Carcinogenic in animal tests. Lifetime skin painting tests produced tumors, but the mechanism is due to repeated cycles of skin damage and restorative hyperplasia. This mechanism is considered unlikely in humans where such prolonged skin irritation would not be tolerated. Did not cause mutations In vitro. Inhalation of vapors did not result in reproductive or developmental effects in laboratory animals. Inhalation of high concentrations in animals resulted in respiratory tract irritation, lung changes and some reduction in lung function. Non-sensitizing in animal tests.

NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

ETHYLBENZENE: Caused cancer in laboratory animal studies. The relevance of these findings to humans is uncertain.

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
ETHYL BENZENE	100-41-4	5
NAPHTHALENE	91-20-3	2, 5

--REGULATORY LISTS SEARCHED--

1 = NTP CARC
 2 = NTP SUS

3 = IARC 1
 4 = IARC 2A

5 = IARC 2B
 6 = OSHA CARC

Product Name: NO. 1 DIESEL FUEL
 Revision Date: 19 Nov 2015
 Page 10 of 14

SECTION 12	ECOLOGICAL INFORMATION
-------------------	-------------------------------

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

Majority of components -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

Majority of components -- Low potential to migrate through soil.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be inherently biodegradable

Atmospheric Oxidation:

Majority of components -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

ECOLOGICAL DATA

Ecotoxicity

Test	Duration	Organism Type	Test Results
Aquatic - Acute Toxicity	96 hour(s)	Oncorhynchus mykiss	LL50 1 - 100 mg/l: data for similar materials
Aquatic - Acute Toxicity	48 hour(s)	Daphnia magna	EL50 1 - 100 mg/l: data for similar materials
Aquatic - Acute Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	EL50 1 - 100 mg/l: data for similar materials
Aquatic - Chronic Toxicity	21 day(s)	Daphnia magna	NOELR 0.48 mg/l: data for similar materials
Aquatic - Chronic Toxicity	72 hour(s)	Pseudokirchneriella subcapitata	NOELR 1 - 10 mg/l: data for similar materials

Persistence, Degradability and Bioaccumulation Potential

Media	Test Type	Duration	Test Results
Water	Ready Biodegradability	28 day(s)	Percent Degraded < 60 : similar material

Product Name: NO. 1 DIESEL FUEL
Revision Date: 19 Nov 2015
Page 11 of 14

SECTION 13	DISPOSAL CONSIDERATIONS
-------------------	--------------------------------

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Potential RCRA characteristics: IGNITABILITY.

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14	TRANSPORT INFORMATION
-------------------	------------------------------

LAND (DOT)

Proper Shipping Name: KEROSENE
Hazard Class & Division: COMBUSTIBLE LIQUID
ID Number: 1223
Packing Group: III
Marine Pollutant: No
ERG Number: 128
Label(s): NONE
Transport Document Name: UN1223, KEROSENE, COMBUSTIBLE LIQUID, PG III

Footnote: The flash point of this material is greater than 100 F. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid.

LAND (TDG)

Proper Shipping Name: KEROSENE
Hazard Class & Division: 3
UN Number: 1223
Packing Group: III

SEA (IMDG)

Proper Shipping Name: KEROSENE
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1223
Packing Group: III
Marine Pollutant: Yes

Product Name: NO. 1 DIESEL FUEL
 Revision Date: 19 Nov 2015
 Page 12 of 14

Label(s): 3
Transport Document Name: UN1223, KEROSENE, 3, PG III, (38°C c.c.), MARINE POLLUTANT

AIR (IATA)

Proper Shipping Name: KEROSENE
Hazard Class & Division: 3
UN Number: 1223
Packing Group: III
Label(s) / Mark(s): 3
Transport Document Name: UN1223, KEROSENE, 3, PG III

SECTION 15	REGULATORY INFORMATION
-------------------	-------------------------------

OSHA HAZARD COMMUNICATION STANDARD: This material is considered hazardous in accordance with OSHA HazCom 2012, 29 CFR 1910.1200.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, KECI, PICCS, TSCA

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

CERCLA: This material is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Contact local authorities to determine if other reporting requirements apply.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Fire. Immediate Health.

SARA (313) TOXIC RELEASE INVENTORY:

Chemical Name	CAS Number	Typical Value
ETHYL BENZENE	100-41-4	0.1 - 1%
NAPHTHALENE	91-20-3	< 1%

The following ingredients are cited on the lists below:

Chemical Name	CAS Number	List Citations
ETHYL BENZENE	100-41-4	1, 4, 10, 17
KEROSENE	8008-20-6	1, 18, 19
NAPHTHALENE	91-20-3	1, 4, 9, 10, 17

--REGULATORY LISTS SEARCHED--

- | | | | |
|---------------|--------------|-------------------|-------------|
| 1 = ACGIH ALL | 6 = TSCA 5a2 | 11 = CA P65 REPRO | 16 = MN RTK |
| 2 = ACGIH A1 | 7 = TSCA 5e | 12 = CA RTK | 17 = NJ RTK |
| 3 = ACGIH A2 | 8 = TSCA 6 | 13 = IL RTK | 18 = PA RTK |
| 4 = OSHA Z | 9 = TSCA 12b | 14 = LA RTK | 19 = RI RTK |

