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July 11, 2007

Mr. John Hill
U. S. Air Force Center for Engineering and the Environment
HQ AFCEE/IWP
3300 Sidney Brooks
Brooks City-Base, TX 78235-5112

SUBJECT: Final Remedial Design Work Plan and Design Report for SEAD-16 and SEAD-17 at Seneca Army Depot Activity; Contract FA8903-04-D-8675, Delivery Order 0031, CDRL A004 and A007

Dear Mr. Hill:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the Final Remedial Design Work Plan and Design Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This document includes the Work Plan and Design.

Responses to USEPA comments received on July 5, 2007 on the Draft Final Remedial Design Work Plan and Design Report are included as Appendix C of the subject document. An entire electronic version and paper copy of replacement pages only are provided for your review.

This work was performed in accordance with the Scope of Work (SOW) for Contract No. FA8903-04-D-8675, Task Order No. 0031.

Parsons appreciates the opportunity to provide you with the Work Plan and Design Report for this work. Should you have any questions, please do not hesitate to call me at (617) 449-1405 to discuss them.

Sincerely,

Todd Heino, P.E.
Project Manager

Enclosures

cc: S. Absolom, SEDA (3 paper copies, 1 electronic copy)
K. Hoddinott, USACHPPM (2 paper copies, 1 electronic copy)
C. Boes, USAEC (1 copy, electronic and paper)
T. Battaglia, USACE, NY District (1 copy, electronic and paper)
K. Schnepf, Portage (1 copy, electronic)
Air Force email (letter only)

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July 11, 2007

Mr. Julio Vazquez
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Mr. Kuldeep K. Gupta, P.E.
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Division of Environmental Remediation
Remedial Bureau A, Section C
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Mr. Mark Sergott
Bureau of Environmental Exposure Investigation
Flanigan Square, Room 300
547 River Street
Troy, New York 12180

SUBJECT: Final Remedial Design Work Plan and Design Report for SEAD-16 and SEAD-17 at Seneca Army Depot Activity; Contract FA8903-04-D-8675; DO# 0031; EPA Site ID# NY0213820830 and NY Site ID# 8-50-006

Dear Mr. Vazquez/Mr. Gupta/Mr. Sergott:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit the Final Remedial Design Work Plan and Design Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This document includes the Work Plan and the Final Design. Responses to USEPA comments received on July 5, 2007 on the Draft Final Remedial Design Work Plan and Design Report were forwarded to you on July 9, 2007 and are included as Appendix C of the subject document. An entire electronic version and paper copy of replacement pages only are provided for your review.

The field crew mobilized to the site on Monday, July 9, 2007 to conduct this work.

Should you have any questions, please do not hesitate to call me at (617) 449-1405 to discuss them.

Todd Heino, P.E.
Program Manager

Enclosures

cc: J. Hill, AFCEE
S. Absolom, SEDA
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T. Battaglia, USACE, NY District

US Army Corps of Engineers

Air Force Center for Engineering and the Environment

Seneca Army Depot Activity
Romulus, New York

FINAL
REMEDIAL DESIGN WORK PLAN AND DESIGN REPORT

FOR THE ABANDONED DEACTIVATION FURNACE (SEAD-16)
AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17)
SENECA ARMY DEPOT ACTIVITY

AFCEE CONTRACT NO. FA8903-04-D-8675
TASK ORDER NO. 0031
CDRL A004 and A007

EPA SITE ID# NY0213820830
NY SITE ID# 8-50-006

PARSONS
JULY 2007

FINAL REMEDIAL DESIGN WORK PLAN AND DESIGN REPORT

FOR THE ABANDONED DEACTIVATION FURNACE (SEAD-16) AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17)

SENECA ARMY DEPOT ACTIVITY, ROMULUS, NEW YORK

Prepared for:

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT
BROOKS CITY-BASE, TEXAS

and

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared by:

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Contract Number FA8903-04-D-8675
Task Order No. 0031
CDRL A004 and A007
EPA SITE ID# NY0213820830
NY SITE ID# 8-50-006

July 2007

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
AFCEE	Air Force Center for Environmental Excellence
ARAR	Applicable or Relevant and Appropriate Requirement
AWQS	Ambient Water Quality Standard
BCT	Base Cleanup Team
BOD	Biological Oxygen Demand
BRAC	Base Realignment and Closure
BTE	benzo(a)pyrene toxicity equivalence
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
C&D	Construction and Debris
CAMP	Community Air Monitoring Plan
CAR	Corrective Action Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
cm/sec	centimeters per second
COC	Contaminant of Concern
COR	Contracting Officer's Representative
cPAH	Carcinogenic Polycyclic Aromatic Hydrocarbon
CQP	Construction Quality Assurance Plan
DCE	Dichloroethene
DDESB	Department of Defense Explosive Safety Board
DOT	Department of Transportation
DQO	Data Quality Objectives
ES	Engineering Science, Inc.
ESI	Expanded Site Inspection
FC/MR	Field Change/Modification Request
FD	Final Design
FFA	Federal Facility Agreement
FSP	Field Sampling Plan
ft	foot
ft/ft	foot per foot
GA	NYSDEC groundwater classification suitable as a source for drinking water
GPS	Global Positioning System
HSP	Health and Safety Plan
IAG	Interagency Agreement
IC	Institutional Controls
IDW	Investigation-derived waste
IRIS	Integrated Risk Information System
LUC	Land Use Control
MEC	Munitions and Explosives of Concern
MPPEH	Material Potentially Presenting an Explosive Hazard
MS	Matrix Spike
NAD	North American Datum
NAVD	North American Vertical Datum
NCR	Non-Conformance Report
NPL	National Priorities List
NWI	National Wetlands Inventory
NYCRR	New York Codes Rules and Regulations

ACRONYMS AND ABBREVIATIONS

NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxidation/reduction potential
PAH	Polycyclic Aromatic Hydrocarbon
PCE	Perchloroethene
PCMMP	Post-Closure Monitoring and Maintenance Plan
PD	Preliminary Design
PHSO	Program Health and Safety Officer
PID	Planned Industrial/Office Development
PM	Project Manager
PM1Ø	Particulate Matter >10 microns
POC	Point of Contact
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
ppm	part per million or parts per million
PRG	Preliminary Remediation Goal
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDWP	Remedial Design Work Plan
RI	Remedial Investigation
ROD	Record of Decision
RTK	Real-Time Kinematic
SAP	Sampling and Analysis Plan
SB	Soil Boring
SEAD	Acronym for the Seneca Army Depot used to designate SWMU numbers
SEDA	Seneca Army Depot Activity
sf	square feet
SHARP	Safety, Health, and Risk Program
SHSO	Site Health and Safety Officer
SM	Site Manager
SPDES	State Pollutant Discharge Elimination System
SS	Surface Soil
SVOC	Semivolatile Organic Carbon
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TOC	Table of Contents
TSS	Total Suspended Solids
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Carbon

1.0 INTRODUCTION

1.1 Report Objectives

This remedial design work plan and design report describes the approach to completing the soil, ditch soil, and groundwater remediation at the Abandoned Deactivation Furnace (SEAD-16) and the soil and groundwater remediation at the Active Deactivation Furnace (SEAD-17), located at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York. SEAD-16 and SEAD-17 are two separate distinct sites; however, they are combined in this report since historically they have been combined in all previous investigations, reports, including the Record of Decision (ROD). This report was developed to outline the necessary steps and guidance for completion of the proposed remediation. The design includes the technical specifications and drawings that provide detail to the construction team to complete the remedial action. This document has been prepared for the Air Force Center for Environmental Excellence (AFCEE) under Contract No. FA8903-04-D-8675, Task Order No. 0031.

Traditionally, the work plan and the design report are submitted as separate documents. Based on the schedules and list of deliverables required in the Federal Facility Agreement (FFA) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 120 dated January 21, 1993, the Army developed a schedule to determine if the remedial actions could be completed to meet SEDA's planned land transfer schedule of remedial actions completed by September 2007. The resulting schedule could not be met principally because the remedial design schedule extends beyond one year. As accepted during other recent remedial actions at SEDA, the Army is proposing a more streamlined schedule for remedial design that meets the intent of the FFA. Section 9.2 of the FFA states that "deliverables are not necessarily discrete documents and may be consolidated with other primary documents and/or secondary documents as appropriate." The Army is proposing that the Remedial Design Work Plan (RDWP), the Preliminary Design (PD), and the Final Design (FD) are submitted as one document. Given the relatively simple nature of the remedial action work proposed, preliminary design (30%) will not be significantly different than the 100% final design and is redundant. As such, the RDWP is included in **Section 2** of this document and the PD/FD is presented in **Section 3** through **Section 9**.

1.2 Site Background

Since its inception in 1941, SEDA's primary mission was the receipt, storage, maintenance, and supply of military items. SEDA was proposed for the National Priorities List (NPL) in July 1989. In August 1990, SEDA was finalized and listed under Group 14 on the Federal Section of the NPL. To facilitate resolution of contamination issues at SEDA, the United States Environmental Protection Agency (USEPA), the New York State Department of Environmental Conservation (NYSDEC), and the Army entered into a FFA, also known as the Interagency Agreement (IAG). This agreement stated that future investigations would be based on CERCLA guidelines, and that the Resource Conservation and Recovery Act (RCRA) was considered an Applicable or Relevant and Appropriate

Requirement (ARAR) pursuant to Section 121 of CERCLA. In October 1995, SEDA was designated as a facility to be closed under the provisions of the Base Realignment and Closure (BRAC) process.

SEDA is a 10,587-acre former military facility located in Seneca County near Romulus, New York, which has been owned by the United States Government and operated by the Department of the Army since 1941. A location map for SEDA is shown in **Drawing C-1**. As shown in **Drawing C-1**, SEDA is located between Seneca Lake and Cayuga Lake in Seneca County. **Drawing C-1** also shows that SEDA is bordered by New York State Highway 96 on the east, New York State Highway 96A on the west, and sparsely populated farmland on the north and south.

The Abandoned Deactivation Furnace (SEAD-16) is located in the east-central portion of SEDA. SEAD-16 consists of 2.6 acres of fenced land with grasslands in the north, east, and west, a storage area for empty boxes and wooden debris, and an unpaved roadway in the south. Also on-site is the building which housed the deactivation furnace (Building S-311), a smaller abandoned building known as the Process Support Building (Building 366), two sets of SEDA railroad tracks, and utilities. A map of SEAD-16 is included as **Drawing C-2** in **Appendix A.**

The Active Deactivation Furnace (SEAD-17) is located in the east-central portion of SEDA. SEAD-17 consists of a deactivation furnace building (Building 367) that is surrounded by a crushed shale road. Beyond the perimeter of the crushed shale road is grassland. Two small sheds are located in the eastern portion of SEAD-17, and there is vehicular access to SEAD-17 from an unpaved road to the north. Access to SEAD-17 is restricted because it is located in the former ammunition storage area. A map of SEAD-17 is included as **Drawing C-3** in **Appendix A**.

Both SEAD-16 and SEAD-17 were used for the demilitarization of various small arms munitions. The process of deactivation of munitions involved heating the munitions within a rotating steel kiln. The heat would cause the munitions to detonate once the detonation temperature was reached. The byproducts produced during this detonation were then swept out of the kiln through the stack.

SEAD-16 has been inactive and abandoned since the 1960s. SEAD-17 was constructed to replace the operation of the deactivation furnace at SEAD-16. However, SEAD-17 has been inactive since 1989 as a result of RCRA permitting issues.

1.3 Previous Work

SEAD-16 and SEAD-17 were investigated, and the results were presented in various reports as follows:

- Remedial Investigation, March 1999
- Feasibility Study, July 2001
- Proposed Plan, December 2003
- Record of Decision, March 2006

SEAD-16

The primary constituents of concern at the Abandoned Deactivation Furnace (SEAD-16) are present in the soil and include arsenic, copper, lead, and zinc. Additionally, carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) were detected in discrete locations. The highest concentrations of soil contamination resulted from the operations that were performed within and in close proximity to the Abandoned Activation Furnace Building and the Process Support Building.

Metals (antimony, copper, lead, mercury, and zinc) were found at concentrations greater than the site-specific cleanup standards for soils in portions of the drainage ditches that were investigated at SEAD-16. **Figure 1-1** shows the historical sampling locations and their respective lead concentrations. All metals above clean up goals were co-located with locations where lead exceeded 1250 mg/kg, the site specific clean up goal for lead.

Four metals (aluminum, iron, manganese, and sodium) were detected in the most recent round of groundwater sampling at concentrations that exceeded the NYSDEC Ambient Water Quality Criteria (AWQS) Class GA or Secondary Standard. Thallium was detected in a sample during the last sampling round, but was not detected in the sample's associated field duplicate. All of these exceedances were less than or close to SEDA background concentrations, except for sodium.

SEAD-17

The primary constituents of concern in soil at the Active Deactivation Furnace (SEAD-17) are the metals antimony, arsenic, copper, lead, mercury, and zinc. In all instances, the detected concentrations of metals were found to be highest in those samples collected closest to the Active Deactivation Furnace Building, particularly near the southwestern area near the building.

None of the ditch soil samples exceeded the site-specific cleanup standards. **Figure 1-2** shows the historical sampling locations and their respective lead concentrations. All metals above clean up goals were co-located with locations where lead exceeded 1250 mg/kg, the site specific clean up goal for lead.

Four metals, (aluminum, iron, manganese, and sodium) were detected in the most recent groundwater sampling round at concentrations that exceeded their respective NYSDEC AWQS Class GA standards or Secondary Standards. However, the levels detected were less than SEDA background concentrations.

1.4 Utilities, On-Site Buildings, and Debris

Overhead electrical lines are present along the roads at both sites, but they are outside the limits of work. At SEAD-16, a water main traverses the southwestern portion of the site with a service line leading to the northwestern side of the Building S-311.

There are buildings within the boundary of both the SEAD-16 and SEAD-17 sites. At SEAD-16, the Abandoned Deactivation Furnace within Building 311 was in use between approximately 1945 to the mid-1960s. Small arms munitions, both obsolete and unserviceable, were destroyed by incineration. Generally, the building is in poor condition. The Process Support Building (Building 366) that was used for propellant/powder collection is composed mostly of corrugated sheet metal (southern end) and brick (northern end). The building is mostly dilapidated. This building was used for storage and process support for munitions deactivation that occurred in the furnace located in Building S-311.

At SEAD-17, the Active Deactivation Furnace (Building 367) is a steel rotary kiln incinerator and is enclosed by an eight foot high reinforced concrete wall. The wall does not contain a roof. The concrete wall is intended to contain the effects of a detonation. The facility has not operated since 1989. A small shed, Building 307T, is located in the eastern portion of the site.

At SEAD-16, building material samples were collected during the ESI and RI within the Former Deactivation Furnace (Building S-311) and the Process Support Building (Building 366). Metals, SVOCs, and nitroaromatics were detected above NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046: *Determination of Soil Cleanup Objectives and Cleanup Levels*. Asbestos was detected at 13 locations in the two buildings in materials including pipe insulation, roofing material, and floor tiles.

Munitions debris from past deactivation activities is present at both sites. The presence of this debris will necessitate UXO oversight during construction activities.

1.5 Report Organization

The first section of this report serves as an introduction to the RDWP and the Design Report. **Section 2** consists of the RDWP and includes a summary of project objectives and the remedial design activities. **Section 3** presents the design elements. **Section 4** presents a Field Sampling Plan (FSP). **Section 5** is the Construction Quality Plan (CQP) and **Section 6** includes the Post-Closure Monitoring and Maintenance Plan (PCMMP). **Section 7** is the Waste Management Plan. **Section 8** consists of a land use control remedial design (LUC RD) plan. **Section 9** includes the remedial action schedule and the project team organization. References are provided in **Section 10**.

Appendix A presents the Design Drawings, and **Appendix B** presents the Technical Specifications.

2.0 REMEDIAL DESIGN WORK PLAN

The purpose of this work plan is to identify the preferred remedial design at SEAD-16 and SEAD-17 and to provide a framework for completion of the remedial design. This work plan has been developed in accordance with requirements of the FFA between the USEPA, NYSDEC, and the Army. This work plan also conforms to appropriate USEPA and NYSDEC guidance documents. The work plan describes the elements of the design, the plans, and the technical specifications.

The remedial action objectives and approach to remedial design for this site are outlined in the Record of Decision for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) (Parsons, 2006a). In general, for SEAD-16, the proposed remedial approach consists of excavation, removal, and off-site disposal of metals- and cPAH-impacted soil and metals-impacted ditch soil, and building debris within Buildings S-311 and 366. Groundwater use controls will be established to restrict groundwater use and access until cleanup standards are achieved. Groundwater monitoring will be conducted.

At SEAD-17, surface soils impacted with metals will be excavated and disposed off-site. In addition, the deactivation furnace at SEAD-17 will be demolished and disposed off-site as part of the RCRA closure requirements. Groundwater monitoring will be conducted.

2.1 Remedial Design Goals

The objectives of the remedial design at SEAD-16 and at SEAD-17 are given below:

- Eliminate or minimize the migration of hazardous contaminants from soil to groundwater.
- Prevent ingestion of groundwater containing contaminants in excess of federal and state drinking water standards or criteria, or which pose a threat to public health.
- Prevent off-site migration of contaminants above levels protective of public health and the environment and,
- Restore groundwater and soil to levels that are protective of public health and the environment.

The remedial action objective for the buildings at SEAD-16 is to remediate these buildings to reduce the risk for a future industrial worker. In addition, RCRA closure requirements at SEAD-17 will be addressed through the demolition and disposal of the deactivation furnace and associated structures at the site.

SEAD-16 and SEAD-17 are located in the Planned Industrial/Office Development (PID) Area. The cleanup goals for the SEAD-16 and SEAD-17 have been selected to be protective of future users of the site as an industrial area. Site-specific cleanup goals for SEAD-16 have been established for

cPAHs and metals, and metals only for SEAD-17. The cleanup goals for SEAD-16 and SEAD-17 are discussed as follows and specified in **Table 2-1**.

- cPAHs: The New York State guidance value of 10 ppm benzo(a)pyrene toxicity equivalence (BTE) will be used for cPAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene]. This toxicity equivalence is based on the relative toxicity of the cPAHs, as cited by the USEPA Integrated Risk Information System (IRIS) Database. The BTE concentration is calculated by multiplying the concentration of the seven individual cPAHs in each sample by the following factors (based on IRIS):

benzo(a)anthracene	0.1
benzo(a)pyrene	1
benzo(b)fluoranthene	0.1
benzo(k)fluoranthene	0.01
chrysene	0.01
dibenz(a,h)anthracene	1
indeno(1,2,3-cd)pyrene	0.1

- Metals

  – Lead - The lead clean up goal is 1,250 mg/Kg and was derived in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996) and in concurrence with NYSDEC and USEPA as outlined in the ROD.

  – Other metals - NYSDEC's Soil Cleanup Objectives for restricted industrial use will be used for metals of concern identified in the ROD. These values became effective in 6 NYCRR Subpart 375-6 on December 14, 2006 and are provided in Table 375-6.8(a). There are two exceptions to this assignment. No NYSDEC restricted industrial value has been established for antimony or thallium. Therefore $1/10^{th}$ of the EPA Region IX Preliminary Remediation Goal (PRG) for industrial soil has been adopted as the soil cleanup goal for these two metals. Additionally, the cleanup goal for arsenic was replaced with the SEDA maximum background value since the NYSDEC restricted industrial value for arsenic (16 mg/Kg) was lower than the maximum SEDA site-wide background value.

In achieving these goals, no unacceptable risk at the site will remain for an industrial setting. The remediation area established based upon these goals also captures any soils where levels of metals exceed $1/10^{th}$ of the USEPA Region IX Industrial PRGs, a conservative value protective of industrial receptors.

It should be noted that the surrounding PID area is subject to institutional controls in a separate Proposed Plan and ROD, ["Final Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004) signed on September 30, 2004]. As part of this ROD, groundwater use restrictions will continue until groundwater constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. With USEPA approval, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated.

2.2 Summary of Remedial Design

The remedial activities for SEAD-16 addressed in this work plan are the following:

- Conducting pre-excavation confirmatory sampling around the perimeter of the excavation areas to confirm the limits of excavation;
- Removing, testing, and disposing off-site of the SEAD-16 building debris during building demolition at SEAD-16. (The Army is planning the demolition and disposal of Building S-311 and 366 at SEAD-16 as they are considered unsafe.);
- Excavating up to 275 cy of ditch soil until cleanup standards are achieved;
- Excavating up to 1,760 cy of surface soils until cleanup standards are achieved;
- Excavating up to 67 cy of subsurface soils to a depth of 2 ft. to 3 ft. (areas around SB16-2 and SB16–5) until cleanup standards are achieved;
- Stabilizing excavated soil exceeding the TCLP criteria in order to render non-hazardous, if necessary;
- Disposing of the excavated material in an off-site landfill;
- Grading the excavated areas to prevent ponding of water;
- Conducting one round of groundwater monitoring and evaluating the need for future monitoring;
- Remediating material potentially presenting an explosive hazard and munitions and explosives of concern to meet the Department of Defense Explosive Safety Board (DDESB) requirements for unrestricted use or to put into place land use restrictions as may be required by DDESB;
- Submitting a Completion Report after completion of the remedial action;

- Establishing and maintaining land use controls (LUCs) to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Completing 5-year reviews to evaluate whether the response action remains protective of public health and the environment.

The remedial activities at SEAD-17 addressed in this document are the following:

- Conduct pre-excavation confirmatory sampling around the perimeter of the excavation areas to confirm the limits of excavation;
- Excavating up to 2,590 cy of surface soils and ditch soils until cleanup goals are attained;
- Stabilizing excavated soils exceeding the TCLP criteria in order to render non-hazardous, if necessary;
- Disposing of the excavated material in an off-site landfill;
- Grading the excavated areas to prevent ponding of water;
- Conducting one round of groundwater monitoring and evaluating the need for future monitoring;
- Remediating material potentially presenting an explosive hazard and munitions and explosives of concern to meet the Department of Defense Explosive Safety Board (DDESB) requirements for unrestricted use or to put into place land use restrictions as may be required by DDESB;
- Submitting a Completion Report after completion of the remedial action;
- Establish and maintain LUCs to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Completing 5-year reviews to evaluate whether the response action remains protective of public health and the environment.

Furthermore, the ROD specifies the decontamination or demolition of the SEAD-17 structures that failed to meet closure standards during interim closure at SEAD-17, as part of the RCRA closure of the deactivation furnace at SEAD-17. The Army is planning the demolition and disposal of Buildings 367 and 307T at SEAD-17, since it has been determined it is more cost effective to remove them than clean and sample them.

2.3 Basis of Document

This report is based on information contained in the administrative record, as listed in **Section 10**.

2.4 Remediation Requirements and Criteria

2.4.1 Applicable or Relevant and Appropriate Requirements (ARARs)

Excavation and off-site disposal requirements and criteria include regulatory and disposal facility requirements.

2.4.1.1 Chemical-Specific Requirements

These requirements include the following:

- Transport and disposal of excavated soil and ditch soil to meet Federal and State of New York Department of Transportation requirements and also requirements based on the operation permit held by the disposal location.
- Discharge requirements based on the Seneca County Sewer District No. 2 discharge permit held by the entity to receive any excavation or decontamination water, in compliance with New York State's State Pollutant Discharge Elimination System (SPDES).

2.4.1.2 Location-Specific Requirements

These requirements are associated with protecting existing resources potentially impacted by site remediation activities.

Wetlands are not present at or adjacent to the area encompassed by SEAD-16 or SEAD-17.

Floodplain information was reviewed from the Federal Emergency Management Agency confirming that SEAD-16 and SEAD-17 are not within the floodplain of a 100-year or 500-year flood. Flood insurance rate maps indicate the entire Depot is outside the 100-year floodplain.

USFWS indicated that no federally listed or proposed endangered or threatened species under their jurisdiction are known to exist in the area of SEAD-16 and SEAD-17. The NYSDEC Natural Heritage Program Biological and Conservation Data System identified no known species of special concern living within the Depot property.

2.4.1.3 Action-Specific Requirements

A water quality certification under Section 401 of the Federal Clean Water Act is not needed for this remediation project. Any water in the excavation area will be collected for disposal.

2.4.2 Notification Requirements and Status

While formal permits are not needed for a CERCLA site remediation, any applicable state or local regulatory permit requirements will be met. Such requirements include disposal requirements for off-site disposal operations as well as Seneca County Sewer District No. 2 water discharge requirements. No special local Town of Romulus requirements have been identified that will need to be met other than SEDA security procedures.

2.4.3 Access Needs During Remediation

Access is being obtained from the SEDA in order for the remediation work to be completed. SEAD-16 and SEAD-17 are directly to the south of the main gate. The main gate will be used for access and egress to and from the site.

3.0 DESIGN ELEMENTS

This section provides a summary of design information for each aspect of the remedial action at SEAD-16 and SEAD-17: site preparation, excavation, disposal, restoration, storm water/erosion and sediment control, and water management.

Drawings (**Appendix A**) and technical specifications (**Appendix B**) present the detailed design information that will be implemented. Confirmatory sampling and disposal characterization sampling is described in the site-specific Field Sampling Plan (FSP) in **Section 4**. The Construction Quality Plan (CQP) is included in **Section 5**, and the Post-Closure Monitoring and Maintenance Plan (PCMMP) is in **Section 6**.

3.1 Site Preparation

Site preparation will be required prior to construction activity at SEAD-16 and SEAD-17. As part of this report, specifications are developed for the following activities:

- Mobilization details;
- Support and decontamination areas;
- Identification of off-site disposal facilities;
- Clearing and grubbing requirements;
- Identification of obstructions and utilities, both overhead and underground;
- Control of run-on and run-off measures;
- Storm water and erosion control measures, including establishing temporary silt fencing;
- Protection and abandonment of monitoring wells;
- Construction of equipment and personnel decontamination area;
- Site controls and security; and
- Health and safety requirements.

3.1.1 Mobilization

Field personnel and equipment will be mobilized to the site. The subcontractor will bring all necessary equipment to the site, arrange for the necessary utilities, and obtain all permits needed.

Travel right-of-ways between the excavation site, support zones and equipment/material staging areas will be established and marked. Access and egress routes within the Depot will be identified and posted to direct and enhance traffic flow and to minimize the impact that construction equipment movement has on other activities underway at the Depot.

Any debris located at SEAD-16 and SEAD-17 in the proposed work areas will be removed and disposed in an appropriate off-site facility.

3.1.2 Support and Decontamination Areas

The perimeter of the site and its support zone will be marked using stakes and orange security ("snow") fencing. Entry/exit ways through the security fencing will be placed as required to support needed traffic flow. Parsons currently anticipates that the support area for the SEAD-16 and SEAD-17 activity will be established within the fenced area, but outside of the areas of excavation, at SEAD-16 and SEAD-17. The work support zone will be arranged to facilitate free and logical equipment movement to and from the site of the excavation work within the area, which will enhance safety, security and minimize the likelihood that known site contaminants will be introduced to new areas of the Depot.

A temporary decontamination area will be established adjacent to the area of excavation at both SEAD-16 and SEAD-17. This excavation area has been previously delineated during pre-excavation perimeter sampling efforts and is shown on **Drawings C-4** and **C-5**. All vehicles and personnel exiting the site will pass through the decontamination area prior to site exit to ensure that loose material is not tracked beyond the bounds of the sites or onto Depot and local roads. All vehicles will be inspected by the Site Manager prior to exiting the decontamination area to ensure that cross contamination does not occur. Personnel decontamination procedures are addressed in the Project Safety Plan and Site-Specific Health and Safety Plan for Seneca Army Depot Activity (Parsons, 2006).

3.1.3 Off-Site Borrow

Backfill will not be required for SEAD-16 and -17 due to the shallow depth of excavations (one foot). The ditches at SEAD-16 and SEAD-17 will not require backfill since the depth of excavation (one foot) is shallow and the drainage ditches are routinely cleaned out as part of ditch maintenance to maintain flow capacity. An off-site borrow source will be identified, however, in the event that backfill is needed for the smaller subsurface excavation areas at SEAD-16 or if the surrounding area cannot be adequately graded to prevent ponding. The soil from the borrow source will comply with the borrow source specifications (Section 02223) in **Appendix B**. Specifically, analytical data from the borrow soil must meet the NYSDEC Unrestricted Soil Cleanup Objectives (Table 375-6.8(a)) for VOCs, the site cleanup goals shown in **Table 2-1** for cPAHs and metals.

The procedure to show acceptability of a borrow source for use as backfill at SEAD-16 and SEAD-17, is consistent with NYSDEC's Draft DER-10 Technical Guidance for Site Investigation and Remediation (December 2002) is as follows:

1. Subcontractor identifies a potential borrow source for the SEAD-16/17 project. Subcontractor provides the name of the site owner, the location where the fill was obtained, and a brief history of the site which is the source of the fill.

2. Subcontractor collects one representative sample from the borrow source and submits for the analysis of metals, VOCs, and cPAHs. The results are provided to Parsons, Army, USEPA and NYSDEC.

3. The analysis results must meet the NYSDEC Unrestricted Soil Cleanup Objectives (Table 375-6.8(a)) for VOCs and meet the cPAH and metals cleanup goals in **Table 2-1**.

4. If all results are lower than the requirements, the material is acceptable for use as backfill. If the results are not acceptable, a new borrow source will be located and the process will be repeated. The Army will provide the comparison of backfill results to the acceptability criteria to NYSDEC and USEPA for review prior to accepting the material onsite. The Army will consider the material approved if it meets all of the requirements as discussed above.

5. No additional borrow source samples will be required once the source is approved. The Army will monitor the incoming loads of backfill to document that the fill is free of extraneous debris or solid waste.

3.1.4 Identification and Qualification of Off-Site Disposal Facilities

Samples of the soil and ditch soil to be excavated will be collected and submitted to potential off-site disposal sites for characterization and approval prior to the initiation of the excavation activity. It is currently expected that two samples (one sample per 700 cubic yards (cy)) will be collected from each site and analyzed to satisfy waste management facility requirements, as detailed in **Section 4**. This sampling requirement is based on the disposal facility's review of the historic sampling results at SEAD-16 and SEAD-17. The disposal facility will pre-approve acceptance of the soil based on these data. The disposal characterization sampling will be completed prior to the commencement of construction activities. The disposal samples will be tested for contaminant leaching using the Toxicity Characteristic Leaching Procedure (TCLP) for metals as well as ignitability, corrosivity, and reactivity. The number of samples and the analyses may vary from this Work Plan depending on the requirements of the selected landfill.

Based on previous data, it is not expected that any soil will fail the TCLP limits. In the event that soil does exceed the TCLP, that soil will be stabilized on-site and then disposed as non-hazardous waste. At other SEDA sites, soils that failed TCLP analysis have been stabilized using lime, cement, or other materials that bind the metals within the matrix. The stabilization materials have been added to the

soil piles and mixed with a loader or excavator until additional TCLP analyses show that the soil has been rendered non-hazardous. If the disposal sample passes the TCLP, then the soil from the excavation will be loaded into dump trucks and transported to and disposed in an off-site Subtitle D landfill. Non-hazardous soil and debris will be managed by the subcontractor (to be qualified and designated by Parsons) and will be transported to either the Seneca Meadows Landfill, Waterloo, New York; Ontario County Landfill, Flint, New York; or an equivalent licensed off-site facility for disposal. It is not expected that any materials will be disposed as hazardous waste.

3.1.5 Clearing and Grubbing

The SEAD-16 and SEAD-17 areas are relatively bare with low lying shrubs covering a portion of the areas. Brush overlying the areas will be mulched with a brush hog, left in place, and then removed with the excavated material.

3.1.6 Identification of Obstructions and Utilities

The subcontractor will call UFPO and work with Parsons and the Army to locate and mark utilities and other obstructions in the immediate areas of the excavation site and the supporting work/staging areas. Currently, all power has been disconnected to the buildings on site. The only possible existing power source is the overhead service on the site from where the building power was terminated. All identified utilities within work/staging areas will either be terminated and disconnected, or if necessary, rerouted to ensure that service is not disrupted during site operations.

3.1.7 Control of Run-on and Run-off Waters

The volume of run-on and run-off at these sites is expected to be minimal due the relatively flat topography of the site. However, measures will be taken to ensure that any run-on or run-off at the site is managed appropriately. Run-on waters in the excavation area will be controlled by installing berms and/or ditches to divert storm waters around the areas of excavation. Berms will be placed upgradient of open excavation areas as work proceeds. These berms will be constructed of clean soil or hay bales. The location of berms will be determined in the field after assessing conditions. Run-off waters will be collected within the excavation area through use of berms or hay bales and will be allowed to infiltrate or evaporate. Water collection will not be required.

All run-on, run-off, and erosion control measures will be inspected daily and repaired as necessary. Water management and control measures will be constructed throughout the project duration and will be adjusted as field conditions warrant.

3.1.8 Erosion and Sedimentation Control

Temporary erosion and sedimentation controls, such as silt fencing, hay bales, or soil berms, will be installed as required during operations to prevent migration of sediments and erosion. Prior to

beginning any excavation work, temporary silt fencing (Specification Section 02370) will be erected, which will surround the downgradient sides of disturbed areas to prevent contaminated sediment transport. The temporary silt fencing will be maintained throughout the project and will not be removed until permanent vegetation has been re-established. In addition, storm water from up gradient locations will be routed away from exposed materials, and storm water contact of exposed material with storm water will be minimized to the extent practical. Any temporary erosion control measures will be removed following remediation so as to return drainage patterns to their general conditions prior to remediation. The final grade will be based on restoring site drainage. **Drawings C-4** and **C-5** shows where temporary silt fencing will be erected.

3.1.9 Protection of Monitoring Wells

Of the seven monitoring wells present at SEAD-16, four of them are located within the proposed excavation area. MW16-3, MW16-4, MW16-6 and MW16-7, which exist within the limits of excavation, will be protected during remediation activities by placing visible barriers around them. All seven wells present at the site will be included in the Post Closure Monitoring and Maintenance Plan described in **Section 6.**

All four monitoring wells present at SEAD-17 are outside of the limits of excavation and will be protected during remediation activities by placing visible barriers around them, as they are included in the Post Closure Monitoring and Maintenance Plan.

3.1.10 Abandonment of Monitoring Wells

All existing wells at SEAD-16 and SEAD-17 will be monitored in accordance with the Post-Closure Monitoring and Maintenance Plan (**Section 6**). If during construction, a well is damaged, or if based on the first round of groundwater sampling results the well is no longer needed, the well will be decommissioned in accordance with NYSDEC's guidance document "Groundwater Monitoring Well Decommissioning Procedures" (Pirnie, 1996). The procedure for well abandonment is outlined in the "Monitoring Well Abandonment Work Plan" for the Seneca Army Depot (Parsons, 2005b). Monitoring wells damaged during construction shall be replaced.

3.1.11 Site Controls and Security

SEAD-16 and SEAD-17 are located within the Depot which is surrounded by a fence with locked gates. The Army will provide site access to the field team prior to and during construction activities. Site security is necessary to prevent exposure of unauthorized, unprotected individuals to the work area. The area immediately surrounding the work area will be clearly marked through the use of signs, barrier rope, tape, or fencing.

Site security will be enforced by the Site Health and Safety Officer (SHSO) or a designated alternate who will ensure that only authorized personnel are allowed in the work area. This person will also ensure that entry personnel have the required level of personal protective equipment (PPE), are

trained under the requirements of 20 Code of Federal Regulations (CFR) 1910.120, and are on a current medical monitoring program.

All visitors to the work site are required to report to the Site Manager (SM) and/or the SHSO as soon as they arrive on site. The presence of visitors on site will be recorded in the field logbook, including the visitor's name, company, date, time, and activities performed while on site.

3.1.12 Health and Safety

All field activities conducted during the remedial action will be performed in accordance with the site-specific health and safety plan (HSP), "Project Safety Plan and Site-Specific Health and Safety Plan for Seneca Army Depot Activity PBC II" (Parsons, 2006b) in accordance with Parsons' Safety, Health, and Risk Program (SHARP) Manual. All subcontractors will review Parsons' HSP and develop their own HSP written specifically for remedial design activities. The HSP will protect site workers through the identification, evaluation, and control of health and safety hazards.

3.2 Building Demolition

Building S-311, the former deactivation furnace, and Building 366, the Process Support Building, at SEAD-16 and Building 367, the active deactivation furnace, and Building 307T at SEAD-17 will be demolished. The Army is planning the demolition and disposal of Building S-311 and 366 at SEAD-16 as they are considered unsafe. Prior to this effort, floor sweepings and debris from the buildings will be tested and disposed in an appropriate manner. This will prevent the floor debris from being mobilized during demolition. Any asbestos containing material will be handled and disposed in accordance with applicable State and Federal laws.

Although decontamination of Building 367 at SEAD-17 is prescribed in the ROD in order to meet RCRA requirements, the Army has elected to remove this building since it will be more cost effective to remove it rather than decontaminate the building. Building 307T is no longer being used at the Depot and the Army has elected to remove this building.

3.3 Excavation and Disposal of Soils and Ditch Soils

The excavation and removal of soil at SEAD-16 and SEAD-17 is the main remedial activity stated in the ROD. The following outlines the aspects of excavation described in this section.

- Pre-excavation activities including perimeter sampling and surveying;
- Excavation of soil and ditch soil;
- Soils and excavated material loading;
- Dust control and air monitoring measures; and

- Confirmatory sampling.

3.3.1 Pre-Excavation Activities

Perimeter Sampling

The horizontal limits of excavation at both SEAD-16 and SEAD-17 were verified by collecting perimeter samples prior to the remedial action (April and May 2007). RI data did not adequately define the southeastern boundaries of contamination at SEAD-16 and SEAD-17; therefore, additional pre-excavation perimeter samples were required. Pre-excavation confirmatory sampling was completed at both SEAD-16 and SEAD-17 and the limits of excavation are fully delineated by the pre-excavation samples in combination with RI data. Details of the numbers of samples and the locations are provided in **Section 4**. Perimeter samples were collected as described in **Section 4.3.1** of the Field Sampling Plan. Analytical results from the confirmatory sampling were compared to the site-specific cleanup goals, summarized in **Table 2-1**. The data set of perimeter samples meets the cleanup goals. By conducting perimeter sampling prior to the excavation, the boundary of excavation is predetermined and post-excavation confirmatory sampling around the perimeter is not necessary. A summary of the number of perimeter samples collected, their locations, and the analytical results are included in **Section 4.3.1**.

