00285

# U.S. Army Corps of Engineers

Omaha District
Offutt AFB, Nebraska

# SENECA ARMY DEPOT ACTIVITY
# TIME CRITICAL REMOVAL ACTION
# METAL SITES – SEAD 67
# SENECA COUNTY
# ROMULUS, NEW YORK

**Contract No. DACA45-98-D-0004**
**Task Order No. 0035**

# FINAL
# COMPLETION REMOVAL REPORT

**February 2005**

01M-0007

WESTON SOLUTIONS

# FINAL

# COMPLETION REMOVAL REPORT
# TIME-CRITICAL REMOVAL ACTION
# METALS SITE – SEAD 67
# SENECA COUNTY
# ROMULUS, NEW YORK

Contract No. DACA45-98-D-0004
Task Order No. 0035

Prepared for

**U.S. ARMY CORPS OF ENGINEERS,**
**OMAHA DISTRICT**
Castle Hall Building No. 525
3rd Floor
Offutt AFB, Nebraska

Prepared by

**WESTON SOLUTIONS, INC.**
One Wall Street
Manchester, New Hampshire 03101-1501

February 2005

W.O. No. 20074.515.035

# TABLE OF CONTENTS

**Section** **Page**

## LIST OF APPENDICES



## LIST OF FIGURES

**Title** **Page**



## LIST OF TABLES

**Title** **Page**

# LIST OF ACRONYMS

| | |
|---|---|
| "SB" | Site Background |
| µg/kg | micrograms per kilogram |
| bgs | below ground surface |
| CERCLA | Comprehensive Environmental Response Compensation and Liability Act |
| COCs | contaminants of concern |
| cPAHs | carcinogenic PAHs |
| cy | cubic yards |
| EPA | U.S. Environmental Protection Agency |
| ESI | Expanded Site Inspection |
| ft | feet |
| $ft^2$ | square feet |
| GPS | Global Positioning System |
| mg/kg | milligrams per kilogram |
| MS/MSD | matrix spike/matrix spike duplicates |
| NYSDEC | New York State Department of Environmental Conservation |
| PAHs | polynuclear aromatic hydrocarbon |
| PCBs | polychlorinated biphenyls |
| QC | Quality Control |
| ROD | Record of Decision |
| RTK | Real-Time Kinematics |
| SEDA | Seneca Army Depot Activity |
| SWMUs | Solid Waste Management Units |
| T&D | transportation and disposal |
| TAGM | Technical Administrative Guidance Memorandum |
| TAL | Target Analyte List |
| TCL | Target Compound List |
| TCRA | Time Critical Removal Action |
| TEQ | Toxicity Equivalent |
| USACE | U.S. Army Corps of Engineers |
| WESTON® | Weston Solutions, Inc. |

# EXECUTIVE SUMMARY

The Seneca Army Depot Activity (SEDA) has been closed since 1992 under the Department of Defense Base Realignment and Closure process. The land encompassing and surrounding the Solid Waste Management Units (SWMUs) that comprise SEDA is in the process of being transferred over to the public for beneficial reuse purposes. As part of the Federal Facilities Agreement, SEDA has identified removal actions that are necessary prior to completion of final remedial actions and property transfer. As part of this objective, an Expanded Site Inspection (ESI) was performed in 1993 at the Dump Site east of Sewage Treatment Plant No. 4. This site includes one SWMU, SEAD 67. Intrusive investigations were performed during the ESI at SEAD 67, which included test pitting, soil borings, installation of monitoring wells, and collection of surface water and sediment samples. Based on soil samples collected during the ESI, it was determined that the waste soil piles and berms in SEAD 67 contained elevated levels of mercury and polynuclear aromatic hydrocarbons (PAHs). Elevated concentrations were also reported for calcium, lead, manganese, and potassium, but these metals are considered non-target metals for the site. Results of groundwater and surface water samples collected during the ESI indicated that neither of these environmental receptors has been significantly impacted by historic operations at the site.

To address the elevated levels of mercury and PAHs in the site soils, SEDA tasked the U. S. Army Corps of Engineers (USACE) with performing a Time Critical Removal Action (TCRA) at the site to reduce and/or eliminate the identified sources of residual chemical materials. On 4 November 2002, USACE scoped Weston Solutions, Inc. (WESTON®) with implementation of the TCRA. In December 2002, WESTON mobilized the site, cleared 1.5 acres of vegetation, and excavated the impacted soils (including the former waste soil piles). A total of 2,104 tons of soil was transported off-site for disposal at the Seneca Meadows Landfill in Waterloo, New York. Soil sampling was conducted throughout the soil removal activities to provide guidance in delineating both the lateral and vertical limits of excavation required. Samples were analyzed for 23 Target Analyte List metals and 17 PAH parameters. Final confirmatory sample results for SEAD 67 are presented in Appendix A of this report. An evaluation of average confirmatory results and maximum confirmatory results are also presented

in Appendix A. With the exception of lead, data has been compared with the cleanup goals for the site, which are based on the New York Technical Administrative Guidance Memorandum (TAGM) No. 4046 Cleanup Objective Values. Where no cleanup value exists (denoted as Site Background (SB) in the TAGM), SB has been replaced with the 95$^{th}$ Percentile of SEDA Soil Background Data (5/13/98). The cleanup goal for lead is based on the U.S. Environmental Protection Agency Risk Based Residential Cleanup Goal.

A total of 23 confirmation samples (8 floor and 15 perimeter) were analyzed in Area 1 of SEAD 67 to verify sufficient delineation and removal of impacted site soils from this area. Sample results indicated there were three exceedances in Area 1 for mercury. The average result for mercury in Area 1 is 0.08 milligrams per kilogram (mg/kg), which is below the cleanup goal of 0.1 mg/kg. Area 1 sample results also indicated exceedances for the following PAHs: Benzo(a)anthracene; Benzo(a)pyrene; Benzo(k)fluoranthene; Chrysene; and Dibenzo(a,h)anthracene. Although there were exceedances for five PAH parameters, an evaluation of the Benzo(a)pyrene Toxicity Equivalent (TEQ) did not result in an exceedance of the 10,000 micrograms per kilogram (µg/kg) limit for total carcinogenic PAHs (cPAHs) in Area 1. The overall average Benzo(a)pyrene TEQ for Area 1 is 598 µg/kg.

A total of 56 confirmation samples (35 floor and 21 perimeter) were analyzed in Area 2 to verify sufficient delineation and removal of impacted site soils in this area. Sample results indicated there were five exceedances in Area 2 for mercury. The average result for mercury in Area 2 is 0.08 mg/kg, which is below the cleanup goal of 0.1 mg/kg. Area 2 sample results also indicated exceedances for the following PAHs: benzo(a)pyrene and dibenzo(a,h)anthracene. Although there were exceedances for these two PAH parameters, an evaluation of the Benzo(a)pyrene TEQ did not result in an exceedance of the 10,000 µg/kg limit for total cPAHs in Area 2. The overall average Benzo(a)pyrene TEQ for Area 2 is 73 µg/kg.

Based on the confirmatory sample results obtained following excavation of impacted soils at SEAD 67, it is recommended that no further action is required at this site. The previously identified potential threat to the public and the environment as identified in the ESI and presented in the *Final Action Memorandum and Decision Document* (Parsons, 2002), has been substantially reduced and/or eliminated based on a reduction in levels of metals and PAHs

detected in soils associated with the SEAD 67 site. In addition to the reduction in contaminant levels, no apparent Comprehensive Environmental Response, Compensation, and Liability Act releases were identified. It is intended that this completion report, in conjunction with the *Proposed Remedial Action Plan* (to be submitted under separate cover by USACE) will serve as the basis for the Record of Decision for site closure and transfer of the SEDA property.

# 1. INTRODUCTION

## 1.1 PROJECT DESCRIPTION

This Final Completion Removal Report documents the completion of the Time Critical Removal Action (TCRA) performed at the SEAD 67 Solid Waste Management Unit (SWMU) located at the Seneca Army Depot Activity (SEDA) in Romulus, Seneca County, New York. The work was performed by Weston Solutions, Inc. (WESTON®) for the U.S. Army Corps of Engineers (USACE), Omaha District under Contract No. DACA45-98-D-0004, Task Order No. 0035.