Product Name: NO. 1 DIESEL FUEL
Revision Date: 19 Nov 2015
Page 13 of 14

5 = TSCA 4 10 = CA P65 CARC 15 = MI 293

Code key: CARC=Carcinogen; REPRO=Reproductive

SECTION 16	OTHER INFORMATION
-------------------	--------------------------

This warning is given to comply with California Health and Safety Code 25249.6 and does not constitute an admission or a waiver of rights. This product contains a chemical known to the State of California to cause cancer. Chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm are created by the combustion of this product.

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):

- H225: Highly flammable liquid and vapor; Flammable Liquid, Cat 2
- H226: Flammable liquid and vapor; Flammable Liquid, Cat 3
- H302: Harmful if swallowed; Acute Tox Oral, Cat 4
- H304: May be fatal if swallowed and enters airways; Aspiration, Cat 1
- H315: Causes skin irritation; Skin Corr/Irritation, Cat 2
- H332: Harmful if inhaled; Acute Tox Inh, Cat 4
- H336: May cause drowsiness or dizziness; Target Organ Single, Narcotic
- H351: Suspected of causing cancer; GHS Carcinogenicity, Cat 2
- H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
- H401: Toxic to aquatic life; Acute Env Tox, Cat 2
- H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1
- H411: Toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 2

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

- Section 05: Hazardous Combustion Products information was modified.
- Section 11: Tox List Cited Table information was modified.
- Section 15: Community RTK - Header information was modified.
- Composition: Component Table information was modified.
- GHS Precautionary Statements - Response information was modified.
- Section 08: Biological Exposure Limits (ACG BEL) - Limit Header information was added.
- Section 16: Revision Information - Implementation of GHS requirements phrase. information was deleted.
- Section 08: Biological Exposure Limits (South Africa) - Limit Header information was deleted.
- Section 02: GHS Contains for LABEL_GHS codes information was deleted.
- Section 02: GHS Contains - Header information was deleted.

THIS MSDS COVERS THE FOLLOWING MATERIALS: DIESEL NO. 1 | ESSO DIESEL FUEL NO. 1 | EXXON DIESEL FUEL NO. 1 | KEROSENE (FUEL) | LOW SULFUR DIESEL NO. 1 | MOBIL DIESEL FUEL NO. 1 | ULTRA LOW SULFUR DIESEL NO. 1 | WINTERIZED DIESEL FUEL NO. 1

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. You can contact ExxonMobil to insure that this document is the most current available from ExxonMobil. The information and recommendations are offered for the user's consideration and examination. It is the user's responsibility to satisfy itself that the product is suitable for the intended use. If buyer repackages this product, it is the user's responsibility to insure proper health, safety and other necessary information is included with and/or on the container. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Except to the extent required by law,



Product Name: NO. 1 DIESEL FUEL
Revision Date: 19 Nov 2015
Page 14 of 14

re-publication or retransmission of this document, in whole or in part, is not permitted. The term, "ExxonMobil" is used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliates in which they directly or indirectly hold any interest.

Internal Use Only

MHC: 1A, 0B, 0, 0, 4, 1

PPEC: C

DGN: 2000440XUS (1016820)

Copyright 2002 Exxon Mobil Corporation, All rights reserved

APPENDIX B

ACTIVITY HAZARD ANALYSES

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Backfilling Excavation

Risk Assessment Code (RAC):

L

Prepared By: Lela Stratton

Reviewed By: Kevin McMahon, CIH

Recommended Protective Clothing & Equipment:

1. Level D PPE: hard hat, safety eye wear, safety toe boots, sturdy work gloves, hi-visibility-traffic vest when exposed to moving equipment, hearing protection;
2. Sound Level Meter;
3. Meteorological Equipment.

S e v e r i t y	P r o b a b i l i t y			
	Frequent			Unlikely
				M
	E			L
				L
	M			L

JOB STEPS			EM 385-1-1 (PARA REF)
<ol style="list-style-type: none"> 1. Designate a spotter who will be responsible for directing the equipment operator to the excavation bank, and to dump load. 2. Check the ground for stability prior to proceeding to the top of the excavation bank. 3. Ensure all personnel are aware of equipment operations, and to stay clear of the area during dumping activity. 4. Check equipment per manufacturer maintenance recommendations, prior to use. 5. Dumping should only occur when the spotter has signaled it is safe to do so. 6. Once load has been dumped, lower the box and carefully pull-away from the excavation bank. 	<ol style="list-style-type: none"> 1. Slip, Trip and Falls 2. Handling Heavy Objects 3. Struck by/ Against Heavy Equipment, Motor Vehicles 	<ol style="list-style-type: none"> 1. Clear walkways, work areas of equipment, ground debris, tools, and other materials. Mark, identify, or barricade other obstructions. Clean up spills immediately. 2. Observe proper lifting techniques (50 lb. maximum per person for manual lifting). Use mechanical lifting equipment to move large, awkward loads. 3. Wear reflective warning vests when exposed to vehicular traffic. Isolate excavation areas as necessary with reflective street barriers / parked motor vehicles. Turn vehicle lights on including 4 way flashers to identify work area. Contact local or state police if road closure is necessary. Maintain eye contact with equipment operators before approaching. Review hand signal procedures with personnel; 	<ol style="list-style-type: none"> 1. 14.D; 05.E 2. 14.A 3. 05.F; 18.A-18.E