Survey

Before excavation commences, Parsons will survey and stake the perimeter of the excavations as shown on **Drawings C-4** and **C-5**.

3.3.2 Excavation of Soil and Ditch Soil

Soils within the areas of excavation will be excavated to a depth of 1 foot, as stated in the ROD, to the staked limits, or as directed by the Site Manager based on the results of confirmatory samples as discussed in **Section 4**. The one-foot excavation depth will not apply to paved areas or areas adjacent to the railroad tracks. For paved areas, the pavement will be swept clean and removed. Confirmation sampling will be performed directly beneath the pavement since the pavement is intact and pre-dates the operation of the furnaces. For areas adjacent to the railroad tracks, excavation depths will not exceed the depth needed to maintain the structural integrity of the tracks.

Two areas at SEAD-16 denoted in **Drawing C-4** will require deeper excavation: the area around SB16-2 (excavation to 2 feet) and the area around SB16-5 (excavation to 3 feet).

The horizontal excavation limits are based on the results of pre-excavation perimeter soil samples shown on **Figures 4-1** and **4-2** and historic RI data. Vertical confirmatory sampling, described in **Section 4,** will be performed to ensure that all cleanup goals have been met.

The approximate excavation volumes based on estimates in the ROD for the two sites are as follows:

- SEAD-16 ditch soil – up to 275 cy
- SEAD-16 surface soils – up to 1,760 cy
- SEAD-16 subsurface soils – up to 67 cy based on an excavation depth of 2 ft. to 3 ft. at SEAD-16 (areas around SB16-2 and SB16–5)
- SEAD-17 surface soil - up to 2,590 cy

A total of up to 4,692 cy of soil and ditch soil will be removed. This estimate is based on the volume provided in the ROD. The actual final volume of soil and ditch soil excavated will be contingent on the confirmatory soil sample results. All soil and crushed rock surfaces will be removed to a depth of one foot using an excavator equipped with a slope bucket. At SEAD-16, railroad tracks will remain; soil will be removed up to the edge of the track beds to a depth that does not compromise the integrity of the tracks. Any asphalt encountered will be broken up as it is removed.

3.3.3 Soil and Waste Material Loading

The excavator will move the newly excavated soil towards a temporary staging area within the impacted area to be excavated, located adjacent to the truck load-out area. The excavated soil will be directly loaded from the temporary staging area into the dump trucks for transportation to the appropriate off-site waste management facility selected as described in **Section 3.1.4** above. It is not anticipated that soil will be stockpiled in a permanent staging area prior to being transported off-site; however, in the event that temporary soil staging areas are required, soils will be temporarily placed in piles lined with 6 mil polyethylene sheeting. All vehicles exiting the site will pass through the decontamination area adjacent to the areas of excavation prior to site exit to ensure that loose material is not tracked beyond the bounds of the sites or onto Depot and local roads, and they will be inspected by the Site Manager prior to exiting the decontamination area to ensure that cross contamination does not occur.

Any debris including railroad ties and oversized pavement at the site will be disposed in an off-site landfill and disposed as C&D. A Waste Management Plan is included in **Section 7**.

3.3.4 Dust Control and Air Monitoring Measures

Water will be utilized to keep haul roads wet to control dust in active areas. Polyethylene sheeting will also be utilized as a barrier on exposed material to control emissions. An air monitoring plan has been developed to protect the workers involved in the construction at SEAD-16 and 17. Public health and safety is ensured by monitoring within the work zone and creating an exclusion zone surrounding the construction area at each site. The air monitoring will be conducted in accordance with the air monitoring program outlined in Section A8 of the HSP (Parsons, 2006b). In addition, perimeter air

monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP). Based on requirements specified in the NYSDOH CAMP, the perimeter air monitoring program will consist of respirable airborne dust particulates (particulate matter less than 10 microns – PM10). Although the CAMP also requires real-time perimeter measurements for total VOCs, such monitoring is not applicable at SEAD-16 and SEAD-17 since VOCs are not contaminants of concern at these sites.

3.3.5 Confirmatory Sampling

Confirmatory samples will be collected from the excavation bottom as described in the Field Sampling Plan (FSP) included as **Section 4.** Pre-excavation confirmatory sampling described in **Section 3.3.1** was conducted around the perimeter of the excavation at both sites prior to excavation activities in April and May 2007. **Section 4** describes the frequency and layout of the confirmatory samples, as well as a summary of the sample collection information and results of the perimeter sampling. Analytical results from the confirmatory sampling will be compared to the site-specific cleanup goals, summarized in **Table 2-1**. If a confirmatory sample exceeds the cleanup goals, additional excavation will be completed in the area and a new sample will be collected.

3.4 Transport of Excavated Soil and Other Materials

Excavated soil will be loaded for transport. Non-hazardous soil and debris will be loaded into separate Department of Transportation (DOT) approved dump trucks and/or dump trailers for transportation to the disposal facility.

Representatives of the transportation companies will be required to attend an orientation prior to hauling the excavated soil off-site. The orientation will cover:

- Traffic patterns
- Haul and disposal procedures
- Project safety issues
- Documentation issues
- Communication issues
- SEDA specific issues

The orientation will be summarized in a handout that will be expected to be passed along to each driver involved with the hauling activities. The transportation company will be required to document that pertinent information was delivered to each driver, or drivers will not be loaded.

Coordination of the off-site disposal activities will be done by the Site Manager. Each load will be tracked utilizing a worksheet provided to them as they arrive at SEDA. The worksheet will record:

- Transportation Company
- Arrival time/date
- Truck No.
- Trailer No.
- Driver's name
- Material to be loaded
- Site name/Excavation No.
- Time loaded
- Decon – Yes
- Tarped – Yes
- Release time
- Destination
- BOL/Manifest No

All shipments to off-site facilities will be tracked utilizing the worksheet and a Parsons-developed database. The database allows for easy cross-referencing, reporting, and quantifying.

Prior to leaving an excavation area, each truck will pass through the decontamination area located adjacent to the area of excavation for decontamination and inspection. Gross levels of contamination to the outside of the vehicle and tires will be swept or removed using other methods.

3.5 Backfilling

Due to the shallow depth of excavation, backfilling of the excavation areas is not anticipated. The excavation area will be graded and blended into the surrounding grade. However, portions where deeper excavation is performed and areas where additional soil may be needed to achieve an even grade may require additional soil. Parsons will verify that each of the final confirmatory samples meets the site specific cleanup goals prior to backfilling. Confirmatory sampling will be performed in accordance with the FSP presented in **Section 4**. Soil for backfilling will be obtained from a borrow source, if needed. Parsons will verify that the borrow soil documentation meets the site cleanup goals by reviewing results of sampling conducted by the subcontractor. Soil compaction will be achieved by three passes of a dozer.

3.6 Site Restoration and Demobilization

The area at SEAD-16 and SEAD-17 is relatively flat and consists primarily of asphalt, gravel and railroad tracks at SEAD-16, and gravel and low brush at SEAD-17. Excavations at SEAD-16 and SEAD-17 will be shallow (one foot), with the exception of two small areas (SB16-2 and SB16-5). Efforts will be made after the remedial action to grade the site such that general topography of the site matches the pre-existing grade and to ensure that no water collection and ponding occur. Disturbed areas at SEAD-16 and SEAD-17, both within and outside the areas of excavation, that were vegetated prior to the remedial action will be seeded to promote vegetation and to prevent erosion. In areas that were originally gravel or asphalt, if soil exists under the layer of gravel or asphalt that is removed, these areas will be re-vegetated to prevent erosion of the area. It is possible that deeper layers of gravel or hardstand exist under the layer removed during remediation. If this is the case, the area will not be re-vegetated since erosion in this area will not be a concern.

Silt fence, hay bales, berms, and ditch checks installed to prevent erosion will be replaced or repaired, as required. These erosion and run-off controls will remain in place until post-construction inspections confirm that vegetation has been established in disturbed areas. Other drainage control features, such as berms disturbed by site operations will be restored to functioning condition.

Demobilization activities include the following:

- All equipment and materials, including the decontamination pad, the frac tank, and site trailers, will be demobilized;
- A final inspection and housekeeping sweep of the work areas will be completed. All trash and waste materials will be removed; and
- All field personnel will be demobilized from the site. The shoulders of the road will be dressed and the adjacent roads will be returned to the condition as existed prior to the commencement of construction. Final topography will be recorded so as-built drawings can be produced.

4.0 FIELD SAMPLING PLAN

4.1 Introduction

This Field Sampling Plan (FSP) describes the approach to completing the soil and water sampling necessary to complete the remediation at SEAD-16 and SEAD-17. The remediation at SEAD-16 and SEAD-17 entails the excavation and disposal of soil and ditch soil. The sampling proposed in this FSP has been designed to provide the information necessary (1) to confirm the removal of all soils exceeding site cleanup goals at SEAD-16 and SEAD-17; (2) for acceptance of off-site fill; and (3) to characterize excavated soils and debris for disposal. In addition, waste residuals generated during sampling and air monitoring requirements are discussed. Project specific data quality objectives (DQOs) for sampling are described throughout this section. Groundwater sampling as part of long-term groundwater monitoring is discussed in the Post-Closure Monitoring and Maintenance Plan (PCMMP) in **Section 6** of this report.

The work covered in this plan encompasses confirmatory soil sampling of the excavations, fill material sampling, sampling of water; disposal characterization sampling; and other miscellaneous sampling requirements. For each type of work, this FSP specifies the following:

- Types of sampling required;
- Number of required samples;
- List of required analyses;
- Acceptance criteria for analytical results; and
- Sample labeling and recording system.

This FSP is supplemented by the "Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP)" (Parsons, 2006c). This SAP was provided to the agencies under separate cover. The SAP specifies the following:

- Data quality objectives;
- Specific field sampling procedures;
- Sample custody and management;
- QC sample collection;
- Analytical methods;
- Data validation;
- Laboratory analytical requirements;
- Data management and evaluation;
- Performance assessment and system audits; and
- Preventative maintenance.

4.2 Task Description

The tasks required to complete field sampling for SEAD-16 and SEAD-17 are presented in this section. Field sampling details are presented in **Section 4.3**.

4.2.1 Confirmatory Sampling of Excavations

Confirmatory sampling is required to ensure that only soils having constituents of concern below the clean up goals listed in **Table 2-1** remain at the site after remediation. At SEAD-16, the areas surrounding soil borings SB16-2 and SB16-5 will be excavated to a depth of 2 to 3 ft, shown on **Figure 4-1**. All other areas shown on the figure, including drainage ditches, will be excavated to a depth of one foot or until cleanup goals have been met. At SEAD-17, all excavation areas shown on **Figure 4-2** will be excavated to a depth of one foot or until cleanup goals have been met. Confirmatory samples will verify that both the lateral extent (perimeter samples) and vertical extent (floor samples) of impacted soils/ditch soils have been removed.

The lateral extent of contamination was determined through the collection of pre-excavation perimeter confirmatory sampling conducted on April 4, 2007 and May 3, 2007. Locations of samples collected on these dates with respective lead results and new limits of excavation based on these results are shown in **Figures 4-3 and 4-4**. Further discussion of these results and the perimeter sampling data set is in **Section 4.3.1** below. These limits of the excavation are also shown on **Drawings C-4** and **C-5** and will be staked by the Site Manager.

To confirm that the vertical extent of impacted soils was removed, floor samples will be collected after excavation has been completed to the staked limits. Samples will be tested for compliance with the site-specific cleanup goals as listed in **Table 2-1**. The analytical results of the confirmatory sampling will determine if the excavation is complete or if more soil must be removed.

4.2.2 Fill Material Sampling

An off-site borrow pit will be designated as a source of fill material for the project, should it be needed. One sample of material from the pit will be collected for characterization to determine that VOCs meet the NYSDEC Unrestricted Soil Cleanup Objectives (Table 375-6.8(a)), and that cPAHs and metals meet the site cleanup goals.

4.2.3 Disposal Characterization Sampling

For disposal characterization, the disposal facility requires that one composite sample will be collected for every 700 cy at each site (two soil samples per site) and submitted for analysis. This sampling requirement is based on the disposal facility's review of the historic sampling results at SEAD-16 and SEAD-17. The disposal facility will pre-approve acceptance of the soil based on these data. The disposal characterization sampling will be completed prior to the commencement of construction activities. The samples will be analyzed for TCLP metals, ignitability, pH, and

reactivity. The specifics of the number of samples and the analyses may vary from this Work Plan depending on the requirements of the selected landfill.

Based on previous data, it is not expected that any soil will fail the TCLP limits. In the event that soil does exceed the TCLP, that soil will be stabilized on-site and then disposed as non-hazardous waste. Soils that failed TCLP analysis at other SEDA sites have been stabilized using lime, cement, or other materials that bind the metals within the matrix. The stabilization materials have been added to the soil piles and mixed with a loader or excavator until additional TCLP analyses show that the soil has been rendered non-hazardous.

In addition to soil sampling, building debris from SEAD-16 will be tested for TCLP metals and SVOCs at a frequency of one sample per 700 cy. The location of asbestos containing materials within the Buildings at SEAD-16 and SEAD-17 has been predetermined. Notification, handling and disposal of this material will be done in accordance with applicable State and Federal laws.

If the disposal sample passes the TCLP, then the soil from the excavation will be loaded into dump trucks and transported to and disposed in an off-site Subtitle D landfill. Non-hazardous soil and debris will be managed by the subcontractor and will be transported to either the Seneca Meadows Landfill, Waterloo, New York; Ontario County Landfill, Flint, New York; or an equivalent approved licensed off-site facility for disposal. It is not expected that any materials will be disposed as hazardous waste.

4.2.4 Waste Residuals

Waste residuals generated during the field sampling activities, including disposable sampling tools, plastic sheeting, and disposable personal protective equipment will be bagged and disposed in an on-site trash dumpster. Waste residuals are discussed further in **Section 7**.

4.2.5 Air Monitoring

An air monitoring plan has been developed to protect the workers involved in the construction at SEAD-16 and SEAD-17. Public health and safety is ensured by monitoring within the work zone and creating an exclusion zone surrounding the construction area at each site. The air monitoring will be conducted in accordance with the air monitoring program outlined in Section A8 of the Project Safety Plan and Site-Specific Health and Safety Plan for Remediation of the Seneca Army Depot (Parsons, 2006b). In addition, perimeter air monitoring will be conducted in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). Based on requirements specified in the NYSDOH CAMP, the perimeter air monitoring program will consist of real-time perimeter measurements for respirable airborne dust particulates (particulate matter less than 10 microns – PM_{10}). Although the CAMP also requires real-time perimeter measurements for total VOCs, such monitoring is not applicable at SEAD-16 and SEAD-17 since VOCs are not contaminants of concern at these sites.

4.3 Field Sampling Detail

This section provides a detailed description of the field activities that were outlined in the previous section. The SAP (Parsons, 2006c) includes a detailed description of the analytical program, including sample custody, sample management, and data validation. Specifics for this project are provided below. Quality control (QC) sample requirements are outlined in **Tables 4-1** through **4-3**, in accordance with the SAP.

4.3.1 Pre-Excavation Perimeter Confirmatory Sampling

Sampling of the excavation perimeter prior to commencement of the remedial action was performed to delineate a boundary for the area to be excavated, and to demonstrate that site-specific cleanup goals are achieved at that boundary.

4.3.1.1 Sample Collection

Pre-excavation perimeter sampling was conducted on April 4, 2007 and May 3, 2007. Sampling was conducted as an iterative process. During the first sampling event (April 4, 2007), samples were collected around the area of excavation derived from the results of the RI. Since some sample results did not meet clean up goals, the area of excavation was expanded and additional samples were collected at the perimeter during the second sampling event (May 3, 2007). These samples were collected such that a sample represented each 50-foot length of the perimeter for each site. The samples collected during the April and May 2007 sampling events are shown in **Figures 4-3 and 4-4**.

A subset of the samples collected during the April and May 2007 sampling events were combined with historic samples that bordered the area of excavation to comprise the perimeter confirmatory sampling set. **Table 4-4a and 4-4b** provides a list of all the samples in this data set and their results. **Figures 4-1** and **4-2** show the location of the perimeter confirmatory dataset as well as additional RI data located further outside of the perimeter of the excavation limits.

Three historic samples collected during the RI (SS16-25, SS16-13, and SS16-28) at SEAD-16 and nine historic RI samples (SS17-16, SS17-20, SS17-19, SS17-28, SS17-12, SS17-24, SS17-26, SS17-31, and SS17-34) at SEAD-17 were used as part of this perimeter confirmatory sample set.

The number of perimeter samples compared to the number required is summarized in the following table.

SEAD-16 Perimeter Sample Collection

	No. Samples Collected				No. Required Perimeter Samples Based on the Perimeter Length (Table 4-1a)	Sufficient No. of Samples?
	RI	Pre-excavation	Post-excavation	Total		
Main Area	3	19	5	27	22	YES
MW16-6 Area		2	1	3	2	YES
SS16-35 Area		4	0	4	4	YES
Ditch Ends		3	1	4	4	YES
Total	**3**	**28**	**7**	**38**	**32**	YES

The details in this summary table indicate that the pre-excavation sample collection along with seven samples that will be collected post-excavation will meet the required frequency for perimeter sampling at SEAD-16. **Figure 4-1** shows the location of the seven perimeter confirmatory samples that will be collected post-excavation. They are located at the southeast end of Ditch #3, to the south east of area MW16-6, and five additional samples are generally evenly distributed around the main excavation area.

SEAD-17 Pre-Excavation Sample Collection

	No. Samples Collected				No. Required Perimeter Samples Based on the Perimeter Length (Table 4-1a)	Sufficient No. of Samples?
	RI	Pre-excavation	Post-Excavation	Total		
SEAD-17	9	20	5	34	24	YES

The data in this summary table indicate that the pre-excavation sample collection met the required frequency for perimeter sampling at SEAD-17. An additional five perimeter confirmatory sampling will be collected, as shown of **Figure 4-2**.

Perimeter samples were not collected along the boundary of Building S-311 and 366 at SEAD-16 or along the boundary of Building 367, since the excavation will extend to the base of the building.

The perimeter samples also included samples collected to determine the downgradient endpoint of each ditch excavation. A sample was not collected from a ditch end if (1) the ditch end is encapsulated by a soil excavation area in which case it will be removed as part of the main excavation area regardless of the presence or absence of contaminants or (2) the upgradient end of the ditch since there is no surface water flow to transport sediments beyond this end. Perimeter samples are not required around ditch sides since the entire width of the ditch will be excavated.

Samples at SEAD-16 and SEAD-17 were collected using disposable sampling scoops and following procedures outlined in the SAP. QC samples were collected in accordance with the SAP and as outlined below and on **Tables 4-1b** and **4-3**.

4.3.1.2 Sample Analysis

All perimeter confirmatory soil samples collected from SEAD-16 were analyzed for the following:

- Metals by USEPA SW846 Method 6010B
- Mercury by USEPA SW846 Method 7471A

Two confirmatory samples, 16EXPR-G4-01 and 16EXPR-G5-01, (areas where cPAHs were elevated), shown on **Figure 4-1,** were also analyzed for:

- cPAHs by USEPA SW846 Method 8270C.

The confirmatory samples collected at SEAD-17 were analyzed for:

- Metals by USEPA SW846 Method 6010B
- Mercury by USEPA SW846 Method 7471A.

These analytes are listed in the ROD and presented in **Table 2-1** as the COCs that have established cleanup goals. The data set of 31 perimeter confirmatory samples collected at SEAD-16 and the data set of 29 perimeter confirmatory samples collected at SEAD-17 and discussed in **Section 4.3.1.1** met the cleanup goals in **Table 2-1**. A summary of the results are presented in **Table 4-4**.

At SEAD-17, lead was detected above the cleanup goal at sample 17EXPR-F7-02 (1,480 mg/Kg) as well. The limit of excavation is set at least 20 feet outside of that sample, and the ProUCL recommended UCL of the mean for lead in the SEAD-17 data set is 747 mg/Kg, well below the 1250 mg/Kg cleanup goal.

The required reporting limits for each COC are listed alongside the project cleanup goals in **Table 4-2**. Sampling frequency and required parameters are presented in **Table 4-3**.

4.3.1.3 Sample Numbering

As a means to track the location of confirmatory samples, 50-foot by 50-foot grids will be laid out over the excavation areas as shown in **Figure 4-1** and **Figure 4-2**. Sample labels were associated with the grid in which the sample is located. For example, perimeter confirmatory samples will be labeled as follows:

16EXPR-ZZ-XX or 17EXPR-ZZ-XX

The first two numbers note the SEAD number (16 or 17). EX designates that the sample is from an excavation. PR denotes a sample collected from the perimeter of the excavation area. ZZ is the grid name. XX is the sample number.

For example, a perimeter sample collected from that grid C10 would be labeled 16EXPR-C10-01. Every label is unique. The perimeter samples collected area shown on **Figures 4-1** and **4-2**.

4.3.2 Post-Excavation Confirmatory Sampling

Sampling of excavations will be performed to show that excavation is complete, site-specific cleanup goals are met, and site restoration can begin.

4.3.2.1 Sample Collection

The number and type of confirmatory samples required at SEAD-16 and SEAD-17 are summarized in **Tables 4-1a and 4-1b**. After excavation, confirmatory samples will be collected from the floor of the excavation at a frequency of one sample per 2,500 square feet (sf). If the edge of excavation extends 2 feet or more below the adjacent ground surface, a sidewall sample will be collected at a depth halfway between the ground surface and the floor of the excavation, or at a location that appears contaminated based on visual or olfactory observations. Sidewall sample frequency will be one for every 50-foot length of excavation sidewall. Each confirmatory sample will be collected as a grab sample from a unique location.

Figure 4-1 shows the sampling grid for floor confirmatory samples at SEAD-16. Based on the area of excavation shown, it is anticipated that confirmatory sampling for SEAD-16 will consist of at least 23 samples from the excavation floor. These samples include the area under the soil staging area located within the excavation area, shown in **Drawing C-4** for SEAD-16. In addition, 8 sidewall and 2 floor samples will be collected from the excavation limits close to SB16-2 and SB16-5 (see **Figure 4-1**) and 1 floor sample will be collected from the area around surface soil location SS16-35 (not contiguous with the main excavation area) and another from the area surrounding MW16-6.

For the SEAD-16 ditch excavation, confirmatory samples will be collected from the floor of the ditches at a frequency of one sample every 50 linear feet. Perimeter samples along the ditch sides will not be collected since the entire width of the ditch will be excavated. One perimeter sample will be collected on the downgradient end of each ditch (three of which were collected during pre-excavation sampling efforts). Sidewall samples will not be collected due to the shallow depth (one foot) of the excavation. Based on the ditch lengths shown in **Figure 4-1**, an estimated 7 confirmatory samples will be collected from the floor of the four ditches.

In total, an estimated 34 floor, 7 perimeter, and 8 sidewall confirmatory samples will be collected post excavation at SEAD-16.

Figure 4-2 shows the proposed spacing and location of the confirmatory samples at SEAD-17. At SEAD-17, confirmatory samples will be collected from the floor of each excavation at a rate of at least one sample per every 2,500 sf, or fraction thereof, of surface area. These samples include the area under the soil staging area located within the excavation area, shown in **Drawing C-5** for SEAD-17. Sidewall samples will not be collected since the excavations are only one foot deep. It is

anticipated, based on the area of excavation shown in **Figure 4-2**, that 33 floor samples and 5 perimeter samples will be collected from the main excavation at SEAD-17.

Samples at SEAD-16 and SEAD-17 will be collected from the interior of the excavations using disposable sampling scoops. Samples will be collected following procedures outlined in the SAP. QC samples will be collected in accordance with the SAP and as outlined below and on **Table 4-1b**.

4.3.2.2 Sample Analysis

All confirmatory soil samples collected from SEAD-16 will be analyzed for the following:

- Metals by USEPA SW846 Method 6010B
- Mercury by USEPA SW846 Method 7471A

Confirmatory samples in the area of grids G4 and G5 (areas where cPAHs were elevated), shown on **Figure 4-1,** will also be analyzed for:

- cPAHs by USEPA SW846 Method 8270C.

The confirmatory samples collected at SEAD-17 will be analyzed for:

- Metals by USEPA SW846 Method 6010B
- Mercury by USEPA SW846 Method 7471A.

These analytes are listed in the ROD and presented in **Table 2-1** as the COCs that have established cleanup goals. If the site-specific cleanup goals are not met, additional excavation will be performed based on visual observations and best professional judgment by the field engineer, and additional confirmatory samples will be collected based on the frequencies discussed above. The required reporting limits for each COC are listed alongside the project cleanup goals in **Table 4-2**. Sampling frequency and required parameters are presented in **Table 4-3**.

4.3.2.3 Sample Numbering

As a means to track the location of confirmatory samples, 50-foot by 50-foot grids will be laid out over the excavation areas as shown in **Figure 4-1** and **Figure 4-2**. Sample labels will be associated with the grid in which the sample is located. For example, confirmatory samples from SEAD-16 will be labeled as follows:

16EXYY-ZZ-XX or 17EXYY-ZZ-XX

The first two numbers note the SEAD number (16 or 17). EX designates that the sample is from an excavation. YY designates the type of sample: “FL” denotes a sample collected from the floor of the

excavation, "PR" denotes a sample collected from the perimeter of the excavation, and "SW" denotes a sample collected from the sidewall. ZZ is the grid name. XX is the sample number.

For example, a floor sample collected from grid C10 would be labeled 16EXFL-C10-01.

Every label will be unique. In the field, the engineer will keep a log of the sample locations and sketch a diagram of sampling grids and the sample locations.

4.3.3 Fill Material Sampling

It is not anticipated that fill material from an off-site borrow pit will be necessary at SEAD-16 and SEAD-17. However, in the event it is needed, fill material will be sampled to determine if it meets the NYSDEC Unrestricted Soil Cleanup Objectives (Table 375-6.8(a)) for VOCs and the site cleanup goals for cPAHs and metals, prior to acceptance. The subcontractor will provide Parsons with a sample that Parsons will analyze. Results must indicate that the soil is below the acceptance criteria in order to be approved as fill.

4.3.3.1 Sample Collection

The subcontractor will submit a representative sample from the borrow pit and provide the analytical results for comparison to acceptance criteria. One sample will be collected from the backfill prior to use.

4.3.3.2 Sample Analysis

The soil sample will be submitted by Parsons for analysis for VOCs, cPAHs, and metals. Analytical data from the borrow soil must be below the NYSDEC Unrestricted Soil Cleanup Objectives (Table 375-6.8(a)) for VOCs, and below the site cleanup goals for cPAHs and metals.

If any of these criteria are not met, the borrow pit will be rejected as a source of fill material for the project.

4.3.3.3 Sample Designation

The fill material will be designated as follows:

16FM-SPXYY or 17FM-SPXYY

The first two numbers note the SEAD number (16 or 17) where the fill is to be used. FM indicates that the sample is fill material. SPX is the number of the source pit, assigned sequentially (e.g., SP1). YY is the sample number.

4.3.4 Disposal Characterization Sampling

For disposal characterization, the disposal facility requires that one composite sample be collected for every 700 CY of soil and debris at each site and submitted for analysis. This sampling requirement is based on the disposal facility's review of the historic sampling results at SEAD-16 and SEAD-17. The samples will be collected prior to the initiation of excavation activities. Disposal characterization samples will be collected and analyzed to determine if the excavated soils can be disposed as non-hazardous waste. The specifics of the number of samples and the analyses may vary from this Work Plan depending on the requirements of the selected landfill.

4.3.4.1 Sample Collection

At SEAD-16, one composite sample for every 700 CY of soil (two samples total) will be collected from grab samples taken from the areas to be excavated. At SEAD-17, one composite sample for every 700 CY (two samples total) of soil will be collected from grab samples taken from the areas to be excavated. Each sample will be composited. The samples will be collected prior to the initiation of excavation activities. In addition, one composite sample of every 700 CY of building debris from SEAD-16 will be collected for disposal characterization.

4.3.4.2 Sample Analysis

Each soil sample will be analyzed for TCLP metals, reactivity, flashpoint, and pH. Each building debris sample will be analyzed for TCLP metals and TCLP SVOCs, reactivity, flashpoint, and pH. Sampling frequency and required parameters are presented in **Table 4-3**.

4.3.4.3 Sample Numbering

The disposal samples will be numbered as follows:

DS-XX-ZZ

DS designates the sample as a disposal characterization sample. XX is the SEAD number (either 16 or 17). ZZ is the sample number.

5.0 CONSTRUCTION QUALITY PLAN

The Construction Quality Plan (CQP) describes the construction quality assurance (QA) and quality control (QC) activities to be performed during the Remedial Action (RA) for SEAD-16 and SEAD-17 at the Seneca Army Depot Activity. This section addresses the QA/QC procedures for site preparation, excavation, soil loading, and restoration. QA/QC for groundwater monitoring is addressed in **Section 6** of this report and the SAP (Parsons, 2006c). This CQP has been developed to ensure that implementation of the remedial action is in compliance with the project documents, including the plans and specifications, **Appendices A** and **B**, respectively. Remediation components include site preparation, excavation, soils management, soils disposal, backfilling, and site restoration. Inspections to verify compliance with the quality requirements will be performed during all phases of construction.

The objective of this plan is to ensure that proper materials, construction techniques, methods, and procedures are implemented by the contractor and completed in accordance with project specifications. This plan provides a means to identify problems that may occur during construction and provides appropriate methods for resolution of these problems.

5.1 Construction Project Organization

The various tasks outlined herein are being implemented by the Army with Parsons as its remediation Contractor. Parsons will provide constant site oversight during the remedial action. Parsons will also interface with Seneca County, as needed, to address management of contaminated water during the remedial action.

Parsons will use the design documentation herein to hire a construction subcontractor, a laboratory subcontractor, and a surveying subcontractor. The overall construction quality assurance program will be implemented directly by Parsons.

Each work effort at SEAD-16 and SEAD-17 is overseen and reviewed by USEPA, NYSDEC, and NYSDOH. The project organization is summarized below:

Name	Title	Phone/Fax Number	Address
John Hill	AFCEE Contracting Officer's Representative (COR)	Office: (210) 536-5289 Fax: (210) 536-4330	HQ AFCEE/IWP 3300 Sidney Brooks Brooks City-Base, TX 78235 john.hill@brooks.af.mil

Name	Title	Phone/Fax Number	Address
Stephen Absolom	Seneca Army Depot Activity's Point of Contact (POC)	Office: (607) 869-1309 Fax: (607) 869-1362	SEDA Attn: SMASE-BEC Building 123 Romulus, NY 14541 stephen.m.absolom@us.army.mil
Thomas Battaglia	Seneca Army Depot Activity's COR	Office: (607) 869-1353 Fax: (607) 869-1251	SEDA Building 125 Romulus, NY 14541 thomas.c.battaglia@nan02.usace.army.mil
Todd Heino	Parsons Project Manager (PM) and Quality Assurance (QA) Manager	Office: (617) 449-1405 Fax: (617) 946-9777	Parsons 150 Federal St. 4th Floor Boston, MA 02110 todd.heino@parsons.com
Tim Mustard	Program Health and Safety Officer (PHSO)	Office: (303) 764-8810 Fax: (303) 831-8208	Parsons 1700 Broadway, Suite 900 Denver, CO 80290 tim.mustard@parsons.com
Tom Andrews	Site Manager (SM)	Office: (716) 541-0730 Cell: (716) 998-7473 Fax: (716) 541-0760	Parsons 40 LaRiviere Drive, Suite 350 Buffalo, NY 14202 tom.andrews@parsons.com
Jackie Travers	Project Engineer	Office: (617) 449-1566 Fax: (617) 946-9777	Parsons 150 Federal St. 4th Floor Boston, MA 02110 jacqueline.travers@parsons.com
Ben McAllister	Quality Assurance (QA)/Quality Control (QC) Manager and Site Health and Safety Officer (SHSO)	Office: (617) 449-1592 Cell: (207) 409-6151 Fax: (617) 946-9777	Parsons 150 Federal St. 4th Floor Boston, MA 02110 benedict.mcallister@parsons.com

Parsons has dedicated, experienced, and competent personnel to manage the remediation. Senior management and staff personnel have been selected based on their knowledge and abilities in areas of site remediation and civil construction; management and administration of environmental contracts; regulatory and technical expertise; and health, safety, and quality awareness.

Responsibilities of key personnel are described in the following subsections.

5.1.1 Project Manager (PM)

The Project Manager (PM), Todd Heino, will manage the project from the Boston, Massachusetts office and will be on-site periodically during construction. Mr. Heino is the final decision authority, and will receive reports from the field from the Site Manager (SM) or the Quality Control (QC) Officer. Mr. Heino will visit the work site, as necessary, to meet with the client and review work progress. Mr. Heino's responsibilities as PM are as follows:

- Managing program administration;
- Serving as primary AFCEE/Army interface on all project issues;
- Serving as primary interface with USEPA and NYSDEC on project issues;
- Resolving conflicts with AFCEE/Army or subcontractors;
- Reviewing and submitting project documentation.

5.1.2 Site Manager (SM)

The Site Manager (SM), Tom Andrews, is directly responsible for all aspects of the contractor's performance including work assignments, approval of all contractor and subcontractor costs, and approval of all subcontracts and procurements. Mr. Andrews will be on-site one or two days a week during the construction phase of this project. Mr. Andrews shall also be responsible for the resolution of all QA issues that arise during construction. Other responsibilities of the SM include:

- Reviewing all construction documents to verify compliance with remedial action objectives;
- Developing a QA program to ensure that program objectives are met through a systematic process of QC and documentation;
- Ensuring that contractor personnel are experienced, competent, and qualified for their assigned tasks;
- Coordinating constructability review of project scoping documents;
- Coordinating with the Project Engineer and the SHSO/QC Officer in developing work plan implementation procedures during pre-construction;
- Selecting the construction subcontractors, as needed, and administration of the construction subcontracts;
- Coordinating all construction activities associated with subcontractors; and
- Coordinating with the SHSO/QC Officer to ensure that inspections, tests, and records are developed and performed adequately.

5.1.3 Project Engineer

The Project Engineer, Jackie Travers, will support the PM in the office. It is not anticipated that Ms. Travers will be on-site, with the exception of an occasional visit, as necessary. The responsibilities of the Project Engineer include the following:

- Reviewing design issues;
- Modifying the design with regulators, if required;
- Reviewing analytical data to assess if results are satisfactory; and
- Preparing AFCEE and regulatory submittal documents for approval, as required.

5.1.4 QA/QC Manager and Site Health & Safety Officer (SHSO)

Ben McAllister will serve in the dual role as the QA/QC Manager and as the Site Health and Safety Officer (SHSO). Mr. McAllister will be on-site full time and will be responsible for all daily operations. Mr. McAllister's key responsibilities are as follows:

- Implementing the QA program, including conducting audits and/or surveillance of project and construction activities, as needed, to verify that project personnel are performing their duties in accordance with this work plan. Scope audits will include verification that project and construction activities are being properly performed and documented, and that health and safety-related or quality-related concerns, nonconformances, and deficiencies are being resolved in a satisfactory manner.
- Implementing the work plan;
- Supervising and coordinating all activities relating to field remediation operations on a daily basis and serving as the subcontractors' primary point of contact for daily and routine operations;
- Completing daily reporting tasks and review of any daily or weekly reports;
- Requisitioning labor, materials, and equipment to perform construction activities;
- Making routine field decisions;
- Identifying problems that cannot be resolved in the field, and reporting them to the SM or PM, as appropriate;
- Communicating QA/QC policies, objectives, and procedures to project personnel and subcontractors during project meetings and informal discussions;
- Conducting sampling and QA testing;

- Monitoring, controlling, and documenting the quality of on-site construction activities;
- Verifying that QC personnel are properly qualified and trained in specified plans and testing procedures;
- Verifying and documenting that construction QC activities involving inspection, testing, and records are complete, accurate, and in accordance with site-specific documents;
- Enforcing site health and safety policies and procedures as defined in this report and in the site-specific HSP (Parsons, 2006b);
- Conducting and documenting health and safety orientation and daily meetings, as required, prior to construction;
- Determining the appropriate levels of PPE for each construction activity; and
- Overseeing construction QC operations performed by subcontractors.

Mr. McAllister will have the authority to stop work on any project activity due to nonconformance with this work plan. All on-site personnel will be encouraged to discuss any quality-related concerns with Mr. McAllister. In the event that Mr. McAllister detects or is informed of a potential nonconformance, he will investigate the matter, determine the corrective action required, document the incident, and report the incident to the SM or Project Engineer.

5.2 Inspection and Testing Requirements

A QC inspection and testing program has been developed for the remediation at SEAD-16 and SEAD-17 to verify that site preparation, excavation and removal of contaminated soils, groundwater treatment, and site restoration meets the project quality requirements. As detailed in **Sections 5.2.1**, **5.2.2**, and **5.2.3**, the QC inspections and testing program includes three phases of inspections for work in progress: pre-construction inspections, construction inspections, and post-construction inspections. Upon substantial completion of the work (or significant portions of the work), completion inspections will be conducted. Completion inspections are also a three-step process, consisting of the QC completion inspection, the pre-final inspection, and the final acceptance inspection. The specific on-site inspection and testing requirements are addressed in **Section 5.2.2**.

The Site QC Officer, Mr. McAllister, will have primary responsibility for conducting and documenting the QC inspections and tests described herein. In the event that QC inspection or testing results indicate nonconformance with the project specifications or this work plan, the SM will be notified of the nonconformance. Corrective action will be coordinated through the SM, and resolution of the nonconformance will be verified by Mr. McAllister, as appropriate.

5.2.1 General Requirements

The general components of inspection activities are provided below and are scheduled in the following three major phases:

1. Pre-construction;
2. Construction;
    a. Construction: Startup;
    b. Construction: In-progress; and
3. Post-construction.