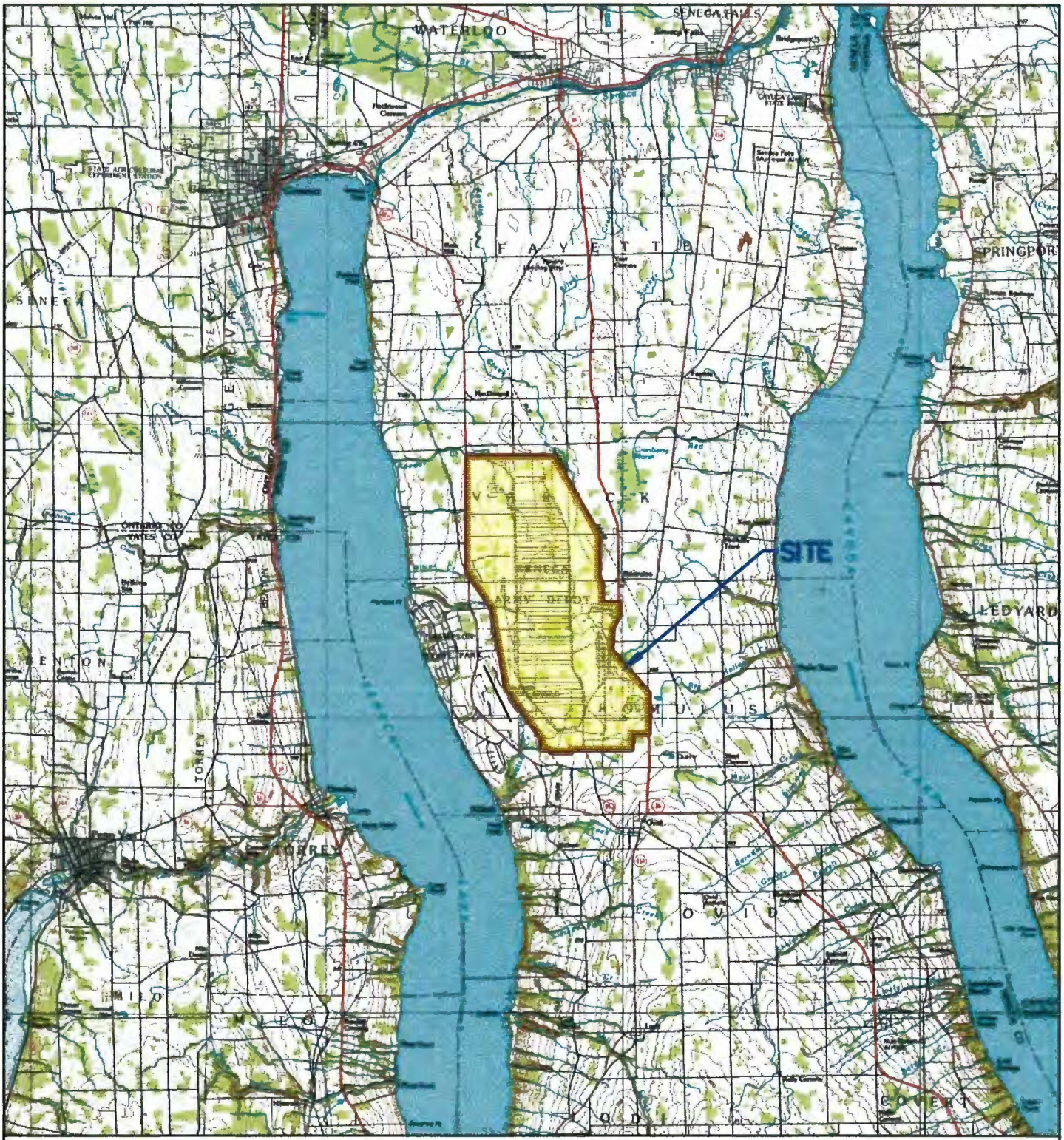
Seneca Army Depot Activity was placed on the Superfund list in 1992 in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and has been undergoing investigation and remediation since that time. The facility was designated for closure in 1992 under the Department of Defense Base Realignment and Closure process.

The TCRA was performed in accordance with the *Final Task Work Plan* (WESTON, November 2002) and *Final Action Memorandum and Decision Document* (Parsons, 2002), which were both drafted as part of the CERCLA process. The removal action was initiated in compliance with Section 11 of the SEDA Federal Facilities Agreement that describes removal actions as viable options for eliminating potential threats.

The goal of a TCRA is to abate, prevent, minimize, stabilize, mitigate, and/or eliminate the threat to public health, welfare, or the environment. The results of the TCRA presented in this completion report, along with the Record of Decision (ROD), will serve as the basis for providing clean closure for the SEAD 67 site.

## 1.2 SITE DESCRIPTION

Seneca Army Depot Activity is a U.S. Army facility located in Romulus, Seneca County, New York (refer to Figure 1-1). The facility property occupies approximately 10,600 acres, is bound to the west by State Route 96A and to the east by State Route 96. Geneva and Rochester are located to the northwest (14 and 50 miles, respectively); Syracuse is 50 miles to the




**SOURCE:**
USGS TOPOGRAPHY MAPS; GENEVA SOUTH, DRESDEN, OVID, & ROMULUS – NEW YORK QUADS

GRAPHIC SCALE
3 1.5 0 1.5 3
APPROXIMATE SCALE IN MILES

TIME CRITICAL REMOVAL ACTION
METALS SITES – SEADS 67
SENECA ARMY DEPOT ACTIVITY (SEDA)
ROMULUS, NEW YORK

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

SITE LOCATION MAP

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

| | |
|---|---|
| DRAWN | BEG |
| DATE | MAR 2004 |
| FIGURE NO. | 1–1 |

M:\Des' DWG\ACOE\SENECA\SEADs\SEAD 67 FINAL REPORT\fig 1-1.dwg, Layout1, 3/16/2004 4:5:24 PM, murrot, 1:1

northeast, and Ithaca is 31 miles to the south. The surrounding area is mainly used for agriculture.

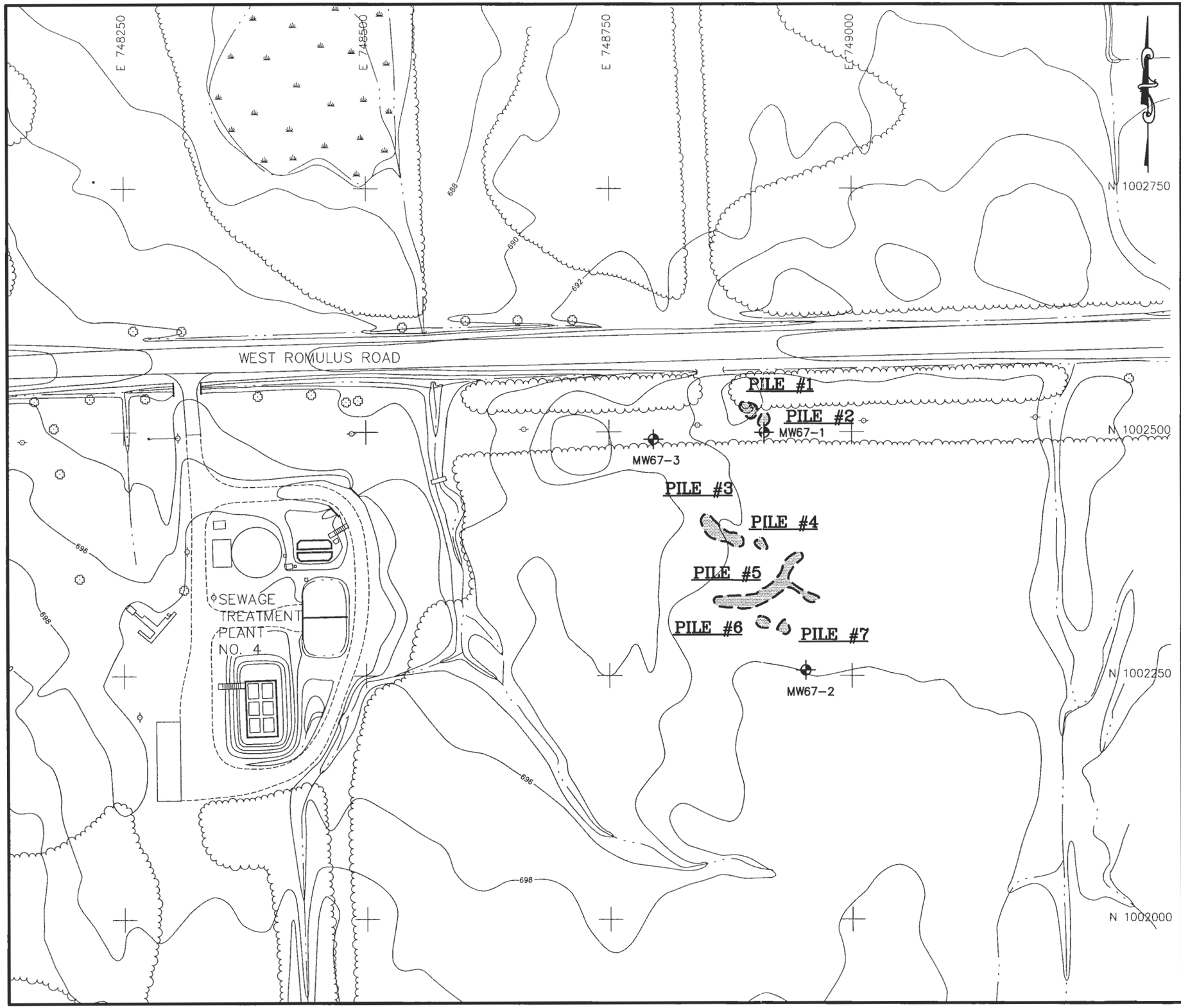
The SEAD 67 site is located in the central eastern portion of SEDA, immediately south of West Romulus Road and east of Sewage Treatment Plant No. 4. The area is undeveloped, and heavily vegetated with low brush and deciduous trees. There is a power line running through the property parallel to, and approximately 50 feet (ft) south, of West Romulus Road. Three wells are also located south of West Romulus Road; one upgradient and two downgradient of the former waste soil piles shown in Figure 1-3.

A total of five waste soil piles and two berms were formerly staged at the SEAD 67 site (Piles 1 through 7 in Figure 1-3). These included: a grass covered 10-ft-diameter waste soil pile and a 5-ft-diameter waste soil pile located approximately 50 ft and 70 ft respectively, to the south of West Romulus Road; a 10-ft-diameter waste soil pile and a 60-ft long brush covered berm located approximately 225 ft south of the road; and two smaller waste soil piles located to the south of the berm. All waste soil piles and berms were approximately 3 to 4 ft high; except for the 10-ft-diameter pile that was approximately 5 ft high. A Site Map showing the location of the former waste piles, monitoring wells, and other site features is included as Figure 1-2.