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Backfilling and Compaction

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
	4. Flying Debris, Protruding Objects	4. Secure the work area with barricades/enclosure, restricting access to authorized personnel. Wear appropriate PPE (including, but not limited to: hard hats, safety glasses with side shields and steel-toed boots).	4. 05.B
	5. Vibration	5. Rotate personnel during compaction tasks to minimize exposure to equipment vibration; use vibration dampening devices;	5. 05.H; 05 Table 5-5; 06.K.02; 25.A.07;
	6. High Noise Levels	6. Use hearing protection when performing high noise level activities (e.g. working near heavy equipment). Use hearing protection when exposed to excessive noise levels (greater than 85 dBA over an 8-hour work period). Assess noise level with sound level meter if possibility exists that level may exceed 85dBA TWA.	6. 05.C
	7. High/Low Ambient Temperature	7. Monitor for heat/cold stress. Provide fluids to prevent worker dehydration.	7. 06.J.01-03; 06. J.04-06

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Backfilling and Compaction

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Backfilling and Compaction

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Backfilling and Compaction

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
<ol style="list-style-type: none"> 1. Backhoe, loader, compactor; 2. Equipment features: Seatbelt, back-up signal; 3. Personal protective equipment; 4. Hand tools; 5. First-aid kit 6. Fire Extinguisher; 7. Operations manual for equipment; 8. Sound Level Meter; 9. Meteorological Equipment; 	<ol style="list-style-type: none"> 1. Inspect equipment and hand tools on a daily basis, and according to equipment manufacturer requirements; 2. Inspect all emergency equipment (i.e.: First Aid kit, Fire Extinguisher) 	<ol style="list-style-type: none"> 1. Proper training for use of tools and equipment; 2. Review of AHA's with all site personnel; 3. Review of hand signals and communication procedures;

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Mobilization - Demobilization

Prepared By: Lela Stratton

Reviewed By: Kevin McMahon, CIH

Risk Assessment Code (RAC):

L

Recommended Protective Clothing & Equipment:
Level D PPE: hard hat, safety eye wear, safety toe work boots, sturdy work gloves, Hi Viz (Class 2) traffic vest, hearing protection, if necessary.

		Probability				
		Frequent				Unlikely
Severity						M
		E				L
						L
						L

JOB STEPS	HAZARDS		EM 385-1-1 (PARA REF)
Mobilization - Demobilization	<ol style="list-style-type: none"> 1. Slips, trips, and falls 2. Striking/struck by, caught-between operating equipment 3. Noise 4. Manual material handling 5. Illumination 6. Heat/cold stress 	<ol style="list-style-type: none"> 1. Keep tools, truck tackle, chains and load straps out of walking lanes. 2. Isolate equipment operating areas; make eye contact with operators before approaching equipment; provide back-up alarms on all operating equipment. 3. Use hearing protection working near operating equipment. 4. Workers will be trained in and use proper lifting techniques. 5. Adequate lighting will be provided in all work areas. 6. Monitor worker activity relative to ambient temperature/related conditions and follow SSHP protocols. 	<ol style="list-style-type: none"> 1. 02.A; 14.C.07 2. 16.A.12; Appx B, 9.b (1) 3. 05.C.01 4. 14.A.01 5. 07.A.01 6. 06.J

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Mobilization - Demobilization

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Mobilization - Demobilization

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Mobilization - Demobilization

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Mobilization - Demobilization

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Related hand tools and maintenance equipment	Daily safety inspections Daily equipment inspection	Project site orientation and AHA review

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil removal, Load-out

Risk Assessment Code (RAC):

L

Prepared By: Lela Stratton

Reviewed By: Kevin McMahon, CIH

Recommended Protective Clothing & Equipment:

Level D PPE: hard hat, safety eye wear, safety toe boots, sturdy work gloves, hi-viz- traffic vest when exposed to moving equipment