Specific inspection requirements for each of the major components of the remedial action are discussed in **Sections 5.2.2** and **5.2.3**.

Pre-Construction Inspections

Preparatory inspections will be performed prior to initiation of specific activities or definable features of work. This phase of inspection is conducted prior to initiating actual construction and will generally consist of the following:

- Review contract with subcontractors, if appropriate, and verify conformance to project objectives;
- Verify that materials and equipment from off-site sources have been inspected and/or tested as required;
- Verify that conformance documentation such as test results for performance data is submitted and approved prior to construction;
- Verify that QA/QC inspection procedures are in place;
- Discuss procedures for conducting the work and discuss quality concerns with project personnel who will perform the work; and
- Review potential safety and environmental hazards that may be associated with the planned activity, including the presence of buried and overhead utilities.

The results of the preparatory inspections will be documented and incorporated with the Daily QC Report.

Construction: Startup

Initial inspections will be performed during the startup of field work. This phase of inspection will generally consist of the following:

- Examine the work area to ensure that all preliminary work has been accomplished in compliance with the contract documents;
- Physically examine required materials, equipment, and storage areas to ensure conformance with contract documents;
- Observe and verify that the construction methods and quality of workmanship meet the requirements set forth in the scoping documents;
- Perform receiving inspections, if required (as described below);
- Check dimensional requirements relevant to the specific work activity and compatibility with subsequent or adjacent work; and
- Verify that safety procedures are strictly enforced and in full compliance with the HSP.

The results of all initial inspections will be documented and incorporated into the daily QC report.

Construction: In-progress

During construction, receiving inspections, periodic follow-up inspections, and work plan compliance inspections will be conducted, as indicated in the following discussion. *Receiving inspections* will be performed when materials or equipment arrive at the project site. The inspections will be performed to verify that the materials or equipment received meet project requirements and specifications, are free of defects, have not been damaged in transport, and are being properly stored at the project site. Receiving inspections will be conducted by the Site QC Officer, Mr. McAllister, and will consist of the following:

- Verification of the quantities of the materials, supplies, or equipment received;
- Visual inspection of the materials, supplies, or equipment for damages, defects, or other quality aspects;
- Acceptance of the transport manifests or other delivery documents;
- Coordination of material and/or equipment storage, if required, prior to construction or installation; and
- Inspection and laboratory sampling of imported construction materials for foreign material will be performed and conducted by Mr. McAllister or the SM.

A qualitative judgment based on visual inspection will be made by Mr. McAllister regarding the material conformance with specifications. Mr. McAllister will document the following information regarding the received materials and/or equipment in the daily QC report:

- Types and quantities of materials and/or equipment received;
- Visual description of the materials and/or equipment; and
- Material and/or equipment storage details, including storage locations.

Follow-up inspections are conducted periodically during specific construction activities to verify that work in progress meets technical, contractual, and regulatory requirements. Follow-up inspections will be conducted no less frequently than indicated in **Sections 5.2.2** and **5.2.3**. Additional follow-up inspections may be performed to verify that any deficiencies noted have been corrected prior to the start of subsequent features of the work. Follow-up inspections will consist of the following types of inspection activities:

- Material quality testing to verify that materials being used conform with project requirements;
- Examination of the work area and QA/QC documentation to verify that all previous work has been accomplished in compliance with the project requirements;
- Placement testing to verify that materials are being placed and constructed in conformance with the plans and scoping documents; and
- Final follow-up inspections to verify that final surface grades and completed work are in compliance with the project requirements.

The results of the follow-up inspections will be documented and incorporated into the daily QC report.

Regular construction inspections will be conducted to verify compliance with the work plan and design documents. These inspections will be performed by the Mr. McAllister and/or Mr. Andrews and include the following:

- Overseeing earthwork to confirm that the excavation and removal of contaminated soils is being performed in accordance with the design drawings and technical specifications.
- Documenting that the subcontractors are taking appropriate measures to control and minimize dust emissions and to control erosion at the site related to the subcontractors' work activities;
- Documenting that trucks and equipment are properly decontaminated, and decontamination spoils are properly managed and disposed;

- Documenting that security measures are being followed, including entry by authorized persons only, use of appropriate personnel protective equipment (PPE), protection of SEDA property, and use of locks and security measures to prevent unauthorized entry to the work site on non-business hours.

- Documenting the effective use of barricades and other temporary controls to prevent impacted storm water and construction-related runoff; and

- Overseeing the collection and laboratory submission of all confirmatory sampling in the excavated areas and subsequent final survey of the excavated area before backfill.

- Documenting the sampling procedure and chain-of custody procedure for all samples.

- Overseeing the re-grading of the excavation areas.

For SEAD-16 and SEAD-17 remedial activities, the Program Health and Safety Officer (PHSO), Tim Mustard, or the SHSO, Mr. McAllister, will conduct periodic health and safety inspections in accordance with the project HSP.

Post-Construction

Post-construction completion inspections will be conducted when the contract work, or specific definable component of the contract work, is substantially complete. Completion inspections are conducted to verify that the work is properly completed and that all specified components of the work have been constructed or installed.

Three types of completion inspections will be performed to verify that site work activities performed meet the requirements of project specifications. These inspections include:

- QC completion inspection;
- Pre-final inspection; and
- Final acceptance inspection.

The QC completion inspection will occur when the contract work is nearing substantial completion. Based on AFCEE's and the Army's concurrence that substantial completion is near, and at least five days prior to the pre-final inspection, the Site QC Officer will conduct a QC Completion Inspection. The Army POC, Mr. Steve Absolom and the AFCEE COR, Mr. Jesse Perez will be notified of the inspection date so that they may participate. Upon completion of the inspection, an itemized list of work that was not properly completed, work that exhibits inferior workmanship, or work that does not conform to project requirements will be prepared. The list will also include outstanding deliverables and appropriate record documents.

The Pre-Final Inspection will be conducted immediately following completion and/or correction of all deficiencies noted during the quality control completion inspection, and following completion of all construction activities. The Site QC Officer will notify the Army POC and the AFCEE COR at least five days prior to conducting the Pre-Final Inspection. The notice will include assurance that all specific items previously identified in the Quality Control Completion Inspection, along with all remaining contract work, will be completed and/or corrected by the date scheduled for the Pre-Final Inspection. The Pre-Final Inspection will be conducted by the Site QC Officer, the Army POC, and the AFCEE COR.

The Site QC Officer will notify the Army POC and the AFCEE COR when the work is ready for the Final Acceptance Inspection. The notice will be given to both at least five days prior to the Final Acceptance Inspection and will include assurance that all specific items previously identified as being unacceptable, along with all remaining work performed under the contract, will be complete and acceptable by the date scheduled for the Final Acceptance Inspection. The Site QC Officer, the Army POC, and the AFCEE COR will conduct the Final Acceptance Inspection.

Meetings

A pre-construction meeting will be held at the site prior to beginning construction activities. AFFCEE COR, SEDA's POC and COR, the PM, the SM, the SHSO, appropriate subcontractors, USEPA, and NYSDEC will attend the pre-construction meeting. This site specific CQP will be reviewed, with specific focus on methods for documenting and reporting inspection data and methods for distributing and storing documents and reports. The responsibility of each party will be reviewed and clearly understood, and the work area security and safety protocols will be transmitted to all participants. This meeting will occur after the procurement for the remedial action implementation has begun.

Progress meetings will be held on a weekly basis and chaired by the SM. The primary subcontractors must send an authorized representative to each meeting. Issues at this meeting may include the progress of work, future scheduling issues, and related topics.

Base Cleanup Team (BCT) and Restoration Advisory Board (RAB) meetings will be held as required. Parsons will attend all BCT and RAB meetings during the course of this contract. Subcontractors will not be required to attend these meetings unless requested by AFCEE, regulatory agencies, Army personnel, or Parsons. The intent of the meetings will be to provide the regulatory agency with a progress update of the project and to address any regulatory issues that might delay the progress of the work.

5.2.2 Pre-Construction Requirements

Field inspections will be performed during on-site construction activities in order to verify that all work is in conformance with the design drawings and specifications. The following subsections

summarize the specific field testing and other QC requirements as components of the three phases of inspection for each of the primary work activities to be performed. Specific pre-construction inspection activities for each of the primary work activities are summarized in **Table 5-1**.

Site Preparation

Site preparation activities are listed in **Table 5-1** and include visual observations to insure that all site preparation activities are completed prior to beginning construction. Site preparation will include finalizing the mark-out of the area to be excavated, finalizing the mark-out of utility locations, clearing and grubbing the excavation area, confirming approval and location for site trailers, and confirming that all necessary roads are accessible and access gates are working properly.

Utility Locating and Availability of Utilities

SEDA and local utility suppliers will provide electrical service to the work area, and the subcontractor will be responsible for the electrical connections to the site trailer. In addition, the earthwork subcontractor will be responsible for obtaining potable water from either the Army or the Town of Romulus.

Prior to the start of construction, the subcontractor will call UFPO and work with Parsons and the Army to locate and mark utilities and other obstructions in the immediate areas of the excavation site and the supporting work/staging areas. All identified utilities within work/staging areas will either be terminated and disconnected, or if necessary, rerouted to ensure that service is not disrupted during site operations.

Site Surveying, Monitoring Well Demarcation, and Clearing

Site surveying will be accomplished by a combination of visual and instrument surveying of the site and construction features. Parsons will perform the following surveys using a Trimble 5700 Real-Time Kinematic (RTK) global positioning system (GPS) unit:

- Pre-construction excavation area survey; and
- Post-excavation survey.

Stakes will be placed along the designed excavation boundary according to the design drawings. Stakes shall be placed at the start and termination of each linear section, at 50-foot intervals along each linear segment, at 20-foot intervals along curves, and at any change in boundary direction not in a curve.

In addition, monitoring wells on site will be located according to the design drawings and visible barriers will be placed to prevent damage.

The excavation areas will be prepared for construction. Whenever possible, 20 feet will be cleared on either side of the work area. If this is not possible, the maximum path will be cleared and work will be coordinated to ensure constructability. All utilities will be clearly marked following the clearing and grubbing.

Disposal Characterization

For disposal characterization, the waste management facility requires that one composite sample will be collected for every 700 CY of excavated soil or debris at each site (two soil samples per site) and submitted for analysis, as detailed in **Section 4**. This sampling requirement is based on the waste management facility's review of the historic sampling results at SEAD-16 and SEAD-17. Each disposal sample for SEAD-16 and SEAD-17 will be a composite of multiple grab samples from the soil excavation and the ditch excavation or building debris. The disposal characterization sampling will be completed prior to the commencement of construction activities. The disposal samples will be tested for contaminant leaching using the TCLP. However unlikely, soil that fails the TCLP will be stabilized on-site and then disposed as non-hazardous waste. If the disposal sample passes the TCLP, then the soil from the excavation will be loaded into dump trucks and transported to and disposed in an off-site Subtitle D landfill. It is anticipated that either Seneca Meadows in Waterloo, New York or Ontario County Landfill in Flint, New York will be used.

5.2.3 Construction Requirements

The construction activities listed in **Table 5-2** include visual observations to ensure that equipment is operating properly and safely, site security is in place, erosion controls are maintained, health and safety monitoring is performed, and the as-built records of the excavated area are maintained. These inspection activities will ensure that the excavation is performed in accordance with the project scope of work and all components of reporting can be fully met.

Excavation

Each area at SEAD-16 and SEAD-17 will be excavated to the designed depth using a tracked excavator, and the excavated soil will be loaded directly onto dump trucks staged outside of the area of excavation for off-site disposal. It is not anticipated that stockpiles outside of the area of excavation will be necessary. If needed, the excavator will stockpile soil at one end of the area of excavation where it can then be loaded into dump trucks staged outside the area of excavation. Any equipment leaving the excavation area will be required to pass through the decontamination area for proper decontamination and inspection.

Observation and Inspection

Mr. McAllister will be on-site during the soil removal to confirm that the removal is conducted in accordance with the Technical Specifications. A photographic log will be performed throughout the removal of the sections to provide documentation of the process and procedure. In addition, a post-

excavation survey will be performed. Mr. McAllister will visually observe the removal of the contaminated soil to the designed depth of excavation, and he will estimate the volume of the waste excavated, based on the dimensions of the excavation.

Mr. McAllister will also be responsible for inspecting all vehicles leaving the area of excavation through the decontamination area.

Backfilling

Due to the shallow excavation at SEAD-16 and SEAD-17, it is unlikely that borrow material for backfilling will be necessary. Instead, the areas will be blended into the surrounding grades.

Confirmation of Removal

Following the excavation of the contaminated soil from a discrete excavation area, confirmatory samples will be collected by Mr. McAllister for chemical analysis. It has been determined that a total of approximately 77 post-excavation confirmatory samples plus 11 QA/QC samples (**Table 4-1b**) will be collected from SEAD-16 and SEAD-17. However, the number and location of soil confirmatory samples may be adjusted in the field based upon the actual area and quantity of soil removed. Confirmatory samples will be collected from the floor of the excavation at a frequency of one sample per 2,500 sf, with a minimum of one sample being collected. For the ditch excavations, confirmatory samples will be collected from the floor of the ditch at a frequency of one sample every 50 linear feet. Prior to excavation, 61 samples were collected from the perimeter of the excavation limits at a rate of no less than one sample per every 50 linear feet on each edge of the excavation. Two sidewall samples will be collected at SEAD-16 at a depth halfway between the ground surface and the base of the excavation, or at a location that appears contaminated based on visual or olfactory observations. The sidewall samples will be collected in the areas of 2- to 3- foot excavation depths located in the vicinity of SB16-2 and SB16-5. At least one discrete sample will be collected from each face of the open excavation.

The following is a summary of the confirmatory soil sample collection procedure:

1. Pre-excavation confirmatory samples were collected around the perimeter of the anticipated limits of excavation and met the cleanup goals specified in **Table 2-1**.

2. Soil will be removed to the staked limits of excavation based on pre-excavation perimeter sampling results.

3. Once Mr. Andrews or Mr. McAllister verifies that the excavation has reached the staked limits and appropriate depth, floor confirmatory samples will be collected according to the frequency described above.

4. Floor confirmatory samples will be collected and sent to the project laboratory by courier for analysis under chain-of-custody procedures. Soil from SEAD-16 will be analyzed for metals, and samples from grids G4 and G5, as shown in **Figure 4-1,** will also be analyzed for cPAHs. Soil from SEAD-17 will be analyzed for metals. Samples will be submitted for a 72-hour turnaround time so the results can be approved by the Project Engineer and the excavation areas can be backfilled as soon as possible. Soil samples will be collected, stored, preserved shipped and analyzed according to the procedures outlined in the SAP (Parsons, 2006c).

5. If the data from the floor confirmatory soil samples indicates the presence of chemical concentrations above the site cleanup goals, additional soil will be excavated from the floor in the location the sample was collected. The amount of additional soil excavated will be decided in the field by the SHSO/QC Officer or the SM in conjunction with the Army POC, based on their best professional judgment and visual observations.

6. If all confirmatory soil samples indicate that chemical concentrations are below the site cleanup goals, the excavation will be complete and the regrading will start upon approval by the PM and Army POC. The excavation area will be blended into the surrounding grades.

The post-excavation survey will be performed following verification that confirmatory samples met the cleanup goals, but before the excavation area is blended into the surrounding grades. This survey will include the delineation of the excavated area. Survey measurements will be collected in North American Datum of 1983 (NAD83) - New York State Plane Central Coordinate System for horizontal control. Elevation measurements will be conducted using the North American Vertical Datum of 1988 (NAVD88) for depth of the excavation. The depth of excavation will be measured by Mr. McAllister.

Soil/Debris Disposal

Based on soil and debris disposal characterization conducted as part of pre-construction activities, excavated materials are expected to be loaded into dump trucks and transported to and disposed in an off-site Subtitle D landfill. It is anticipated that either Seneca Meadows in Waterloo, New York or Ontario County Landfill in Flint, New York will be used for disposal of site soil. It is not expected that any materials will be disposed as hazardous waste. Wastes will be “packaged” by loading non-hazardous soil into DOT approved dump trucks and/or dump trailers. No hazardous soil will be shipped. If hazardous soils are encountered, they will be treated on-site and then disposed off-site as non-hazardous materials. All haul vehicles exiting the site will pass through the decontamination area prior to site exit to ensure that loose material is not tracked beyond the bounds of the sites or onto Depot and local roads. All vehicles will be inspected by the Site Manager prior to exiting the decontamination area to ensure that cross contamination does not occur.

Erosion Control Maintenance

Temporary erosion and sedimentation controls, such as silt fencing, hay bales, or soil berms, will be installed as required during operations to prevent migration of sediments and erosion. Prior to beginning any excavation work, temporary silt fencing (Specification Section 02370) will be erected, which will surround the down gradient sides of disturbed areas to prevent contaminated sediment transport. The temporary silt fencing will be maintained throughout the project and will not be removed until permanent vegetation has been re-established. In addition, storm water from up gradient locations will be routed away from exposed materials, and storm water contact of exposed material with storm water will be minimized to the extent practical. A visual inspection of the site will be conducted daily and during and after significant rainfall to ensure that control measures are in good repair and that there is no migration of sediments or evidence of erosion. Any temporary erosion control measures will be removed following remediation so as to return drainage patterns to their general conditions prior to remediation. The final grade will be based on restoring site drainage. **Drawings C-4** and **5** shows where temporary silt fencing will be erected.

Site Security

All visitors to the work site are required to report to Mr. McAllister and/or the SM upon arrival. SEAD-16 and SEAD-17 are located within the Depot which is surrounded by a fence with locked gates. The Army will provide site access to the field team prior to and during construction activities. Site security is necessary to prevent exposure of unauthorized, unprotected individuals to the work area. The area immediately surrounding the work area will be clearly marked through the use of signs, barrier rope, tape, or fencing.

Site Restoration

Field inspection for site restoration activities is identified in **Table 5-3**. Inspection activities include observations to verify the final location of the excavation. Any vegetated areas that were disturbed as a result of remedial activities will be seeded. A final site survey will be conducted once construction is complete.

5.3 Subcontractor Quality Control

All subcontractors and material suppliers involved with on-site construction activities shall comply with this plan. Subcontractor personnel qualifications, technical performance levels, QA/QC procedures, acceptability levels, and documentation and submittal requirements will be clearly defined in the subcontractor's scope of work and procurement documents. The PM will review the scope of work and procurement documents to verify that all of the relevant QA/QC requirements have been adequately communicated to the subcontractor.

Each subcontractor shall identify a qualified individual within their organization to be responsible for QC and performance of QC testing. Mr. McAllister will coordinate all QC functions with the

designated subcontractor QC representative. Mr. McAllister has authority over all subcontractor QC requirements. These activities will be documented on inspection reports, checklists, audit reports, field logs, or other forms appropriate to the function performed.

5.4 Quality Control Documentation

An effective QA/QC program depends on thorough monitoring of all construction activities. This is most effectively accomplished by observation and documentation during all phases of construction. Documentation shall consist of project submittals, daily QC inspection reports, weekly QC summary reports, non-conformance and corrective action reports, design and specification clarifications or modifications, photographic records, observation and testing data sheets, as-built documentation, and a summary report. This section describes the requirements of each of these aspects of the QC documentation.

5.4.1 Daily QC Inspection Reports

Mr. McAllister will prepare a Daily QC Report and submit it to the SM, who will sign it to acknowledge non-conformances and observations, and place it in the project files or begin the corrective action request. The Daily QC Reports will be submitted (daily, or at some other agreeable interval) to the AFCEE and Army contact, and will also be included as part of the weekly progress reports submitted to AFCEE and the Army.

The Daily QC Report will include the following information:

- Project name, location, and date;
- Personnel and equipment used;
- Estimated volume of excavated material shipped off-site during the day;
- Weather conditions;
- Narrative description of inspections, tests, and sampling;
- Description of kinds and types of material delivered and used;
- Narrative description of work performed, problems encountered, and corrective measures taken; and
- Record of any data or measurements collected.

5.4.2 Weekly QC Summary Reports

The Site QC Officer will draft the Weekly QC Summary Report and submit it to the SM. The SM will review the report, and then submit it to the AFCEE and Army contacts.

The Weekly QC Summary Report will include the following information:

- Date, project name, and location;
- Summary of construction-related activities;
- Summary of QC activities;
- Attached inspection reports;
- Test results;
- Volume of soil shipped for disposal;
- Volume of soil shipped for disposal to other locations (e.g., off-site, if necessary);
- Non-Conformance Reports (NCRs);
- Non-Conformance/Corrective Action Tracking Log; and
- Corrective Action Reports.

5.4.3 Non-Conformance Documents

As the Site QC Officer, Mr. McAllister will report each nonconforming item on a NCR form. The NCR form will include the information listed below:

- Name and job title of the individual who identified the non-conformance;
- Description of the non-conformance;
- Effect of non-conformance on suitability of the work for the intended purpose;
- Immediate corrective measures taken; and
- Recommended corrective action or variance/field change to the project documents.

The Site QC Officer will describe the NCR in the Daily QC Report, and then log it on the Non-Conformance/Corrective Action Tracking Log. The Site QC Officer will include the revised log in the Weekly QC Report. The SM will review this list and initiate a Corrective Action Report (CAR) if a non-conformance is not satisfactorily corrected in a timely manner. The CAR will include the following and will be signed by all responsible parties:

- Summary of the affected project requirements;
- The nature of the non-conformance;
- The corrective action to be taken;
- Action items/responsibilities for each affected individual;
- A schedule for completion of the corrective action; and
- Recommendations for preventing recurrence of the problem.

The PM will review unresolved CARs and take appropriate measures to ensure that the corrective actions are completed on schedule. The Site QC Officer will conduct an inspection to verify that the CAR is resolved, update the Non-Conformance/Corrective Action Tracking Log, and document the resolution in the Daily and Weekly QC Reports.

5.4.4 Design and Specification Clarifications or Modifications

The need to address design and specification changes or scope changes may arise. In such cases, the PM will notify the Army POC and the AFCEE COR. A design, specification, or scope of field change that will impact the project or its cost must be approved by the PM, the Army POC, and the AFCEE COR before it is implemented. Approvals by these parties may be obtained concurrently, if possible. Approval of USEPA/NYSDEC may be necessary if the proposed change affects the project's ability to achieve the performance objectives or impact the project goals. To approve a change, a Field Change/Modification Request (FC/MR) form will first be completed by the PM and then submitted to AFCEE. A standard FC/MR form will be completed which includes the following information:

- Date of request/order;
- FC/MR number;
- Name of originator of request/order;
- Summary of existing requirements;
- Description of requested/ordered changes in the affected requirements in sufficient detail for cost, schedule, and technical evaluation;
- Description of estimated cost impact of change; and
- Approval signatures of the PM, the Army POC, and the AFCEE COR.

The PM will establish and maintain an FC/MR Log to track dates of requests, approvals, and completions.

5.4.5 Photographic Documentation

All phases of construction will be documented with photographs taken by QA/QC personnel. All photographs will be identified as to location, time, date, and initials of the person taking the photograph.

5.4.6 As-Built Drawings

The Site QC Officer will establish and maintain a set of project drawings in the project office for the purpose of noting changes. Changes will be noted in red ink or pencil and referenced to the approved FC/MRs. New drawings will be added to the set if required for major or extensive changes. Copies

of all FC/MRs, change orders, notes, sketches, and memoranda will be available for reference in the project field office. As-built drawings will be available for review in the project field office at all times.

5.4.7 Summary Reporting

At the completion of construction, a Removal Action Implementation Report will be issued. This report will include a description of the construction activities, QC testing results, waste disposal records, copies of the field reports, boring logs and as-built drawings.

6.0 POST-CLOSURE MONITORING AND MAINTENANCE PLAN

6.1 Introduction

This section presents a Post-Closure Monitoring and Maintenance Plan (PCMMP) for the post-remediation monitoring and maintenance activities to be performed at SEAD-16 and SEAD-17. The objective of post-closure monitoring is to monitor the groundwater until either NYSDEC Class GA groundwater standards are met; or until the results show concentrations are consistent with background.

Under the ROD for SEAD-16 and SEAD-17, there is a requirement to establish and maintain land use controls to prevent access to or use of the groundwater at the site until cleanup standards are met. In addition, because SEAD-16 and SEAD-17 are part of the Planned Industrial/Office Development (PID) Area, these sites are subject to institutional controls (IC) in a separate Proposed Plan and ROD, ["Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004) signed on September 30, 2004]. With USEPA approval, once groundwater cleanup standards are achieved for the entire PID area, the groundwater use restrictions may be eliminated.

Monitoring and maintenance activities will be conducted as part of the approved remedy for these sites. This section has been prepared in accordance with 40 Code of Federal Regulations (CFR) 265.118 regarding the contents of post-closure plans.

This PCMMP provides the following:

- Overview of site hydrogeologic conditions;
- Description of the monitoring plan and procedures;
- Summary of required maintenance activities, and
- Reporting requirements.

6.2 Site Hydrogeology and Impacts

The hydrogeologic setting for SEAD-16 and SEAD-17 has been described in detail in Sections 3.1.6 and 3.2.6 of the "Final Remedial Investigation (RI) Report at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17)" (Parsons, March 1999). A brief summary of hydrogeologic conditions and chemical impacts found in the RI Report is presented below for each site.

6.2.1 SEAD-16

The depth to water was investigated at SEAD-16 on three different occasions (April 1994, August 1996 and December 1996). Groundwater flow direction at SEDA generally trends to the west based on water table maps prepared for 27 sites on the Depot. Water table maps from several of these 27 sites provide additional evidence for a groundwater divide near and approximately parallel to Route 96 near Romulus, New York, indicating that the groundwater in the area encompassing SEAD-16 flows west. The groundwater elevation data at SEAD-16 is difficult to interpret due to localized areas of roof drain outlets, pavings, swales, etc. that affect water levels, though all rounds indicated a component of westerly or southwesterly flow at SEAD-16, shown on **Figure 6-1**. Groundwater elevation data indicate that there may be a regional high south west of the Building 311, which could contribute to local fluctuations in groundwater flow.

Horizontal hydraulic conductivities were determined for five till/weathered shale wells at SEAD-16. The saturated thickness in the till/weathered shale aquifer was less than 2 feet when the slug tested was performed in September 1996. Therefore, the potential amount of water that could be displaced for each slug test was relatively small. Because of this, many of the slug tests were performed by hand. Hydraulic conductivity values for the shallow till/weathered shale aquifer range from 2.8×10^{-3} cm/sec to 2.5×10^{-2} cm/sec and the geometric mean was 7.3×10^{-3} cm/sec.

Impacts to Soil

The primary impact to soils at SEAD-16 is from metals. Lead is pervasive in the surface soil at the site, and other metals, such as arsenic, copper, and zinc, were detected as well at levels above the site-specific cleanup standards for soils at SEAD-16. cPAHs were detected above the BTE value of 10 ppm in discrete locations. All of the soil above the cleanup goals will be removed from the site as part of the remedial action described in detail in **Section 3**, thereby eliminating the source of any potential groundwater contamination.

Impacts to Groundwater

Three rounds of groundwater monitoring were conducted at SEAD-16. The first round was completed in 1993 as part of the Expanded Site Investigation (ESI) and the subsequent two rounds were conducted in 1996 during the RI. The first two rounds of groundwater sampling were not conducted using low flow sampling techniques, resulting in high turbidity samples and elevated metals results. A subsequent round of sampling (the second RI round) was completed to confirm that with low turbidity, metals were not of concern in the groundwater at SEAD-16.

The table below provides a comparison of the second RI round of sampling to the maximum SEDA background concentrations at SEAD-16. The second RI round of sampling was conducted using low flow sampling techniques to show that the elevated metals concentrations were due to turbid samples.

Parameter	Max. Det. in 2nd RI Round (µg/L)	Max. SEDA Background (µg/L)
Aluminum	490	42,400
Iron	923	69,400
Manganese	1,380	1,120
Sodium	409,000	59,400
Thallium	7.6	4.7

Aluminum and iron were detected at concentrations below the SEDA background concentrations. The maximum detection of manganese in the recent sampling round was slightly above the background concentration. Sodium was detected above the maximum; however the other sodium detections were less than the maximum background concentration. Thallium was detected once (11 µg/L) in one sample during the second RI round; however, thallium was not detected in the duplicate (4.1 U µg/L) associated with that sample. Based on these results, the groundwater at SEAD-16 is generally consistent with background. The monitoring round proposed in this section will confirm this.

6.2.2 SEAD-17

The depth to water was investigated at SEAD-17 on three different occasions. The depth to water varied from between 2.38 feet (MW17-3 on April 4, 1994) to 7.64 feet (MW17-1 on August 29, 1996). The horizontal hydraulic gradient was calculated to be 0.01ft/ft between monitoring wells MW17-1 and MW17-3 (Parsons Engineering Science, 1998a).

Results of groundwater contour mapping indicate that groundwater flow is to the southwest (**Figure 6-2**). Hydraulic conductivities were found to range from 2.9×10^{-3} cm/sec to 1.4×10^{-2} cm/sec.

The primary contaminants detected at SEAD-17 are metals in the soil and groundwater.

Impacts to Soil

The primary constituents of concern in soil at SEAD-17 are the metals, specifically lead. Other metals, such as antimony, arsenic, copper, lead, mercury, and zinc, were detected at the same locations as the elevated lead concentrations. In all instances, the detected concentrations of metals were found to be highest in those samples collected closest to the Active Deactivation Furnace Building, particularly near the southwestern area near the building. Soil in exceedance of the site-specific cleanup goals will be removed as part of the remedial action described in detail in **Section 3** of this design report.

Impacts to Groundwater

Three rounds of groundwater monitoring were conducted at SEAD-17. The first round was completed in 1993 as part of the Expanded Site Investigation (ESI) and the subsequent two rounds were conducted in 1996 for the RI. The first two rounds of groundwater sampling were not

conducted using low flow sampling techniques, resulting in high turbidity samples and elevated metals results. A subsequent round of sampling (the second RI round) was completed to confirm that with low turbidity, metals were not of concern in the groundwater at SEAD-17.

The table below provides a comparison of the second RI round of sampling to the maximum SEDA background concentrations at SEAD-17.

Parameter	Max. Det. in 2nd RI Round (µg/L)	Max. SEDA Background (µg/L)
Aluminum	386	42,400
Iron	572	69,400
Manganese	73.8	1,120
Sodium	30,100	59,400

The table above shows that all the metals detected were at concentrations below SEDA background levels. Based on these results, it is believed that the groundwater has not been impacted. The monitoring round proposed in this section will confirm this.

6.3 Long Term Monitoring

Groundwater monitoring will be performed as part of the SEAD-16 and SEAD-17 post-closure operations. Seven monitoring wells are located at SEAD-16, and five monitoring wells are located at SEAD-17. All 12 wells will be sampled for metals.

6.3.1 Monitoring Strategy and Well Locations

SEAD-16

The seven existing monitoring wells at SEAD-16 will be used for groundwater monitoring: MW16-1 through MW16-7 (see **Figure 6-3** for well locations). **Table 6-1** provides well construction details. Wells MW16-3, MW16-4, MW16-6 and MW16-7 are located within the excavation boundaries. These wells will be protected during excavation. If any well is compromised during excavation activities, it will be removed and replaced.

Though it is believed that groundwater generally flows in a southwesterly direction at SEAD-16, groundwater elevation data indicate that there may be a regional high south west of the Building 311, which could create local fluctuations in groundwater flow direction. As a result, it is difficult to determine which wells are upgradient or downgradient of the site. Instead, Parsons will identify wells relative to their proximity to the soil excavation areas. Three wells, MW16-1, MW16-2, and MW16-5, will monitor the quality of the groundwater outside the excavation areas. Monitoring wells MW16-3, MW16-4, MW16-6, and MW16-7 will monitor the groundwater quality at locations within the excavation area.

After the first monitoring event, the monitoring program will be reviewed and modified, as necessary, after consultation with the USEPA and NYSDEC. At that time, any additional wells that are determined to no longer be necessary at SEAD-16 will be abandoned in accordance with the well abandonment procedure outlined in "Monitoring Well Abandonment Work Plan" (Parsons, 2005b).

SEAD-17

Five monitoring wells were previously installed at SEAD-17 and will be used for groundwater monitoring: MW17-1 through MW17-5 (see **Figure 6-4**). **Table 6-1** provides well construction details.

The groundwater flows to the west at SEAD-17. All of the wells are outside of the area of excavation, though their location is in close proximity to the boundary of excavation. The five wells will serve as sentinel wells to monitor the water quality flowing into and out of the excavation area.

After the first monitoring event, the monitoring program will be reviewed and modified, as necessary, after consultation with the USEPA and NYSDEC. At that time, any additional wells that are determined to no longer be necessary at SEAD-17 will be abandoned in accordance with the well abandonment procedure outlined in "Monitoring Well Abandonment Work Plan" (Parsons, 2005b).

6.3.2 Groundwater Sampling

Based on the historical groundwater data, groundwater sampling will be conducted once after the remedial action is completed to confirm that groundwater concentrations meet the GA groundwater standards or are consistent with SEDA background levels. Groundwater samples will be analyzed for antimony and thallium by USEPA SW846 Method 6020, mercury by USEPA SW846 Method 7470A, and the remaining TAL metals by USEPA SW846 Method 6010B. A list of the groundwater standards and the laboratory's reporting limits are presenting in **Table 6-3**. In the field, pH, oxidation-reduction potential (ORP), specific conductivity, turbidity, and dissolved oxygen will be measured and recorded as an indicator of stabilization. A summary of the monitoring well sampling requirements is presented in **Table 6-2.**

All samples will be collected using low flow sampling techniques. Sampling procedure, sample handling and custody, holding times, and collection of field parameters will be conducted in accordance with the SAP (Parsons, 2006c). Additional QC samples will be collected, as follows (in accordance with the SAP). One field duplicate and one MS will be collected for every 20 project samples at each site. For SEAD-16 and SEAD-17, this corresponds to collecting one duplicate and one MS at each site, since the total number of samples is less than 20. A rinsate blank will be collected when sampling equipment is decontaminated and reused.

6.3.3 Contact Information

A list of remedial program contacts is provided in **Section 5.1**.

6.4 Procedures

The SAP for the SEDA (Parsons, 2006c) presents the Quality Assurance Program Plan and Field Sampling Plan, and should be consulted for further information on the following general procedures to be followed during all SEDA work, including post-remedial monitoring and maintenance activities:

- Quality Control Activities (discussed in **Section 6.3.2**);
- Field Sampling Procedures;
- Sample Handling and Custody;
- Screening Analytical Methods;
- Data Analytical Methods;
- Data Management and Evaluation;
- Performance Assessment;
- Equipment Maintenance;
- Corrective Actions; and
- Certification Requirements.

6.5 Maintenance

6.5.1 Introduction

This section contains procedures for post-closure care and maintenance of SEAD-16 and SEAD-17, including general site inspections and monitoring well maintenance.

6.5.2 Routine Inspections

SEAD-16 and SEAD-17 will be inspected during the first monitoring event and no less frequently than semi-annually thereafter to ensure site integrity. The following will be inspected during the sampling event:

- Condition of access road, gates, and fences;
- Establishment of re-vegetation of disturbed areas to prevent erosion; and
- Condition of groundwater monitoring wells.

A checklist of maintenance inspection elements to be used in the field is provided in **Table 6-3**. Any problems identified during the routine inspections should be noted in the field notebook. These problems should be corrected or disclosed to the SEDA POC as soon as possible.

6.5.3 Groundwater Monitoring Well Maintenance

Monitoring wells which are damaged such that representative groundwater samples cannot be obtained will be repaired or replaced. Repair measures will be based on case-specific evaluations. Any well damaged beyond repair or rendered inoperative will be replaced with a new well of similar depth and construction. Any locks or caps that have been damaged will be replaced.

6.6 Reporting

Upon completion of the post-remediation groundwater sampling event, a report will be prepared and submitted. The report will contain a summary of the groundwater data compared to Class GA standards. Laboratory reporting limits are provided in **Table 6-4**. Based on the results of the groundwater monitoring during the RI, it is believed that only one round of groundwater sampling will be necessary to show that the groundwater at these sites has not been impacted above background concentrations. However, if the results show otherwise, modifications to the monitoring program may be considered and may include changes to the sampling frequency, the number of analytical parameters, and the number of monitoring wells included in the sampling program. Recommendations for reducing groundwater monitoring efforts will be based on the groundwater concentrations. If needed, an annual report including subsequent sampling events will be submitted to the USEPA and NYSDEC for review and approval.

7.0 WASTE MANAGEMENT PLAN

Investigation-derived waste (IDW) will include equipment decontamination rinsate and PPE. Soils from the excavation areas and water recovered from the excavation, run-on, or run-off are managed independently from IDW, as discussed in **Section 3.3**.

Since it is not anticipated that hazardous material will be encountered during the construction activities, any water used for decontamination can be collected in the frac tank with the construction water discussed in **Section 3.3**.

Expendable sampling equipment, if needed, and materials that may be generated during field activities (e.g., PPE) will be bagged and disposed of in a trash dumpster located on-site. Miscellaneous trash generated during field activities (e.g., empty sand bags) also will be placed in the dumpster.

8.0 LAND USE CONTROL REMEDIAL DESIGN

The Land Use Control Remedial Design (LUC RD) Plan for SEAD-16 and SEAD-17 will be an amendment to the LUC RD prepared for SEADs 27, 66, and 64A at SEDA (SEDA, December 2006).

9.0 REMEDIAL ACTION SCHEDULE

9.1 Schedule

Given the relatively simple nature of the remedial action work proposed, the Army proposed that the Remedial Design Work Plan (RDWP), the Preliminary Design (PD), and the Final Design (FD) be consolidated into one document.

This schedule allows for the full FFA review periods. A schedule for the remedial design is presented as **Figure 9-1**. The schedule allows 30 days for the Army, NYSDEC, and USEPA to review and provide comments on the design documents. It also allows 14 days for Parsons to incorporate comments into the design documents. This schedule will be updated on a continuing basis.