The topography of the site slopes gently to the west to an unnamed stream, which is approximately 250 ft away from the former waste piles and berm structures. The stream is a Class C surface water body that flows north beneath West Romulus Road into a regulated wetland area. Downstream of the wetland, the stream enters into Kendig Creek. The stream also receives discharge from Sewage Treatment Plant No. 4, which is located west of the SEAD 67 site (refer to Figure 1-2).

## 1.3 SITE BACKGROUND

Historically, little is known about the origin of the five waste piles and two berms that formerly occupied SEAD 67, or the dates soil was placed in the area. Due to the thick vegetation at the site, it is suspected that the waste piles and berms were placed in the area many years ago.




## LEGEND

- GROUND CONTOUR AND ELEVATION (696)
- PAVED ROAD
- RAILROAD
- STREAM
- WETLAND
- UTILITY POLE
- BRUSH
- AREA TO BE REMEDIATED
- MW67-1 — MONITORING WELL

GRAPHIC SCALE

100 50 0 50 100

APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

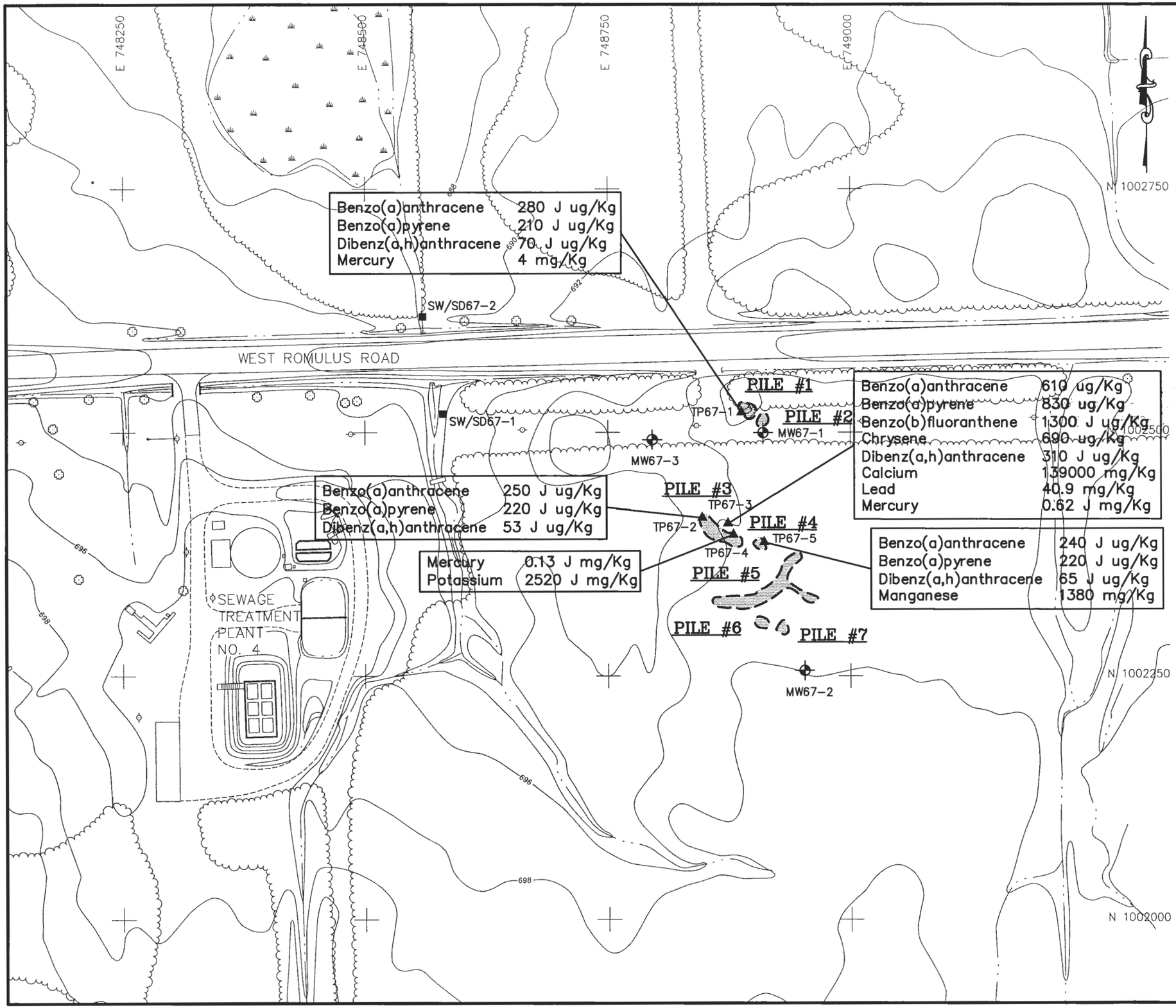
DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

SEAD-67
DUMP SITE EAST OF SEWAGE TREATMENT PLANT NO. 4
SENECA ARMY DEPOT ACTIVITY

# SITE MAP

| DRAWN | DATE | FIGURE NO. |
|---|---|---|
| A.J.M. | MAR 2004 | 1-2 |
| CHECKED | W.O. NO. | |
| C.G.K. | 20074-515-035 | |

M:\Desig VG\ACOE\SENECA\SEADs\SEAD 67 FINAL REPORT\FIG 1-2.dwg, Layout1, 3/4/2004 9:5[illegible] AM, girardeb, 1:1




## LEGEND

- GROUND CONTOUR AND ELEVATION (696)
- PAVED ROAD
- RAILROAD
- STREAM
- WETLAND
- UTILITY POLE
- BRUSH
- AREA TO BE REMEDIATED
- MW67-1 — MONITORING WELL
- SW/SD67-1 — SURFACE WATER/ SEDIMENT SAMPLE
- TP67-1 — TEST PIT SAMPLES

GRAPHIC SCALE
100 50 0 50 100
APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

SEAD-67
DUMP SITE EAST OF SEWAGE TREATMENT PLANT NO. 4
SENECA ARMY DEPOT ACTIVITY

# ANALYTES EXCEEDING TAGM RECOMMENDED SOIL CLEANUP OBJECTIVES

| DRAWN | DATE | FIGURE NO. |
|---|---|---|
| A.J.M. | MAR 2004 | 1-3 |
| CHECKED | W.O. NO. | |
| C.G.K. | 20074-515-035 | |

M:\Desi WG\ACOE\SENECA\SEADs\SEAD 67 FINAL REPORT\FIG 1-3.dwg, Layout1, 3/4/2004 1[illegible]:55 AM, girardeb, 1:1

## 1.4 PREVIOUS INVESTIGATION

An Expanded Site Inspection (ESI) was performed at SEAD 67 in 1993. Intrusive investigations performed as part of the ESI included test pitting, soil borings, installation of monitoring wells, and collection of surface water and sediment samples. Based on eight soil samples (five from test pits and three from soil borings) collected during the ESI, it was determined that soils in the waste soil piles and berms contained elevated levels of metals and polynuclear aromatic hydrocarbon (PAHs). Maximum concentrations were reported in surface soils as follows for the contaminants of concern (COCs): 4 milligrams per kilogram (mg/kg) for mercury; 610 micrograms per kilogram (µg/kg) for benzo(a)anthracene; 830 µg/kg for benzo(a)pyrene; 1,300 µg/kg for benzo(b)flouranthene; 690 µg/kg for chrysene; and 310 µg/kg for dibenzo(a,h)anthracene. Elevated concentrations were also reported for calcium, lead, manganese, and potassium, but these metals are not considered primary COCs. Based on three groundwater samples and two surface water samples collected during the ESI, it was determined that the groundwater and surface water were not significantly impacted by historic operations at the site. Sediment in the drainage ditch east of the sewage treatment plant was found to contain elevated levels of pesticides (alpha-chlordane, endosulfan 1 and 4,4-dichlorodiphenyl trichlorothane), PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene], and indeno(1,2,3-cd)pyrene), and metals (copper, manganese, nickel, and silver) from the two samples collected. No soil, groundwater, surface water, or sediment samples exceeded the cleanup goals for pesticides or polychlorinated biphenyls (PCBs). The location of analytes that exceeded the cleanup goals for soils, and the respective concentrations found during the ESI, are shown in Figure 1-3. The potential source release locations (Piles 1-7) as identified in the *Final Action Memorandum and Decision Document* (Parsons, 2002), are also shown in Figure 1-3.

Following the ESI, it was determined that releases of hazardous constituents, consisting primarily of the metal mercury and semi-volatile contaminants (mainly PAHs), had occurred at SEAD 67. In order to address the release, SEDA tasked USACE with performing a TCRA at the site to reduce and/or eliminate the identified sources of residual chemical materials.