P r o b a b i l i t y				
Frequent				Unlikely
				M
E				L
				L
				L

S
e
v
e
r
e
I
t
y

JOB STEPS	HAZARDS		EM 385-1-1 (PARA REF)
Soil Removal, Load-out	<ol style="list-style-type: none"> 1. Slips and Falls 2. Striking/struck by operating equipment 3. Noise 4. Severe Weather 5. Sunburn 	<ol style="list-style-type: none"> 1. Keep tools, truck tackle, chains and load straps out of walking lanes. 2. Isolate equipment unloading areas; make eye contact with drivers, operators before approaching equipment; provide back-up alarms on all operating equipment; equipment shall not be used within regulated areas surrounding overhead utilities; Wear appropriate PPE for equipment mobilization per SSHP. 3. Use hearing protection working near operating equipment . 4. Review weather data and anticipated conditions prior to work activities; maintain contact with (via cell phone or computer) with national weather service or similar weather data sources. 5. Use sunscreen as necessary. 	<ol style="list-style-type: none"> 1. 14.C.01 2. 16.A.12; Appx B, 9.b (1); 11.F.4b; 18.H.06 3. 05.C.01a 4. 06.I.01 5. 06.I.05

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil removal, Load-out

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
	6. Heat / Cold Stress	6. Monitor worker activity relative to ambient temperature/related conditions and follow SSHP protocols.	6. 06.I.05
	7. Sharp Objects/Edges	7. Wear cut resistant gloves and/or handle potential sharp objects remotely.	7. 05.A.08; 05.A.01.a
	8. Respirable Crystalline Silica	8. Employee exposure to respirable crystalline silica must be controlled through the implementation of feasible engineering practices. Use water and/or dust suppressant to minimize hazard.	8. 06.N.01.b(1)
	9. Excavation and Trenching	9. A Competent Person shall inspect the excavation, the adjacent areas, and protective systems daily, before each shift, throughout shifts, after adverse weather conditions, when changes in physical conditions (fissures, tension cracks, sloughing, etc.) are observed, and any indication of change in adjacent structures; Protection shall be provided to prevent personnel, vehicles, and equipment from falling into excavation; Sufficient stairs, ramps, or ladders shall be provided to require no more than 25 feet of lateral travel, in excavations/trenches over 4 feet in depth; Protective systems, including but not limited to benching, trench-box, and shoring, must be in-place as appropriate, prior to trench entry by personnel;	9. 25.A.02.a; 25.B.01; 25.B.06; 25.A.04.a.(2).b
	10. Oxygen-deficient and/or gaseous conditions	10. Should personnel enter the excavation where oxygen-deficiency or gaseous conditions are known or suspected in excavations greater than 4 feet in depth, the air shall be tested and logged prior to and during shifts.	10. 25.A.02.g

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil removal, Load-out

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil removal, Load-out

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil removal, Load-out

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Track excavators, Trucks	daily safety inspections	Annual OSHA HAZWOPER Training 29 CFR 1910.120 / 1926.65
Related hand tools and maintenance equipment	daily equipment inspection	Project site orientation and AHA reviews
Direct-reading instrument	daily instrument inspection	Technical manual.

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil Sampling

Risk Assessment Code (RAC):

L

Prepared By: Lela Stratton

Reviewed By: Kevin McMahon, CIH

Recommended Protective Clothing & Equipment:
Level D PPE: hard hat, safety eye wear, safety toe boots, sampling gloves

P r o b a b i l i t y				
Frequent				Unlikely
				M
E				L
				L
				L

JOB STEPS			EM 385-1-1 (PARA REF)
Collect / prepare soil samples	<ol style="list-style-type: none"> 1. Slips and Falls 2. Site obstructions (if/when present) 3. Toxic Plants 4. Wildlife 5. Severe Weather 6. Soil contact 	<ol style="list-style-type: none"> 1. Remove or mark ground hazards before starting work. 2. Identify any unusual conditions and plan work based on existing conditions at the time of sampling. 3. Avoid areas where poisonous plants can be found. 4. Do not approach wild animals; report aggressive animal behavior to Police Use insect repellent (containing DEET) as necessary. 5. Review weather data and anticipated conditions prior to sampling activities; maintain contact with (via cell phone or computer) with national weather service or similar weather data source. 6. Wear sampling gloves and other PPE as necessary to minimize exposure to soils. 	<ol style="list-style-type: none"> 1. 14.C.01 2. 14.C.01 3. 06.D.03 4. 06.D.01 5. 06.I.01 6. 05.A.01.b

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil Sampling

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
	7. Sunburn	7. Use sunscreen as necessary.	7. 06.I.05
	8. Heat/Cold Stress	8. Monitor worker activity relative to ambient temperature/related conditions and follow SSHP protocols.	8. 06.I.02
	9. Bird/ Rat Droppings	9. Avoid contact with any bird/ rat droppings. Wear sampling gloves to minimize exposure.	9. 06.D

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil Sampling

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

Project: Camp Ravenna

Job: Soil Sampling

JOB STEPS	HAZARDS	ACTIONS TO ELIMINATE OR MINIMIZE HAZARDS	EM 385-1-1 (PARA REF)
This page was intentionally left blank.			