10.0 REFERENCES

NYSDEC, Groundwater Monitoring Well Decommissioning Procedures. Pirnie, 1996

NYSDEC, Draft DER-10 Technical Guidance for Site Investigation and Remediation. December 2002

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Parsons, Record of Decision for Sites Requiring Institutional Controls in the Planned Industrial / Office Development or Warehousing Areas. 2004

Parsons, Monitoring Well Abandonment Work Plan for Seneca Army Depot Activity. 2005b

Parsons, Record of Decision for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17). 2006a

Parsons, Project Safety Plan and Site-Specific Health and Safety Plan for Seneca Army Depot Activity PBC II. 2006b

Parsons, Final Sampling and Analysis Plan for Seneca Army Depot Activity. 2006c

SEDA, Land Use Control Remedial Design (LUC RD) Plan for SEADs 27, 66, and 64A. December 2006

USEPA, Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. December 1996

Woodward-Clyde Federal Services, U.S. Army Base Realignment and Closure 95 Program, Environmental Baseline Survey Report. March 1997

TABLE 2-1
PROJECT CLEANUP GOALS
SEAD-16/17 Remedial Design
Seneca Army Depot Activity

Compounds	Units	Project Cleanup Goal
Carcinogenic PAHs[1]		
BTE	mg/Kg	10
Metals [2]		
Antimony [5]	mg/Kg	41
Arsenic [3]	mg/Kg	21.5
Cadmium	mg/Kg	60
Copper	mg/Kg	10,000
Lead [4]	mg/Kg	1,250
Mercury	mg/Kg	5.7
Thallium [5]	mg/Kg	6.7
Zinc	mg/Kg	10,000

Notes:
BTE = Benzo(a)pyrene Toxicity Equivalence
1. The cleanup goal for cPAHs is the 10 ppm BTE value. The cPAH cleanup goal only applies to SEAD-16.
2. The cleanup goals for metals are the NYSDEC Restricted Use Soil Cleanup Objective for Industrial Use (Table 375-6.8(b)).
3. The cleanup goal for arsenic was replaced with the SEDA maximum background value since the NYSDEC restricted industrial value for arsenic was lower than the maximum SEDA site-wide background value.
4. The lead cleanup goal was derived in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996) and in concurrence with NYSDEC and USEPA.
5. Since no NYSDEC Soil Cleanup Objective for Industrial use exists, 1/10th the USEPA Region IX PRG Industrial value was used.

Table 4-1a
Confirmation Sampling at SEAD-16 and SEAD-17
SEAD-16 and SEAD-17 Remedial Design
Seneca Army Depot Activity

Areas	Anticipated dimensions				Theoretical Number of Required Samples[2]				Actual Number of Samples[3]			
	Ditch Length (ft)	Perimeter (ft)[1]	Depth (ft)	Area (SF)	FL	PR	SW	**Subtotal**	FL	PR	SW	**Subtotal**
SEAD-16 Main Excavation	NA	1100	1	40,598	17	22	0	**39**	23	22	0	45
SEAD-16 MW16-6 Area	NA	93	1	856	1	2	0	**3**	1	3	0	4
SEAD-16 SS16-35 Excavation	NA	65	1	315	1	4	0	**5**	1	4	0	5
SEAD-16 SB16-2 Excavation	NA	54	2	233	1	--	4	**5**	1	--	4	5
SEAD-16 SB16-5 Excavation	NA	55	3	231	1	--	4	**5**	1	--	4	5
SEAD-16 Soil Excavation (Total)					21	28	8	57	27	29	8	64
SEAD-16 Ditch 1	81	NA	1	620	2	1	--	**3**	2	1	--	3
SEAD-16 Ditch 2	50	NA	1	435	1	1	--	**2**	1	1	--	2
SEAD-16 Ditch 3	90	NA	1	716	2	1	--	**3**	2	1	--	3
SEAD-16 Ditch 4	85	NA	1	700	2	1	--	**3**	2	1	--	3
SEAD-16 Ditch Excavation (Total)					7	4		11	7	4	0	11
SEAD-17 Soil Excavation	NA	1363	1	73,387	30	24	--	**54**	33	29	--	**62**
											Total Samples	**137**
											Total for SEAD-16	**75**
											Total for SEAD-17	**62**

Notes:
NA = Not applicable
Dups - Sample duplicate
MS/MSD - Matrix spike / matrix spike duplicate

1. The perimeter measurement is the actual perimeter minus the length against the building.
2. The theoretical number of samples is based on the anticipated dimensions divided by the required frequency of collection.
   FL = Floor, 1 sample per 50 l.f. of ditch or 2500 sq.ft. of soil excavation area
   PR = Perimeter, 1 sample per downgradient end of ditch or 50 l.f. of soil excavation perimeter.
   SW = Sidewall, one sample per 50 l.f. of soil excavation wall exceeding 2 feet in depth.
3. The actual number of samples is based on the required frequency, but takes into account the geometry of the excavation area. In order to ensure adequate coverage of all grids and perimeter lengths, additional samples are required as shown in Figures 4-1 and 4-2.

Table 4-1b
Pre- and Post-Excavation Confirmation Sampling at SEAD-16 and SEAD-17
SEAD-16 and SEAD-17 Remedial Design
Seneca Army Depot Activity

					Pre-Excavation[2]										Post-Excavation									
	Actual Required Total Number of Confirmatory Samples[1]				Confirmatory Samples				QA/QC samples[3]				Total Analyses[5]		Confirmatory Samples				QA/QC samples[3]				Total Analyses[5]	
Areas		PR	SW	**Subtotal**	FL	PR	SW	**Subtotal**	Dups	MS	MSD	**TOTAL[4]**	*Metals*	*cPAHs[6]*	FL	PR	SW	**Subtotal**	Dups	MS	MSD	**TOTAL[4]**	*Metals*	*cPAHs[6]*
SEAD-16 Main Excavation	23	22	0	45	0	22	0	22	1	1	0	24	*24*	*0*	23	5	0	28	2	2	0	32	*32*	*0*
SEAD-16 MW16-6 Area	1	3	0	4	0	2	0	2	1	1	1	5	*5*	*5*	1	1	0	2	1	1	1	5	*5*	*5*
SEAD-16 SS16-35 Excavation	1	4	0	5	0	4	0	4	--	--	--	4	*4*	*0*	1	0	0	1	--	--	--	1	*1*	*0*
SEAD-16 SB16-2 Excavation	1	--	4	5	0	--	0	0	--	--	--	0	*0*	*0*	1	--	4	5	--	--	--	5	*5*	*0*
SEAD-16 SB16-5 Excavation	1	--	4	5	0	--	0	0	--	--	--	0	*0*	*0*	1	--	4	5	--	--	--	5	*5*	*0*
SEAD-16 Soil Excavation (Total)	27	29	8	64	0	28	0	28	2	2	1	33	*33*	*5*	27	6	8	41	3	3	1	48	*48*	*5*
SEAD-16 Ditch 1	2	1	--	3	0	1	--	1	--	--	--	1	*1*	*0*	2	0	--	2	--	--	--	2	*2*	*0*
SEAD-16 Ditch 2	1	1	--	2	0	1	--	1	--	--	--	1	*1*	*0*	1	0	--	1	--	--	--	1	*1*	*0*
SEAD-16 Ditch 3	2	1	--	3	0	0	--	0	1	1	0	2	*2*	*0*	2	1	--	3	1	1	0	5	*5*	*0*
SEAD-16 Ditch 4	2	1	--	3	0	1	--	1	--	--	--	1	*1*	*0*	2	0	--	2	--	--	--	2	*2*	*0*
SEAD-16 Ditch Excavation (Total)	7	4	0	11	0	3	0	3	1	1	0	5	5	0	7	1	0	8	1	1	0	10	10	0
SEAD-17 Soil Excavation	33	29	--	**62**	0	29	--	**29**	2	2	0	33	*33*	*0*	33	5	--	**38**	2	2	0	42	*42*	*0*
	Total Samples			**137**	**Total Samples**			**60**	5	5	1	71	*71*	*5*	**Total Samples**			**87**	6	6	1	100	100	5
	Total for SEAD-16			**75**	**Total for SEAD-16**			**31**	3	3	1	38	*38*	*5*	**Total for SEAD-16**			**49**	4	4	1	58	58	5
	Total for SEAD-17			**62**	**Total for SEAD-17**			**29**	2	2	0	33	*33*	*0*	**Total for SEAD-17**			**38**	2	2	0	42	*42*	*0*

Notes:
NA = Not applicable
Dups - Sample duplicate
MS/MSD - Matrix spike / matrix spike duplicate
FL = Floor
PR = Perimeter
SW = Sidewall

1. The actual number of samples is based on the required frequency, but takes into account the geometry of the excavation area. In order to ensure adequate coverage of all grids and perimeter lengths, additional samples are required as shown in Figures 4-1 and 4-2. (Refer to Table 4-1a).
2. Samples collected during the RI and during pre-excavation sampling in April and May 2007.
3. The number of QA/QC samples are calculated based on the total number of samples for each media type at each site. One field duplicate every 20 project samples. One MS/MSD for cPAHs and one MS for metals per 20 project samples. See Table 4-3.
4. The number of samples are based on the actual number of samples plus QA/QC samples
5. Additional details on the analytical requirements, including analytical methods, are provided in Table 4-3.
6. cPAH analysis is required for grids G4 and G5 only within the MW16-6 area shown in Figure 4-1.

TABLE 4-2
Project Cleanup Goals and Laboratory Reporting Limits
SEAD-16/17 Remedial Design
Seneca Army Depot Activity

Compounds	Units	Project Cleanup Goal	Laboratory Method Detection Limits [1,2]	Laboratory Reporting Limits [1,2]
Carcinogenic PAHs[3]				
Benzo(a)anthracene	ug/Kg	NA	2.91	330
Benzo(a)pyrene	ug/Kg	NA	4.07	330
Benzo(b)fluoranthene	ug/Kg	NA	3.28	330
Benzo(k)fluoranthene	ug/Kg	NA	1.86	330
Chrysene	ug/Kg	NA	1.69	330
Dibenz(a,h)anthracene	ug/Kg	NA	1.99	330
Indeno(1,2,3-cd)pyrene	ug/Kg	NA	4.67	330
BTE	mg/Kg	10		
Metals [4]				
Antimony [7]	mg/Kg	41	0.69	15
Arsenic [5]	mg/Kg	21.5	0.37	2
Cadmium	mg/Kg	60	0.06	0.2
Copper	mg/Kg	10,000	0.5	1
Lead [6]	mg/Kg	1,250	0.19	1
Mercury	mg/Kg	6.0	0.02	0.0047
Thallium [7]	mg/Kg	6.7	0.66	6
Zinc	mg/Kg	10,000	0.16	1

Notes:

BTE = Benzo(a)pyrene Toxicity Equivalence

NA = Not Applicable

1. Laboratory Method Detection Limits and Reporting Limits from STL, Buffalo as of March, 2007.
   For both carcinogenic PAHs and metals, the laboratory will report any analytical results above the method detection limits.
2. The laboratory method detection limits and reporting limits for soil are based on 100% solids.
   Samples with less than 100% solids will have limits greater than those listed in the table above.
3. The cleanup goal for cPAHs is the 10 ppm BTE value. There are no cleanup goals for individual cPAHs. The cPAH cleanup goal only applies to SEAD-16.
4. The cleanup goals for metals are the NYSDEC Restricted Use Soil Cleanup Objective for Industrial Use (Table 375-6.8(b)).
5. The cleanup goal for arsenic was replaced with the SEDA maximum background value since the NYSDEC restricted industrial value for arsenic was lower than the maximum SEDA site-wide background value.
6. The lead cleanup goal was derived in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996) and in concurrence with NYSDEC and USEPA.
7. Since no NYSDEC Soil Cleanup Objective for Industrial use exists, 1/10th the USEPA Region IX PRG Industrial value was used.

TABLE 4-3
Field Sampling Matrix
SEAD-16 and SEAD-17 Remedial Design
Seneca Army Depot Activity

Sample Type	Sampling Frequency[1]	Analytical Requirements (Method)	Acceptance Criteria	Field Quality Assurance/Quality Control Sample Requirement
Confirmatory Samples				
SEAD-16 Soil Excavation	Floor - every 2,500 SF Perimeter - every 50 LF Sidewalls - every 50 LF	Metals (SW846 Method 6010B), Mercury (SW846 Method 7471A). cPAHs (SW846 Method 8270C) in grids G4 and G5 (Figure 4-1)	Site Cleanup Goals for metals and cPAHs (Section 2)	One field duplicate every 20 project samples. One MS/MSD for cPAHs and one MS for metals per 20 project samples. Rinsate Blank[3].
SEAD-16 Ditch	Floor - every 50 LF + 1 sample at downgradient end of excavation	Metals (SW846 Method 6010B), Mercury (SW846 Method 7471A).	Site Cleanup Goals for metals (Section 2)	One field duplicate every 20 project samples. One MS for metals per 20 project samples. Rinsate Blank[3].
SEAD-17 Soil Excavation	Floor	Metals (SW846 Method 6010B) and Mercury (SW846 Method 7471A)	Site Cleanup Goals for metals (Section 2)	One field duplicate every 20 project samples. One MS/MSD for cPAHs and one MS for metals per 20 project samples. Rinsate Blank[3].
Water Samples				
Excavation/Decon Water	one sample from frac tank or other container	Metals (SW846 Method 6010B) and Mercury (SW846 Method 7470A) VOCs (SW846 Method 8260B) SVOCs (SW846 Method 8270C)	Evaluated by Seneca County Sewer District No. 2's discharge requirements 6 NYCRR Part 371	Not Required
Fill Material Samples (if needed)				
Soil from Borrow Source	One sample per source	Metals (SW846 Method 6010B) and Mercury (SW846 Method 7471A) VOCs (SW846 Method 8260B) cPAHs (SW846 Method 8270C)	Metals below site cleanup goals VOCs below NYSDEC Unrestricted (Table 375-6.8(a)) cPAHs below site cleanup goals	Not Required
Disposal Characterization[2]				
Soil Samples/Building Debris	Soil: 2 composite samples from SEAD-16 and 2 composite samples from SEAD-17 (one for every 700 CY); Debris: one composite sample from debris within SEAD-16 buildings (1/700 cy debris).	TCLP Metals (EPA Method 1311) Ignitability (EPA Method 1030) pH Reactivity (40CFR 261.23) TCLP SVOCs (EPA Method 1311) (debris only)	RCRA definition of non-hazardous material	Not Required

1. In each excavation area, a minimum of one sample will be collected from the floor of excavation. A minimum of one sidewall or perimeter sample will be collected from each edge of excavation. Sidewall samples will be collected halfway between the floor of excavation and the ground surface, only if excavation depth exceeds 2 feet.
2. The exact number of samples and the specific analyses may vary depending on the requirements of the selected landfill.
3. If sampling equipment is not reused, no rinsate blank is required. Currently no sampling equipment is expected to be reused. However, when sampling equipment is decontaminated and reused, rinsate blank sample will be collected one per sampling event or one per 20 project samples, whichever is more frequent.

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
SAMPLE AREA									Main Excavation	Main Excavation	Main Excavation	Ditch 2	Main Excavation
LOCATION ID									16EXPR-A8-01	16EXPR-A8-02	16EXPR-A9-01	16EXPR-B10-01	16EXPR-B10-02
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE ID									16EXPR-A8-01	16EXPR-A8-02	16EXPR-A9-01	16EXPR-B10-01	16EXPR-B10-02
TOP OF SAMPLE									0	0	0	0	0
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2
SAMPLE DATE									5/3/2007	5/3/2007	5/3/2007	4/4/2007	4/4/2007
QC CODE									SA	SA	SA	SA	SA
STUDY ID									RA	RA	RA	RA	RA
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Carcinogenic PAHs													
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2					
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2					
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2					
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2					
Chrysene	UG/KG	2300	*	100%		0	2	2					
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2					
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2					
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2					
Metals													
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	12.9 J	4.7 J	3.4 J	9.9 J	2.1 J
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	5.4	5.5	4.6	5.3	4.8
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	0.44 J	0.29 J	0.18 J	0.8	0.42
Copper	MG/KG	2390	261	100%	10000	0	31	31	119	52.2	51.5	142	44.3
Lead	MG/KG	1070	605	100%	1250	0	31	31	676	239	179	786	137
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	4.3	0.342	0.344	0.385	0.357
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	1.2 U	0.98 U	1 U	1.1 U	0.92 U
Zinc	MG/KG	711	211	100%	10000	0	31	31	163	104	84.2	143 J	81.5 J

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION								SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
SAMPLE AREA								Main Excavation	Main Excavation	Main Excavation	Ditch 1	Main Excavation
LOCATION ID								16EXPR-B5-01	16EXPR-B6-01	16EXPR-B7-01	16EXPR-B9-01	16EXPR-B9-02
MATRIX								SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE ID								16EXPR-B5-01	16EXPR-B6-01	16EXPR-B7-01	16EXPR-B9-01	16EXPR-B9-02
TOP OF SAMPLE								0	0	0	0	0
BOTTOM OF SAMPLE								0.2	0.2	0.2	0.2	0.2
SAMPLE DATE								5/3/2007	4/4/2007	4/4/2007	4/4/2007	39176
QC CODE								SA	SA	SA	SA	SA
STUDY ID								RA	RA	RA	RA	RA
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Carcinogenic PAHs													
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2					
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2					
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2					
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2					
Chrysene	UG/KG	2300	*	100%		0	2	2					
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2					
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2					
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2					
Metals													
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	14.6 J	6.9 J	4.3 J	20.8 J	14.8 J
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	6.2	5.7	5.4	5.9	7.7
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	0.6 J	0.8	0.62	0.69	2.2
Copper	MG/KG	2390	261	100%	10000	0	31	31	169	99	67.6	209 J	160 J
Lead	MG/KG	1070	605	100%	1250	0	31	31	884	424	363	791	1050
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	0.207	0.313	0.345	0.449	0.613
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	0.95 U	1 U	1.1 U	0.94 U	0.93 U
Zinc	MG/KG	711	211	100%	10000	0	31	31	224	127 J	112 J	194	222

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
SAMPLE AREA									Main Excavation	Main Excavation	Main Excavation	Main Excavation	Ditch 4
LOCATION ID									16EXPR-C10-01	16EXPR-C4-01	16EXPR-D4-01	16EXPR-D4-02	16EXPR-E13-01
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE ID									16EXPR-C10-01	16EXPR-C4-01	16EXPR-D4-01	16EXPR-D4-02	16EXPR-E13-01
TOP OF SAMPLE									0	0	0	0	0
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2
SAMPLE DATE									4/4/2007	4/4/2007	4/4/2007	4/4/2007	4/4/2007
QC CODE									SA	SA	SA	SA	SA
STUDY ID									RA	RA	RA	RA	RA
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Carcinogenic PAHs													
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2					
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2					
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2					
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2					
Chrysene	UG/KG	2300	*	100%		0	2	2					
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2					
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2					
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2					
Metals													
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	7.2 J	3.6 J	16.3 J	11 J	3.2 J
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	5.2	3.3	8.5	5.1	7.8
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	0.93	0.29	0.74	0.93	1
Copper	MG/KG	2390	261	100%	10000	0	31	31	109	68.5	196	154	50.6 J
Lead	MG/KG	1070	605	100%	1250	0	31	31	530	589	1070	887	187
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	0.331	0.026	0.126	0.104	0.042
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	1 U	0.68 U	0.74 U	0.87 U	0.82 J
Zinc	MG/KG	711	211	100%	10000	0	31	31	140 J	62.6 J	153 J	176 J	141

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
SAMPLE AREA									Main Excavation	Main Excavation	Main Excavation	Main Excavation	Main Excavation
LOCATION ID									16EXPR-E3-01	16EXPR-E9-01	16EXPR-F3-01	16EXPR-F8-01	16EXPR-F9-01
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE ID									16EXPR-E3-01	16EXPR-E9-01	16EXPR-F3-01/02	16EXPR-F8-01	16EXPR-F9-01
TOP OF SAMPLE									0	0	0	0	0
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2
SAMPLE DATE									4/4/2007	4/4/2007	4/4/2007	4/4/2007	4/4/2007
QC CODE									SA	SA	SADU	SA	SA
STUDY ID									RA	RA	RA	RA	RA
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Carcinogenic PAHs													
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2					
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2					
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2					
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2					
Chrysene	UG/KG	2300	*	100%		0	2	2					
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2					
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2					
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2					
Metals													
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	5.6 J	0.65 UJ	3.2 J	2.6 J	5 J
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	4.3	4.2	4.75	5.7	5
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	0.76	0.38	0.46	0.28	0.85
Copper	MG/KG	2390	261	100%	10000	0	31	31	83.5 J	14.1	71.35	29.7	172
Lead	MG/KG	1070	605	100%	1250	0	31	31	444	70.3	334 J	205	643
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	0.409	0.01 J	0.029	0.022	0.021
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	1.3 U	0.8 U	0.755 U	0.65 U	0.7 U
Zinc	MG/KG	711	211	100%	10000	0	31	31	122	36.2 J	83.25 J	36.8 J	144 J

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
SAMPLE AREA									Main Excavation	Main Excavation	MW16-6	MW16-6	SS16-35
LOCATION ID									16EXPR-G2-01	16EXPR-G3-01	16EXPR-G4-01	16EXPR-G5-01	16EXPR-H3-01
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE ID									16EXPR-G2-01	16EXPR-G3-01	16EXPR-G4-01	16EXPR-G5-01/02	16EXPR-H3-01
TOP OF SAMPLE									0	0	0	0	0
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2
SAMPLE DATE									4/4/2007	4/4/2007	4/4/2007	4/4/2007	4/4/2007
QC CODE									SA	SA	SA	SADU	SA
STUDY ID									RA	RA	RA	RA	RA
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Carcinogenic PAHs													
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2			2400 J	170 J	
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2			5800	240 J	
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2			7500 J	310 J	
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2			3600 UJ	1697.5 J	
Chrysene	UG/KG	2300	*	100%		0	2	2			2300 J	1255 J	
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2			1600 J	5600 U	
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2			6000	205 J	
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2			9.031	3.138025	
Metals													
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	0.56 UJ	3.1 J	5 J	1.0925 J	7.7 J
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	2.2	1.5 J	4.8	4.9	5.3
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	0.33	0.25	0.52	2.05 J	2.5
Copper	MG/KG	2390	261	100%	10000	0	31	31	9.5 J	36.4 J	72.7 J	33.5	209 J
Lead	MG/KG	1070	605	100%	1250	0	31	31	12.4	285	302	110.3	822
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	0.102	0.147	0.263	0.0445 J	0.169
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	0.68 U	0.71 U	0.7 U	1.12 U	0.99 U
Zinc	MG/KG	711	211	100%	10000	0	31	31	24	45	109	281.5 J	211

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
SAMPLE AREA									SS16-35	SS16-35	SS16-35	Main Excavation	Main Excavation
LOCATION ID									16EXPR-H3-02	16EXPR-I3-01	16EXPR-I3-02	SS16-25	SS16-13
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL
SAMPLE ID									16EXPR-H3-02	16EXPR-I3-01	16EXPR-I3-02	16050	SS16-13-1
TOP OF SAMPLE									0	0	0	0	0
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2
SAMPLE DATE									4/4/2007	4/4/2007	4/4/2007	8/20/1996	10/20/1993
QC CODE									SA	SA	SA	SA	SA
STUDY ID									RA	RA	RA	RI PHASE 1	ESI
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Carcinogenic PAHs													
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2					
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2					
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2					
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2					
Chrysene	UG/KG	2300	*	100%		0	2	2					
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2					
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2					
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2					
Metals													
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	15.8 J	10.9 J	11 J	3.1 J	8.2 U
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	5.5	5.1	4.7	4 J	6.8
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	5.7	4.7	1.9	0.25	0.51 U
Copper	MG/KG	2390	261	100%	10000	0	31	31	362 J	2390 J	223 J	86.6 J	204
Lead	MG/KG	1070	605	100%	1250	0	31	31	1010	765	533	439 J	460
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	0.14	0.153	0.061	0.4 J	1
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	0.79 U	0.87 U	0.71 U	0.82 U	0.16 U
Zinc	MG/KG	711	211	100%	10000	0	31	31	398	512	711	113	128

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4a
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-16
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION	SEAD-16
SAMPLE AREA	Main Excavation
LOCATION ID	SS16-28
MATRIX	SOIL
SAMPLE ID	16044
TOP OF SAMPLE	0
BOTTOM OF SAMPLE	0.2
SAMPLE DATE	8/19/1996
QC CODE	SA
STUDY ID	RI PHASE 1

Parameter	Units	Maximum Value	UCL of the Mean [3]	Frequency of Detection	Cleanup Goals	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value (Q)
Carcinogenic PAHs									
Benzo(a)anthracene	UG/KG	2400	*	100%		0	2	2	
Benzo(a)pyrene	UG/KG	5800	*	100%		0	2	2	
Benzo(b)fluoranthene	UG/KG	7500	*	100%		0	2	2	
Benzo(k)fluoranthene	UG/KG	1697.5	*	50%		0	1	2	
Chrysene	UG/KG	2300	*	100%		0	2	2	
Dibenz(a,h)anthracene	UG/KG	1600	*	50%		0	1	2	
Indeno(1,2,3-cd)pyrene	UG/KG	6000	*	100%		0	2	2	
BTE[4]	MG/KG	9.031	*	100%	10	0	2	2	
Metals									
Antimony	MG/KG	20.8	9.34	90%	41	0	28	31	6.7 J
Arsenic	MG/KG	8.5	5.6	100%	21.5	0	31	31	5.2 J
Cadmium	MG/KG	5.7	2.04	97%	60	0	30	31	0.3
Copper	MG/KG	2390	261	100%	10000	0	31	31	192 J
Lead	MG/KG	1070	605	100%	1250	0	31	31	626 J
Mercury	MG/KG	4.3	0.71	100%	5.7	0	31	31	0.11 J
Thallium	MG/KG	0.82	0.48	3%	6.7	0	1	31	0.86 U
Zinc	MG/KG	711	211	100%	10000	0	31	31	115

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.
2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.
4) Benzo(a)pyrene Toxicity (BTE) value was calculated assuming non-detects were at half value.

Below are the toxicity equivalent factors (TEF) for the NYSDEC BTE guidelines.

cPAHs	NYSDEC TEF
Benzo(a)anthracene	0.1
Benzo(a)pyrene	1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.01
Dibenz(a,h)anthracene	1
Indeno(1,2,3-cd)pyrene	0.1

Table 4-4b
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-17
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-17		SEAD-17		SEAD-17	
LOCATION ID									17EXPR-A3-01		17EXPR-A3-02		17EXPR-A5-01	
MATRIX									SOIL		SOIL		SOIL	
SAMPLE ID									17EXPR-A3-01		17EXPR-A3-02		17EXPR-A5-01	
TOP OF SAMPLE									0		0		0	
BOTTOM OF SAMPLE									0.2		0.2		0.2	
SAMPLE DATE									5/3/2007		5/3/2007		4/4/2007	
QC CODE									SA		SA		SA	
STUDY ID									RA		RA		RA	
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value	(Q)	Value	(Q)	Value	(Q)
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	25.1	UJ	27.8	UJ	10.5	J
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	4.9		5.7		5.2	
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	3.2	J	5.9	J	3.6	J
Copper	MG/KG	202	106	100%	10000	0	29	29	74.5		92.8		94.8	J
Lead	MG/KG	1480	747	100%	1250	1	29	29	736		1020		1050	J
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.073		0.073		0.084	
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	1.1	U	1.2	U	1.1	U
Zinc	MG/KG	574	283	100%	10000	0	29	29	314		493		343	

SITE LOCATION									SEAD-17		SEAD-17		SEAD-17	
LOCATION ID									17EXPR-A7-01		17EXPR-B7-02			
MATRIX									SOIL		SOIL			
SAMPLE ID									17EXPR-A7-01		17EXPR-B7-02			
TOP OF SAMPLE									0		0			
BOTTOM OF SAMPLE									0.2		0.2			
SAMPLE DATE									5/3/2007		5/3/2007			
QC CODE									SA		SA			
STUDY ID									RA		RA			
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value	(Q)	Value	(Q)		
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	21.4	UJ	21.2	UJ		
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	4.9		4.7			
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	1.7	J	1.6	J		
Copper	MG/KG	202	106	100%	10000	0	29	29	49.6		121			
Lead	MG/KG	1480	747	100%	1250	1	29	29	304		717			
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.067		0.043	J		
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	0.94	U	0.93	U		
Zinc	MG/KG	574	283	100%	10000	0	29	29	145		259			

Notes:

1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select RI samples.

2) Sample duplicate pairs have been averaged and the average values for a sample and its duplicate are presented in this table.

3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due to small sample size.

4) Bold and shaded cells represent exceedance of cleanup goal.

Table 4-4b
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-17
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	
LOCATION ID									17EXPR-B8-01	17EXPR-C3-01	17EXPR-C3-02	17EXPR-C7-02	17EXPR-D7-02	
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE ID									17EXPR-B8-01	17EXPR-C3-01	17EXPR-C3-02	17EXPR-C7-02	17EXPR-D7-02	
TOP OF SAMPLE									0	0	0	0	0	
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2	
SAMPLE DATE									4/4/2007	4/4/2007	5/3/2007	4/4/2007	4/4/2007	
QC CODE									SA	SA	SA	SA	SA	
STUDY ID									RA	RA	RA	RA	RA	
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	2.4 J	13.9 J	24.3 UJ	11.8 J	6 J	
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	4.2	8.2	4.4	7.9	5.4	
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	0.97 J	16.2	6 J	3.1 J	2.4	
Copper	MG/KG	202	106	100%	10000	0	29	29	45.5 J	118	158	149 J	72.8	
Lead	MG/KG	1480	747	100%	1250	1	29	29	208 J	909 J	1040	912 J	528 J	
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.045	0.046	0.047 J	0.057	0.048	
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	0.88 U	0.87 U	1.1 U	1.1 U	1.1 U	
Zinc	MG/KG	574	283	100%	10000	0	29	29	74.8	227 J	493	210	199 J	

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select I
2) Sample duplicate pairs have been averaged and the average values for a sample and
its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due t
4) Bold and shaded cells represent exceedance of cleanup goal.

Table 4-4b
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-17
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	
LOCATION ID									17EXPR-D8-01	17EXPR-E8-01	17EXPR-F2-01	17EXPR-F5-01	17EXPR-F6-01	
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE ID									17EXPR-D8-01	17EXPR-E8-01	17EXPR-F2-01	17EXPR-F5-01	17EXPR-F6-01/02	
TOP OF SAMPLE									0	0	0	0	0	
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2	
SAMPLE DATE									4/4/2007	4/4/2007	4/4/2007	4/4/2007	4/4/2007	
QC CODE									SA	SA	SA	SA	SADU	
STUDY ID									RA	RA	RA	RA	RA	
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	6.5 J	11 J	1.3 J	1.9 J	14.9 J	
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	5.1	4.9	6.1	5.7	5.55	
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	2	4.1	0.41	0.85	5.75 J	
Copper	MG/KG	202	106	100%	10000	0	29	29	91.2	93.7	31	39	162.5 J	
Lead	MG/KG	1480	747	100%	1250	1	29	29	542 J	937 J	97.1 J	108 J	1121 J	
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.063	0.048	0.05	0.027	0.0695	
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	0.95 U	0.98 U	0.99 U	0.81 U	0.895 U	
Zinc	MG/KG	574	283	100%	10000	0	29	29	169 J	258 J	95.2 J	107 J	175	

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select I
2) Sample duplicate pairs have been averaged and the average values for a sample and
its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due t
4) Bold and shaded cells represent exceedance of cleanup goal.

Table 4-4b
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-17
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	
LOCATION ID									17EXPR-F7-02	17EXPR-F8-02	17EXPR-G2-01	17EXPR-G4-01	17EXPR-G5-02	
MATRIX									SOIL	SOIL	SOIL	SOIL	SOIL	
SAMPLE ID									17EXPR-F7-02	17EXPR-F8-02	17EXPR-G2-01	17EXPR-G4-01	17EXPR-G5-02	
TOP OF SAMPLE									0	0	0	0	0	
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2	0.2	
SAMPLE DATE									5/3/2007	5/3/2007	4/4/2007	4/4/2007	5/3/2007	
QC CODE									SA	SA	SA	SA	SA	
STUDY ID									RA	RA	RA	RA	RA	
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	12 J	7.2 J	3.9 J	5.9 J	5.2 J	
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	4.5	3.5	5.7	4.7	4.6	
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	6.1 J	3.4 J	2.3	1.3	1.9 J	
Copper	MG/KG	202	106	100%	10000	0	29	29	127	65.3	47.9	51.2	59.3	
Lead	MG/KG	1480	747	100%	1250	1	29	29	**1480**	798	317 J	386 J	403	
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.048 J	0.039 J	0.036	0.055	0.057 J	
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	1 U	0.99 U	1.1 U	0.97 U	1 U	
Zinc	MG/KG	574	283	100%	10000	0	29	29	316	170	188 J	111 J	137	

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select I
2) Sample duplicate pairs have been averaged and the average values for a sample and
its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due t
4) Bold and shaded cells represent exceedance of cleanup goal.

Table 4-4b
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-17
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-17		SEAD-17		SEAD-17	
LOCATION ID									SS17-16		SS17-20		SS17-19	
MATRIX									SOIL		SOIL		SOIL	
SAMPLE ID									SS17-16-1		SS17-20-1		SS17-19-1	
TOP OF SAMPLE									0		0		0	
BOTTOM OF SAMPLE									0.2		0.2		0.2	
SAMPLE DATE									10/21/1993		10/21/1993		10/21/1993	
QC CODE									SA		SA		SA	
STUDY ID									ESI		ESI		ESI	
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value	(Q)	Value	(Q)	Value	(Q)
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	12.4	UR	8.7	UR	9	UR
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	6.5		6.5		6.3	
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	2.3		0.54	U	2.9	
Copper	MG/KG	202	106	100%	10000	0	29	29	182		26.9		81.7	
Lead	MG/KG	1480	747	100%	1250	1	29	29	595		69.2		402	
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.36	J	0.08	J	0.07	J
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	0.27	U	0.2	U	0.25	U
Zinc	MG/KG	574	283	100%	10000	0	29	29	150		71.6		351	

SITE LOCATION	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
LOCATION ID	SS17-28	SS17-12			
MATRIX	SOIL	SOIL			
SAMPLE ID	16064	SS17-12-1			
TOP OF SAMPLE	0	0			
BOTTOM OF SAMPLE	0.2	0.2			
SAMPLE DATE	8/21/1996	10/21/1993			
QC CODE	SA	SA			
STUDY ID	RI PHASE 1 STEP 1	ESI			
Value	(Q)	Value	(Q)		
2.7	J	10.8	UR		
5		6.5			
5.6		4.5			
141		202			
524		1210			
0.06		0.07	J		
0.9	J	0.25	U		
468		574			

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select I
2) Sample duplicate pairs have been averaged and the average values for a sample and
its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due t
4) Bold and shaded cells represent exceedance of cleanup goal.

Table 4-4b
Data Summary of Perimeter Confirmatory Sampling Set at SEAD-17
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

SITE LOCATION									SEAD-17	SEAD-17	SEAD-17	SEAD-17
LOCATION ID									SS17-24	SS17-26	SS17-31	SS17-34
MATRIX									SOIL	SOIL	SOIL	SOIL
SAMPLE ID									16072	16069	16071	16079
TOP OF SAMPLE									0	0	0	0
BOTTOM OF SAMPLE									0.2	0.2	0.2	0.2
SAMPLE DATE									8/22/1996	8/22/1996	35299	35299
QC CODE									SA	SA	SA	SA
STUDY ID									RI PHASE 1 STEP 1	RI PHASE 1 STEP 1	RI PHASE 1 STEP 1	RI PHASE 1 STEP 1
Parameter	**Units**	**Maximum Value**	**UCL of the Mean [3]**	**Frequency of Detection**	**Cleanup Goals**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Analyzed**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Antimony	MG/KG	14.9	9.7	80%	41	0	20	25	3.3 J	5 J	3.4 J	1.5 J
Arsenic	MG/KG	8.2	5.75	100%	21.5	0	29	29	5.4	6.5	4.1	4.2
Cadmium	MG/KG	16.2	4.4	97%	60	0	28	29	2.8	3.6	1.6	2.1
Copper	MG/KG	202	106	100%	10000	0	29	29	59	80.6	67.6	39.3
Lead	MG/KG	1480	747	100%	1250	1	29	29	496	697	450	265
Mercury	MG/KG	0.36	0.09	100%	5.7	0	29	29	0.06	0.11	0.06	0.05
Thallium	MG/KG	1.5	0.78	10%	6.7	0	3	29	1.5	1.5	0.94 U	0.84 U
Zinc	MG/KG	574	283	100%	10000	0	29	29	222 J	233 J	139 J	167 J

Notes:
1) Samples that delineate the limit of excavation are inlcuded in this table, which includes pre-excavation perimeter samples and select I
2) Sample duplicate pairs have been averaged and the average values for a sample and
its duplicate are presented in this table.
3) UCL of mean values presented are based on EPA ProUCL software Version 3.002. (*) UCL evaluation could not be performed due t
4) Bold and shaded cells represent exceedance of cleanup goal.