# 2. SITE MANAGEMENT

## 2.1 PROJECT ORGANIZATION

Weston Solutions, Inc. coordinated all work activities with USACE, Omaha District, USACE, New York District (located at SEDA), and SEDA. A list of primary representatives from each firm is listed below:

| FIRM/REPRESENTATIVE | ROLE |
|---|---|
| **SEDA** | |
| Mr. Steven Absolom | Base Environmental Coordinator |
| **USACE** | |
| Mr. Thomas Westenburg: | Project Manager |
| Mr. Thomas Battaglia[1]: | Contracting Officers Representative and On-site Representative |
| **WESTON** | |
| Mr. Christopher Kane: | Project Manager |
| Mr. Edwin Benton & Mr. Miles Gelatt [1]: | Site Manager |
| Mr. Steven Kirejczyk[1]: | Site Safety and Health Officer/Quality Control (QC) Officer and Sample Technician |
| **SUBCONTRACTORS** | |
| Sessler Wrecking[1]: | Sitework Services |
| Severn Trent Laboratories | Laboratory Analytical Services |
| SJB Drilling[1]: | Drilling Services |

*Note:* [1] On-site

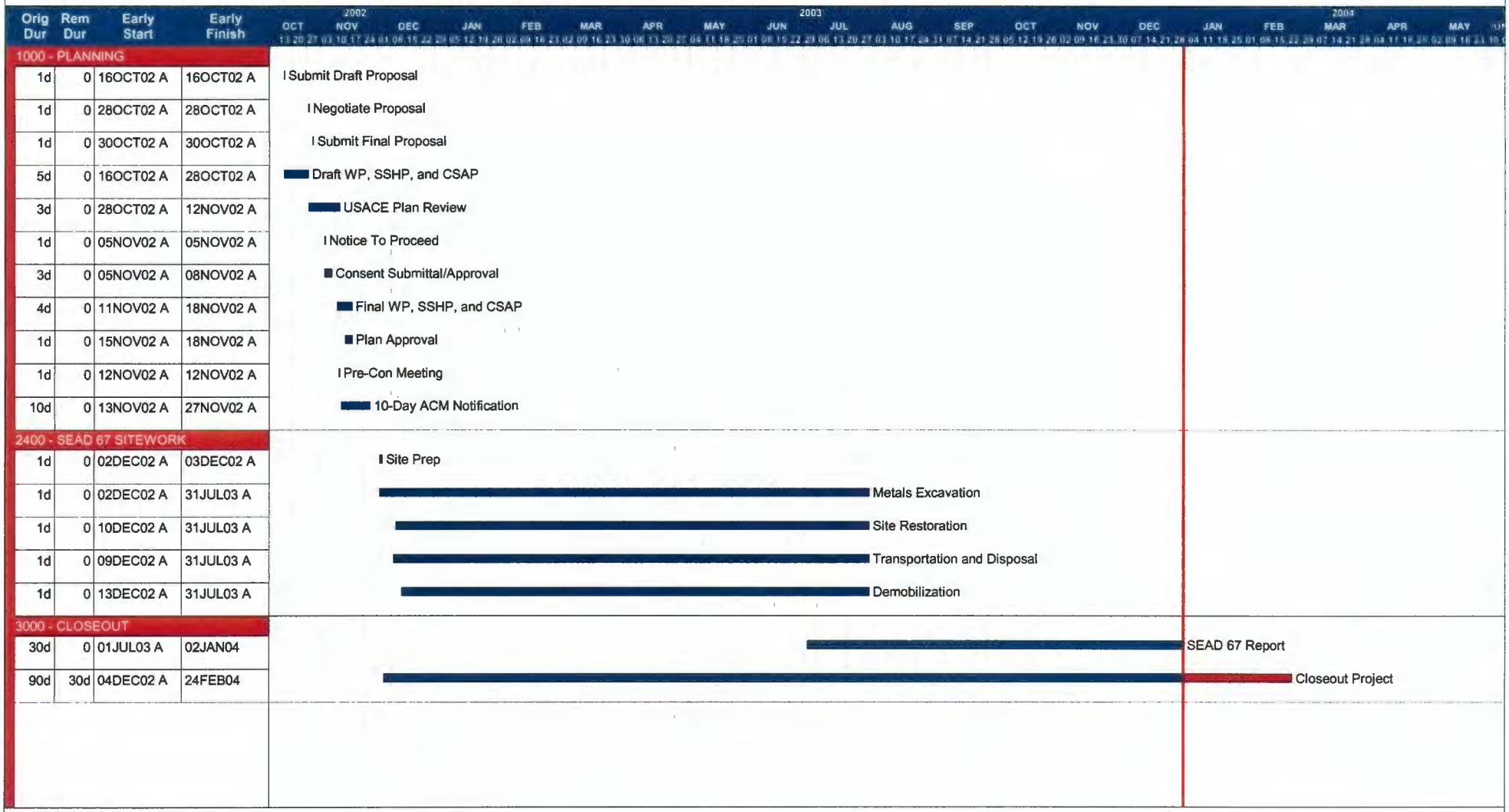
## 2.2 PROJECT SCHEDULE

The project schedule shown in Figure 2-1 summarizes the start and completion dates for each activity.

## 2.3 MEETINGS

On 9 September 2002, personnel from the USACE Omaha District, USACE New York District, and WESTON conducted a site visit and project kick-off meeting to discuss project objectives and Scope of Work (USACE, September 2002). A Pre-Construction Meeting was held between USACE and WESTON on 12 November 2002, to discuss logistics, safety, submittals, and QC and Quality Assurance. This meeting was followed by a site walk on 13 November 2002.

FIGURE 2-1
TIME CRITICAL REMOVAL ACTION
SEADS 50/54, 24 & 67
SENECA ARMY DEPOT
ROMULUS, NY




| | |
|---|---|
| Start date | 16OCT02 |
| Finish date | 24FEB04 |
| Data date | 02JAN04 |
| Run date | 31JAN05 |
| Page number | 1A |



FIGURE 2-1
U.S. ARMY CORPS OF ENGINEERS
OMAHA DISTRICT
CONTRACT NO.: DACA45-98-D-0004

Prepared by:
WESTON SOLUTIONS

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

# 3. SITE ACTIVITIES

The primary objective of this project was to perform a TCRA to reduce or eliminate any potential threat that exists at SEAD 67 due to elevated levels of mercury and PAHs that were identified during the ESI. The results of this removal action along with the ROD will serve as the basis for providing clean closure for the SEAD 67 site. To accomplish this objective, WESTON performed the following tasks:

- **Task 1. Mobilization**: This task included procurement and mobilization of all equipment and personnel necessary to perform site activities.
- **Task 2. Site Preparation**: This task included laying out work areas, installing and maintaining erosion and sedimentation controls (as applicable), clearing the site of vegetation, and establishing work zones.
- **Task 3. Soil Removal**: This task consisted of removing the five soil piles and two berms followed by removal of surface soils to a depth of 12 inches to eliminate any immediate threats associated with the presence of site contaminants.
- **Task 4. Sampling and Analysis**: This task included the collection and analysis of post excavation confirmatory samples in Areas 1 and 2 to verify the vertical and horizontal limits of soil removal necessary to achieve site closure.
- **Task 5. Transportation and Disposal**: This task included the preparation of waste manifests and off-site transportation and disposal (T&D) of non-hazardous soil.
- **Task 6. Site Restoration**: This task included removal of erosion and sedimentation controls.
- **Task 7. Demobilization**: This task included the removal of equipment and supplies from the site following completion of project objectives.

## 3.1 TASK 1 – MOBILIZATION

Weston Solutions, Inc. mobilized the site on 11 November 2002. The mobilization task included the procurement and delivery of equipment and personnel necessary to implement all aspects of the work as defined in the *Final Task Work Plan* (WESTON, 2002). This task included moving into office space provided by SEDA, mobilizing construction equipment and project personnel, and familiarizing project personnel with the site and project requirements.

## 3.2 TASK 2 – SITE PREPARATION

In order to prepare the site for intrusive operations, the site was surveyed, air monitoring was performed, erosion and sedimentation controls were installed, the site was cleared of all vegetation, a central staging area was identified, and both SEDA and Dig-Safe (No. 11122-065-055) were contacted to verify utility locations. A summary of these tasks is included in Subsections 3.2.1 through 3.2.4.

### 3.2.1 Survey

A Model 5700 Trimble Real-Time Kinematics (RTK) Global Positioning System (GPS) was used to survey the waste soil piles and berms located within SEAD 67 prior to excavation. Due to tree cover and poor GPS reception at the SEAD 67 site, WESTON utilized the control point located at the Area 44a site. Once the RTK's position was acquired and confirmed, the perimeter of the five soil piles and two berms were staked out and flagged. Survey information was used to delineate and confirm soil pile and berm locations, and to control the lateral and vertical limits of excavation during subsequent removal efforts.

### 3.2.2 Air Monitoring

Prior to commencement of site work, air monitoring was performed within the work zone in accordance with the U.S. Environmental Protection Agency (EPA), the New York State Department of Health Community Air Monitoring Program, and the New York State Department of Environmental Conservation (NYSDEC) Fugitive Dust Suppression and Particulate Monitoring guidelines. No elevated particulate levels were noted prior to excavation.

Based on historical data, background particulate concentrations and heavy precipitation, air monitoring was not performed during site work activities. Additional dust suppression was not required, and all work activities were conducted in Level D Modified personal protective equipment.

### 3.2.3 Erosion and Sedimentation Control

Erosion and sedimentation controls consisting of hay bales and/or silt fences, and stakes were installed to manage storm water runoff within the work areas, at drainage outlet points, and at the materials stockpile area. Additional erosion controls were placed along the drainage swale adjacent to West Romulus Road.

During the course of the project, it was not necessary to collect or store storm water since all of the soil piles and berms were located above existing ground surface. In addition, because the site drains east to west and the drainage swale provides storm water relief, no ponding of water was encountered during the limited soil excavation period.

### 3.2.3 Clearing

Clearing limits were established by delineating the limits of excavation on the north, south, east, and west borders of SEAD 67 using painted lines and/or survey flagging. The vegetation, consisting of light brush, tall grass, and trees was removed with an excavator. Trees 6 inches in diameter and larger were left standing. Clearing activities were completed on 2 December 2003. The total area cleared was approximately 1.5 acres.