ACTIVITY HAZARDS ANALYSIS

Date Prepared (mm-dd-yyyy): 11/7/2018

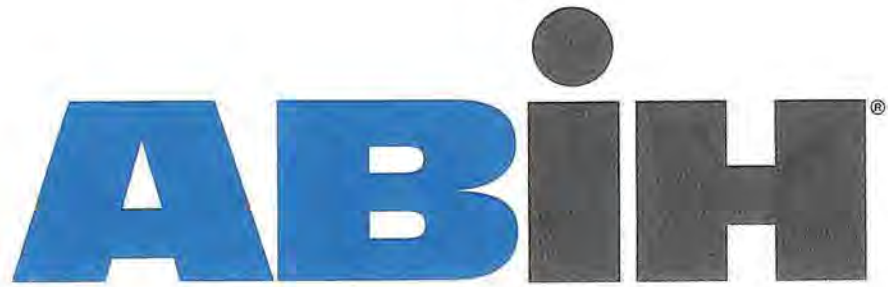
Project: Camp Ravenna

Job: Soil Sampling

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Sampling Equipment (hand auger, trowel, bowls, spoons) Sample containers	daily safety inspections Sampling equipment / container inspection	Annual OSHA HAZWOPER Training 29 CFR 1910.120 / 1926.65 Project site orientation and AHAs -

APPENDIX C

QUALIFICATIONS OF HEALTH AND SAFETY PERSONNEL



american board of industrial hygiene®

organized to improve the practice of industrial hygiene
proclaims that

Kevin J. McMahon

having met all requirements of
education, experience and examination, and
ongoing maintenance,
is hereby certified in the

**COMPREHENSIVE PRACTICE
of
INDUSTRIAL HYGIENE**

and has the right to use the designations

CERTIFIED INDUSTRIAL HYGIENIST

CIH

Certificate Number	3452 CP
Awarded:	December 12, 1986
Expiration Date:	June 1, 2019



Mark B. Lewis
Chair ABIH

Lynn C. O'Donnell
Executive Director ABIH

PARS ENVIRONMENTAL, INC.

CERTIFICATE OF COMPLETION

THIS IS TO CERTIFY THAT

ALLEN CAMPIONE

HAS SUCCESSFULLY COMPLETED THE COURSE ENTITLED

8-HOUR HAZWOPER TRAINING- REFRESHER

(IN ACCORDANCE WITH OSHA 29 CFR 1910.120)

COURSE DATE: FEBRUARY 14, 2018



EXPIRATION DATE: FEBRUARY 14, 2019

RAFAEL L. TORRES, III
PROGRAM DIRECTOR

CERTIFICATE NUMBER: HAZ-8HR-00744

United States Department of Labor
Mid Atlantic OTI Education Center

This is to certify that on
April 1-3, 2014

ALLEN CAMPIONE

Diligently and with merit completed training in

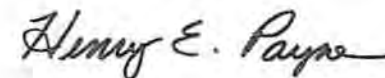
OSHA COURSE #3015

Excavation, Trenching & Soil Mechanics

20 Contact Hours



Rod Markley
Program Director, Mid Atlantic OTI Education Center



Henry E. Payne, PhD
Director, Directorate of Training and Education



**MID-ATLANTIC OSHA TRAINING
INSTITUTE EDUCATION CENTER**



PARS ENVIRONMENTAL, INC.

CERTIFICATE OF COMPLETION

THIS IS TO CERTIFY THAT
ALLEN CAMPIONE
HAS SUCCESSFULLY COMPLETED THE COURSE ENTITLED
HAZWOPER SUPERVISOR TRAINING



PAUL A. LAWLESS, CIH
PROGRAM DIRECTOR

COURSE DATE: FEBRUARY 21, 2014 CERTIFICATE NUMBER: HAZ-SUP-0002

PARS ENVIRONMENTAL, INC.

CERTIFICATE OF COMPLETION

THIS IS TO CERTIFY THAT

CODY POSTLETHWAIT

HAS SUCCESSFULLY COMPLETED THE COURSE ENTITLED
8-HOUR HAZWOPER TRAINING- REFRESHER

(IN ACCORDANCE WITH OSHA 29 CFR 1910.120)

COURSE DATE: FEBRUARY 14, 2018



EXPIRATION DATE: FEBRUARY 14, 2019

RAFAEL L. TORRES, III
PROGRAM DIRECTOR

CERTIFICATE NUMBER: HAZ-8HR-00739

CPR, AED, and Basic First Aid

cody postlethwait

has successfully completed and competently performed the required knowledge and skill objectives for this program.

- Adult
- Adult and Child
- Adult, Child, and Infant

Card is void if more than one box is checked.



Andrew McEvoy

Authorized Instructor (Print Name)

2479220

Registry No.

03/15/2018

Class Completion Date

732-919-6070

Training Center Phone No.

03/15/2020

Expiration Date

Life204

Training Center I.D.

This card certifies the above named individual has successfully completed the required objectives and hands-on skill evaluations to the satisfaction of a currently authorized ASHI instructor. This program conforms to the 2015 AHA Guidelines Update for CPR and ECC and the 2015 AHA and ARC Guidelines Update for First Aid. This program is not designed to meet pediatric first aid training regulatory requirements and should not be used for that purpose. Expiration date may not exceed two years from month of class completion.