TABLE 5-1
PRE-CONSTRUCTION INSPECTION ACTIVITIES FOR REMOVAL ACTION
SEAD-16 and SEAD-17 Construction Quality Plan
Seneca Army Depot Activity, New York

Preparatory Inspection Activity	Method	Frequency	Acceptance Criteria
Survey and Excavation Layout	Site Survey – Survey in area to be excavated and marked with grade stakes.	Once after final design approval.	Establish grade stakes along the designed excavation boundary according to the design drawings. Grade stakes shall be placed at the start and termination of each linear section, at 50-foot intervals along each linear segment, at 20-foot intervals along curves, and at any change in boundary direction not in a curve.
Excavation Area Clearing and Grubbing	Visual	Once within the excavated area prior to excavation of the area.	Confirm that the excavation area has been cleared of obstructions and that equipment can operate in the area with no obstructions.
Utility Mark Out	Call UGFPO and consult As-Built drawings provided by the facility	Once prior to commencing excavation.	Confirm all subsurface and overhead utilities are clearly marked and that excavation plans take the utilities into consideration.
Off- Site Access / Egress Approval	Visual	Once prior to commencing construction	Confirm approval for use of off-site roads for contaminated soil transportation. Confirm that all access gates are working properly.
Job Site Trailer and Lay-Down Approval	Visual	Once prior to start of construction	Confirm approval and location for site trailer and lay-down area and availability of electrical power.
Demarcation of Monitoring Wells	Site Survey – Survey in monitoring wells.	Once prior to construction.	Establish grade stakes at locations according to the design drawings and place visible barriers to prevent damage.
Equipment Examinations (Earthwork)	Visual	Once upon arrival at site.	Determine that equipment type and size conform to project specifications and record information in field book. Determine that equipment conforms to OSHA safety requirements. Determine that equipment is in working order and is not leaking oil or fuel in quantities sufficient to be classified as a spill.
Soil Disposal Acceptance	TCLP Metals and waste characterization Analytical	2 composite samples per site	The waste management facility requires that one composite sample be collected at each site and submitted for analysis, based on the waste management facility's review of the historic sampling. For disposal as non-hazardous material, samples must pass TCLP.
Fill Material Acceptance (if needed)	Metals, VOCs, and cPAH Analysis	1 initial sample	Compliance with the site cleanup goals for metals and cPAHs, and VOCs no greater than NYSDEC Unrestricted Soil Cleanup Objectives (Table 375-6.8(a)).

TABLE 5-2
CONSTRUCTION INSPECTION ACTIVITIES FOR REMOVAL ACTION
SEAD-16 and SEAD-17 Construction Quality Plan
Seneca Army Depot Activity, New York

Construction Inspection Activity	Method	Frequency	Acceptance Criteria
Air Monitoring	Thermo 4000 dust monitor	During start-up and construction.	Readings below 1 ppm per the HSP Section 8 (HSP).
Construction Methods Observation	Visual	During start-up and construction.	Ensure that the methods conform to standard construction practices and the worker safety is always a primary consideration.
Depth of excavation	Visual	Every 2,500 sq ft of 'completed' excavation.	The depth of the excavation will be as specified in the design and the depth will be recorded in the field log for each 50'x50' excavated area.
Site Security	Visual	Daily during construction.	Confirm that any open excavation is fenced off and the base perimeter is secure.
Confirmatory sampling	Analytical testing	Collect base samples every 2,500 sf and perimeter samples every 50 lf for main excavation areas and collect base samples every 50 lf in the ditch. In deeper excavations at SEAD-16, collect base samples every 2,500 SF and sidewall samples every 50 lf.	Site cleanup goals for metals for SEAD-17 and metals and cPAHs for SEAD-16.
Backfill of excavation (if needed)	Visual	Every lift of backfill	Clean backfill will be placed in the excavation in 1 to 2 foot lifts and compaction as specified in the design.
Erosion Control Maintenance	Visual	Daily and during and after significant rainfall events	Control measures in good repair and ensure no migration of sediments or evidence of erosion.
Location of Excavation	Site Survey.	Once at each excavation after the backfill is placed, before site restoration	Survey the final location of each excavation for position and elevation.

TABLE 5-3
POST-CONSTRUCTION ACTIVITIES FOR REMOVAL ACTION
SEAD-16 and SEAD-17 Construction Quality Plan
Seneca Army Depot Activity, New York

Follow-Up Inspection Activity	Method	Frequency	Acceptance Criteria
Final Grading	Visual	At completion of backfill operation, if needed.	The final grade should prevent storm water run-off or collection.
Site Restoration	Visual	Once for each excavation after construction has been completed.	To ensure that the excavated areas and staging areas are graded to the original grade and seeded to promote vegetation where pre-construction vegetation existed.
Revegetation	Visual	During the monitoring event, and subsequently no less than semi-annually.	The previously vegetated disturbed areas are re-vegetated and no erosion is occurring.

TABLE 6-1
MONITORING WELL CONSTRUCTION DETAILS
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

Well ID	Well Type (1)	Depth of Well Relative to Ground Surface (ft)	Depth of Well Relative to Top of PVC (ft)	Diameter of Boring/Core (in)	Diameter of Well (in)	Well Screen Length (ft)	Screened Interval Relative to Ground Surface (ft)	Well Screen Slot Size (in)	Thickness of Bentonite Seal (ft)	Height of PVC Well Stickup (ft)	Elevation of Top of PVC Well (MSL)	Well Casing Material	Well Screen Material
MW16-1	T/WS	6.0	7.8	8.0	2.0	2.0	3.3 to 5.3	0.01	2.2	1.8	735.5	PVC	PVC
MW16-2	T/WS	4.1	5.8	8.0	2.0	2.0	1.4 to 3.4	0.01	1.1	1.7	734.6	PVC	PVC
MW16-3	T/WS	5.0	7.4	8.0	2.0	2.0	2.3 to 4.3	0.01	1.8	2.4	735.5	PVC	PVC
MW16-4	T/WS	5.2	6.8	8.0	2.0	2.0	2.5 to 4.5	0.01	1.0	1.6	733.9	PVC	Wire wrapped PVC
MW16-5	T/WS	4.0	5.3	8.0	2.0	2.0	1.3 to 3.3	0.01	0.4	1.3	733.4	PVC	Wire wrapped PVC
MW16-6	T/WS	5.1	6.6	8.0	2.0	2.3	2.6 to 4.9	0.01	0.7	1.5	733.6	PVC	Wire wrapped PVC
MW16-7	T/WS	5.3	6.9	8.0	2.0	2.0	2.6 to 4.6	0.01	0.7	1.6	734.4	PVC	Wire wrapped PVC
MW17-1	T/WS	8.5	10.4	8.0	2.0	4.0	3.4 to 7.4	0.01	1.0	1.9	736.3	PVC	PVC
MW17-2	T/WS	6.0	8.1	8.0	2.0	2.0	3.3 to 5.3	0.01	0.3	2.1	733.8	PVC	PVC
MW17-3	T/WS	6.0	8.0	8.0	2.0	2.0	3.1 to 5.1	0.01	0.7	2.0	732.2	PVC	PVC
MW17-4	T/WS	6.0	8.1	8.0	2.0	2.0	3.1 to 5.1	0.01	0.7	2.1	734.6	PVC	PVC
MW17-5	T/WS	8.3	10.4	8.0	2.0	4.5	3.4 to 7.9	0.01	1.0	2.1	733.6	PVC	Wire-wrapped PVC

Notes:
(1) T/WS = Till and Weathered Shale Aquifer

TABLE 6-2
MONITORING WELL SAMPLING SUMMARY
SEAD-16 and SEAD-17 Remedial Design Work Plan and Design Report
Seneca Army Depot Activity

Well ID	Groundwater Analytes	Frequency[1]	Monitoring Purpose
SEAD-16			
MW16-1 MW16-2 MW16-3 MW16-4 MW16-5 MW16-6 MW16-7	Metals (except antimony and thallium) - USEPA SW846 Method 6010B Mercury – USEPA SW846 Method 7470A Antimony & Thallium – USEPA SW846 Method 6020	Post-remediation	To confirm GA standards have been met, or that concentrations are consistent with background.
SEAD-17			
MW17-1 MW17-2 MW17-3 MW17-4 MW17-5	Metals (except antimony and thallium) - USEPA SW846 Method 6010B Mercury – USEPA SW846 Method 7470A Antimony & Thallium – USEPA SW846 Method 6020	Post-remediation	To confirm GA standards have been met, or that concentrations are consistent with background.

Notes:

1. An initial round of groundwater sampling will be conducted after the completion of the remedial action. After the first sampling event, the monitoring program will be reviewed and modified, as necessary, after consultation with the USEPA and NYSDEC.

Table 6-3
Post-Closure Monitoring and Maintenance Plan
Routine Inspections Checklist
Seneca Army Depot – SEAD 16 & 17
List of Project Requirements

DATE:
INSPECTED BY: _____

Maintenance Inspections:

_____ (1) Inspect condition of all wells – document and report any damage to wells.

_____ (2) Confirm that vegetation is re-established in designated areas and erosion is not occurring. Designated areas include all disturbed areas that were previously vegetated and areas with an exposed layer of soil that were previously covered with gravel and/or asphalt.

_____ (3) Once inspection (2) is confirmed, erosion controls, such as hay bales, berms, and silt fencing will be removed. Confirm that drainage patterns have returned to their general conditions prior to remediation.

_____ (4) Review condition of access roads, gates, and fences.

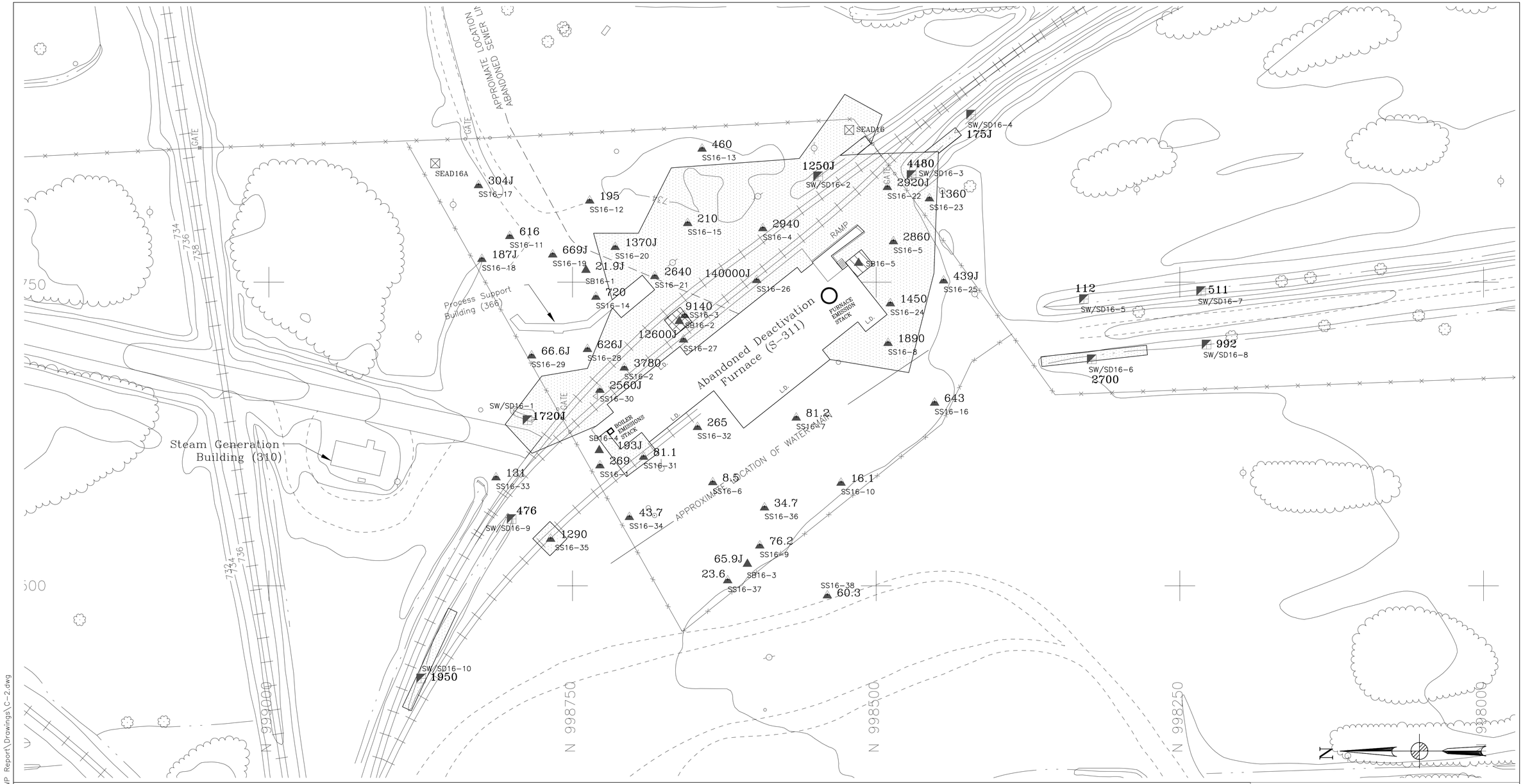
TABLE 6-4
NYSDEC Class GA Standards and Laboratory Reporting Limits for Groundwater Samples
SEAD-16/17 Remedial Design
Seneca Army Depot Activity

Compounds	Units	NYSDEC Class GA Standards [1]	Laboratory Method Detection Limits [2]	Laboratory Reporting Limits [2]
Metals				
Aluminum	µg/L	50 [3]	26	200
Antimony	µg/L	3	1 [7]	5 [7]
Arsenic	µg/L	25	4.2	10
Barium	µg/L	1000	0.17	2
Beryllium	µg/L	3	0.25	2
Cadmium	µg/L	5	0.36	1
Calcium	µg/L	NA	21	500
Chromium	µg/L	50	0.44	4
Cobalt	µg/L		0.79	4
Copper	µg/L	200	2	10
Iron	µg/L	300 [4] 500 [5]	17	50
Lead	µg/L	25	2.2	5
Magnesium	µg/L	35000 [6]	7.7	200
Manganese	µg/L	300 [4] 500 [5]	0.16	3
Mercury	µg/L	0.7	0.12 [8]	0.2 [8]
Nickel	µg/L	100	1.4	10
Potassium	µg/L	NA	24	500
Selenium	µg/L	10	6.1	15
Silver	µg/L	50	1	3
Sodium	µg/L	20000	339	1000
Thallium	µg/L	0.5 [6]	0.2 [7]	1 [7]
Vanadium	µg/L	NA	0.98	5
Zinc	µg/L	2000 [6]	3.6	10

Notes:

1. Unless otherwise specified, the NYSDEC (2004) Ambient Water Quality Standards for Class GA groundwater are presented.
2. Laboratory Method Detection Limits and Reporting Limits for all metals except Hg, Sb, and Th - SW 846 Method 6010B from STL, Buffalo as of March, 2007. For metals, the laboratory will report any analytical results above the method detection limits.
3. The Secondary Standard published under the National Secondary Drinking Water Regulations is used for aluminum.
4. Applies for iron and manganese, respectively.
5. Applies to the sum of iron and manganese.
6. NYSDEC Ambient Water Quality Guidance Values.
7. Laboratory Method Detection Limits and Reporting Limits for SW 846 Method 6020 from STL, Buffalo as of May, 2007. For metals, the laboratory will report any analytical results above the method detection limits.
8. Laboratory Method Detection Limits and Reporting Limits for SW 846 Method 7470A from STL, Buffalo as of March, 2007. For metals, the laboratory will report any analytical results above the method detection limits.

NA = Not Available



LEGEND

- SEAD AND LAND USE CONTROL BOUNDARY
- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR

- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

- SB16-3 RI SUBSURFACE SOIL LOCATION WHERE Pb > 1250 mg\kg
- 23.6 SS16-37 RI SURFACE SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/Kg)
- 1950 SW/SD16-10 RI SEDIMENT SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/Kg)
- LIMITS OF ONE FOOT EXCAVATION
- LIMITS OF 2 FOOT EXCAVATION
- LIMITS OF 3 FOOT EXCAVATION

NOTES:

1. LEAD CLEANUP GOAL IS 1,250 mg/Kg (TABLE 2-1).
2. ONLY LEAD DATA IS PRESENTED ON THIS FIGURE. CONCENTRATIONS OF OTHER METALS OF CONCERN THAT EXCEED CLEAN UP GOALS IN TABLE 2-1 ARE CO-LOCATED WITH LEAD EXCEEDANCES.
3. SAMPLE SS16-31 EXCEEDS CLEAN UP GOALS FOR PAHS AND IS THE DRIVER FOR EXCAVATION OF SOILS IN THE NORTHWEST CORNER OF S-311.

0 80 160

SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE

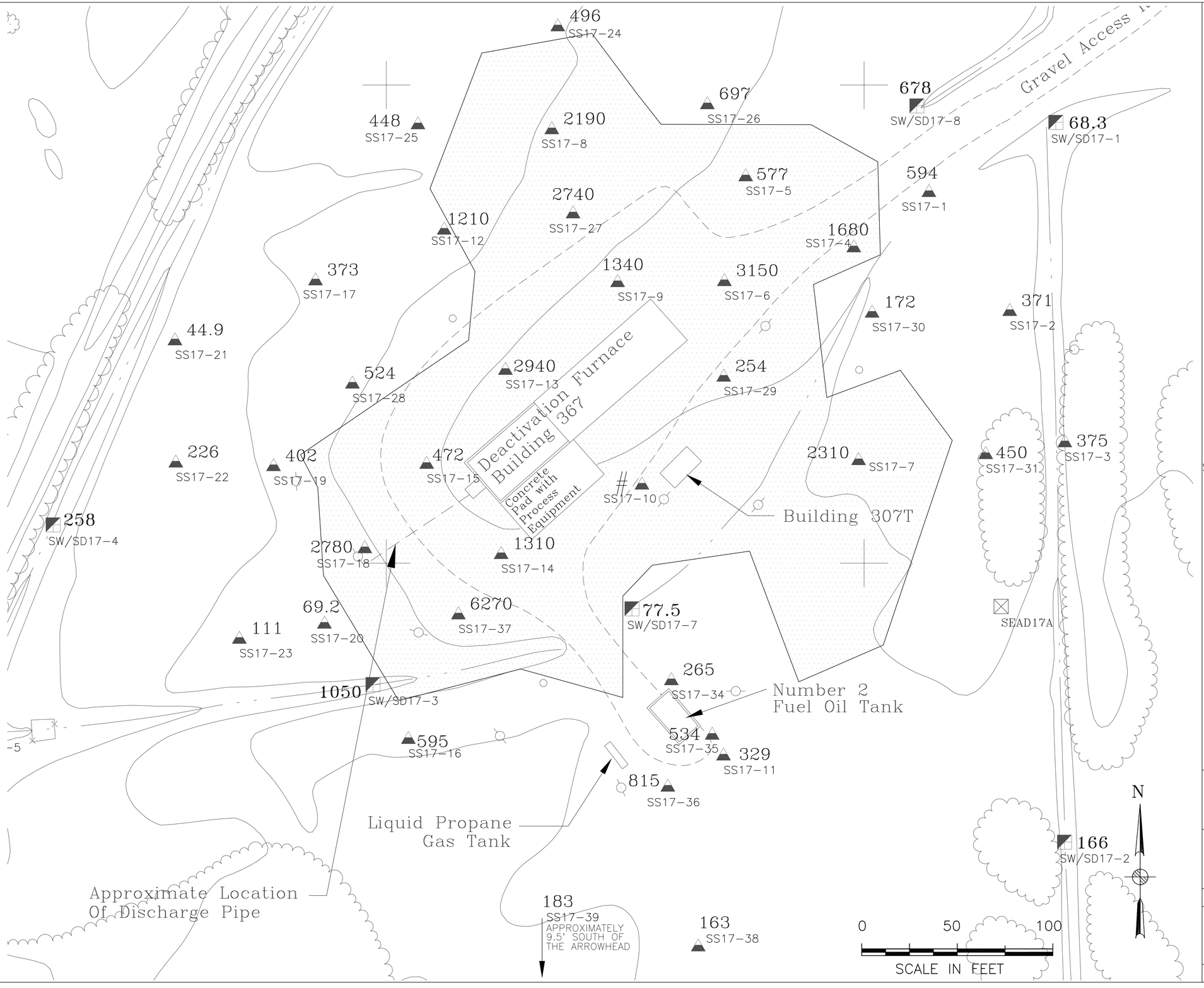
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No. 745172-01200

FIGURE 1-1
SEAD-16 LOCATION OF HISTORICAL SAMPLES

SCALE 1" = 60'-0" | DATE JUNE 2007 | REV B

P:\PIT\Projects\Seneca PBC II\SEAD-16_17\Design WP Report\Drawings\C-2.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR

- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

172 / SS17-30 — SURFACE SOIL SAMPLE WITH LEAD CONCENTRATION (mg/Kg)

166 / SW/SD17-2 — SEDIMENT SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/Kg)

\# — REJECTED DATA

LIMITS OF ONE FOOT EXCAVATION

NOTES:

1. LEAD CLEANUP GOAL IS 1,250 mg/Kg (TABLE 2-1).
2. ONLY LEAD DATA IS PRESENTED ON THIS FIGURE. CONCENTRATIONS OF OTHER METALS OF CONCERN THAT EXCEED CLEAN UP GOALS IN TABLE 2-1 ARE CO-LOCATED WITH LEAD EXCEEDANCES.

PARSONS

CLIENT/PROJECT TITLE

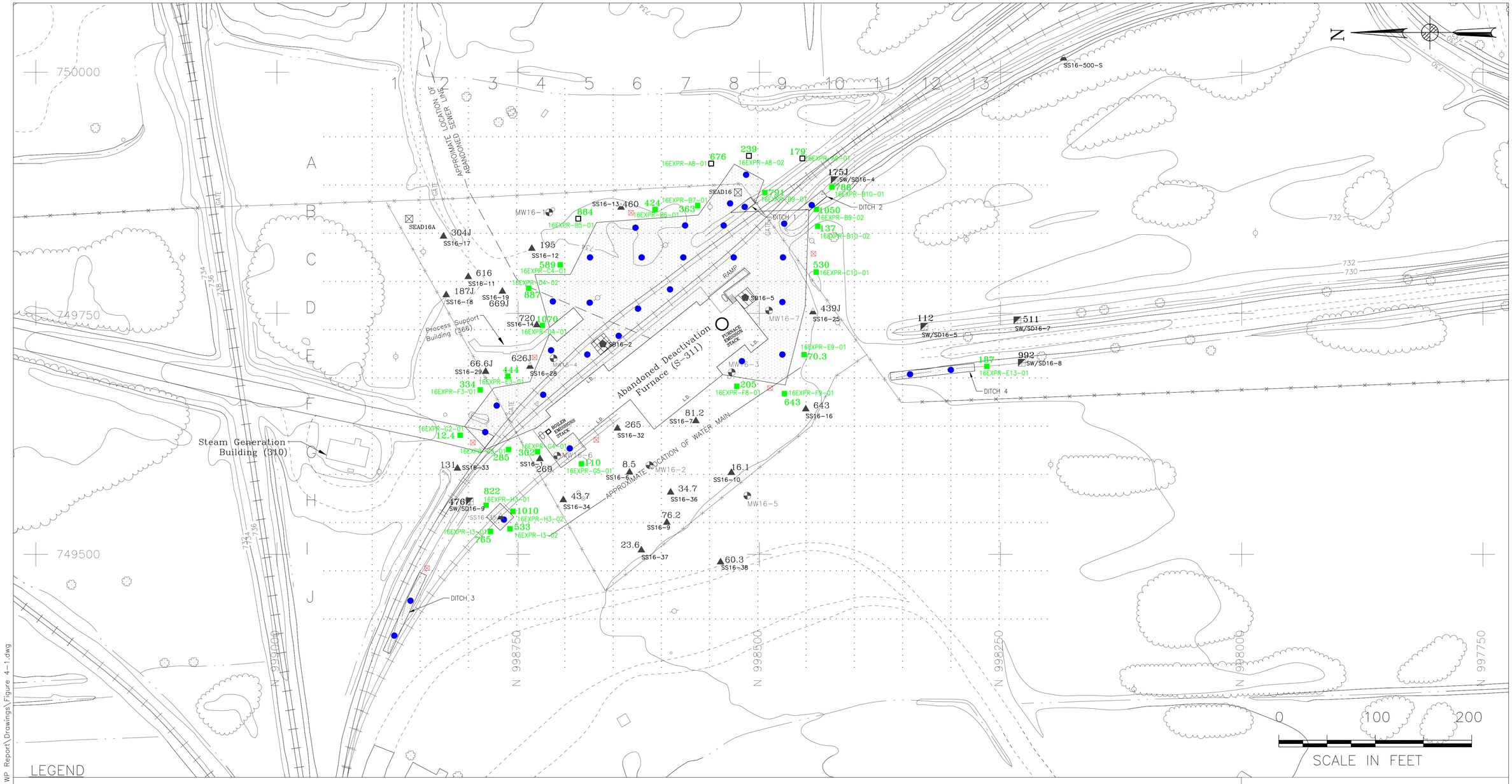
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 1-2
SEAD-17 LOCATION OF HISTORICAL SAMPLES

SCALE	DATE	REV
1" = 50'-0"	JUNE 2007	B

P:\PIT\Projects\Seneca PBS II\SEAD-16_17\Design WP Report\Drawings\C-3.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE GUIDE POST
- MONITORING WELL LOCATION
- ▲34.7 SS16-36 — RI SURFACE SOIL LOCATION WITH Pb CONCENTRATION (mg/kg) INCLUDED IN PRE-EXCAVATION PERIMETER SOIL DATASET
- ⬟SB16-5 — RI SUBSURFACE SOIL LOCATION WHERE Pb > 1250 mg/kg
- ◪992 SW/SD16-8 — RI SEDIMENT SAMPLE LOCATION WITH Pb CONCENTRATION (mg/kg)
- ▲131 SS16-33 — RI SURFACE SOIL LOCATION WITH Pb CONCENTRATION (mg/kg)
- ● — POST-EXCAVATION FLOOR SOIL SAMPLE (TO BE ANALYZED FOR METALS LISTED ON TABLE 2-1. SAMPLES COLLECTED FROM SAMPLING GRID G4 AND G5 REQUIRE cPAH ANALYSIS)
- ■166 — PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/kg) (APRIL 2007)
- □752 — PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/kg) (MAY 2007)
- ⊠ — PERIMETER SOIL SAMPLE TO BE COLLECTED POST EXCAVATION
- LIMITS OF ONE FOOT DEEP EXCAVATION
- LIMITS OF 2 FOOT DEEP EXCAVATION
- LIMITS OF 3 FOOT DEEP EXCAVATION

PARSONS

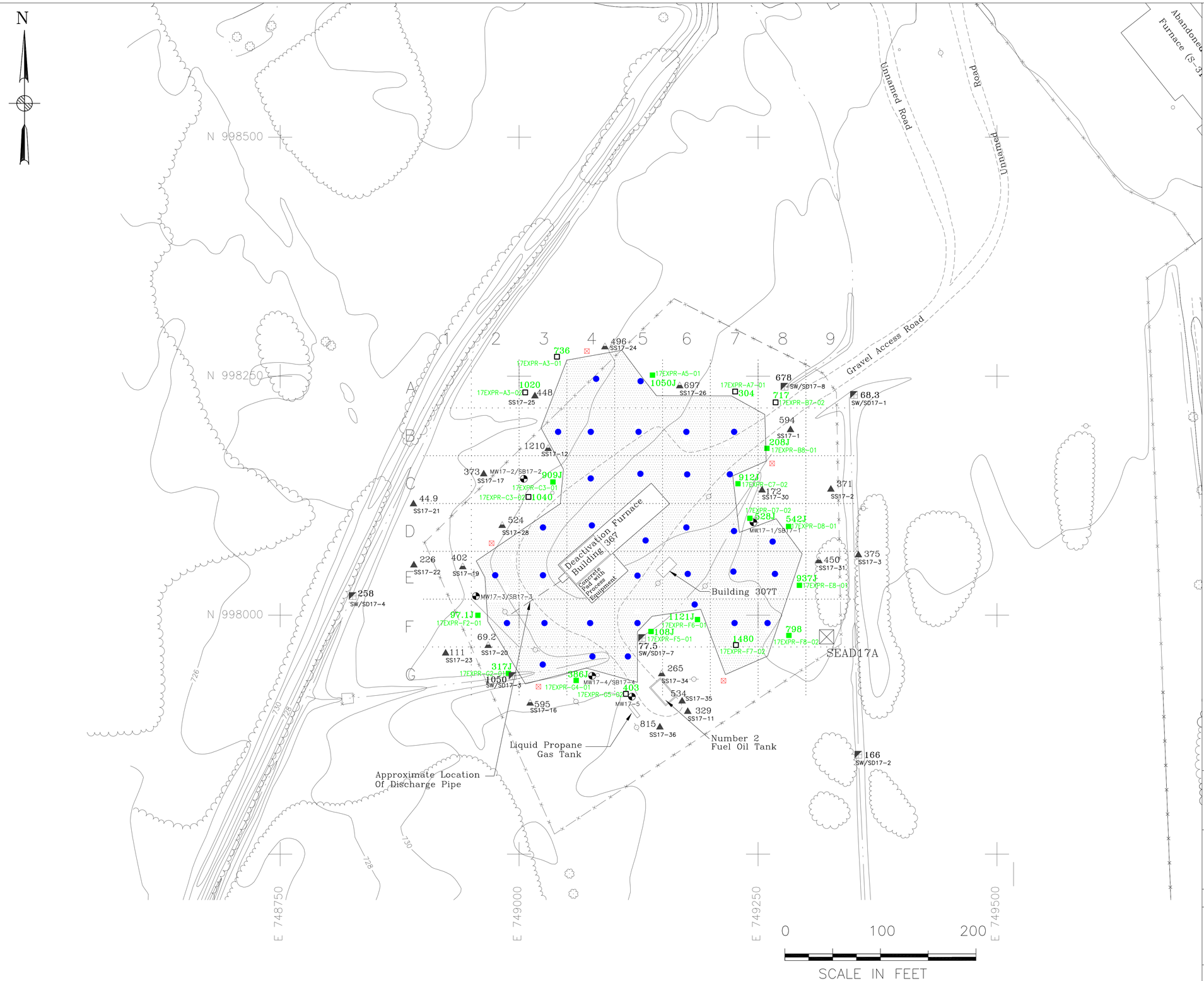
CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No. 745172-01200

FIGURE 4-1
SEAD-16 CONFIRMATORY SAMPLING GRID AND LOCATIONS

SCALE 1" = 50'-0"
DATE JUNE 2007
REV C

P:\PIT\Projects\Seneca PBC II\SEAD-16_17\Design WP Report\Drawings\Figure 4-1.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT

- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MW17-5 MONITORING WELL LOCATION
- LIMITS OF ONE FOOT EXCAVATION
- POST-EXCAVATION FLOOR SOIL SAMPLE
- 166 PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCETRATIONS (mg/kg) (APRIL 2007)
- 798 PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/kg) (MAY 2007)
- PERIMETER SOIL SAMPLE TO BE COLLECTED POST EXCAVATION
- 163 SS17-38 RI SURFACE SOIL LOCATION WITH Pb CONCENTRATION (mg/kg) INCLUDED IN PRE-EXCAVATION PERIMETER SOIL DATASET
- 170 SS17-40 RI SURFACE SOIL LOCATIONS WITH Pb CONCENTRATION (mg/kg)
- 166 SW/SD17-2 RI SEDIMENT SAMPLE LOCATION WITH Pb CONCENTRATION (mg/kg)

PARSONS

CLIENT/PROJECT TITLE

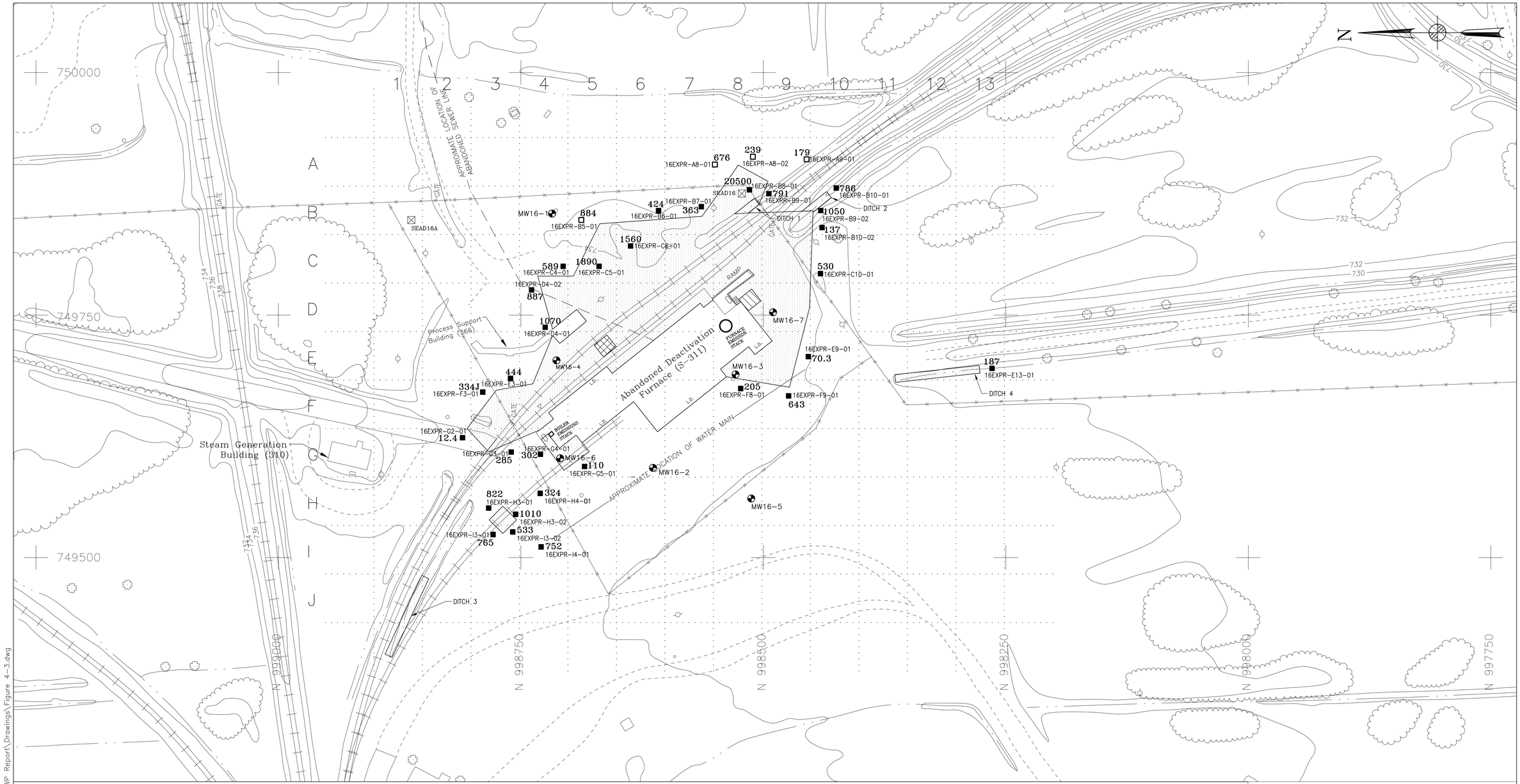
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 4-2
SEAD-17 CONFIRMATORY SAMPLING GRID AND LOCATIONS

SCALE	DATE	REV
1" = 50'-0"	JUNE 2007	C

P:\PIT\Projects\Seneca PBS II\SEAD-16_17\Design WP Report\Drawings\Figure 4-2.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT

- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

- MW16-7 MONITORING WELL LOCATION
- ■ 166 PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/kg) (APRIL 2007)
- □ 752 PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/kg) (MAY 2007)

- LIMITS OF ONE FOOT DEEP EXCAVATION
- LIMITS OF 2 FOOT DEEP EXCAVATION
- LIMITS OF 3 FOOT DEEP EXCAVATION

0 100 200
SCALE IN FEET

P:\PIT\Projects\Seneca PBC IR\SEAD-16_17\Design WP Report\Drawings\Figure 4-3.dwg

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No. 745172-01200

FIGURE 4-3
SEAD-16 PRE-EXCAVATION PERIMETER SOIL LOCATIONS

SCALE 1" = 50'-0"
DATE JUNE 2007
REV A

N

N 998500

N 998250

N 998000

E 748750

E 749000

E 749250

E 749500

A B C D E F G

1 2 3 4 5 6 7 8 9

736
17EXPR-A3-01

1700J
17EXPR-A4-01

17EXPR-A5-01

1050J

1020
17EXPR-A3-02

1390J
17EXPR-A4-02

17EXPR-A7-01

304

717
17EXPR-B7-02

5190J
17EXPR-B6-01

1725J
17EXPR-B3-02

2740J
17EXPR-B7-01

208J
17EXPR-B8-01

MW17-2/SB17-2

909J
17EXPR-C3-01

17EXPR-C3-02

1040

912J
17EXPR-C7-02

1930J
17EXPR-C7-01

17EXPR-D7-02

528J

542J
17EXPR-D8-01

3090J
17EXPR-D3-01

2100J
17EXPR-D7-01

MW17-1/SB17-1

Deactivation Furnace Building 307

Concrete Pad with Process Equipment

1385
17EXPR-E2-01

937J
17EXPR-E8-01

Building 307T

MW17-3/SB17-3

2680J
17EXPR-F7-01

17EXPR-F8-01

97.1J
17EXPR-F2-01

1121J
17EXPR-F6-01

1550J

108J
17EXPR-F5-01

798
17EXPR-F8-02

1480
17EXPR-F7-02

SEAD17A

317J
17EXPR-G2-01

17EXPR-G5-01

2090J

386J
17EXPR-G4-01

MW17-4/SB17-4

403
17EXPR-G5-02

MW17-5

Liquid Propane Gas Tank

Number 2 Fuel Oil Tank

Approximate Location Of Discharge Pipe

Gravel Access Road

Unnamed Road

Unnamed Road

Abandoned Furnace (S-31)

726

728

730

0 100 200

SCALE IN FEET

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT

SURVEY MONUMENT

ROAD SIGN

DECIDOUS TREE

FIRE HYDRANT

MANHOLE

GUIDE POST

POLE

UTILITY BOX

CORDINATE GRID (250' GRID)

OVERHEAD UTILITY POLE

MAILBOX/RR SIGNAL

MW17-5 MONITORING WELL LOCATION

LIMITS OF ONE FOOT EXCAVATION

■166 PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCETRATIONS (mg/kg) (APRIL 2007)

□798 PRE-EXCAVATION PERIMETER SOIL SAMPLE LOCATION WITH LEAD CONCENTRATION (mg/kg) (MAY 2007)