### 3.2.4 Staging Area

In order to contain and control soil removed from the site, a soil staging area was located adjacent to the SEAD 50/54 site. This staging area was located off-site of SEAD 67 to minimize the lateral extent of disturbed area within SEAD 67. Soil from the initial excavation effort at SEAD 67 (the five waste soil piles and two berms) was loaded into an articulated haul truck, and transported to the temporary staging area where it was stockpiled on a concrete pad located southwest of SEAD 50/54 (adjacent to Avenue H and the existing rail location). All stockpiled material was covered with 6-mil polyethylene sheeting and weighted down on a daily basis to prevent erosion of the pile by wind, rain, snow, and/or storm water. These controls were maintained throughout the project and removed following completion of site activities.

All material excavated from the site following removal of the waste soil piles and berms was either segregated inside the area being excavated or live-loaded for off-site disposal without temporary stockpiling.

## 3.3 TASK 3 – SOIL REMOVAL

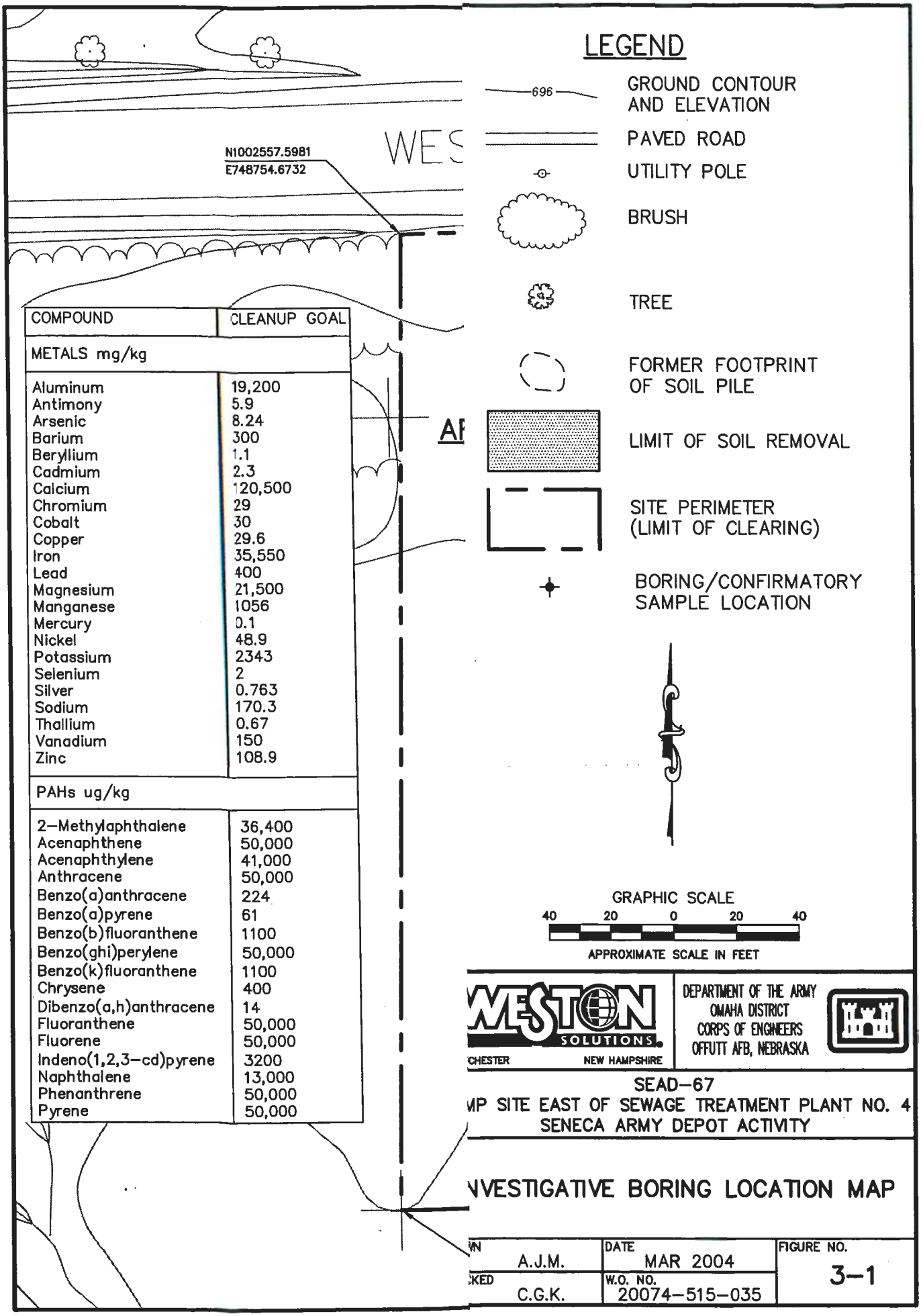
As shown in Figure 3-1, a total of seven piles [representing the five former waste soil piles and two berms identified in the *Final Action Memorandum and Design Document* (Parsons, 2002) were found to be impacted by elevated concentrations of metals (mercury) and PAHs during the 1993 ESI. These locations were designated for removal to eliminate a potential threat to human health and/or the environment that could exist due to the the abandoned soil.

Initial excavation activities to remove the former waste soil piles in SEAD 67 were performed between 2 December 2002 and 3 December 2002. An excavator was used to remove approximately 249 cubic yards (cy) of impacted soil to the existing surface grade. The excavated material was transported in articulated haul trucks to the temporary staging area located at SEAD 50/54. Initially, the volume of soil to be removed from SEAD 67 was estimated to be 150 cy [*Final Action Memorandum and Design Document* (Parsons, 2002)]; however, elevated levels of mercury and/or PAHs were reported in many of the initial post excavation samples at concentrations above the cleanup goals. Consequently, following removal of the seven waste soil piles, additional excavation and sampling activities were conducted with USACE approval.

To delineate the lateral and vertical extents of the additional excavations required at the former waste soil pile locations, soil borings were advanced in two areas to a depth of 2 ft; Excavation Area 1 encompassed the area bordering the former location of Piles 1 and 2, while Excavation Area 2 encompassed the area bordering Piles 3, 4, 5, 6 and 7. Boring locations are shown in Figure 3-1.

### 3.3.1 Excavation Area 1

As shown in Figure 3-1, Excavation Area 1 which encompasses a total of 6,300 square feet ($ft^2$) subdivided into five areas measuring: 30 ft by 15 ft; 30 ft by 35 ft; 30 ft by 65 ft; 30 ft by 65 ft;




## LEGEND

- 696 — GROUND CONTOUR AND ELEVATION
- PAVED ROAD
- UTILITY POLE
- BRUSH
- TREE
- FORMER FOOTPRINT OF SOIL PILE
- LIMIT OF SOIL REMOVAL
- SITE PERIMETER (LIMIT OF CLEARING)
- BORING/CONFIRMATORY SAMPLE LOCATION

| COMPOUND | CLEANUP GOAL |
|---|---|
| **METALS mg/kg** | |
| Aluminum | 19,200 |
| Antimony | 5.9 |
| Arsenic | 8.24 |
| Barium | 300 |
| Beryllium | 1.1 |
| Cadmium | 2.3 |
| Calcium | 120,500 |
| Chromium | 29 |
| Cobalt | 30 |
| Copper | 29.6 |
| Iron | 35,550 |
| Lead | 400 |
| Magnesium | 21,500 |
| Manganese | 1056 |
| Mercury | 0.1 |
| Nickel | 48.9 |
| Potassium | 2343 |
| Selenium | 2 |
| Silver | 0.763 |
| Sodium | 170.3 |
| Thallium | 0.67 |
| Vanadium | 150 |
| Zinc | 108.9 |
| **PAHs ug/kg** | |
| 2-Methylaphthalene | 36,400 |
| Acenaphthene | 50,000 |
| Acenaphthylene | 41,000 |
| Anthracene | 50,000 |
| Benzo(a)anthracene | 224 |
| Benzo(a)pyrene | 61 |
| Benzo(b)fluoranthene | 1100 |
| Benzo(ghi)perylene | 50,000 |
| Benzo(k)fluoranthene | 1100 |
| Chrysene | 400 |
| Dibenzo(a,h)anthracene | 14 |
| Fluoranthene | 50,000 |
| Fluorene | 50,000 |
| Indeno(1,2,3-cd)pyrene | 3200 |
| Naphthalene | 13,000 |
| Phenanthrene | 50,000 |
| Pyrene | 50,000 |

GRAPHIC SCALE

40 20 0 20 40

APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS

CHESTER NEW HAMPSHIRE

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

SEAD-67

MP SITE EAST OF SEWAGE TREATMENT PLANT NO. 4
SENECA ARMY DEPOT ACTIVITY

# NVESTIGATIVE BORING LOCATION MAP

| | | | |
|---|---|---|---|
| WN A.J.M. | DATE MAR 2004 | FIGURE NO. 3-1 |
| CKED C.G.K. | W.O. NO. 20074-515-035 | |

M:\De DWG\ACOE\SENECA\SEADs\SEAD 67 FINAL REPORT\FIG 3-1 and 3-2.dwg, 3-1, 2/4/ 9:11:27 AM, girardeb, 1:1

and 30 ft by 30 ft. Based on a review of the initial post-excavation analytical data, these areas were established around the perimeter of former waste soil Pile 1 and boring locations to delineate the vertical and horizontal extents of excavation.