This card acknowledges that the recipient has successfully completed a 30-hour Occupational Safety and Health Training Course in **Construction Safety and Health**

Cody L Postieithwait

RICK GLEASON, CIH, CSP

9/4/2013

(Trainer name – print or type)

(Course end date)

APPENDIX D

SSHP ACKNOWLEDGEMENT FORM

INITIAL SITE-SPECIFIC HEALTH AND SAFETY DOCUMENTATION ACKNOWLEDGMENT

My signature below indicates that I am aware of the potential hazardous nature of performing work at the:

Non Time-Critical Removal Action at Camp Ravenna 895-28

I have received initial site-specific health and safety training including the following elements:

- Names of personnel responsible for site health and safety and emergency response
- Contents of the Site Safety and Health Plan (SSHP)
- Safety, health and other hazards present on-site (e.g., chemical, physical, biological, munitions and explosives of concern, etc.)
- Signs and symptoms of overexposure
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment
- Accident, incident, injury, property damage, and near miss reporting requirements
- Use, limitations, maintenance, storage and disposal of site-specific personal protective equipment (PPE); complete a "PPE Training Certification Form"
- Use, limitations, maintenance, storage and disposal of site-specific respiratory protection (if required)
- Emergency response procedures (evacuation and assembly points), and location of site emergency telephone numbers, route to hospital information, and emergency equipment
- Provide emergency contact information
- Requirements of the site-specific Hazard Communication Program, and review contents of relevant Safety Data Sheets (SDSs)

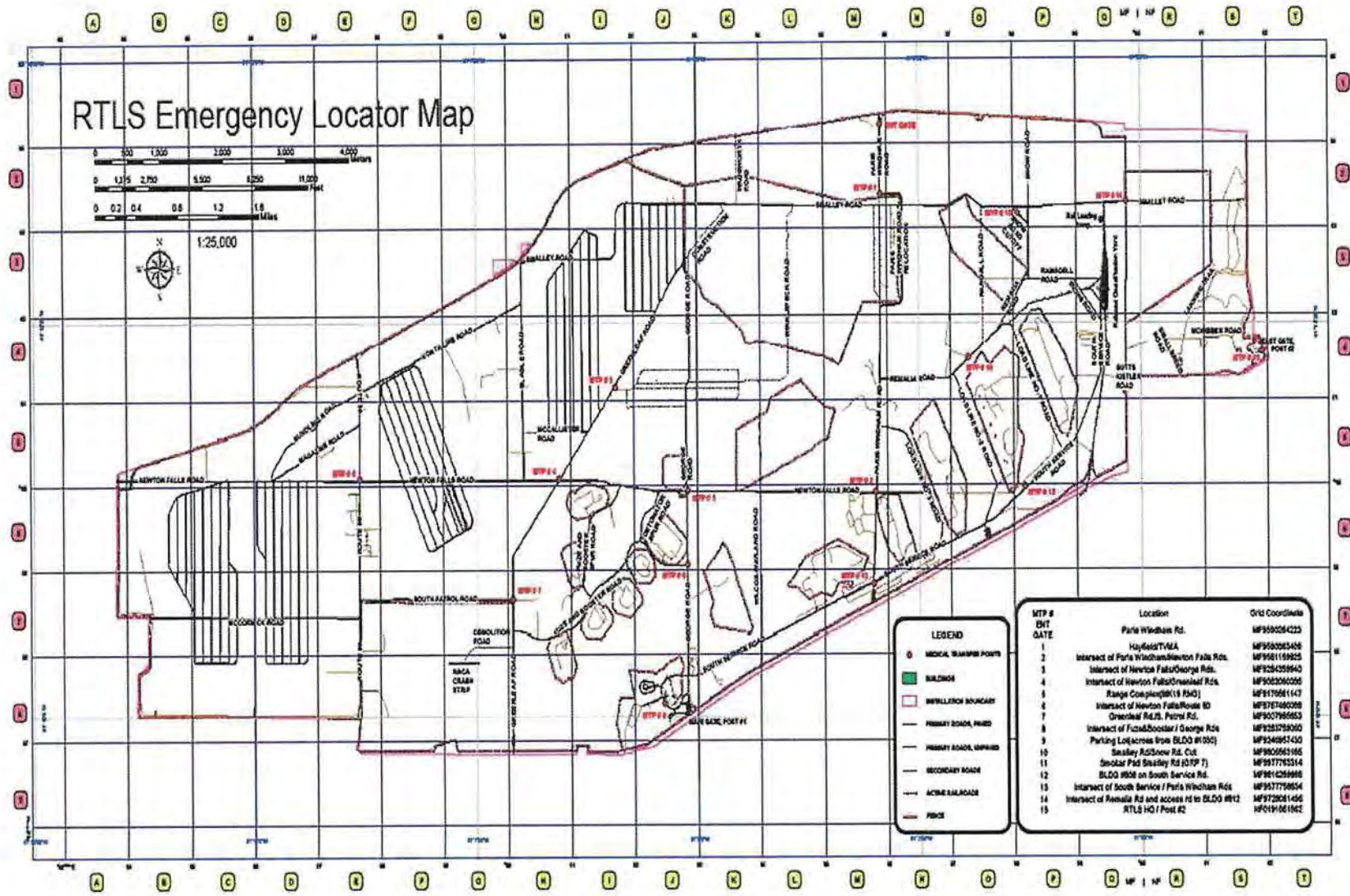
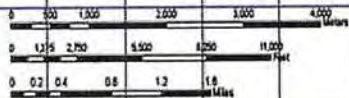
I have been given the opportunity to ask questions, and all of my questions have been answered to my satisfaction.