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING

Dwg. No. 745172-01200

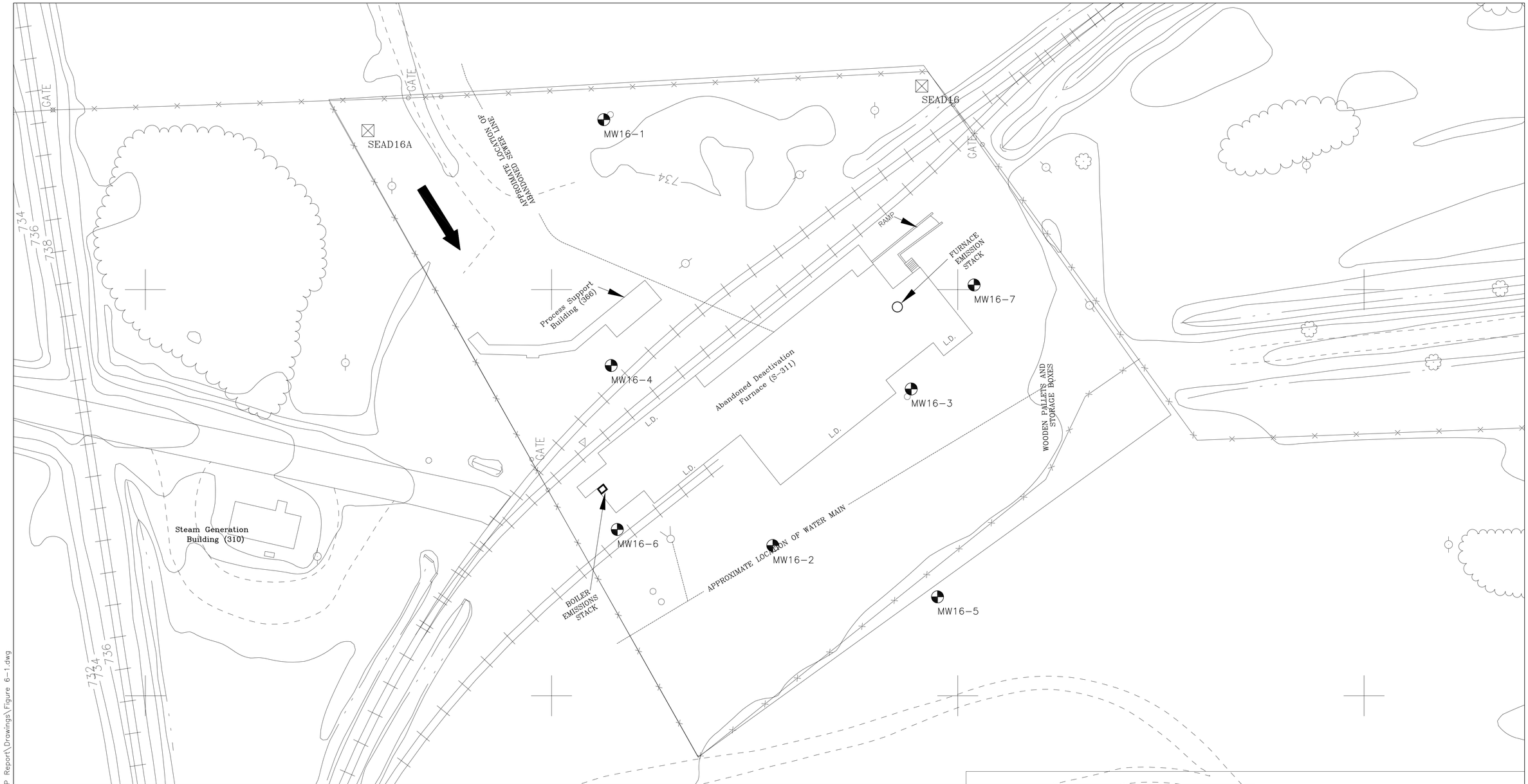
FIGURE 4-4
SEAD-17 PRE-EXCAVATION PERIMETER SOIL LOCATIONS

SCALE 1" = 50'-0"

DATE JUNE 2007

REV A

P:\PIT\Projects\Seneca PBS II\SEAD-16_17\Design WP Report\Drawings\Figure 4-4.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- UNPAVED ROAD
- FENCE
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR

- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

- MW16-5 MONITORING WELL
- ARROW INDICTES APPROXIMATE DIRECTION OF GROUNDWATER FLOW

N

0 30 60 120

SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 6-1
SEAD-16 GROUNDWATER FLOW TREND

SCALE	DATE	REV
1" = 50'-0"	APRIL 2007	A

P:\PIT\Projects\Seneca PBC IR\SEAD-16_17\Design WP Report\Drawings\Figure 6-1.dwg

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MW17-3/SB17-3 — MONITORING WELL
- ARROW INDICATES APPROXIMATE DIRECTION OF GROUNDWATER FLOW

30 0 30 60
1" = 30 FEET

PARSONS

CLIENT/PROJECT TITLE

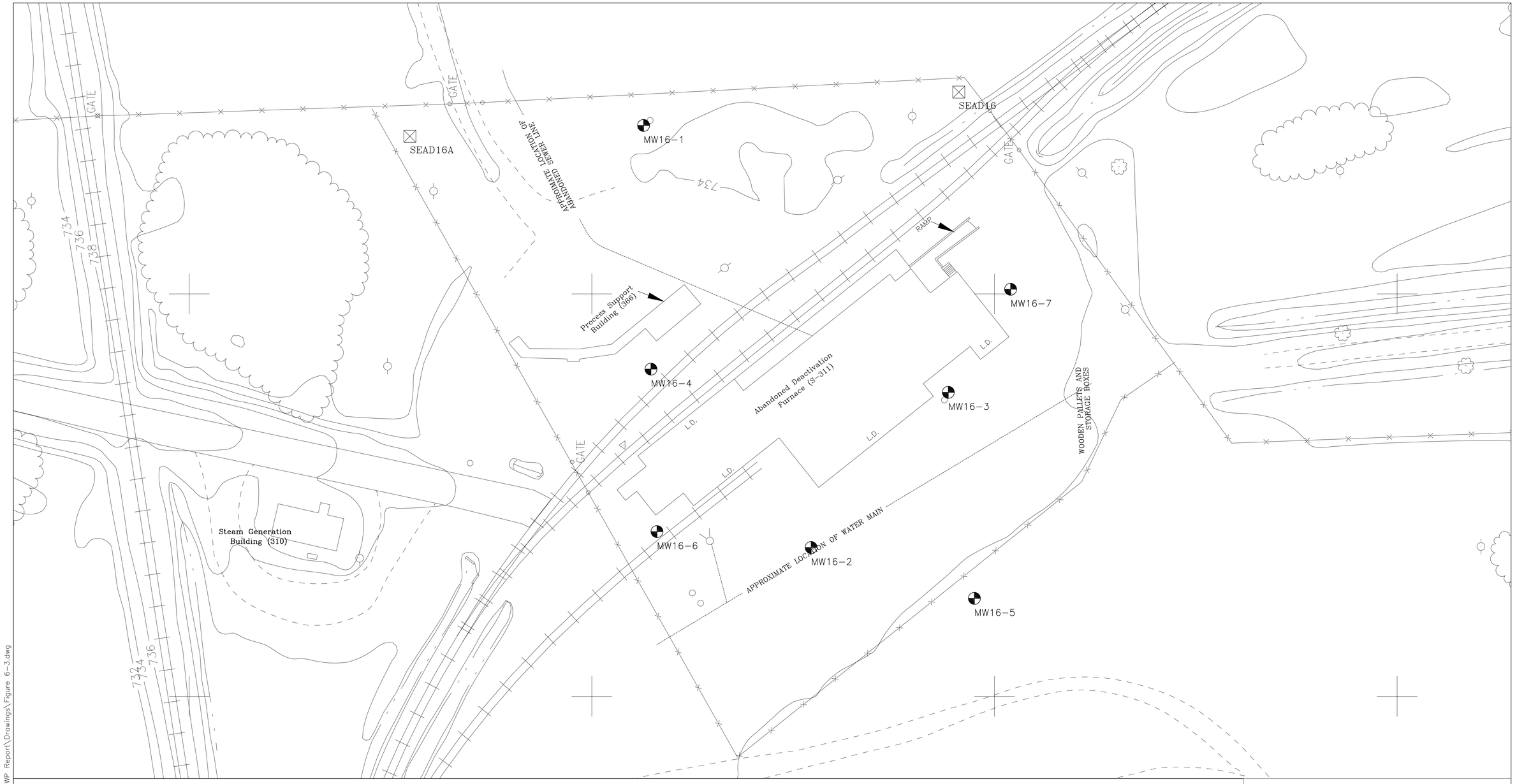
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 6-2
SEAD-17 GROUNDWATER FLOW TREND

SCALE	DATE	REV
1" = 30'-0"	APRIL 2007	A

P:\PIT\Projects\Seneca PBS II\SEAD-16_17\Design WP Report\Drawings\Figure 6-2.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- UNPAVED ROAD
- FENCE
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR

- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

MW16-5 MONITORING WELL LOCATION

N

0 30 60 120

SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE

SENECA army DEPOT ACTIVITY

REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING

Dwg. No. 745172-01200

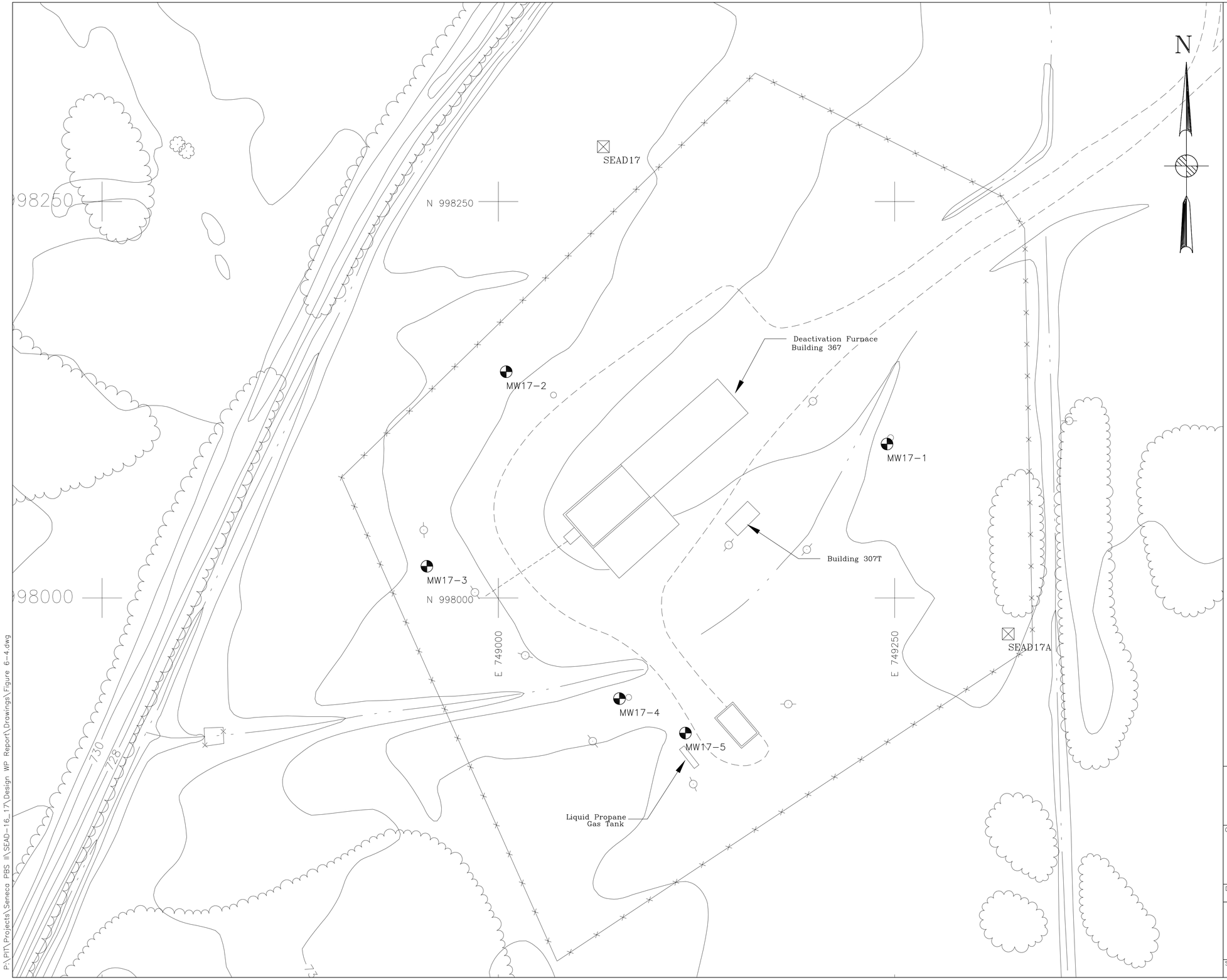
FIGURE 6-3
SEAD-16 PROPOSED LONG-TERM MONITORING WELL LOCATIONS

SCALE 1" = 30'-0"

DATE APRIL 2007

REV A

P:\PIT\Projects\Seneca PBC II\SEAD-16_17\Design WP Report\Drawings\Figure 6-3.dwg



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MW17-1 — MONITORING WELL LOCATION

30 0 30 60
1" = 30 FEET

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

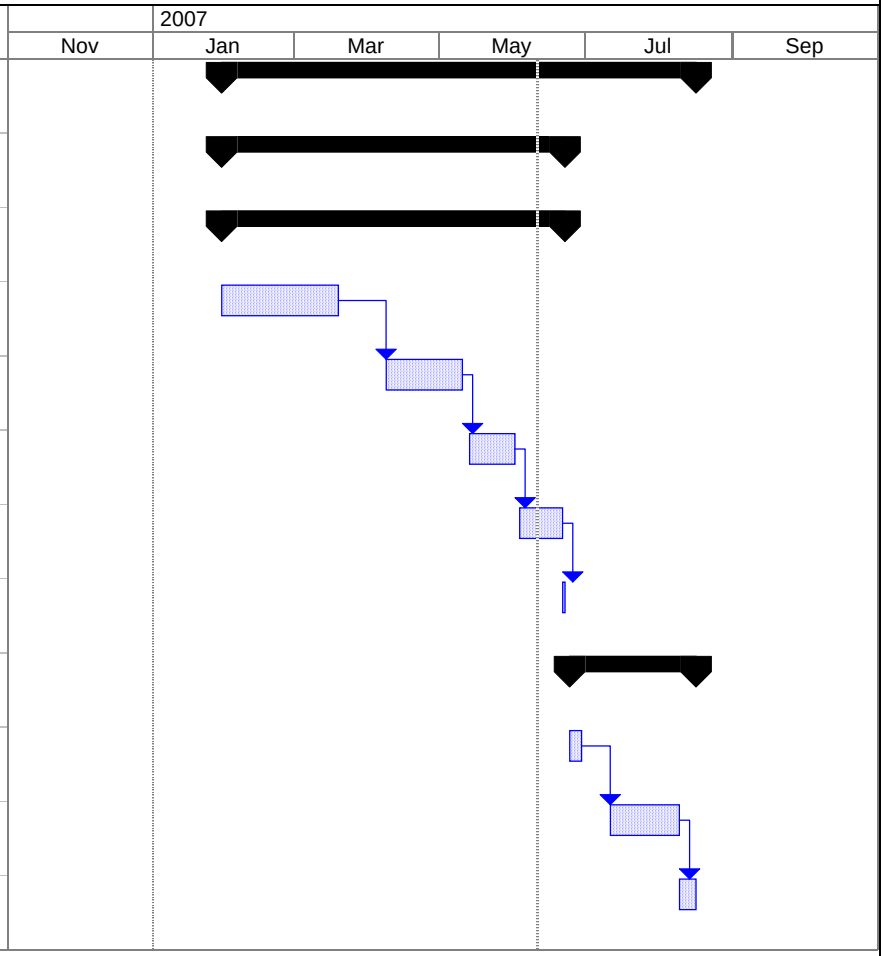
FIGURE 6-4
SEAD-17 PROPOSED LONG-TERM MONITORING WELL LOCATIONS

SCALE	DATE	REV
1" = 30'-0"	APRIL 2007	A

P:\PIT\Projects\Seneca PBS II\SEAD-16_17\Design WP Report\Drawings\Figure 6-4.dwg

Figure 9-1
Remedial Design Schedule For SEAD-16/17 (FFA)
Seneca Army Depot Activity, Romulus, New York

ID	Task Name	Start	Finish
1	**Remediation of the SEAD-16 & SEAD-17**	**Tue 1/30/07**	**Thu 8/16/07**
2	**Remedial Design WPs and Design**	**Tue 1/30/07**	**Fri 6/22/07**
3	**Remedial Design Work Plan/RD (CDRL A004)**	**Tue 1/30/07**	**Fri 6/22/07**
4	Prepare Draft Design	Tue 1/30/07	Mon 3/19/07
5	Regulator Review of Draft Design	Mon 4/9/07	Thu 5/10/07
6	Prepare Final Design (FD)	Mon 5/14/07	Fri 6/1/07
7	Regulator Review of FD	Mon 6/4/07	Thu 6/21/07
8	Final RD Approved	Fri 6/22/07	Fri 6/22/07
9	**Remedial Action**	**Mon 6/25/07**	**Thu 8/16/07**
10	Mobilization	Mon 6/25/07	Fri 6/29/07
11	Construction	Thu 7/12/07	Thu 8/9/07
12	Demobilization	Fri 8/10/07	Thu 8/16/07



Project: SEAD-16/17 Design
Date: Mon 6/11/07

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

LIST OF APPENDICES

APPENDIX A

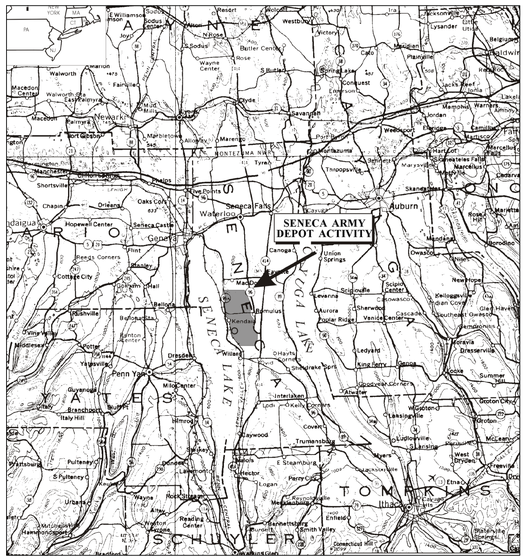
DESIGN DRAWINGS

PREPARED FOR:

AIR FORCE CENTER OF ENVIRONMENTAL EXCELLENCE

REMEDIATION OF ABANDONED DEACTIVATION FURNACE (SEAD-16) AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17) SENECA ARMY DEPOT ROMULUS, NEW YORK

DESIGN DRAWINGS
(JUNE 2007)



LOCATION MAP

DRAWING LIST

SHEET NO.	REVISION NO.	DESCRIPTION
C-1	B	TITLE SHEET
C-2	A	SEAD-16 EXISTING CONDITIONS PLAN
C-3	A	SEAD-17 EXISTING CONDITIONS PLAN
C-4	B	SEAD-16 EXCAVATION PLAN
C-5	B	SEAD-17 EXCAVATION PLAN

SITE PLAN
NTS

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

C-1
TITLE SHEET

SCALE	DATE	REV
NA	JUNE 2007	B

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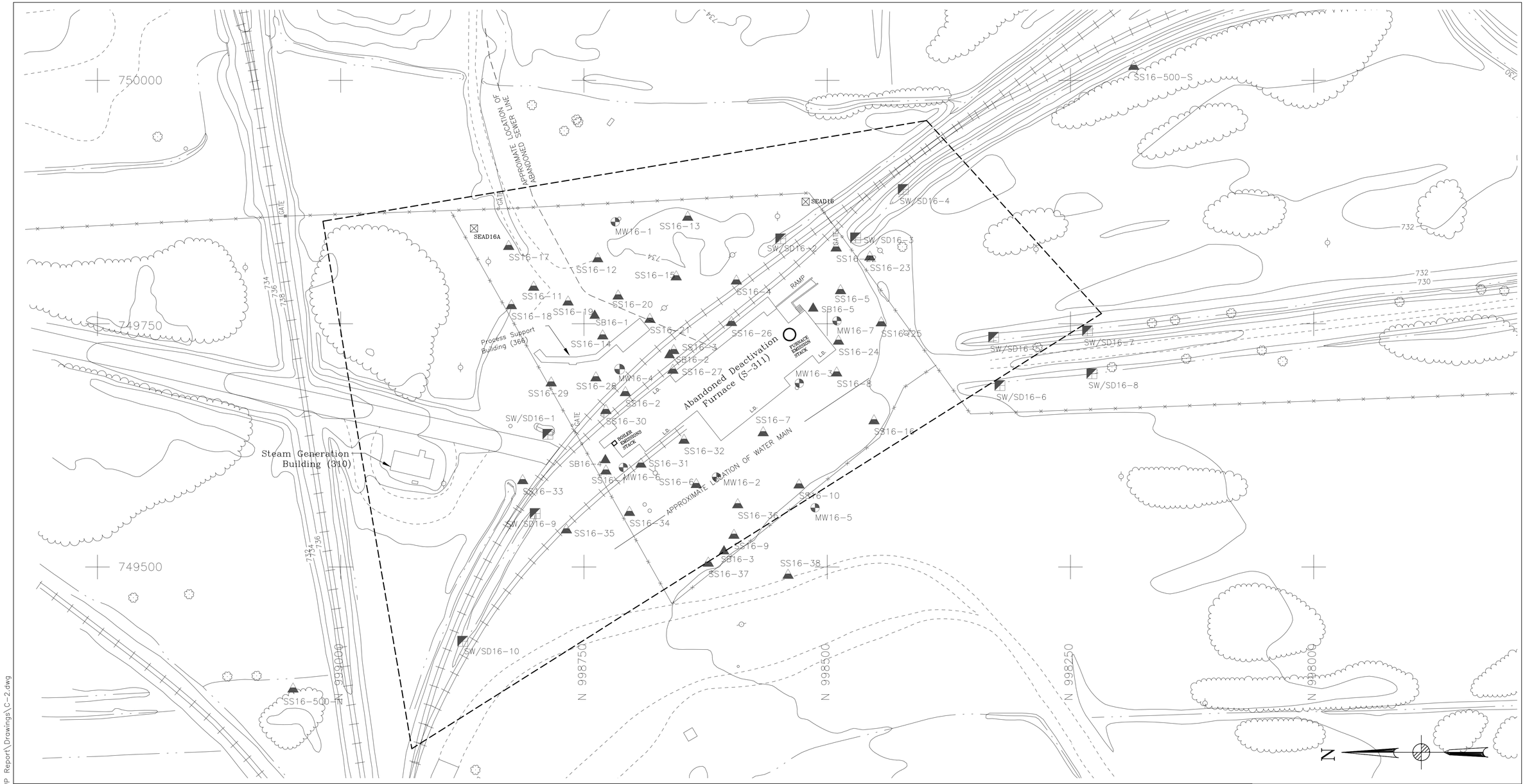

LEGEND

- SEAD AND LAND USE CONTROL BOUNDARY
- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- SB16-4 SOIL BORING LOCATION
- MW16-7 MONITORING WELL LOCATION
- SS16-5 SURFACE SOIL SAMPLE LOCATION
- SW/SD16-6 SEDIMENT SAMPLE LOCATION

0 100 200

SCALE IN FEET

N

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING

Dwg. No. 745172-01200

C-2
SEAD-16
EXISTING CONDITIONS PLAN

SCALE 1" = 100'-0"

DATE APRIL 2007

REV A

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LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- SEAD AND LAND USE CONTROL BOUNDARY (LIMIT OF WORK)
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- SB16-4 — SOIL BORING LOCATION
- MW16-7 — MONITORING WELL LOCATION
- SS16-5 — SURFACE SOIL SAMPLE LOCATION
- SW/SD16-6 — SEDIMENT SAMPLE LOCATION

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

C-3
SEAD-17
EXISTING CONDITIONS PLAN

SCALE	DATE	REV
1" = 100'-0"	APRIL 2007	A

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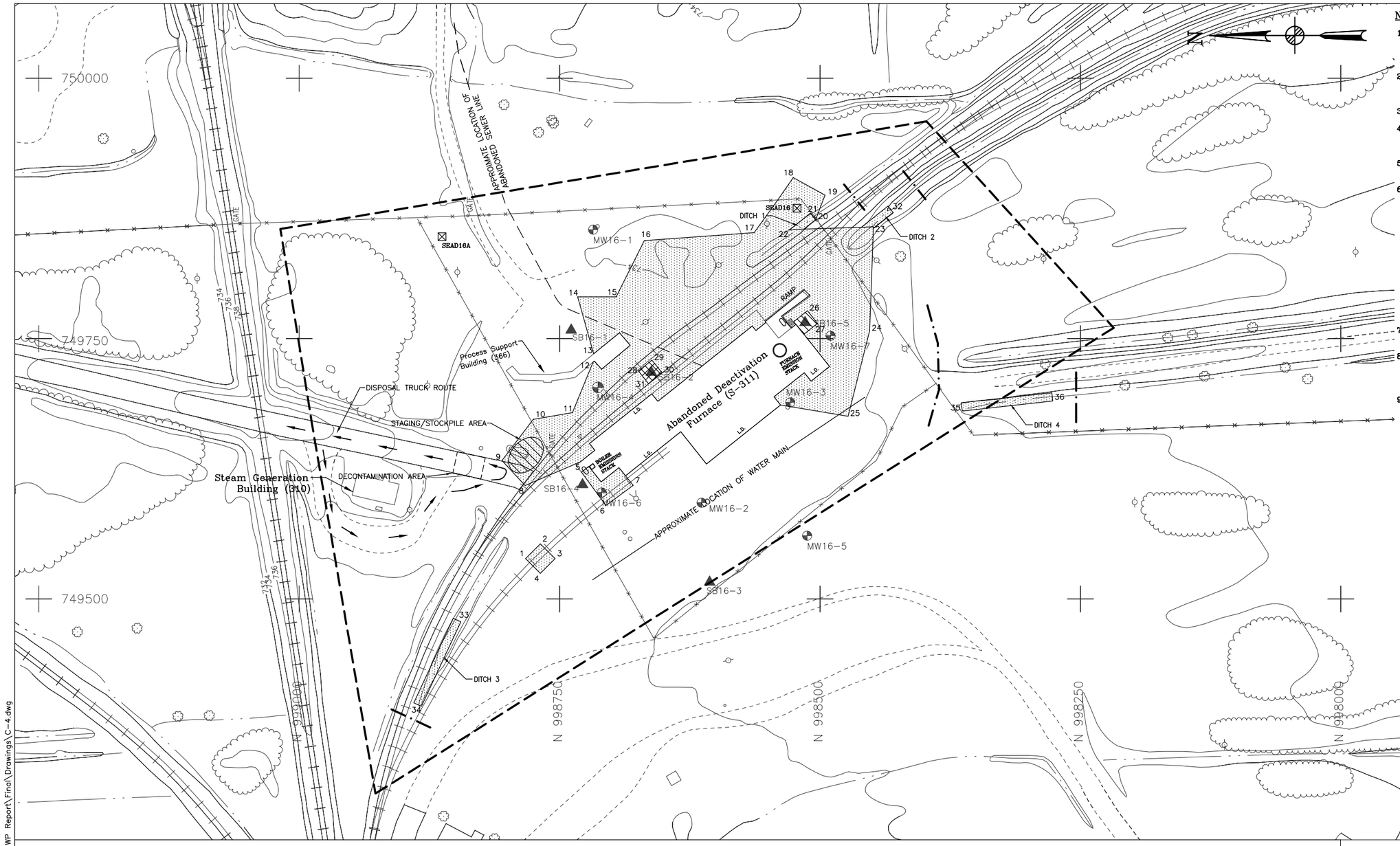

NOTES:

1. TOPOGRAPHY BASED ON AERIAL SURVEY BY:
   LOCKWOOD SURVEY
   36 KARLAN DRIVE
   ROCHESTER, NEW YORK
2. HORIZONTAL DATUM IS BASED ON NAD83 PER SENECA ARMY DEPOT SEAD-16 MONUMENTS SURVEY CONTROL COORDINATES DATED 1994.
3. VERTICAL DATUM BASED ON NAD88.
4. SILT FENCING SHALL BE PLACED AT AREAS SHOWN ON THE PLAN TO PREVENT TRANSPORT OF SOIL TO ONSITE DRAINAGE DITCHES.
5. BUILDING S-311 AND ASSOCIATED EQUIPMENT WILL BE DEMOLISHED AND DISPOSED OFFSITE.
6. SOIL SHALL BE EXCAVATED TO THE VERTICAL AND HORIZONTAL LIMITS SHOWN ON THIS PLAN. DITCHES SHALL BE EXCAVATED TO THE FULL WIDTH OF THE DITCH TO A DEPTH OF ONE FOOT. ALL UPLAND AREAS SHALL BE EXCAVATED TO A DEPTH OF ONE FOOT WITH THE EXCEPTION OF TWO AREAS SURROUNDING SB16-2 (2 FEET) AND SB16-5 (3 FEET). THE ONE FOOT DEPTH WILL NOT APPLY TO PAVED AREAS OR AREAS ADJACENT TO RAILROAD TRACKS. FOR PAVED AREAS, PAVEMENT WILL BE SWEPT CLEAN AND REMOVED. FOR AREAS ADJACENT TO THE TRACKS, EXCAVATION DEPTHS WILL NOT EXCEED THE DEPTH NEEDED TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE TRACKS.
7. SEE EXCAVATION LAYOUT TABLE FOR EXCAVATION STAKE LOCATION COORDINATES.
8. SOIL EXCAVATION SHALL TERMINATE AT THE EDGE OF THE BUILDING STRUCTURE. NO EXCAVATION SHALL BE CONDUCTED BENEATH ANY BUILDING OR STRUCTURE.
9. AFTER ACCEPTANCE OF CONFIRMATORY SAMPLING RESULTS, THE ENGINEER WILL DIRECT THE CONTRACTOR TO REGRADE EXCAVATED AREAS TO PROMOTE POSITIVE DRAINAGE.

EXCAVATION LAYOUT TABLE

ID	NORTHING	EASTING
1	998782.7247	749538.8439
2	998768.5825	749552.9860
3	998754.4404	749538.8439
4	998768.5825	749524.7018
5	998729.1200	749621.8100
6	998705.5734	749589.9272
7	998679.5197	749609.2401
8	998783.3319	749609.0705
9	998805.4178	749633.0074
10	998775.3491	749672.6168
11	998737.6911	749679.0409
12	998717.8804	749727.5509
13	998717.3581	749735.4679
14	998732.6858	749790.2551
15	998695.8253	749790.2551
16	998668.6939	749844.1269
17	998563.3296	749851.8012
18	998525.8496	749904.6397
19	998495.2291	749887.8686
20	998504.2533	749864.2141
21	998509.2358	749870.4730
22	998529.4475	749854.3723
23	998448.7609	749857.4340
24	998452.4071	749757.4822
25	998473.1377	749675.5360
26	998512.1328	749776.7881
27	998502.5011	749764.6888
28	998674.4708	749718.9791
29	998661.3702	749729.4080
30	998651.7384	749717.3087
31	998664.8391	749706.8798
32	998432.3709	749874.1693
33	998848.6006	749479.8665
34	998886.3749	749398.7347
35	998363.9931	749684.5706
36	998277.0738	749694.1046

LEGEND

- SEAD AND LAND USE CONTROL BOUNDARY (LIMIT OF WORK)
- SILT FENCE/HAYBALES
- SURFACE WATER
- FENCE
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT
- TRUCK DISPOSAL ROUTE
- SURVEY MONUMENT
- L.D. LOADING DOCK
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- SB16-4 SOIL BORING LOCATION
- MW16-7 MONITORING WELL LOCATION
- LIMITS OF ONE FOOT DEEP EXCAVATION
- LIMITS OF 2 FOOT DEEP EXCAVATION
- LIMITS OF 3 FOOT DEEP EXCAVATION

0 100 200
SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN REPORT
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No. 745172-01200

C-4
SEAD-16
EXCAVATION PLAN

SCALE 1" = 100'-0"
DATE JULY 2007
REV C

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NOTES:

1. TOPOGRAPHY BASED ON AERIAL SURVEY BY:
   LOCKWOOD SURVEY
   36 KARLAN DRIVE
   ROCHESTER, NEW YORK
2. HORIZONTAL DATUM IS BASED ON NAD83 PER SENECA ARMY DEPOT SEAD-17A MONUMENTS SURVEY CONTROL COORDINATES DATED 1994.
3. VERTICAL DATUM BASED ON NAD88.
4. SILT FENCING SHALL BE PLACED AT AREAS SHOWN ON THE PLAN TO PREVENT TRANSPORT OF SOIL TO ONSITE DRAINAGE DITCHES.
5. BUILDINGS 367 AND 307T AND ASSOCIATED EQUIPMENT WILL BE DEMOLISHED AND DISPOSED OFFSITE.
6. SOIL SHALL BE EXCAVATED TO THE VERTICAL AND HORIZONTAL LIMITS SHOWN ON THIS PLAN. AREAS SHALL BE EXCAVATED TO A DEPTH OF ONE FOOT.
7. SEE EXCAVATION LAYOUT TABLE FOR EXCAVATION STAKE LOCATION COORDINATES.
8. SOIL EXCAVATION SHALL TERMINATE AT THE EDGE OF THE BUILDING STRUCTURE. NO EXCAVATION SHALL BE CONDUCTED BENEATH ANY BUILDING OR STRUCTURE.
9. AFTER ACCEPTANCE OF CONFIRMATORY SAMPLING RESULTS, THE ENGINEER WILL DIRECT THE CONTRACTOR TO REGRADE EXCAVATED AREAS TO PROMOTE POSITIVE DRAINAGE.

EXCAVATION LAYOUT TABLE

ID	NORTHING	EASTING
1	997928.0880	749006.5538
2	997993.5089	748967.1832
3	998039.6072	748964.1989
4	998056.7191	748955.1722
5	998116.5520	749043.0770
6	998152.6163	749046.4094
7	998195.8592	749022.8996
8	998266.7499	749050.0000
9	998277.0575	749107.5260
10	998229.4772	749143.7900
11	998229.2456	749222.3153
12	998209.8918	749257.1467
13	998161.2021	749258.5124
14	998145.7082	749223.5098
15	998086.5881	749230.4912
16	998100.8340	749268.9121
17	998064.1932	749296.1334
18	997957.1513	749260.0432
19	997937.9356	749215.8506
20	998006.2574	749190.0623
21	997998.8853	749139.1352
22	997982.7836	749123.7849
23	997929.7438	749123.7849
24	997944.6600	749070.2774

LEGEND

- SURFACE WATER
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT
- SEAD AND LAND USE CONTROL BOUNDARY
- SILT FENCE/HAYBALES
- TRUCK DISPOSAL ROUTE
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MW17-3 MONITORING WELL LOCATION
- LIMITS OF ONE FOOT EXCAVATION

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
REMEDIAL DESIGN
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No. 745172-01200

C-5
SEAD-17
EXCAVATION PLAN

SCALE 1" = 100'-0"
DATE JULY 2007
REV C

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APPENDIX B

TECHNICAL SPECIFICATIONS

SECTION 01010

SUMMARY OF WORK

PART I GENERAL

1.01 PROJECT DESCRIPTION

A. Work under this contract includes the excavation of impacted soil at SEAD-16 and SEAD-17 at the Seneca Army Depot Activity in Romulus, New York.

1.02 PROJECT SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and complete the work in its entirety as shown on the drawings and as specified herein.

B. The work required under this contract includes, but is not necessarily limited to, the following:

1. Project startup, including mobilization to the site;

2. Obtain all necessary permits;

3. Develop, implement and maintain a site-specific Health and Safety Plan;

4. Survey excavation areas (To be conducted by Engineer);

5. Install temporary sediment and erosion protection measures;

6. Remove debris;

7. Clear and grub the site;

8. Excavate metals- and polycyclic aromatic hydrocarbon (PAH)-impacted soil at SEAD-16;

9. Excavate metals-impacted soil at SEAD-17;

10. Load soils and transport to off-site disposal facility (under a separate contract);

11. Conduct confirmation sampling (To be conducted by Engineer);

12. Re-grade the soil excavation area at SEAD-16 and 17;

13. Demobilize.

1.03 DEFINITIONS

A. For the purposes of these Technical Specifications, Drawings, and other contract documents, the following definitions apply:

1. Owner: The Army

2. Engineer: Owner's Representative or Engineer (Parsons)

3. Contractor: The individual, firm partnership, or corporation designated as the Contractor in these contract documents

4. Vendor: The individual, firm, partnership, or corporation selected to supply certain major system equipment components

B. Term "provide" or "provided" shall mean "furnish, install in-place" and demonstrate to the satisfaction of the Engineer and in accordance with these plans and specifications.

C. The term "demonstrate" shall mean "to prove that the item of Work in question fulfills the requirements of the Drawings and Specifications to the satisfaction of the Engineer".

1.04 CONTRACTORS USE OF PREMISSES

A. The entrance to the site is through the main gate located on Route 96.

B. The Contractor shall notify the Engineer 7 days prior to the commencement of work.

END OF SECTION

SECTION 01011

ENGINEER'S DRAWINGS

PART 1 GENERAL

1.01 DIMENSIONS

A. If the Contractor discovers any discrepancies between the physical condition of the work and the drawings, he shall immediately notify the Engineer. Any work performed after such discovery without the agreement of the Engineer shall be at the Contractor's risk and expense.

1.02 CONTRACT DRAWINGS

A. The following Drawings are hereby included as part of the Contract Documents.

- Drawing C-1 Title Sheet
- Drawing C-2 SEAD-16 Existing Conditions Plan
- Drawing C-3 SEAD-17 Existing Conditions Plan
- Drawing C-4 SEAD-16 Excavation Plan
- Drawing C-5 SEAD-17 Excavation Plan

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 GENERAL

1.01 WORK INCLUDED

A. This section describes the coordination and meetings that the Contractor shall comply with for the duration of the project.