Additional soil was removed to a depth of 12 inches from within Area 1 between 24 June 2003 and 27 June 2003, using an excavator with a 4-ft wide grading bucket. Based on the excavation limits shown in Figure 3-1, an additional volume of 234 cy of soil was removed from this area for a cumulative total of 483 cy. Additional information on confirmatory sampling is presented in Subsection 3.4.

### 3.3.2 Excavation Area 2

As shown in Figure 3-1, Excavation Area 2 encompasses a total of 22,275 $ft^2$ represented by one area measuring 135 ft by 165 ft. Based on a review of the initial post-excavation analytical data, this area was established around the perimeter of former waste soil Piles 3 through 7 and boring locations to delineate the vertical and horizontal extents of excavation. Additional soil was removed to a depth of 12 inches from within Area 2 between 24 June 2003 and 27 June 2003, using an excavator with a 4-ft wide grading bucket. Based on the excavation limits shown in Figure 3-1, an additional volume of 825 cy of soil was removed from this area for a cumulative total of 1,308 cy. Additional information on confirmatory sampling is presented in Subsection 3.4.

## 3.4 TASK 4 – CONFIRMATORY SAMPLING AND ANALYSIS

Following removal of the former waste soil piles, initial confirmatory samples were collected from the surface soils beneath the former piles and from the perimeter of each pile. Initial sample locations are shown in Figure 3-3 of WESTON's *Chemical Sampling and Analysis Plan* dated November 2002. A total of 38 confirmation samples were initially collected from within the excavation limits of Areas 1 and 2, and analyzed for metals (mercury), and PAHs [benzo(a)pyrene and dibenzo(a,h)anthracene]. Approximately 20% of those samples were analyzed for the full suite of Target Analyte List (TAL) metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc)

and 17 Target Compound List (TCL) PAHs (2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, chrysene, dibenzo(ah)anthracene, fluoranthene, fluorine, indeno(123-cd)pyrene, naphthalene, phenanthrene, and pyrene).

Following collection of soil borings and additional excavations in Areas 1 and 2, final confirmatory samples were collected from SEAD 67. Soil boring sample locations and final confirmatory sample locations are shown in Figures 3-1 and 3-2, respectively in this report. A total of 79 final confirmation samples were collected within the excavation limits of Areas 1 and 2. All of the samples were analyzed for mercury, and approximately 27% of those samples were also analyzed for the full suite of TAL metals (listed above) and TCL PAHs (listed above).

The total number of initial and final confirmation samples collected from SEAD 67 is summarized in Table 3-1.

**Table 3-1**
**Summary of Confirmation Soil Samples Collected**

| | Number of Initial Samples | | | Number of Final Samples | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| **SEAD 67 Area** | **Floor** | **Perimeter** | **Subtotal** | **Floor** | **Perimeter** | **Subtotal** | **Floor** | **Perimeter** | **Total** |
| **1** | 2 | 4 | 6 | 8 | 15 | 23 | 10 | 19 | 29 |
| **2** | 12 | 20 | 32 | 35 | 21 | 56 | 47 | 41 | 88 |
| **Total** | **14** | **24** | **38** | **43** | **36** | **79** | **57** | **60** | **117** |

Note: The totals above do not include duplicate or QC samples

Quality Control samples were also collected throughout implementation of the TCRA. These included internal field duplicates and matrix spike/matrix spike duplicates (MS/MSD). One duplicate sample was collected for every 10 field samples (10%). One MS/MSD sample was collected for every 20 field samples (5%).

The data summarized in this report references cleanup goals in evaluating the horizontal and vertical limits of excavation. For comparison purposes, the New York Technical Administrative Guidance Memorandum (TAGM) No. 4046 Cleanup Objective Values were used for the cleanup goal for all site-specific target compounds identified in the 1993 ESI (mercury and all PAHs).

Non-target metal compounds that were reviewed in accordance with the TAGM No. 4046 values included barium, cobalt, selenium, and vanadium. With the exception of lead, all other non-target metals were compared with the 95$^{th}$ Percentile Background Numbers for SEDA where no TAGM value exists [denoted as Site Background ("SB") in the TAGM] or where comparisons to "SB" are allowed in lieu of the default TAGM 4046 values. The 95$^{th}$ Percentile Background Numbers have been used by SEDA at other SEADs in evaluating closure status. The cleanup goal for lead is based on the EPA Risk Based Residential Cleanup Goal. Final results for carcinogenic PAHs (cPAHs) were also compared to a Benzo(a)pyrene Toxicity Equivalent (TEQ) limit of 10,000 µk/kg. The Benzo(a)pyrene TEQ is calculated by multiplying the concentration of each cPAH in a given sample by the appropriate TEQ multiplier and then summing the results to obtain the corresponding TEQ for the cPAHs. The cPAHs and associated TEQ multipliers include the following:

- Benzo(a)pyrene = 1.0
- Dibenzo(a,h)anthracene = 1.0
- Benzo(a)anthracene = 0.1
- Benzo(b)fluoranthene = 0.1
- Indeno(1,2,3-cd)pyrene = 0.1
- Benzo(k)fluoranthene = 0.01
- Chrysene = 0.01

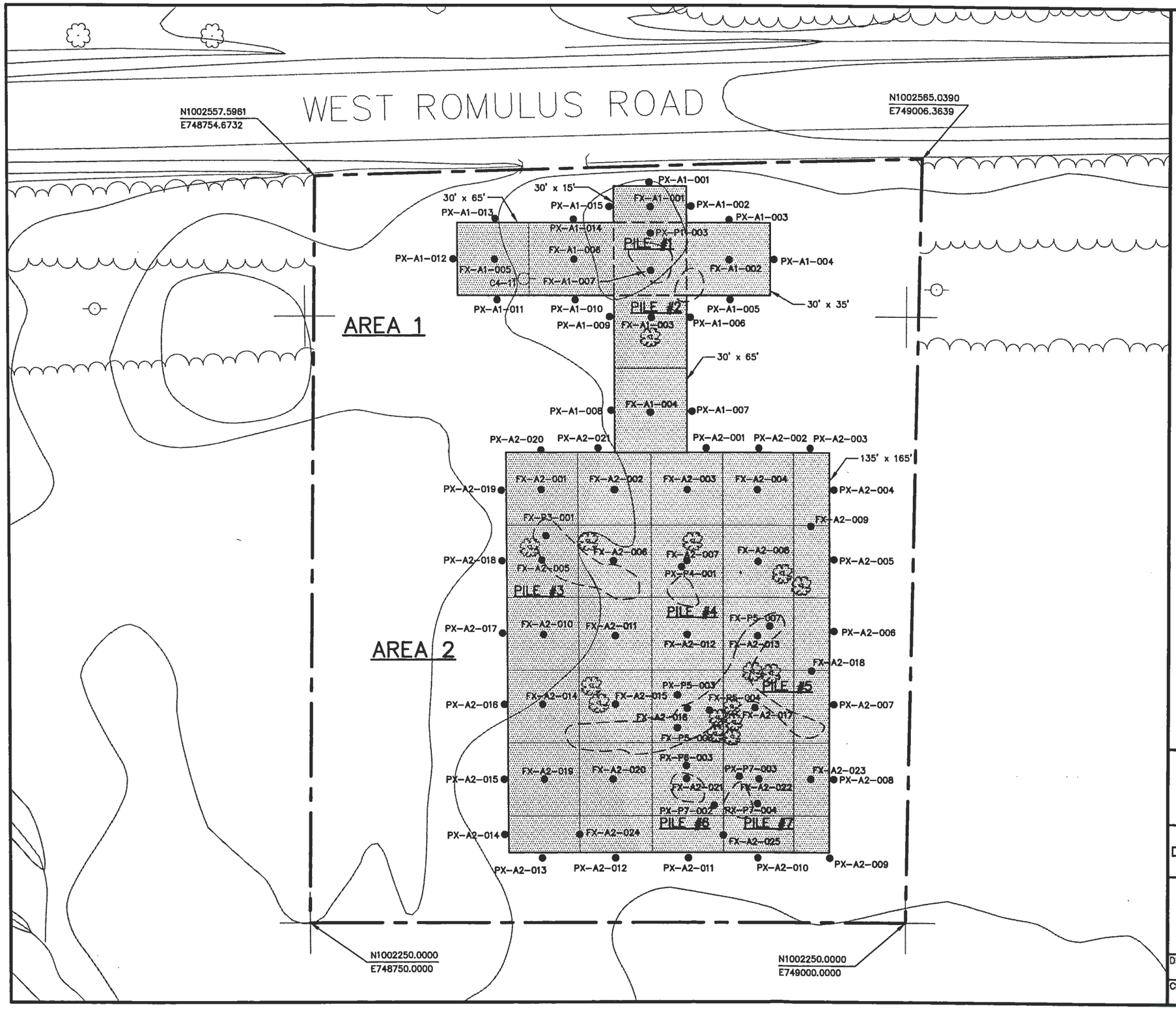
A summary of the sampling and analysis performed during excavation activities is outlined in Subsections 3.4.1 and 3.4.2.