Name	Signature	Date

APPENDIX E

MAP – EMERGENCY TRANSFER POINTS

RTLS Emergency Locator Map



LEGEND

- MEDICAL TRANSFER POINTS
- BUILDINGS
- BOUNDARY
- PRIMARY ROADS, PAVED
- PRIMARY ROADS, UNPAVED
- SECONDARY ROADS
- HOME ENCLOSURES
- FENCE

MTP #	ENT	DATE	Location	Grid Coordinates
1			Paris Wincham Rd.	MP9500264223
2			Hayfield/TV6A	MP9500263406
3			Intersect of Paris Wincham/Newton Falls Rds.	MP9501159925
4			Intersect of Newton Falls/George Rds.	MP9264359940
5			Intersect of Newton Falls/Oreana/Rd.	MP9262060206
6			Range Coop/Spk(BK19 RDG)	MP9170981147
7			Intersect of Newton Falls/Rouse RD	MP9374602006
8			Oreana/Rd. 2/Parry Rd.	MP9279666653
9			Intersect of Fitch/Boschar / George Rds	MP9263758000
10			Parking Lot/across from BLDG #1000	MP9246957400
11			Snalley Rd/Snow Rd. Cut	MP9805651166
12			Snolar Pad Snalley Rd (JTFP 7)	MP9577433114
13			BLDG #808 on South Service Rd.	MP9614259886
14			Intersect of South Service / Paris Wincham Rds	MP9577708504
15			Intersect of Annalia Rd and access rd to BLDG #812 RTLS HQ / Post Rd	MP9728281496 MP0191561862