1.02 PRE-CONSTRUCTION MEETING

A. A pre-construction meeting will be held at the site after all required permit approvals are obtained and after the contract has been awarded to the Contractor. The Contractor shall attend this meeting.

B. The purpose of the pre-construction meeting is to review in detail the operating concepts and the existing site conditions that will guide the project. The meeting will define, assign, and schedule the required submissions, key tasks to be performed, and the reporting plan to be implemented. Prior to the meeting, the Contractor shall submit a construction schedule and personnel list. After the meeting, the Contractor shall submit a revised construction schedule and personnel list, as necessary. Additional items to be addressed include Health & Safety, Submittals, and Environmental Protection.

C. At a minimum, the Contractor's Superintendent, Quality Control Officer, and Safety personnel shall be in attendance.

1.03 WEEKLY CONSTRUCTION MEETING

A. The Engineer shall conduct progress meetings to review the progress of the work, schedule, and budget. The Contractor's attendance shall be mandatory.

B. The meetings will be documented by the Engineer and copies of the meeting minutes will be distribute to the Contractor.

C. Progress meetings shall be held at least once a week, at which time the weekly progress report will be reviewed.

1.04 WEEKLY PROGRESS REPORTS

A. The Contractor shall provide written weekly progress reports to the Engineer outlining the current status of the work, budget status, budget impacts, unexpected conditions, updated schedule, and any information pertinent to the progress of the work. The Engineer will keep Daily Field Reports and submit Weekly Field Reports to the Engineer.

1.05 COORDINATION

A. The Contractor shall fully cooperate with all other Contractors and Subcontractors and shall assist in incorporating the work of other trades where necessary or required.

B. The Contractor shall fully cooperate with the Engineer and shall assist obtaining all samples for quality assurance testing.

C. All on-site work shall be coordinated by the Contractor, with the approval of the Owner.

D. Contractor shall submit a list of all personnel to be used on the project to the Engineer for coordination. Security badges will not be provided to contractor personnel; however, the Contractor shall insure all employees have contractor issued identification while on the installation.

E. The annual deer harvest occurs within the depot limits during the months of November and December. The harvest will not be conducted within the work area and should not affect the construction schedule. During the construction period at the end of each week, the contractor shall also notify the Engineer regarding what work is intended for the following week. The Engineer may stop work at any time when an imminent danger/serious safety violation is found.

F. Site, facility, and utility access shall be coordinated through the appropriate utility authority in the Town of Romulus.

G. All key Contractor personnel proposed for the project and accepted by the Owner shall not be removed or re-assigned from the Project without the approval of the Owner or the Engineer.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01046

CONTROL OF WORK

PART 1 GENERAL

1.01 MATERIALS

A. Furnish materials and equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the time stipulated in the Contract. If at any time such materials appear to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he/she may order the Contractor to increase the efficiency, change the character, or increase the materials and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his/her obligations to secure the quality of the work and rate of progress required.

1.02 PRIVATE LAND

A. Do not enter or occupy private land outside the property boundary or easements, except by written permission of the Owner and the Engineer.

1.03 OPEN EXCAVATIONS

A. Excavations shall conform to the requirements of the OSHA Standards and Interpretations, Subpart P – Excavation, Trenching and Shoring.

B. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights, and other means to prevent accidents to persons and damage to property. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer.

C. Take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles, which could be dangerous to the public, shall be marked.

1.04 MAINTENANCE OF TRAFFIC

A. All work shall be completed so that vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, the Contractor shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the Owner.

B. Take precautions to prevent injury to the public due to open trenches.

1.05 CARE AND PROTECTION OF PROPERTY

A. Be responsible for the preservation of all public and private property and use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Owner.

B. The Contractor shall obtain an agreement with the Town of Romulus and the Owner and repair and restore the road to its original condition after construction.

1.06 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

A. Assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to building, utilities in the street, gas pipes, water pipes, fences, monitoring wells, hydrants, sewers, drains, and electric and telephone cables that are not specifically required to be demolished, removed, or disposed, whether or not they are shown on the Drawings. Carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by the Contractor at the Contractor's expense.

B. Assistance will be given to the Contractor by the Owner in determining the location of existing services.

C. Contractors shall contact Underground Facilities Protection Organization (UFPO) at 1-800-962-7962 prior to any earthwork operations or excavation.

1.07 CLEANUP AND DISPOSAL OF EXCESS MATERIALS

A. During the course of the work, keep the site of operations in as clean and neat a condition as is possible. Trash generated by the Contractor as a result of work performed shall be picked up and placed in containers that are emptied on a regular schedule. On completion, all areas shall be clean and natural looking to the maximum extent possible. Signs of temporary construction and activities necessary for construction of the permanent work shall be removed.

B. All trash generated by the Contractor will be transported and disposed of in a manner that complies with federal, state, and local requirements by the Town of Romulus and the Owner. The Owner will maintain a copy of any state and/or local permits or licenses that reflect such agency's approval and compliance with applicable solid waste disposal regulations. The permits or licenses and the location of the disposal area shall be provided prior to transporting any waste material.

C. Fueling and lubricating of equipment and motor vehicles shall be conducted in a manner that affords the maximum protection against spills and evaporation. Lubricants and waste oil shall be disposed of by the Contractor at his expense, in accordance with approved procedures meeting federal, state, and local regulations.

D. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the Contractor and its subcontractors shall comply with all applicable Federal, State and local laws and regulations concerning waste material disposal as well as the specific requirements stated in this Section and elsewhere in the Specifications.

E. The Contractor is advised that the disposal of excess excavated material in wetlands, stream corridors, and plains is strictly prohibited even if the permission of the Owner is obtained. Any violation of this restriction by the Contractor or any person employed by the Contractor will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. Therefore, the Contractor will be required to remove the fill at his/her own expense and restore the area impacted.

1.08 RESTORATION

A. Restore all areas outside limit of work as shown on the Drawings, to conditions that existed prior to construction.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01100

HEALTH AND SAFETY REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Contractor is responsible for implementation and enforcement of safe Work practices including, but not limited to, personnel exposure to waste and gases; use of shoring, materials handling, operation of equipment; and safety of public during progress of Work.

1.02 APPLICABLE REGULATIONS

A. Contractor shall plan for, and ensure that, all personnel comply with the basic provisions of OSHA Health and Safety Standards (29 CFR 1920) and General Construction Standards (29 CFR 1926), and any applicable local, state, and federal regulations related to worker health and safety. Workers directly involved in waste regrading or trenching operations shall meet applicable requirements of OSHA Hazardous Waste Operations and Emergency Response, Final Rule (29 CFR 1910).

1.03 OPERATIONS AND EQUIPMENT SAFETY

A. Contractor shall initiate, maintain, and supervise safety precautions and programs in connection with Work. Take necessary precautions for safety of employees on Project site and other persons that may be affected by Project.

B. Contractor’s duties and responsibilities for safety in connection with Work shall continue until such time as Work is complete and the Owner or the Engineer has issued notice to Contractor that Work is complete.

1.04 HEALTH AND SAFETY PLAN

A. Contractor shall implement and enforce health and safety requirements and shall take necessary precautions and provide protection for the following:

1. Personnel working on or visiting Project site, irrespective of employer.

2. Work and materials or equipment to be incorporated in Work area on or off site.

3. Other property at or adjacent to Project site.

4. Public exposed to job related operations or potential release of toxic or hazardous materials.

B. Contractor shall prepare a site-specific health and safety plan (HSP) in accordance with Parsons’ Safety, Health, and Risk Program (SHARP) Manual. Contractor is solely responsible for adequacy of HSP's preparation, monitoring, management, and enforcement. At a minimum, Contractor's HSP shall address the following:

1. Site description and history.

2. Project activities and coordination with other Contractors.

3. Hazard evaluation.

4. On-site safety responsibilities.

5. Work zones.

6. Personnel training.

7. Atmospheric monitoring (if required).

8. Personal protection, clothing, and equipment.

9. Emergency procedures.

C. The HSP shall be submitted in accordance with Section 01350 14 days prior to the start of work for approval by the Engineer. Work shall not commence without the Engineer's approval.

D. The Contractor shall make arrangements for all emergency services. The Owner does not have these services available from its staff.

E. If the Engineer observes situations, which appear to have potential for immediate and serious injury to persons, the Engineer may warn persons who appear to be affected by such situations. Such warnings, if issued, shall be given based on general humanitarian concerns, and the Engineer will not, by issuance of any such warning, assume any responsibility to issue future warnings or any general responsibility for protection of persons affected by Work.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment to perform all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Section, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.

C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, berms, staked hay bales, silt curtains, seeding or other special surface treatments as are required to prevent transport of silt. All erosion control measures shall be in place in an area prior to any construction activity in that area.

D. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

E. All phases of sedimentation and erosion control shall comply with and be subject to the approval of the applicable State and local laws and regulations.

1.02 APPLICABLE REGULATIONS

A. Comply with all applicable Federal, State and local laws and regulations concerning environmental pollution control and abatement.

1.03 NOTIFICATIONS

A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Engineer, of any non-compliance with State or local requirements. After receipt of such notice from the Engineer or from the regulatory agency through the Engineer, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for this purpose. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work

until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

1.04 IMPLEMENTATION

A. Prior to commencement of the work, meet with the Engineer to develop mutual understanding relative to compliance with these provisions and administration of the environmental pollution control program.

B. Remove temporary environmental control features, when approved by the Engineer, and incorporate permanent control features into the project at the earliest practicable time.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EROSION CONTROL

A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures, such as hay check dams and other equivalent techniques, shall be used as appropriate. Flow of surface water into excavated areas shall be prevented as much as is practical. Berms around construction area shall also be used to shed away water resulting from dewatering of excavated areas. At the completion of the work, ditches used for erosion control shall be backfilled and the ground surface restored to original condition.

3.02 PROTECTION OF STREAMS AND SURFACE WATERS

A. Take all precautions to prevent, or reduce to a minimum, any damage to any stream or surface water from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams or surface water. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream or surface water shall not be directly returned to the stream or surface water. Divert such waters, through a settling basin or filter before being directed into streams or surface waters, as approved by the Engineer.

B. Take all preventative measures to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with State and Federal Regulation and as approved by the Engineer.

3.03 PROTECTION OF LAND RESOURCES

A. Restore land resources within the project boundaries and outside the limits of permanent work to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas shown on the Drawings.

B. Outside of areas requiring earthwork for the construction of the new facilities, do not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer.

C. Before beginning operations near them, protect trees that may possibly be defaced, bruised, injured, or otherwise damaged by the construction equipment or other operations, by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly.

D. Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to their original condition. The Engineer will decide the method of restoration to be used and whether damaged trees shall be treated and healed or removed and disposed of.

1. All scars on trees caused by equipment, construction operations, or by the removal of limbs larger than 1-inch in diameter shall be coated as soon as possible with an approved tree wound dressing. Experienced workmen shall perform all trimming or pruning in an approved manner with saws or pruning shears. Tree trimming with axes will not be permitted.

2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed or replaced.

E. The location of the Contractor's temporary storage and other construction buildings shall be cleared as shown on the Drawings and approved by the Engineer and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.

F. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, he shall submit the following for approval at least ten days prior to scheduled start of such temporary work.

1. A layout of all temporary roads, excavations, embankments, and drainage to be constructed within the work area.

2. Details of temporary road construction.

G. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions, which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in Section 02990, or as approved by the Engineer.

3.04 PROTECTION OF AIR QUALITY

A. Burning – The use of burning at the project site for the disposal of refuse and debris will not be permitted.

B. Dust Control

1. Maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others, as approved by the Engineer.

2. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.

3. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

3.05 NOISE AND ODOR CONTROL

A. Make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with Federal and State regulations.

B. Conduct work in a manner to minimize odors to residences in the vicinity of work. If odors become a problem, as determined by the Engineer, provide an odor control material or procedure acceptable to the Engineer.

3.06 LITTER CONTROL

Provide litter control to keep exposed waste from blowing off-site. Collect litter present on site and dispose. Maintain site free of litter generated by Contractor's employees.

3.07 USE OF CHEMICALS

A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, shall be approved by USEPA, U.S. Department of Agriculture, or any other applicable regulatory agency.

B. Use and dispose of chemicals and residues in compliance with manufacturer's instructions and applicable regulations.

3.08 FUEL AND LUBRICANTS

A. Comply with local, state and federal regulations concerning transportation and storage of fuels and lubricants.

B. Fuel storage area and fuel equipment shall be approved by the Engineer prior to installation.

C. Report spills or leaks from fueling equipment or construction equipment to the Engineer and cleanup as required.

D. The Engineer may require Contractor to remove damaged or leaking equipment from Project site.

END OF SECTION

SECTION 01350

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

A. This section specifies the general methods and requirements of submissions and distributions applicable to Samples and other Submittals. Detailed submittal requirements are specified in the technical sections.

B. All submittals shall be clearly identified by reference to specification section number, paragraph, Drawing number, or detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data and information.

1.02 SUBMITTAL OF CONTRACTOR FURNISHED SAMPLES AND LANDFILL DOCUMENTATION PARSONS WILL HANDLE THE T&D

A. Samples

A representative sample from an off-site borrow source will be necessary should backfill be required during grading of the site. Sample requirements are documented in Specification 02223 Backfilling. The name, owner, and representative sample of the borrow source shall be submitted to the Engineer 14 days prior to construction. Borrow source must be approved by the Engineer prior to use.

B. Landfill Documentation

All weigh tickets documenting the weight of deliveries of waste to the landfill shall be submitted to the Engineer within 5 business days. Parsons is handling T&D.

1.03 CONSTRUCTION SCHEDULE

A. The Contractor shall submit a construction schedule within five (5) calendar days after signing of Agreement. The schedule shall state the expected number of days needed to complete the entire project, and each individual project task.

B. The Contractor shall submit revised schedules as substantial variations are identified and required by the Owner.

C. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the start and finish dates and duration. Presentation shall be neat and accurate utilizing MS Project© or comparable project tracking software package.

D. The Contractor shall check with the Owner regarding the Owner-furnished equipment delivery dates, progress of construction by Others and to schedule the arrival of his materials, equipment and labor at the site so as to properly coordinate his and the work by Others. There will be no extra compensation for extra work,

which the Contractor must perform due to his failure to coordinate his work and the work of others.

1.04 PROPOSED SUBCONTRACTOR LIST

A. The Contractor shall submit a complete list of Subcontractors, with name, address, and experience within five (5) calendar days after signing of Agreement.

B. No work on the Contract shall commence until the Owner in writing has approved all the proposed Subcontractors.

C. If the Contractor plans to use a subcontractor that is not on the original subcontractor list submitted with their cost estimate, the Contractor may propose in writing an alternative Subcontractor or additional Subcontractors for the Owner or Engineer's approval.

D. No work on the Contract shall commence until the Owner in writing has approved all the proposed Subcontractors.

1.06 HEALTH AND SAFETY PLAN

A. The Contractor shall prepare a construction Health and Safety Plan and submit the plan to the Owner and Engineer for review and comments at least 14 days prior to the start of work. The Contractor shall address the Owner and Engineer's comments and resubmit the plan, as necessary. The Contractor shall complete the plan in accordance with the site-specific Health and Safety Plan, OSHA, NYSDEC, county, and local government requirements.

B. No work shall commence at the site until the plan has been approved and is in place.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01 QUALITY CONTROL OF INSTALLATION

The Contractor shall:

A. Monitor quality control over products, services, site conditions, and workmanship to produce work of specified quality.

B. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

C. Perform work by persons qualified to produce workmanship of specified quality.

D. During freezing or inclement weather, or other adverse conditions, no work shall be performed except that which can be performed in a manner, which will ensure first class construction throughout.

1.02 WORKMANSHIP

A. The intent of these Technical Specifications is to describe definitely and fully the character of materials and workmanship required with regard to all ordinary features, and to require first-class work and material in all particulars.

B. For any unexpected features arising during the progress of the work and not fully covered herein, the specifications shall be interpreted by the Owner to require first-class work and materials; and such interpretation shall be accepted by the Contractor.

C. All labor shall be performed in the best and most workmanlike manner by mechanics skilled in their respective trades. The standards of the work required throughout shall be of such grade as will bring only first-class results.

1.03 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to current reference standards by contract documents date of issue, except where specified date is established by Code.

C. Obtain copies of standards when required by contract documents.

D. Should specified reference standards conflict with contract documents, request clarification from the Owner before proceeding.

E. The contractual relationship of the parties to the Contract shall not be altered from the contract documents by mention or inference otherwise in any reference document.

1.05 FIELD INSPECTION OF CONTRACTOR'S WORK

A. The Engineer will provide daily inspection of the Contractor's work, which will ensure that the work is being performed in accordance with the Drawings and specifications such that the end product will be in conformance with the Drawings and specifications.

B. The Contractor and its subcontractors are responsible for complete conformance to the Drawings and specifications for all work performed on the project.

C. The Contractor will provide ample opportunity for safe and easy access to the inspectors for proper inspection of the work.

D. The Contractor will inform the Engineer in advance of periods when the Contractor does not intend to work due to, but not limited to, inability to obtain materials or equipment or expected inclement weather. If ample warning is not given to the Engineer and unnecessary trips are made to the field, funds will be deducted from monies due to the Contractor to reimburse the Engineer for his/her time.

1.06 ON SITE AND LABORATORY TESTING

A. The Engineer shall be responsible for collecting samples and conducting tests related to identification of borrow source materials in order to meet the specifications.

1.07 VENDOR'S FIELD SERVICES AND REPORTS

A. When stated in individual specification sections, the Contractor is responsible for coordinating required material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces, conditions of installation, quality of workmanship, testing, as applicable, and to initiate instructions when necessary.

B. Contractor shall report to the Owner observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to Vendor's written instructions.

C. Submit report under provisions of Section 01350 (Submittals) within 30 calendar days of observation to the Owner for review.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 TEMPORARY CONSTRUCTION FACILITIES

A. The Contractor shall provide and pay for the provisions of a temporary construction office (trailer) to be used by on-site Contractor personnel only,

B. The location of the Contractor's office (trailer) may be setup up within the limit of work at SEAD-16 or SEAD-17 at the Owner's discretion.

C. Contractor shall park their vehicles in locations as directed by the Owner.

1.02 TELEPHONE

A. The Contractor will make arrangements with the local telephone company to provide and maintain telephone and facsimile service for the duration of the Work, if needed.

1.03 SANITARY FACILITIES

A. The Contractor shall provide and pay for temporary toilet facilities for the office personnel in addition to facilities for field personnel conforming to state and local health and sanitation regulations in sufficient number for use of the Contractor's, Owner's, Engineer's and subcontractor's personnel.

B. The Contractor shall maintain the facilities daily in clean and sanitary conditions.

1.04 WATER

A. Contractor shall provide all water necessary to complete the work, including drinking water for the Engineer and Owner.

1.05 TEMPORARY ELECTRICAL POWER AND LIGHTING

A. The Contractor shall provide all temporary electricity and lighting, including poles, transformers, and meters. All temporary distribution materials and installation shall conform to the requirements of the National Electrical Code and any applicable local codes.

B. Provide and maintain lamps, wiring, switches, sockets, and similar equipment required for temporary lighting and power tools.

C. Temporary lighting shall be sufficient to enable Contractor to complete Work and enable Owner or the Engineer to observe work as it is being performed. Illumination shall meet or exceed state code requirements.

D. Contractor shall provide and pay for electrical energy required for temporary heating and cooling of the Contractor's temporary construction offices.

1.06 CONSTRUCTION SIGNS

A. The Engineer shall provide signs at the office indicating the Contractor's and Engineer's name.

B. The Engineer shall provide directional signs to direct traffic into and within the site. The signs shall be relocated as Work progresses.

C. The Engineer shall design the signs and sign posts to withstand 60 mile per hour wind velocity.

D. The Engineer shall maintain the signs and signposts and repair as necessary. The Contractor shall remove signs and supports at completion of the Project and restore the area.

E. The number, size, and text of construction signs displayed at the jobsite shall be subject to review, prior to installation, by the Owner.

F. Owner furnished signs may be provided at the Owner's discretion at no cost to the Contractor. The Engineer is responsible for maintaining the sign at the site.

1.07 SECURITY

A. The Contractor shall assume sole responsibility for security at the site for the entire duration of the Work. The Owner will not provide site security.

B. The Contractor shall take at all times such usual and ordinary precautions as may be required to protect all materials, equipment and completed work that are susceptible to damage by sabotage or vandalism and that would cause loss of life or property, or would endanger the work of this or other contracts in connection with this project, or which would effect a substantial delay in the completion of the work of this or other contracts.

C. The Contractor shall make provisions to exclude all unauthorized persons from the vicinity of his construction operations.

1.08 SNOW REMOVAL

A. The Owner shall provide snow removal to gain access to the sites.

B. The Contractor shall be required to remove snow from the work area, should it be necessary. In the event of a major snowfall, the Contractor shall coordinate with the Owner for timely access as may be needed.

1.09 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. The Contractor shall remove temporary utilities, equipment, facilities, and materials prior to demobilization from the site.

B. The Contractor shall clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02100

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 DESCRIPTION

A. Remove debris, stumps, roots, and other objectionable materials within the excavation limits designated on the Drawings. Chip the above-grade portions of trees and brush for erosion control measures and spread on-site. Grind stumps and leave grindings in place.

B. Work Included in this Section. Principal items are:

1. Selective debris removal to excavation limits shown on the Drawings.

2. Protection and preservation of trees and vegetation outside the clearing limits.

3. Cutting and onsite use/disposal of above-grade timber, if any.

4. Off-site disposal of debris and other objectionable materials.

C. Related Work Specified in Other Sections.

1. Section 02219 - Contaminated Soil Excavation and Disposal

2. Section 02370 - Erosion Control

1.02 CODE REQUIREMENTS AND ENVIRONMENTAL SAFEGUARDS

Accomplish disposal of material removed from site in accordance with applicable Federal, State, and local regulations. Comply with regulations to prevent pollution of air and water.

1.03 SITE INVESTIGATIONS

Carefully examine the site to determine the full extent, nature, and location of work required to conform with the Drawings and Specifications. Bring any inaccuracies or discrepancies between the Drawings and Specifications to the Engineer's attention in order to clarify the exact nature of the Work to be performed.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING.

A Remove all vegetation, brush, shrubs, stumps, logs, roots, debris, metal debris, and boulders within the excavation area. Backfill holes outside of planned excavation

areas resulting from the removal of underground structures and roots that extend below finished grade with unclassified fill or backfill.

B. Immediately restore or replace any damaged items.

C Above-Grade Material: Cut above-grade timber within 12 inches of grade. Chip and dispose of above-grade timber on-site outside the excavation area as erosion control measures.

D. Below-Grade Material: Chip and grind below-grade material from grubbing, including roots, stumps and other materials, and leave on-site.

E. Provide a chipper and/or grinder of sufficient size to handle material expected from the cleared and grubbed areas.

F. Do not burn any materials on-site.

3.02 TOPSOIL REMOVAL

None required. Topsoil within the excavation limits is generally contaminated and must be removed and loaded directly onto a truck for off-site disposal. Reuse of site topsoil for site grading or backfilling is not permitted.

3.03 GUARANTEE

Guarantee that Work performed under this Section will not permanently damage trees, shrubs, turf, or plants designated to remain, or other adjacent work or facilities. If damage resulting from operations appears during a period up to 12 months after completion of the project, replace damaged items.

END OF SECTION 02100

SECTION 02140

CONSTRUCTION AND STANDING WATER MANAGEMENT

PART 1 GENERAL

1.1 WORK INCLUDED

A. Handling, storage, treatment (if necessary), and disposal of all construction water and associated residual sediments generated during construction in accordance with all applicable local, State, and Federal regulations.

B. The Contractor is to obtain (if necessary) and operate within all required local, State, and Federal permits and requirements required to implement the proposed construction water management plan. Any and all civil, criminal, and monetary penalties associated with non-compliance in any regard shall be the responsibility of the Contractor.

C. Provide materials and equipment required for containment of construction water in accordance with the Engineer-approved construction water management procedures.

1.2 RELATED SECTIONS

A. Section 01010 – Summary of Work

B. Section 02219 – Contaminated Materials Excavation and Disposal

C. Section 02370 – Erosion Control

1.3 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

A. The Contractor shall comply with applicable federal, state, and local applicable codes, ordinances, regulations, statues and standards.

1.4 DEFINITIONS

A. Construction water: Construction water shall be defined as the following:

1. Groundwater or surface water entering excavations.

2. Liquids generated during decontamination activities.

3. Surface water resulting from precipitation during construction which has come in contact with potentially contaminated soils, sediment, fill, or debris, except from potentially contaminated soil, sediment, fill, or debris which is in place and undisturbed.

4. Water or other liquids, which have come into contact with potentially exposed contaminated soils, sediment, or debris, in addition to that resulting from precipitation.

B. Construction Water does not include water contacting non-disturbed excavation areas. This water shall be diverted from the excavation area as required to minimize the potential for contact with the construction operations.

PART 2 PRODUCTS

2.1 GENERAL

A. Construction and Standing Water Management Procedures

1. All construction and standing water shall be contained with either: a.the excavation area by use of soil berms or haybales around the area of excavation, or b. the decontamination area by use of a 6 mil poly liner bounded by soil berms or haybales.

2. All contained waters within the excavation area shall be allowed to evaporate or infiltrate during excavation operations and will be allowed to drain prior to any soil removal from the area.

3. All contained waters within the decontamination area will be allowed to evaporate prior to dismantlement of the decontamination area. The acceptable methods of handling sediment with the decontamination area is to allow for drying, collect within the 6 mil poly liner and dispose off-site with excavated soil.

B. Facilities

1. The Contractor shall provide methods, means, and facilities required to manage construction water and residuals generated during construction water management.

C. Equipment

1. The Contractor shall provide equipment and personnel to manage construction water.

PART 3 EXECUTION

3.1 GENERAL

A. Contractor shall be responsible for estimating the quantity and quality of construction water expected for this project based on the existing site conditions.

B. It shall be the responsibility of the Contractor to investigate and comply with all applicable Federal, State, and local laws and regulations governing the handling, storage and disposal of construction water. All construction water shall be disposed of in a manner which meets applicable permit requirements, laws, and regulations.

C. The Contractor shall obtain all required permits, manifests, and approvals required for the handling, storage, transport, treatment, and disposal of construction water and

residuals generated during construction water management. Parsons will supply the analytical and disposal. Contractor to collect and transport.

D. Any sampling and analyses necessary to protect the health and welfare of the Contractor's employees and/or agents and/or to characterize collected water, or residuals shall remain the sole responsibility of the Contractor.

E. Construction water shall be handled using equipment compatible with anticipated contaminants which may be present.

3.3 OFF-SITE DISPOSAL OF WASTES

A. Contractor shall dispose of water related wastes with excavated soil in designated off-site facility.

B. Contractor shall dispose of wastes designated for off-site disposal within 90 days of filling the container.

C. Contractor shall mark, label, placard, package, and manifest wastes in accordance with applicable codes, regulations, and statues.

3.4 MINIMIZATION OF CONSTRUCTION WATER

A. The Contractor shall make every effort to minimize the generation of construction water and associated sediment and sludges. Methods to minimize generation of construction water include, but are not limited to:

1. Erection of temporary berms using existing soil located at least 25 feet outside of the planned excavation areas or using clean approved borrow soil.

2. Use of low permeability tarpaulin or suitable means to cover exposed contaminated areas and materials.

3 Limiting the amount of exposed contaminated areas.

4. Grading to control run-on and run-off.

END OF SECTION

SECTION 02219

CONTAMINATED MATERIALS EXCAVATION AND DISPOSAL

PART 1 GENERAL

1.01 DESCRIPTION

A. The work specified in this section consists of the labor, equipment, tools, materials, and services needed to perform the excavation and disposal of contaminated materials (i.e., ditch soil, soils, and debris) as described herein, shown on the Contract Drawings, or directed by the Engineer

B. Related Sections:

1. Section 02100 – Clearing and Grubbing

2. Section 02140 – Construction Water Management

3. Section 02223 – Backfilling

4. Section 02228 – Compaction

5. Section 02370 – Erosion Control

6. Section 02990 – Finish Grading and Seeding

1.02 SUBMITTALS

A. Name, location, and a copy of the operating permit for off-site disposal facilities to be utilized. Statement of acceptability from disposal facilities for each material to be received.

B. Procedures, materials, and equipment to be used for the excavation, transportation, and disposal of contaminated materials. Include a spill contingency plan as part of this submittal. Do not begin soil excavation work until the Engineer has approved this submittal.

1.03 REFERENCES

None.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum. Review subsurface investigation reports and other available site information.

B. Protect plants, lawns, and other features that have been designated on the Contract Drawings to remain.

C. Protect control points, bench marks, existing structures, features, fences, sidewalks, paving, and curbs from excavation equipment and vehicular traffic. Repair or replace damaged items.

D. Prior to the start of construction, notify the appropriate organizations, and have staked or marked underground utilities. Contractors shall contact Underground Facilities Protection Organization (UFPO) at 1-800-962-7962 prior to any earthwork operations or excavation. Utilities include, but are not limited to water, gas, electric, telephone, cable, storm sewer, sanitary sewers, laterals, and services. If utility locations indicate a possible interference, or points of connection to existing facilities need to be identified, perform exploratory excavations to determine the utilities' location and elevation. Provide the utility owner with results from exploratory excavations for review. Allow the Engineer sufficient time to review exploratory excavation results and evaluate if changes are required to the design prior to start of construction.

E. Maintain existing manholes, catch basins, and other utility structures above and below grade in their pre-work condition. Promptly remove any material or debris entering same due to the operation.

F. Grade areas to receive compacted fill to prevent surface water run-off and ponding.

G. Establish exclusion zones for work areas in accordance with the HSP.

H. Establish decontamination area adjacent to the exclusion zone to prevent contamination of areas outside of the area of excavation.

I. Engineer will survey and stake the corners of the excavation according to the Contract Drawings or the Engineer.

3.02 EXCAVATION

A. Protect adjacent structures that may be damaged by excavation work, including but not limited to utilities, monitoring wells, and pipe chases. Repair or replace any structure damaged as a result of operations. Railroad tracks and beds must remain intact.

B. Excavate to the staked lines and to the depths shown on the Contract Drawings. Do not over-excavate any area without prior approval from the Engineer. Stop excavating if bedrock is encountered.

C. Shore or machine-slope banks to an angle that is safe for the material in which the excavation is made.

D. Excavations shall not interfere with the normal 45-degree bearing splay of foundations. Do not undercut excavation faces.

E. Remove lumped subsoil, boulders, and rock under 1 cubic yard in size.

F. Notify the Engineer of unexpected subsurface conditions, or of questionable soils encountered at required sub-grade elevations, and discontinue work in the area until notified to resume work.

G. Furnish and place backfill to meet the pre-construction grades, if needed. Spread and compact fill used for backfilling in conformance with the requirements of Section 02228 - Compaction.

H. Place excavated material directly in dump truck for off-site disposal, or as designated by the Engineer.

I. Keep varying contaminant types and concentrations segregated as necessary for disposal if directed by the Engineer.

J. Where required, the Engineer will perform confirmatory or post-construction sampling to evaluate the need for additional excavations. Allow a minimum of 72 hours for analytical test results.

K. Perform excavation in a manner that prevents migration of contaminants to clean areas. Remove and dispose of contamination that spreads beyond the existing contamination limits in accordance with this section.

L. Minimize the frequency with which equipment enters/leaves the exclusion zone by staging newly excavated soil within the area of excavation, but adjacent to a truck load-out area. Direct load excavated soil directly to dump trucks from the excavated soil staging area within the exclusion zone.

M. Grade the excavation perimeter to provide continuous drainage and prevent ponding. Direct surface water away from excavation areas. Contain and handle surface water and groundwater seepage that collect in disturbed excavation areas known to contain contaminated material in accordance with Section 02140.

N. Provide oil absorbent pads and/or booms to contain and collect oil sheens emanating from the excavation areas.

O. Transport excavated materials in accordance with Federal, State and Local requirements and in a manner that prevents spills and the spread of contamination. No free liquids will be allowed. All materials should be drained into a contained area prior to loading into trucks. All trucks will be covered.

P. Do not exceed legal load limits for truck weight.

Q. Stop work immediately and notify the Engineer if hazardous materials (i.e., drums, etc.) are encountered during excavation. Do not proceed with removal of hazardous materials without prior approval from the Engineer unless an emergency situation requiring immediate action exists.

R. Decontaminate equipment used for excavation of contaminated materials prior to reuse on clean material. Decontaminate equipment between distinct areas of excavation if directed by the Engineer. Decontamination shall occur within the

decontamination area located directly adjacent to the area of excavation. Water from the decontamination area shall be managed in accordance with Specification 02140.

3.03 PROTECTION OF EXCAVATIONS

A. Prevent cave-ins or loose soil from falling into excavation.

B. Properly and legally maintain excavations while they are open and exposed. Install and maintain sufficient and suitable barricades, warning lights, flood lights, signs, etc., to protect life and property until the excavation has been backfilled and graded to a safe and satisfactory condition.

C. Make excavations in accordance with the Contractor's HSP.

3.04 DISPOSAL

A. Debris: Dispose of site debris with the contaminated materials unless specifically instructed otherwise.

B. Disposal of excavated materials will be coordinated by Parsons. Excavated materials will be loaded into trucks and transported off-site to either Seneca Meadows in Waterloo, NY or to Ontario County Landfill in Flint, NY.

C. All weigh tickets shall be submitted to the Contractor within 5 business days.

END OF SECTION

SECTION 02223

BACKFILLING (OPTIONAL)

PART 1 GENERAL

1.01 DESCRIPTION

The work specified in this section consists of the labor, equipment, tools, materials, and services needed to perform backfilling as described herein or shown on the Contract Drawings. Due to the shallow excavation (6 inches in most places, and up to three feet in discrete locations at SEAD-16), it is not anticipated that backfill will be needed. The areas will most likely be re-graded to match existing topography. If backfill is required, the specifications herein will be used.

A. Work included in this section:

1. Analytical/geotechnical testing of imported backfill materials prior to placement and compaction.

2. Site filling and backfilling.

3. Classification of materials.

B. Related sections:

1. Section 02219 – Contaminated Materials Excavation and Disposal

3. Section 02228 - Compaction

4. Section 02990 – Finish Grading and Seeding

1.02 SUBMITTALS

A. One sample for each material proposed. The name and owner of the borrow source provided to the engineer 14 days prior to construction. Materials must be approved by the Engineer prior to use.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM D2487 - Test Method for Classification of Soil for Engineering Purposes.

B. Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste (SW)

1. EPA SW846 Method 8260B – Volatile Organic Compounds (VOCs) by Gas Chromatography/Mass Spectrometry (GC/MS).

2. EPA SW846 Method 8270C – Semivolatile Organic Compounds (SVOCs) by Gas Chromatography/Mass Spectrometry (GC/MS).

3. EPA SW846 Method 6010B – Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry.

4. EPA SW846 Method 7471 – Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique).

1.04 QUALITY ASSURANCE

A. The Owner and the Engineer reserve the right to inspect proposed sources of off-site materials and to order tests of the materials to ascertain its quality and particle size. Engage an approved testing laboratory to perform such tests, and submit certified test results.

B. Do not use materials until approval is obtained from the Engineer. Use material from approved sources.

PART 2 PRODUCTS

2.01 OFF-SITE MATERIALS

A. Acceptability of off-site material follows procedure consistent with NYSDEC's Draft DER-10 Technical Guidance for Site Investigation and Remediation (December 2002).

1. Contractor identifies a potential borrow source for SEAD-16 and SEAD-17 and provides the name of the site owner, the location where the fill was obtained, and a brief history of the site which is the source of the fill. Fill is natural material from approved off-site sources, free from trash, debris, deleterious materials, snow, or ice.

2. Contractor collects one representative sample from the borrow source and submits it for the analysis of metals, VOCs, and cPAHs. The results are provided to the Engineer, USEPA, and NYSDEC.

3. Analytical results are compared to the metals and cPAH cleanup goals at SEAD-16 and metals cleanup goals at SEAD-17. VOCs shall not exceed NYSDEC criteria.

4. If all results are lower than the requirements, the material is acceptable for use as backfill. If the results are not acceptable, a new borrow source will be located and the process will be repeated. The Owner will provide the comparison of backfill results to the acceptability criteria to NYSDEC and USEPA for review prior to accepting the material onsite. The Owner will consider the material approved if it meets all of the requirements as discussed above.

5. No additional borrow source samples will be required once the source is approved. The Army will monitor the incoming loads of backfill to document that the fill is free of extraneous debris or solid waste.

B. Natural material from approved off-site sources, free from trash, debris, deleterious materials, snow, or ice.

C. Material free of hazardous wastes, hazardous substances, meeting the site-specific cleanup goals for metals at SEAD-17 and metals and PAHs at SEAD-16.

D. Materials classified in ASTM D 2487 as GW, GP, GC, SW, SP, and SC that are free from roots and other organic matter, trash, debris, frozen materials, and stone larger than 2 inch in any dimension.

PART 3 EXECUTION

3.01 GENERAL BACKFILLING REQUIREMENTS

A. Verify that fill materials are acceptable.

B. Confirm with the Engineer that confirmatory samples have been analyzed and are acceptable prior to backfilling.

C. Backfill the excavation areas at SEAD-16 and SEAD-17 to match pre-excavation grades.

D. Repair or replace settlement in the finished work in accordance with this Section.

E. Place and compact fill materials in continuous layers to meet appropriate requirements of Section 02228 - Compaction.

F. Remove surplus backfill materials from site and/or place in an accepted area.

3.02 TESTING

A. Collect and analyze one sample prior to acceptance as the borrow source. The sample will be analyzed for VOCs (EPA Method SW846 8260B), SVOCs (EPA Method SW846 8270C), Metals (EPA Method SW846 6010B including Mercury 7471), and classification of soil (ASTM D-2487).