### 3.4.1 Area 1 Sampling and Analysis

A total of six confirmation samples (two composite floor samples and four discrete sidewall samples) were initially collected in Area 1 following removal of former waste soil Piles 1 and 2. One (1) of the initial confirmation samples was analyzed for the full suite of TAL metals (23 metals) using EPA Method SW-846/6010B and TCL PAHs using EPA Method SW-846/3541/3540B/8270C. The remaining samples were analyzed for mercury only. All six samples exceeded the cleanup goal of 0.1 mg/kg for mercury with a maximum concentration of 1.1 mg/kg reported at PX-P1-03. A total of four additional non-target metals were reported at concentrations above the cleanup goals as follows: antimony (13.6 mg/kg); cadmium (3.5 mg/kg); selenium (19 mg/kg); and thallium (25.5 mg/kg). Also at sample location

PX-P1-03, concentrations were reported above the cleanup goals for the following PAHs, benzo(a)pyrene (150 µg/kg) and dibenzo(a,h)anthracene (37 µg/kg). Additional sampling was not performed for the non-target metals that exceeded the cleanup goals; however, to address the mercury and two PAH exceedances, WESTON further investigated the area by collecting soil boring samples using a drill rig. To determine the lateral extent required for further excavation, samples were collected at 10 ft, 25 ft, and 50 ft increments to the north, south, east and west of the footprint represented by former waste soil Pile 1. Samples were collected at 0-1 ft, 1-2 ft, 2-3 ft, and 3-4 ft depth intervals to determine the vertical extent required for further excavation. Refer to Figure 3-1 for investigative boring sample locations. Out of the 40 samples collected from the 10 soil boring locations shown in Figure 3-1, a total of 14 samples were analyzed to confirm the final lateral and vertical extents required for additional excavation in Area 1. Out of the 14 confirmation samples, six were analyzed for mercury with a maximum detected concentration of 0.074 mg/kg reported at sample location PX-A1-SS-S-25(0-1). The cleanup goal for mercury is 0.1 mg/kg. A total of 10 out of the 14 samples were analyzed for the two PAH parameters, benzo(a)pyrene and dibenzo(a,h)anthracene, with maximum concentrations of 72 µg/kg and 23 µg/kg, respectively, reported at sample location PX-A1-S-50. The cleanup goals for benzo(a)pyrene and dibenzo(a,h)anthracene are 61 µg/kg and 14 µg/kg, respectively. Although exceedances were reported for these two PAH parameters, an evaluation of the Benzo(a)pyrene TEQ did not result in an exceedance of the 10,000 µg/kg limit for total cPAHs in Area 1. The area was excavated to a depth of 1 ft to the lateral limits shown in Figure 3-1. Soil boring results are included in Appendix A.

On 11 May 2004, 8 confirmatory floor samples and 15 confirmatory perimeter samples were collected from the Area 1 excavation. Samples were collected as discrete grab samples between 2-6 inches below ground surface (bgs). Refer to Figure 3-2 for sample locations and Appendix A for sample results. Of the 23 confirmatory samples collected in Area 1, two floor samples and three perimeter samples were analyzed for the full suite of TAL metals and TCL PAHs. The remaining samples were analyzed for arsenic, mercury, and zinc only. An evaluation of the maximum confirmatory sample results for Area 1 (refer to Appendix A), indicates three exceedances in Area 1 for mercury. However, the overall average result for mercury in Area 1 is 0.08 mg/kg, which is below the cleanup goal of 0.1 mg/kg. Maximum confirmatory sample results also indicate exceedances for the following PAHs in Area 1: benzo(a)anthracene;




## LEGEND

- 696 — GROUND CONTOUR AND ELEVATION
- PAVED ROAD
- UTILITY POLE
- BRUSH
- TREE
- FORMER FOOTPRINT OF SOIL PILE
- LIMIT OF SOIL REMOVAL
- SITE PERIMETER (LIMIT OF CLEARING)
- CONFIRMATORY SAMPLE LOCATION

NOTES

1. ALL EXCAVATION WAS PERFORMED TO A DEPTH OF 1'.
2. ALL CONFIRMATORY SAMPLE LOCATIONS REPRESENT FINAL EXCAVATION LIMITS.
3. PX SAMPLES REPRESENT PERIMETER SAMPLES COLLECTED ON SURFACE, 1' OUTSIDE THE LIMIT OF EXCAVATION.
4. FX SAMPLES REPRESENT FLOOR SAMPLES COLLECTED ON THE SURFACE OF THE LIMIT OF EXCAVATION.
5. ALL SAMPLES COLLECTED AS GRABS.

GRAPHIC SCALE

40 20 0 20 40

APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

DEPARTMENT OF THE ARMY
OMAHA DISTRICT
CORPS OF ENGINEERS
OFFUTT AFB, NEBRASKA

SEAD-67
DUMP SITE EAST OF SEWAGE TREATMENT PLANT NO. 4
SENECA army DEPOT ACTIVITY

# CONFIRMATORY SOIL SAMPLE LOCATION MAP

| DRAWN | DATE | FIGURE NO. |
|---|---|---|
| BEG | DEC 2004 | 3-2 |
| CHECKED | W.O. NO. 20074-515-035 | |

M:\De ,DWG\ACOE\SENECA\SEADs\SEAD 67 FINAL REPORT\FIG 3-1 and 3-2.dwg, 3-2, 12/1 4 11:42:53 AM, girardeb, 1:1

benzo(a)pyrene; benzo(k)fluoranthene; chrysene; and dibenzo(a,h)anthracene. However, evaluation of the Benzo(a)pyrene TEQ does not result in an exceedance of the 10,000 µg/kg limit for total cPAHs in Area 1. The overall average Benzo(a)pyrene TEQ for Area 1 is 598 ug/kg.

### 3.4.2 Area 2 Sampling and Analyses

A total of 32 confirmation samples (12 composite floor samples and 20 discrete sidewall samples) were initially collected in Area 2 following removal of former waste soil piles 3, 4, 5, 6, and 7. Seven (7) of the initial confirmation samples were analyzed for the full suite of TAL metals (23 metals) using EPA Method SW-846/6010B, and TCL PAHs using EPA Method SW-846/3541/3540B/8270C. The remaining samples were analyzed for mercury only. Twenty-six of the 32 samples analyzed for mercury exceeded the cleanup goal of 0.1 mg/kg with a maximum concentration of 10 mg/kg, reported at PX-P3-03. A total of five additional non-target metals were reported at concentrations above the cleanup goals as follows: arsenic (8.7 mg/kg); copper (78.8 mg/kg); selenium (24 mg/kg); silver (4.7 mg/kg); and thallium (31.8 mg/kg). A total of three out of the seven samples analyzed for all PAHs had reportable concentrations above the cleanup goals for benzo(a)pyrene and dibenzo(a,h)anthracene, with maximum concentrations of 470 µg/kg and 75 µg/kg, respectively. Additional sampling was not performed for the non-target metals that exceeded the cleanup goals; however, to address the 26 mercury and 3 PAH exceedances, WESTON further investigated the area using a drill rig to collect soil boring samples. Samples were collected at eight locations in Area 2 within a 135-ft by 165-ft perimeter limit encompassing the footprint represented by the former waste soil piles. To determine the lateral extent required for further excavation, samples were collected to the north, south, east, and west of the former waste soil piles. Samples were collected at 0-1 ft, 1-2 ft, 2-3 ft, and 3-4 ft depth intervals to define the vertical extents required for additional excavation. Refer to Figure 3-1 for investigative boring sample locations. Out of the 32 samples collected from 8 boring locations, a total of 10 samples were analyzed to confirm the final lateral and vertical extents required for additional excavation in Area 2. Out of the 10 confirmation samples, 8 were analyzed for mercury with a maximum detected concentration of 0.097 mg/kg reported at FX-A2-SS-W(0-1). The cleanup goal for mercury is 0.1 mg/kg. A total of 8 out of the 10 samples were also analyzed for the two PAH parameters, benzo(a)pyrene, and

dibenzo(a,h)anthracene. A maximum detected concentration of 62 µg/kg was reported for benzo(a)pyrene at FX-A2-W. The cleanup goal for benzo(a)pyrene is 61 µg/kg. A maximum detected concentration of 18 µg/kg was reported for dibenzo(a,h)anthracene at PX-A2-S-10. The cleanup goal for dibenzo(a,h)anthracene is 14 µg/kg. Although exceedances were reported for these two PAHs, an evaluation of the Benzo(a)pyrene TEQ did not result in an exceedance of the 10,000 µg/kg limit for total cPAHs in Area 2. Therefore, the area was excavated to a depth of 1 ft to the lateral limits shown in Figure 3-1. Soil boring results are included in Appendix A.

On 11 May 2004, 35 confirmatory floor samples and 21 confirmatory perimeter samples were collected from the Area 2 excavation. Samples were collected as discrete grab samples between 2-6 inches bgs. Refer to Figure 3-2 for sample locations and Appendix A for confirmatory sample results. A total of 12 floor samples and 4 perimeter samples were analyzed for the full suite of TAL metals and TCL PAHs. The remaining samples were analyzed for arsenic, mercury, and zinc only. Evaluation of the maximum confirmatory sample results for Area 2 (refer to Appendix A), indicates five exceedances in Area 2 for mercury; however, the overall average result for mercury in Area 2 is 0.08 mg/kg, which is below the cleanup goal of 0.1 mg/kg. Maximum confirmatory sample results for Area 2 also indicate exceedances for benzo(a)pyrene and dibenzo(a,h)anthracene. Although there were exceedances for two PAH parameters, an evaluation of the Benzo(a)pyrene TEQ does not result in an exceedance of the 10,000 µg/kg limit for total cPAHs in Area 2. The overall average Benzo(a)pyrene TEQ for Area 2 is 73 ug/kg.

### 3.4.3 Waste Characterization Sampling

Waste disposal samples were utilized as the basis for characterizing excavated soil for off-site landfill disposal. All excavated material was stockpiled prior to transportation and off-site disposal. A representative waste disposal characterization sample was collected from each stockpile as a five-point composite at a rate of one composite sample per 750 tons of impacted soil.