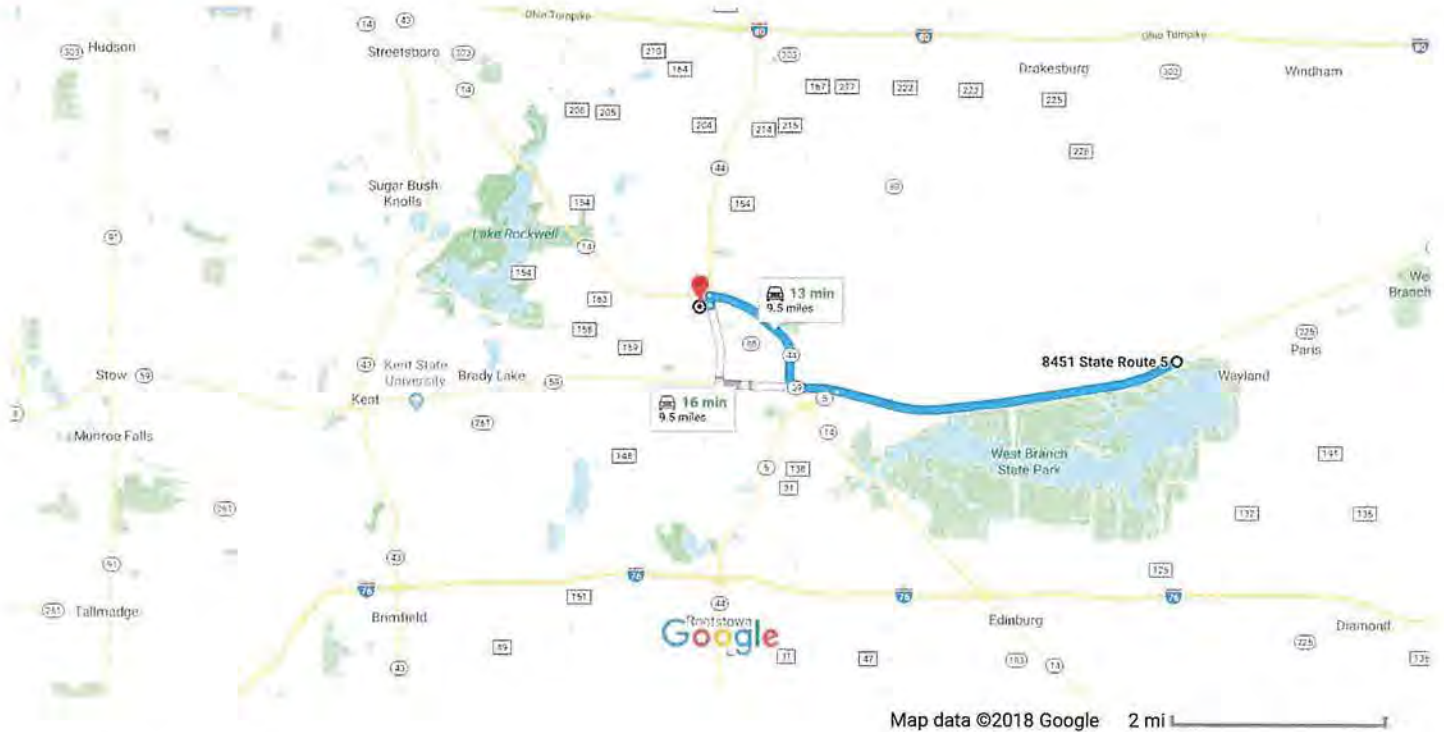
APPENDIX F

HOSPITAL ROUTE



8451 State Route 5, Ravenna, OH to university hospital portage

Drive 9.5 miles, 13 min



8451 State Rte 5

Ravenna, OH 44266

- ↑ 1. Head southwest on State Rte 5 W 5.9 mi
- ↑ 2. Continue straight onto OH-59 W 0.8 mi
- ↗ 3. Turn right onto OH-14 W/OH-44 N/Cleveland - East Liverpool Rd 2.4 mi
- ↖ 4. Turn left onto N Chestnut St/Ravenna Painesville Rd 0.2 mi
 ⓘ Continue to follow N Chestnut St
- ↗ 5. Turn right 466 ft
- ↗ 6. Turn right 0.1 mi
- ↖ 7. Turn left 174 ft

University Hospitals Portage Medical Center:
Emergency Department

11/6/2018

8451 State Route 5, Ravenna, OH to university hospital portage - Google Maps

6847 N Chestnut St, Ravenna, OH 44266

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

APPENDIX B

Camp Ravenna Weekly Non-Hazardous & Hazardous Waste Inspection/Inventory Sheet

**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 OFFICE 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.

APPENDIX C
Comment Response Table

Comment Resolution Table

Installation: RVAAP/Camp Ravenna/Camp James A. Garfield

Document: Draft Work Plan Non-Time-Critical Removal Action for CC RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant

Reviewer(s): Ed D'Amato, Ohio EPA DERR-NEDO

Date: March 18, 2019

Cmt. No.	Page or Sheet	Comment	Recommendation	Response
ED 1	Executive Summary	The NCTRA is also intended to be an RD.	Add text to explain.	The following text has been added: Page iv Line 21-22: Per the EE/CA (Leidos, 2017), this WP is intended to fulfill the requirements of a Remedial Design (RD).
ED 2	General	Per the 2017 EE/CA, the RD would include a discussion of erosion control.	Update document to include erosion control.	Erosion control was indicated in Section 3.2 on Page 8 Lines 25-27. The following text has been added: Page 12 Lines 14-20: One of the two permanent cover seed mixture types listed in <i>OHARNG Approved Grass Seed Mixes for Temporary Cover and Final Site Closures</i> dated July 29, 2014 will be applied at the Site using an erosion control germination blanket. If either ... Site. The erosion control blanket will be properly staked to ensure it remains in place during germination to allow vegetation to establish.
ED 3	General	Per the 2017 EE/CA, the RD would include a discussion of transportation routes.	Update document to include transportation routes.	The following text has been added: Page 11 Lines 14-20: Load Line 2 FA will be accessed by an unimproved access road located to the north of South Service Road. If required, crushed stone will be used to stabilize the access road. Loose soil/sediment will be removed from transportation vehicles prior to leaving the Site and the transportation route will be kept free of Site-generated debris. Transportation vehicles leaving Load Line 2 FA will turn right (westbound) onto South Service Road

Comment Resolution Table

Installation: RVAAP/Camp Ravenna/Camp James A. Garfield

Document: Draft Work Plan Non-Time-Critical Removal Action for CC RVAAP-67 Facility-Wide Sewers and CC RVAAP-75 George Road Sewage Treatment Plant

Reviewer(s): Ed D’Amato, Ohio EPA DERR-NEDO

Date: March 18, 2019

				<p>and follow appropriate signage south towards George Road to exit the installation. A map detailing the transportation route is included in Figure 5.</p> <p>Page 13 Line 35-41: George Road STP will be accessed by an unimproved access road located to the south of South Service Road. If required, crushed stone will be used to stabilize the access road. Loose soil/sediment will be removed from transportation vehicles prior to leaving the Site and the transportation route will be kept free of Site-generated debris. Transportation vehicles leaving the George Road STP will turn left (westbound) onto South Service Road and follow appropriate signage south towards George Road to exit the installation. A map detailing the transportation route is included in Figure 5.</p> <p>Figure 5 created and included as a layout for transportation routes.</p>
BD 4	Page 11 line 2	Change wording “at least two feet of material” to “at least two feet of clean material”	Change wording.	Changed per recommendation.
BD 5	Page 12 Line 34	Change wording “at least two feet of material” to “at least two feet of clean material”	Change wording	Changed per recommendation.