END OF SECTION

SECTION 02228

COMPACTION

PART 1 GENERAL

1.01 DESCRIPTION

A. Due to the shallow nature of the excavations at SEAD-16 and SEAD-17 (six inches in most places, with up to three feet in discrete locations at SEAD-16), it is not anticipated that compaction will be required. If it is necessary, the procedures outlined in this specification will be followed.

B. Work included in this section:

1. Placement and compaction of imported backfill materials and relocated site materials.

C. Related Sections:

1. Section 02219 - Contaminated Materials Excavation and Disposal

2. Section 02223 - Backfilling

3. Section 02990 - Finish Grading and Seeding

1.02 SUBMITTALS

None.

1.03 REFERENCES

None.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.01 COMPACTION

A. Backfill soil shall be placed in maximum of 2 foot loose lifts prior to compaction. Each lift shall be compacted prior to placing the next lift. Compaction shall be achieved by three passes of a dozer or other equipment with suitable ground pressure.

3.02 QUALITY ASSURANCE/QUALITY CONTROL

A. The Contractor shall ensure that the backfilled areas have been compacted to meet final grades prior to demobilizing from the site.

3.03 PROTECTION

A. Do not compact a layer of fill on snow, ice, or frozen soil. Remove unsatisfactory materials prior to compacting fill.

END OF SECTION

SECTION 02370

EROSION CONTROL

PART 1 GENERAL

1.01 DESCRIPTION

The work specified in this section consists of the labor, equipment, tools, materials, and services needed to accomplish erosion control measures during and following construction as described herein, shown on the Contract Drawings.

A. Work included in this section:

1. Installation of temporary erosion control measures.

2. Controlling erosion from contaminated soil stockpiles, if any.

3. Inspection of erosion control measures during and after significant rainfall.

4. Repairing failed erosion control measures.

5. Removing and disposing of sediment deposits in a manner that does not result in additional erosion or pollution.

6. Removal of temporary erosion control measures once construction and permanent stabilization is complete.

B. Related Sections:

1. Section 02219 – Contaminated Materials Excavation and Disposal

2. Section 02223 - Backfilling

3. Section 02228 - Compaction

4. Section 02990 - Finish Grading and Seeding

1.02 PERFORMANCE REQUIREMENTS

A. Observe government policy established by United States Environmental Protection Agency (USEPA).

B. Conform to all erosion and sedimentation control measures established by the State of New York.

C. Temporary erosion and sediment control measures shall be installed as one of the first steps in construction, shall be maintained throughout the construction period, and shall not be removed until permanent cover is completely established and stabilized, with Engineer's approval.

1.03 SUBMITTALS

A. Product Data. Provide product data for each component to be used in erosion and sediment control.

PART 2 PRODUCTS

2.01 MATERIALS

A. Straw Bales

1. Shall be securely tied.

B. Silt Fence

1. Mirafi “Envirofence” or equivalent.

2. Rexius Ecoberm or equivalent.

C. Stakes and Fasteners

1. Shall be two rebar or two wood stakes for each hay/straw bale.

D. Oil Sorbents

1. Booms – New Pig Spaghetti Boom or equal shall be used.

2. Socks – New Pig Skimmer Socks or equal shall be used.

2.02 METHODS

A. Sediment Barriers - Sediment barriers shall be straw bales, stone, silt fences, ecoberms, or other approved materials that will prevent migration of silts and sediment to different areas.

B. Temporary Diversion Ditches – Temporary diversion ditches shall be installed by the Contractor to control surface water and minimize construction water.

C. Oil Sorbent Booms/Socks - Oil sorbent booms/socks shall be installed to contain oil sheens emanating from waste materials, if any. Keep a supply of clean oil sorbent booms/socks on-site at all times and install within one hour after discovery of a sheen.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. It is the Contractor's responsibility to implement and maintain erosion and sedimentation control measures to effectively minimize erosion and sedimentation.

B. Earthmoving activities shall be conducted in such a manner as to minimize erosion and sedimentation.

C. Install erosion and sedimentation control measures in accordance with manufacturer recommendations and where designated on the Drawings.

D. Erosion and sedimentation control measures shall be inspected by the Engineer and Contractor daily. Repairs shall be made as soon as practical.

E. Employ, construct, and maintain all temporary erosion and sediment control measures in accordance with *New York Standards and Specifications for Erosion and Sediment Control***.**

3.02 SPECIAL CONDITIONS

A. Prohibited construction practices include, but are not limited to, the following:

1. Dumping of spoil material into any stream corridor, any wetlands, any surface waters, at unspecified locations, or locations not expressly approved by Engineer.

2. Indiscriminate, arbitrary, or capricious operation of equipment in any stream corridors, any wetlands, or any surface waters.

3. Pumping of silt-laden water from trenches or other excavations into any surface waters, any stream corridors or wetlands, or locations not expressly approved by Engineer.

4. Disposal of trees, brush, and other debris in stream corridors, wetlands, surface water, unspecified locations, or locations not expressly approved by Engineer.

5. Permanent or unspecified alteration of the flow line of any stream.

3.03 ADJUSTMENT OF PRACTICES

A. If the planned measures do not result in effective control of erosion and sediment runoff to the satisfaction of the regulatory agencies having jurisdiction over the project, the Contractor shall immediately adjust his program and/or institute additional measures so as to eliminate excessive erosion and sediment-runoff.

B. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor.

END OF SECTION

SECTION 02990

FINISH GRADING AND SEEDING

PART 1 GENERAL

1.01 SUMMARY

A. The work specified herein includes the material, equipment, labor, and services necessary to final grade and seed on the vegetative cover and repair disturbed and/or damaged areas.

B. Related Sections:

1. Section 02370 - Erosion Control

1.02 SUBMITTALS

A. Materials and Products:

1. Grass Seed Vendors Certificate: Seed vendor's certified statement for the grass seed mixture required, stating common name, percentage by weight, and percentages of purity and germination.

2. Hydroseeding: Data concerning hydroseeding equipment (if used) including material application rates.

B. Installer - Name of subcontractors (if used) and Qualification Statements.

C. Manufacturer's Certification - Certify that products meet or exceed specified requirements.

1.03 REFERENCES

None.

1.04 QUALITY ASSURANCE

A. Label seed in accordance with USDA Rules and Regulations under the Federal Seed Act and applicable State seed laws. Furnish seed in sealed bags or containers bearing the date of the last germination which shall be less than six (6) months prior to commencement of planting operations. Inspect seeding material upon arrival at the job site. Remove unacceptable material from the job site. Seed shall be from same or previous year's crop. Each variety of seed shall have a purity of more than 85%, a percentage of germination more than 90%, a weed content of less than 1%, and contain no noxious weeds.

PART 2 PRODUCTS

2.01 GRASS SEED

A. A seed mixture beneficial to wildlife, as recommended by the US Fish and Wildlife Service, consisting of the following proportions or equal approved by the Owner:

Common Name	Species	Pounds per Acre
White Clover	*Trifolium repens*	5
Lancer perennial pea	*Lathyrus latifolius*	5
Perennial ryegrass	*Lolium perenne*	10
Timothy grass	*Phleum pratense*	10
Orchard grass	*Dactylis glomerata*	10
Smooth bromegrass	*Bromus intermis*	10

PART 3 EXECUTION

3.01 APPLICATION PROCEDURES

A. Excavation areas and disturbed surfaces outside the excavation limits that have been disturbed or damaged during completion of the work shall be final graded to pre-excavation grades. Any areas that were vegetated prior to the remedial action shall be reseeded.

3.02 SEEDING

A. Apply seed mixture uniformly on the prepared surface with a hand or mechanical spreader. Lightly rake and roll seed into the surface.

B. Apply hydroseed (optional) uniformly on the prepared surface.

3.03 WARRANTY

A. One year warranty period for seed from the date of substantial completion or correction period. Maintain as necessary including repairs, re-seeding, so that an acceptable grass stand is established. The Engineer will provide approval and direction during the one-year warranty period.

END OF SECTION

APPENDIX C

RESPONSE TO COMMENTS

Army's Response to Comments from the United States Environmental Protection Agency

Subject: Draft Remedial Design Work Plan and Design Report for SEAD-16 & 17
Seneca Army Depot
Romulus, New York

Comments Dated: May 17, 2007

Date of Comment Response: June 8, 2007

Army's Response to Comments

GENERAL COMMENTS

Comment 1: The Report proposes the use of perimeter sampling prior to the initiation of excavation activities to determine the horizontal extent of excavation. This will allow the boundary of the excavation to be predetermined so that post-excavation confirmatory sampling around the perimeter will not be necessary. Although EPA does not object to this approach, we recommend some level of post-excavation confirmatory sampling be performed at the perimeter.

Response 1: The Army performed pre-design sampling to determine the horizontal excavation limits prior to beginning construction. Pre-construction sampling helps to avoid the multiple mobilization/demobilization efforts required by the earthwork contractor while waiting for post excavation confirmation sample results such as that experienced during the SEAD-11 removal effort. The Army recognizes that additional excavation may be required due to vertical confirmation results; however, we believe the risk is minimal due to the surficial nature of contamination.

This approach was presented during at least two BCT meetings when the Army presented an actual plan showing the locations of the pre-construction sample locations. The USEPA and NYSDEC did not disagree with this approach. The Army would not have completed this recent effort if it was known that additional horizontal delineation samples could be required. It should also be noted that there are some additional RI sample locations outside the pre-construction sampling limits that provide further confidence that the contamination limits have been established. The Army will conduct any stockpiling or truck loading activities within the excavation areas to prevent cross-contamination of clean areas. Vertical confirmation sampling of these work areas will be performed after all load out activities are performed.

Results from the sampling confirm where cleanup goals have been met. Confirmatory samples will be collected from the floor of the excavation and from any walls should the excavation depth exceed 2 feet. Figures 4-1 and 4-2 show the confirmatory sampling locations and results from the perimeter sampling effort. Using a combination of RI data and samples collected in April and May 2007, a total of 22 samples were used to delineate the excavation area at SEAD-16 (22 were required based on the perimeter of the excavation area). Likewise, a total of 29 samples were used to delineate the excavation area at SEAD-17 (only 24 were required based on the perimeter of the excavation area). Perimeter samples meeting cleanup goals exist every 50 feet on average at both sites. Using this perimeter confirmatory sampling data, the ProUCL recommended UCL of each metal of concern is as shown:

Summary of EPA ProUCL Recommended UCL values for Perimeter Soil Samples						
			SEAD-16		SEAD-17	
Compound	Units	CUG	Maximum Detected	ProUCL Recommended UCL	Maximum Detected	ProUCL Recommended UCL
Antimony	mg/Kg	41	20.8	9.34	14.9	9.7
Arsenic	mg/Kg	21.5	8.5	5.6	8.2	5.75
Cadmium	mg/Kg	60	5.7	2.04	16.2	4.4
Copper	mg/Kg	10000	2390	261	202	106
Lead	mg/Kg	1250	1070	605	1480	747
Mercury	mg/Kg	5.7	4.3	0.71	0.36	0.09
Thallium	mg/Kg	6.7	0.82	0.48	1.5	0.78
Zinc	mg/Kg	10000	711	211	574	283

The Army has sufficiently delineated the perimeter of the excavations. Additional perimeter samples will be collected as discussed in response to comment # 11 below.

Comment 2: Section 3.3.2, on page 3-7 indicates that the proposed excavation depth will be initially set at 6 inches. The Record of Decision (ROD) prescribes a nominal excavation depth of one foot. According to the Army, the historical Remedial Investigation (RI) data demonstrate that an excavated depth of 6 inches is adequate to remove all site contamination. This constitutes a significant difference from what was originally intended by the ROD. Furthermore, a 6-inch lift operation would seem to be less efficient than the agreed nominal excavation of one foot.

Response 2: The Army agrees to excavate to a nominal depth of one foot as stated in the ROD with a couple of exceptions. The one-foot excavation depth will not apply to paved areas or areas adjacent to the railroad tracks. For paved areas, the pavement will be swept clean and removed. Confirmation sampling will be performed directly beneath the pavement since the pavement is intact and pre-dates the operation of the furnaces. Excavation depths will vary in the vicinity of the railroad tracks to maintain the structural integrity of the tracks.

Comment 3: The Report indicates in Section 3.1.1, Mobilization, that the removal action subcontractor will submit for Parson's/Army approval a proposed plan for decontamination of personnel and equipment, as well as their plan for a work/staging area arrangement a minimum of five working days prior to commencement of work. Currently, the Report contains only general statements regarding decontamination activities and includes little to no information on material management, loading procedures, or procedures to be employed to prevent cross-contamination. Although it may be appropriate to allow the removal action contractor to specify these procedures, typically EPA is included in the review of these procedures to ensure that adequate measures are taken to prevent cross-contamination as part of material management and load-out. Revise the Report to provide for a greater lead time for submission of these documents to allow EPA and other stakeholders to be included in the evaluation of these plans. Alternatively, the Report could be revised to include minimum criteria to which the removal action contractor will need adhere in order to allow EPA and other stakeholders to access the proposed decontamination, material management and load-out procedures. The information in Section 3.3.3, Soil and Waste Material Loading, currently only indicates that it is anticipated that materials will be direct loaded. No minimum criteria for this process are specified.

This comment also impacts the construction requirements for soil and debris disposal presented in Section 5.2.3, the Contingency Plan criteria in Section 9.2, Water Treatment, and Specification Section 02219, Subsection 1.02.B in Appendix B.

Response 3: Additional detail has been added to the following sections to address EPA's concerns that only general statements concerning decontamination, material management, loading procedures, and water treatment have been made within the document:

- Section 3.1.2 Decontamination and Support Areas (this section was previously called Staging Areas and text from the draft version of Section 3.1.1, Mobilization regarding decontamination, has been moved to this section);
- Section 3.3.2 Excavation of Soil and Ditch Soil;
- Section 3.3.3 Soil and Waste Material Loading;
- Section 3.4 Transport of Excavated Soil and Other Materials;
- Section 5.2.3 Construction Requirements;
- Specification 02219 Contaminated Materials Excavation and Disposal
  - Added Section 3.02L;
  - Modified Section 3.02R; and
  - Added Section 3.01H

In addition, Sections 3.3.6, Water Management, has been deleted since storage and sampling of water on site will not be required due to the shallow nature of excavations and the flat nature of the site. Additionally, the action will be completed during the summer when little precipitation falls. For this reason, Section 9, Contingency (for Water Treatment), has also been deleted from the document.

The additional detail added to Sections 3 and 5 and itemized in the Specifications should be sufficient in providing minimum requirements for the contractor. The drawings and specifications will become part of the remediation contractor's contract. It is the Army's anticipation that these modifications will suffice as minimum criteria and submission of contractor documents to the agencies will not be warranted. The Army believes that such a submission and review cycle will cause delays in mobilizing for this remediation in late June.

Comment 4: The Report discusses the use of holding tanks to manage run-off water that will need to settle for 72 hours prior to sampling to determine compliance with discharge criteria. There are no flow diagrams or discussions presented to define minimum anticipated water volumes that will need to be managed, or an estimate of how many holding tanks will be necessary to have on site in order to manage the anticipated water volumes. Revise the Report to include an assessment of the anticipated water volumes that will need to be managed, and how many tanks it will require to manage this water to allow for testing and disposal.

Response 4: Storage, testing and disposal of run-off and decontamination water at the site is not anticipated. Such references were made within the draft document inadvertently. Management of site water through storage, testing and disposal is not deemed necessary for the following reasons:

- The topography of the site is relatively flat
- The daily average rainfall for the area during the time of construction is fairly low (0.11 inches/day) and the time to perform the construction is relatively small (i.e. two weeks).
- Run-on waters (if any) will be diverted through use of berms or haybales;

- Berms or hay bales will be established around the area of excavation to prevent run-off from the area of excavation.
- The excavations are mainly shallow (one foot) and groundwater intrusion is not anticipated.

Any water that enters the excavation area due to precipitation will be contained within the excavation area and allowed to infiltrate or evaporate.

- Section 3.1.7 has been revised to provide additional specific information regarding the local topography and management plan for run-off water;
- Specification 01110, Section 3.01B has been deleted;
- Specification 02140 has been updated to reflect the changes discussed above.
  - Section 1.1 C has been modified;
  - Section 1.1D has been deleted;
  - Section 2.1 A has been modified;
  - Section 3.1 C has been modified;
  - Section 3.2 has been deleted;
  - Section 3.3A has been deleted.
- Sections 3.3.6, Water Management has been deleted since it is no longer relevant;
- Section 4.2.1. Sampling of Excavation or Decontamination Water has been deleted since storage and sampling of water is not deemed necessary;
- Section 4.3.3, Sampling of Excavation of Decontamination Water has been deleted since storage and sampling of water is not deemed necessary.
- Section 9, Contingency has been deleted from the document since it addressed water treatment which is no longer deemed necessary.

Comment 5: Section 3.6, Site Restoration and Demobilization, of the Report indicates that SEAD-16 and SEAD-17 will be allowed to re-vegetate naturally. The Specifications in Appendix B include Section 02990, Finish Grading and Seeding. Specification 02990 includes grass seeding requirements and states that, "Excavation areas and disturbed surfaces outside the excavation limits that have been disturbed or damaged during completion of the work shall be final graded to pre-excavation grades [and] reseeded." Revise the Report to indicate that excavation areas and disturbed surfaces outside the excavation limits will be seeded to prevent erosion and sedimentation concerns.

Response 5: The SEAD-16 and SEAD-17 areas are relatively flat and are gently sloped so that run off travels towards the constructed ditches on site. At SEAD-16, none of the area of excavation is currently vegetated (currently asphalt, gravel and railroad bed) and at SEAD-17, approximately 80% of the area is currently vegetated (the remainder is gravel).

Upon completion of the work, the site will be graded to maintain the current surface run-off patterns. Any disturbed areas that were vegetated prior to the remedial action will be re-seeded. In addition, any currently vegetated areas outside of the excavation limits that are disturbed during remediation due to the presence of staging or decontamination areas will be re-seeded upon completion of the work. Section 3.6 has been updated to reflect this. Specification 02990, Part 3.01 A has also been updated to state:

> Excavation areas and disturbed surfaces outside the excavation limits that have been disturbed or damaged during completion of the work shall be final graded to pre-

excavation grades. Any areas that were vegetated prior to the remedial action shall be reseeded.

Comment 6: Section 6.5, Maintenance, addresses routine inspections and groundwater monitoring. The description of the routine inspection does not propose for the completion of a checklist or form to be filled out, and does not address evaluation of any seeded areas to ensure that erosion is not occurring. Revise the Report to propose completion of an inspection checklist and include a copy of the checklist. Also, revise the inspection procedures to include assessment of erosion and sedimentation as part of routine inspections.

Furthermore, inspections are to occur during monitoring events, but no frequency for monitoring events is specified. Section 6.6 implies that the Army anticipates collecting only one round of groundwater samples, and then if all values are below the Project Cleanup Goals specified in Table 2-1, groundwater monitoring will be discontinued. This is problematic, as routine inspections will still be necessary at some specified interval, even if groundwater monitoring is no longer occurring. Revise the Report to specify a minimum inspection frequency for maintenance inspections. These inspections can be scheduled to occur in conjunction with the groundwater sampling activities when they are being conducted.

Response 6: Section 6.5 has been revised to include an inspection checklist and also include the inspection of any seeded areas to ensure that erosion is not occurring. Inspections will occur during any groundwater sampling events, but no less frequently than semi-annually until vegetation has been established in all re-vegetated areas. The site is relatively flat and will be graded after remediation to maintain current run-off patterns. Erosion is not anticipated.

Comment 7: The inspection criteria during remedial activities are described in specification Section 02370, Subpart 1.01.A.3 (inspection of erosion control measures during and after significant rainfall events) and specification Section 02370, Subpart 3.01.D (inspections daily by the Engineer and Contractor). However, inspections to be conducted during remedial activities are not addressed in the Report. Revise the Report to include an inspection schedule to be implemented during remedial actions that address the above-listed inspections.

Response 7: Section 5.2.3 has been revised to include the specific inspection requirements for erosion control that are stated in Specification 02370, Erosion Control. An inspection schedule is provided in **Table 5-2** and this table has been updated to reflect the frequency of erosion control inspections.

Comment 8: Table 6-3 shows the NYSDEC Class GA Standards and Laboratory Reporting Limits for groundwater samples. For antimony and thallium, the laboratory method detection limit is higher than the NYSDEC Class GA Standard. This could be problematic, as the best achievable analytical result is above the remedial goal. The Report does not discuss how this will be addressed. Revise the Report to include a discussion on how achievement of the NYSDEC Class GA Standard for antimony and thallium will be demonstrated.

Response 8: The EPA SW846 Method 6010B is proposed as the analytical method for TAL metal analyses for groundwater samples collected from SEAD-16/17 and was used for analysis of groundwater samples collected during the Remedial Investigation. As shown in the table below, the laboratory method detection limits are below the estimated instrument detection limits (IDLs) presented in the Method 6010B. The laboratory MDLs are also below the quantitation limits required by the CLP program for ICP-AES method. Therefore, the laboratory MDLs are in line with the limits that can be achieved by the

Method 6010B, which is a commonly used method for superfund metal characterization. Method 6010B, however, cannot meet the NYSDEC Class GA Standards for antimony and thallium. EPA SW846 Method 6020 (ICP-MS) or Method 7471 (GFAA) can achieve lower limits for antimony and thallium. However, they are not as rigorous in achieving the standards for the other metals of concern.

It should be noted that the 0.5 ug/L value for thallium is not a promulgated NYSDEC standard; rather it is a guidance value that is regarded as TBC for the project.

The Army proposes to use Method 6010B for all metals other than thallium and antimony. These two metals will be analyzed using Method 6020.

	NYSDEC Class GA Standard / Guidance Value (µg/L)	Laboratory Method Detection Limit for 6010B (µg/L)	SW 846 Method 6010B IDL (µg/L)	Contract Required Quantitation Level for Method 6020 (µg/L)	Laboratory Method Detection Limit for Method 6020 (µg/L)
Antimony	3	5.6	21	5	1
Thallium	0.5	6.4	27	1	0.2

Note: Laboratory Method Detection Limits from STL, Buffalo as of May, 2007.

Table 6-4 has been revised to reflect this change.

Comment 9: Several samples shown on Figure 1-1 are not shown in the same locations on Figure 4-1. For example, SS16-2, SS16-3 and SS16-5 are shown at different locations on the figures. Given that these sampling locations are used to identify key excavation features, it is unclear why they are not in the same locations spatially with respect to the fixed site features such as limits of excavation. Revise the two figures to correctly locate all the sample locations.

Response 9: It is believed that the reviewer is referring to subsurface soil samples SB16-2, SB16-3 and SB16-5. These sample locations are shown on Figure 4-1, but are not shown on Figure 1-1. In addition, only results outside of the excavation are shown on Figure 4-1. To avoid confusion, their location has been added to Figure 1-1 and clarification of the sample location labels has been added. Figures 4-1 and 4-2 have been updated as well. Excavations in the vicinity of SB16-2 and SB16-3 will be to a depth of two and three feet, respectively.

Comment 10: Figure 4-1 does not indicate that the sample collected in support of Grids G4 and G5 will also need to be sampled for polycyclic aromatic hydrocarbons (PAHs). Revise Figure 4-1 to clearly indicate that samples collected from Grids G4 and G5 will need to also be analyzed for PAHs.

Response 10: A note has been added to Figure 4-1 to convey that samples collected from grids G4 and G5 will include analysis of PAHs.

Comment 11: The following areas do not appear to have adequate perimeter sampling:

- The northwest end of Ditch 3;
- The southeast end of Ditch 4; and
- The southeast end of the area designated at SS16-31.

Revise Figure 4-1 to allow for the placement of one additional perimeter sample to be collected from each of these three locations.

Response 11: The Army offers the following clarification with respect to the additional sampling proposed by the EPA.

Regarding additional sampling on the northwest end of Ditch 3, the Army does not believe this is necessary since the ditch does not extend beyond the northwest end. Surface water accumulates between the two RI surface water/sediment samples shown on the ends of this ditch. Water does not flow up onto the tracks. In essence the bottom of the ditch will be excavated from its northwest end to the midpoint of the ditch as confirmed by the end sample shown on Figure 4-1 in grid I2. This sample was not noted in Table 4-1 of the draft version as a perimeter sample for Ditch 4, but has now been added.

Regarding additional sampling on the southeast end of Ditch 4, a perimeter sample was collected on the southern end of this ditch in April 2007 and the results of this sample have met site specific cleanup goals. No additional sampling is required here. Excavation of Ditch 4 will extend from its northern end to the confirmatory sample already collected. Surface water flow in this ditch is to the south. Again, this sample was not noted in Table 4-1 of the draft version as a perimeter sample for Ditch 4, but has now been added.

Regarding additional sampling on the southeast end of the area designated at SS16-31, the Army will collect one additional sample within Grid G5 west of the tracks, as requested.

Comment 12: Table 4-1, Confirmation Sampling at SEAD-16 and SEAD-17, has the following inconsistencies that need to be resolved:

- The table does not indicate that 3 PAH samples and associated QC samples will be collected from Grids G4 and G5. The table does contain a footnote, but the samples are not included in the numbers presented in the table. Revise the table to include the PAH samples in the total number of samples to be collected.
- It is unclear how 20 perimeter samples were identified for the SEAD-16 Main Excavation Area. Revise the table to include a footnote explaining how this number was derived, as it does not appear to be reflective of Figure 4-1.
- The number of floor samples for SEAD-16 Main Excavation and SEAD-17 Soil Excavation is incorrect when compared to the sample locations shown on Figures 4-1 and 4-2, respectively. There are 21 floor samples shown in the SEAD-16 Main Excavation area on Figure 4-1, and 20 floor samples shown for the SEAD-17 Soil Excavation on Figure 4-2. Revise Table 4-1 to accurately reflect the number of sample locations shown on the corresponding figures showing SEAD site limits of excavation.

Response 12: Table 4-1 has been split into two tables Table 4-1a and Table 4-1b and revised significantly to provide clarification. Specifically, the table has been updated to include the following:

- An additional column to note the number of samples to be collected for cPAHs.
- Footnote explaining how the number of samples were derived.
- Reconciliation of the number of samples with those shown on Figures 4-1 and 4-2.

In general, Table 4-1a shows the theoretical number of samples required in order to meet the frequency specified in the plan. Figure 4-1 and 4-2 show the location of these samples. Based on the geometry of

the area of excavation, additional samples beyond the minimum number required (listed in Table 4-1a) are necessary to cover all areas of the excavation grid (referred to as the actual number of samples). Sampling of some partial grids is necessary. The Table has been revised to clarify this. In Table 4-1b, the actual number of confirmatory samples are divided up between those collected during pre-excavation sampling efforts and those that will be collected post excavation.

SPECIFIC COMMENTS

Comment 1: Section 4.3.1.1: Sample Collection, Page 4-5. The second sentence in the first full paragraph on this page is incomplete. Revise the Report to clearly indicate how the ends of the ditches will be sampled. Additionally, the last sentence in this paragraph indicates that 11 confirmation samples will be collected from the floor of the ditches, but it appears from Figure 4-1 that the 11 samples include the ditch perimeter sampling. Revise the statement in this sentence to reflect the locations depicted in Figure 4-1.

Response 1: The incomplete sentence referenced is extraneous and has been deleted. The sentence that follows describes how the ditches will be sampled:

> "The perimeter samples also included samples collected to determine the downgradient endpoint of each ditch excavation. A sample was not collected from a ditch end if (1) the ditch end is encapsulated by a soil excavation area in which case it will be removed as part of the main excavation area regardless of the presence or absence of contaminants or (2) the upgradient end of the ditch since there is no surface water flow to transport sediments beyond this end. Perimeter samples are not required around ditch sides since the entire width of the ditch will be excavated."

The number of sample locations has been resolved and updated in the text and Tables 4-1a and 4-1b. Text in Section 4.3.1 indicates that 3 samples at the ends of ditches were collected during the pre-excavation sampling and that an additional sample at the southeast end of Ditch 3 will be collected once the excavation is complete. Additional information is provided in response to comment #11.

Comment 2: Table 5-2, Construction Inspection Activities for Removal Action. In Table 5-2, under the Air Monitoring line, the Acceptance Criteria appears to contain an editorial note in lieu of the inspection criteria. Review Table 5-2 to ensure that the correct inspection criterion is indicated and remove the editorial reference.

Response 2: Table 5-2 has been modified to show the correct inspection criterion for air monitoring.

Comment 3: Table 5-3, Post-Construction Inspection Activities for Removal Action. Table 5-3 does not address seeding as part of Final Grading or as a separate line item. Revise Table 5-3 to either include inspection of the condition of vegetation in those areas seeded, or include inspection of the condition of vegetation under Final Grading.

Response 3: Table 5-3 has been revised to include seeding and vegetation under post-construction inspection activities.

Comment 4: Table 6-2, Monitoring Well Sample Summary. Table 6-2 includes a footnote "1" under the Frequency column. This footnote is not defined on the table. Revise Table 6-2 to include a description for footnote "1" under the Frequency column.

Response 4: Footnote 1 has been added to Table 6-2.

Comment 5: Appendix B, Specification Section 01100, Health and Safety Requirements, Part 1.04.D. This subsection is included under Part 1.04.C. Revise this section such that Part 1.04.D aligns along the left hand side of the page.

Response 5: The formatting of Specification 01100 has been revised.

Army's Response to Comments from the United States Environmental Protection Agency

Subject: Draft Final Remedial Design Work Plan and Design Report for SEAD-16 & 17
Seneca Army Depot
Romulus, New York

Comments Dated: July 5, 2007

Date of Comment Response: July 11, 2007

Army's Response to Comments

GENERAL COMMENTS

Comment 1: The Report indicates in Section 3.1.2, Support and Decontamination Areas, that decontamination and excavation/material load out activities are to be conducted adjacent to each other, but within the exclusion zone to prevent cross-contamination. The Response to General Comment No. 1 in Appendix C indicates that, "Vertical confirmation sampling of these work areas [those areas used for stockpiling or truck loading activities within the excavations] will be performed after all load out activities are performed." However, neither the Report nor Specifications describe this sampling. Revise the Report, drawing and specifications as necessary to include the statements that vertical confirmation sampling of those areas used for stockpiling or truck loading activities within the excavations and within the exclusion zone will be conducted after all load out activities are performed. In addition, the Report does not show the load out area and decontamination pad areas on any figures. Revise the Report to at a minimum include a schematic on how the load out area and decontamination pad area will function.

Response 1: The drawings have been revised to show the location of the load out and decontamination areas. The vertical confirmation sampling referred to in Appendix C is confirmatory floor samples that represent each grid within the excavation area. Section 4.3.2.1 has been revised to clarify that these samples collected from each grid (and already located on Figures 4-1 and 4-2) include the stockpile and load out area within the excavation area.

Comment 2: The Draft Report has been revised to remove the need for any water management activities, and this (Draft Final) Report indicates that all water that enters the excavation or soil management areas will be left to either infiltrate or evaporate. The following sections of the Report still discuss water management and should be revised: Section 3.3, page 3-7; and Section 4.1, page 4-1. Revise the Report so that all references to active water management activities are removed.

Response 2: Section 3.3, page 3-7; and Section 4.1, page 4-1 have been revised so that all references to active water management activities were removed.

Comment 3: Section 3.3.2, Excavation of Soil and Ditch Soil, of the Report itemizes the estimated soil volumes to be excavated. Although the anticipated depth has been modified for most areas from six inches to one foot, the total estimated soil volumes presented on page 3-8 have not changed from those presented in the Draft version. Revise the Report so that it either accurately presents the updated estimated soil volumes, or indicates why they were not revised when the proposed initial excavation interval was revised from six inches to one foot.

Response 3: The volumes represented within the text of the report are the volumes documented in the ROD. Therefore, no change to these volumes was made upon issuing the draft final version. The final volumes will be contingent upon the confirmatory sample results. The report will be revised to explain the basis of the volumes stated in the report.

Comment 4: Table 4-1b, Pre- and Post-Excavation Confirmation Sampling at SEAD-16 and SEAD-17, has the following inconsistencies that need to be resolved:

- The table indicates that 23 floor samples will be collected from SEAD-16. Figure 4-1 shows 24 floor confirmation samples. Revise the table to indicate that 24 floor confirmation samples will be collected.
- Figure 4-1 shows five additional perimeter samples for the SEAD-16 Main Excavation. Table 4-1 does not indicate that any additional perimeter samples will be collected for SEAD-16 Main Excavation. Revise the table to include the five perimeter samples for SEAD-16 Main Excavation.
- The number of additional perimeter samples for SEAD-17 according to Figure 4-2 is five samples. Table 4-1b does not include any post-excavation perimeter samples for SEAD-17. Revise Table 4-1b to accurately reflect the five additional perimeters sample locations shown on Figure 4-2.

Response 4: Table 4-1 has been revised as noted so that it is consistent with the revised figures that were provided to EPA based on preliminary comments received after the Draft Final document was issued. Note that the table correctly states that there are 23 proposed floor samples from the main area of SEAD-16. It is likely that the 24th sample referenced in the comment is actually one of the two ditch samples proposed for Ditch 1, located in grid B8.

The five additional perimeter samples for SEAD-16 and SEAD-17 have been added to Figures 4-1 and 4-2, respectively, represented by a red square with an "x". Table 4-1b has been updated to reflect the addition of these samples.

Comment 5: Table SEAD-16 Perimeter Sample Collection on page 4-5 includes the number of perimeter samples to be collected. The total for the number of pre-excavation samples should add to 28, and the post-excavation samples should be two based on the information contained in the table. In

addition, the information in this table does not appear to coincide with the information in Table 4-1b. Revise the Report such that the two tables reflect the same information.

Response 5: The table on page 4-5 and Table 4-1b have been revised so that they are consistent. Table 4-1b has been updated as discussed in Comment 4 above. The total number of pre-excavation perimeter samples collected at SEAD-16 was 28. As discussed above, the collection of 5 post-perimeter samples has been added to the sampling plan. The total number of post-excavation perimeter samples to be collected at SEAD-16 is 7.

Comment 6: Section 6.5, Maintenance, addresses routine inspections and groundwater monitoring. The description of the routine inspections indicates the inspections of site conditions are to coincide with monitoring events, but no frequency for monitoring events is specified. Section 6.6 still implies that the Army anticipates collecting only one round of groundwater samples, and then if all values are below the Project Cleanup Goals specified in Table 2-1, groundwater monitoring will be discontinued. Table 5-3 indicates that site inspections are to occur no less than semi-annually. Revise the Report so that Sections 6.5 and 6.6 are consistent with the inspection frequency proposed in Table 5-3.

Response 6: Section 6.5 and 6.6 have been updated so that they are consistent with the inspection frequency proposed in Table 5-3. Inspections will be completed during the groundwater monitoring event, and then inspections will continue with a frequency no less than semi-annually.

Comment 7: The inspection criteria for Post-Closure Monitoring are included in Table 6-3. The table does not address the gravel or asphalt areas which were excavated or when soil berms and hay bales will be removed. Revise either Table 6-3 or the Report to address those areas which were originally gravel or asphalt, and how all erosion and sedimentation features will eventually be removed.

Response 7: Details have been added to Section 3.6 to clarify that measures to prevent erosion, such as berms and hay bales, will remain in place until post-construction inspections confirm that vegetation has been established in disturbed areas. An additional inspection requirement has been added to Table 6-3 to confirm that once the site has been re-vegetated and erosion control measures are removed, an inspection will be conducted to "confirm that drainage patterns have returned to their general conditions prior to remediation."

In areas that were originally gravel or asphalt, if soil exists under the layer of gravel or asphalt that is removed, this area will be re-vegetated to prevent erosion of the area. Table 6-3 has been revised to clarify that areas that will be re-vegetated "include all disturbed areas that were previously vegetated and areas with an exposed layer of soil that were previously covered with gravel and/or asphalt." It is possible that deeper layers of gravel or hardstand exist under the layer removed during remediation. If this is the case, the area will not be re-vegetated since erosion in this area will not be a concern.

Comment 8: Appendix C of the Report indicates in the Response to Comment No. 5 on page 4 of 9, that only those areas that were initially vegetated will be re-seeded. The site also has areas that are currently covered with gravel or asphalt which will be excavated. If these areas are left as soil after excavation activities, but not vegetated, these areas will eventually under go erosion. Revise the Report to either allow for the replacement of the gravel of asphalt or allow for seeding of there areas in order to prevent long term erosion of disturbed areas.

Response 8: In areas that were originally gravel or asphalt, if soil exists under the layer of gravel or asphalt that is removed, these areas will be re-vegetated to prevent erosion of the area. It is possible that deeper layers of gravel or hardstand exist under the layer removed during remediation. If this is the case, the area will not be re-vegetated since erosion in this area will not be a concern. The text has been revised accordingly.

SPECIFIC COMMENTS

Comment 1: Appendix A, Design Drawings, Drawing C-4. The legend indicates that a · · · · symbol represents a remediation limit, when it appears to represent surface water. Revise the drawing to ether change the legend or the symbols used on the drawing to correctly reflect the site features.

Response 1: The drawing has been revised such that the line representing the remediation limit is dashed as indicated in the legend.

Comment 2: Appendix B, Specification Section 02219, Contaminated Materials and Excavation and Disposal, Part 3.04.A. This subsection indicates that building debris will be disposed with other site debris. The Report does not discuss building debris. Please revise the Report so to that it elaborates on the types of building debris that will be disposed.

Response 2: The phrase "including building debris" has been deleted from this section of Specification 02219. Building debris will not be removed as part of the soil excavation but will be done instead during building demolition. Based on the RI, building debris at SEAD-16 includes (1) small soil piles accumulated within the Deactivation Furnace building that contain elevated levels of lead and (2) propellant that exists within vacuum system within the Process Support Building and contains explosives residue. Due to the poor condition of the deactivation furnace building, such soil debris cannot be collected and disposed of separately. Therefore, such areas will be contained during building demolition and disposed of properly. The contents of the vacuum system in the Process Support Building will be taken to the tray at the OB Grounds for processing prior to demolition of this building. No change will be made to the text.