A total of three samples were collected and analyzed for waste characterization from SEAD 67. Each waste characterization sample was analyzed for TCL procedure metals using EPA Method SW-846/1311/6010B, volatile organic compounds using EPA Method SW-846/5035A/8260B, semi-volatile organic compounds using EPA Method SW-846-3541/3540B/8270C, PCBs using

EPA Method SW-846-3541/3540B/8082, and Pesticides using EPA Method SW-846-3541/3540B/8081A. Waste characterization samples were also analyzed for reactivity-cyanide using EPA Method 7.3.3.2/9014, reactivity-sulfide using EPA Method 7.3.4.2/9034, corrosivity using EPA Method 9045C, and hydrogen ion concentration and. No QC samples were collected from the waste characterization samples.

The waste characterization analytical results from SEAD 67 soils did not exhibit any hazardous waste characteristics; therefore, the material was classified and profiled as a non-hazardous metal and PAH contaminated soil for T&D. A summary of waste characterization data is included in Appendix B.

## 3.5 TASK 5 – TRANSPORTATION AND DISPOSAL

Approximately 1,654 tons of non-hazardous metal and PAH-contaminated soil were removed from SEAD 67 between 16 July and 31 July 2003, as a result of the TCRA performed in Areas 1 and 2. Soil was shipped to the Seneca Meadows Landfill located in Waterloo, New York. A summary containing the manifest number, shipment date, truck numbers, scale weights, and tare weights is included in Appendix C. Manifests are on file with SEDA, and will be submitted under separate cover upon request.

## 3.6 TASK 6 – SITE RESTORATION

Site restoration was not conducted at SEAD 67. The site is located in a remote area, east of the prison water treatment plant in the center of SEDA, surrounded by dense hardwoods and underbrush, and there is no planned use for this area. Based on the limited removal depth of 12 inches, no backfill was brought into the site.

## 3.7 TASK 7 – DEMOBILIZATION

Upon completion of soil removal activities, USACE inspected the excavation areas within SEAD 67 in August 2003 to ensure that that site limits were completed in accordance with the project objectives. Since the excavation, sampling, and T&D efforts were performed intermittently over the 6 month period between 02 November 2002 and 1 August 2003,

equipment was demobilized from the site in a phased manner following completion of each activity. Final demobilization was performed on 1 August 2003, following completion of T&D activities.

## 3.8 CONCLUSION

This final report documents completion of the metals and PAH removal from the SEAD 67 SWMU in accordance with the WESTON *Final Task Work Plan* (WESTON, 2002), which was prepared in accordance with the *Final Action Memorandum and Design Document* (Parsons, 2002). During the TCRA conducted at SEAD 67, WESTON removed a total of seven former waste soil piles that were identified as the source for metals (mercury) and PAH impacted soil at the site. Following removal of the waste soil piles, additional soil was excavated to a 1 ft depth from the surrounding area. All excavated soils were disposed off-site as non-hazardous material.

Following a comparison of confirmatory sample results with the cleanup goals, it is concluded that the horizontal and vertical extents of elevated levels of mercury and PAHs in soil have been sufficiently delineated and removed from SEAD 67. As a result, the potential threat to human health and the environment posed by the formerly impacted site soils has been eliminated through the source reduction and removal efforts described in this report. The confirmatory soil sample results presented in this report indicate that the average mercury content in SEAD 67 soils is below the 0.1 mg/kg cleanup goal for mercury. Confirmatory soil sample results also indicate that neither the maximum result nor the site-wide average for total cPAHs in SEAD 67 soils exceeds the Benzo(a)pyrene TEQ of 10,000 µg/kg. Based on these results, it is recommended that USACE, SEDA, NYSDEC, and EPA evaluate this site for closure and/or transfer status.

# 4. REFERENCES

New York State Department of Environmental Conservation (NYSDEC) *Technical and Administrative Guidance Memorandum No. 4046, Determination of Soil Cleanup Objectives and Cleanup Levels*, January 1994.

Omaha District Corps of Engineers, *Final Scope of Work for Rapid Response Action – Metal Sites – SEADs 24, 50/54, & 67, Seneca Army Depot, Romulus, NY*, 30 September 2002.

Parsons, *Final Action Memorandum and Decision Document, Time-CriticalRemoval Actions, Four Metals Sites (SWMU's SEAD-24, 50/54, and 67)*, August 2002.

U.S. Army Corps of Engineers (USACE), *USACE Requirements for the Preparation of Sampling and Analysis Plans*, EM-200-1-3, (1994).

U.S. Army Corps of Engineers (USACE), *Safety and Health Requirements Manual*, EM 385-1-1, September 1996.

United States Environmental Protection Agency (EPA), *Management of Remediation Waste Under RCRA*, EPA530–F–98–026, October 1998.

Weston Solutions, Inc. (WESTON), *Chemical Sampling and Analysis Plan*, November 2002

Weston Solutions, Inc. (WESTON), *Final Task Work Plan*, November 2002

## Table Notes

**1.** The Cleanup goal is based on the New York Technical Administrative Guidance Memorandum (TAGM) No.4046
Recommended Soil Cleanup Objectives. Values denoted as Site Background ("SB") in TAGM 4046 were compared with the highlighted values (95th percentile of Seneca Army Depot (SEDA) Site Background) in lieu of the TAGM "SB" since no background cleanup objectives exist for certain parameters.

**2.** U.S. Environmental Protection Agency Risk Based Residential Cleanup Goal for lead

**3.** Where exceedances for individual PAHs exist, evaluation of the Benzo(a)pyrene Toxicity Equivalent for total carcinogenic PAHs (cPAHs) would not exceed the 10,000 µg/kg limit for total cPAHs for any sample collected. The cPAHs include: benzo(a)pyrene; dibenzo(a,h)anthracene; benzo(a,h)anthracene; benzo(b)fluoranthene; indeno(1,2,3-cd)pyrene; benzo(k)fluouranthene; and chrysene.

**4.** Benzo(a)pyrene TEQ for carcinogenic PAHs is calculated by multiplying the individual cPAH results by the applicable factor from the list below, and then summing the results:

Benzo(a)pyrene = 1.0
Dibenzo(a,h)anthracene = 1.0
Benzo(a)anthracene = 0.1
Benzo(b)fluoranthene = 0.1
Indeno(1,2,3-cd)pyrene = 0.1
Benzo(k)fluoranthene = 0.01
Chrysene = 0.01

**mg/kg**= milligram per kilogram
**µg/kg**= microgram per kilogram

**B**= Result is less than the CRDL/Reporting Limit (RL), but >/= to the Instrument Detection Limit/method detection limit (MDL).
**H**= Alternate peak selection upon analytical review
**J**= Result is less than the RL, but greater than or equal to the MDL.
**M**= Manually integrated compound.
**N**= Matrix spike/matrix spike duplicate (MS/MSD): Spike recovery exceeds the upper or lower control limits.
**E** = Result exceeded calibration range, secondary dilution required.
**A** = Concentration exceeds the instrument calibration range or below the RL.
**U**= Analyte was not detected at or above the RL.
95th percentile of SEDA Site Background
Result Exceeds Cleanup Criteria

**Confirmatory Samp. .esults for Area 1 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-FX-A1-SS-001-FS | SEAD67-FX-A1-SS-002-FS | SEAD67-FX-A1-SS-003-FS | SEAD67-FX-A1-SS-004-FS | SEAD67-FX-A1-SS-005-FS | SEAD67-FX-A1-SS-006-FS | SEAD67-FX-A1-SS-007-FS | SEAD67-PX-P1-SS-003-FS | SEAD67-PX-A1-SS-001-FS | SEAD67-PX-A1-SS-002-FS | SEAD67-PX-A1-SS-003-FS | SEAD67-PX-A1-SS-004-FS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) |
| Aluminum | 19,200 | | | | | 12100 | | | 13200 | | | | |
| Antimony | 5.9 | | | | | 0.56 U | | | 13.6 u | | | | |
| Arsenic | 8.24 | 5.6 | 5.3 | 4.4 | 4.9 | 4.1 | 5.7 | 5.8 | 4.9 J | 4.9 | 4.7 B | 3.5 B | 4.4 |
| Barium | 300 | | | | | 53.7 | | | 71.8 | | | | |
| Beryllium | 1.1 | | | | | 0.65 B | | | 0.69 J | | | | |
| Cadmium | 2.3 | | | | | 0.49 U | | | 3.5 u | | | | |
| Calcium | 120,500 | | | | | 1770 | | | 3080 | | | | |
| Chromium | 29 | | | | | 18.1 | | | 19.8 | | | | |
| Cobalt | 30 | | | | | 10.8 | | | 11 | | | | |
| Copper | 29.6 | | | | | 15.9 | | | 19.5 | | | | |
| Iron | 35,550 | | | | | 24500 | | | 24100 | | | | |
| Lead[2] | 400 | | | | | 11.6 | | | 19.3 | | | | |
| Magnesium | 21,500 | | | | | 3810 | | | 3890 | | | | |
| Manganese | 1,056 | | | | | 445 | | | 438 | | | | |
| **Mercury** | 0.1 | 0.038 B | 0.047 B | 0.079 B | 0.056 B | 0.039 B | 0.032 B | 0.032 B | | 0.055 B | 0.079 B | 0.064 B | 0.064 B |
| Nickel | 48.9 | | | | | 26.3 | | | 26 | | | | |
| Potassium | 2,343 | | | | | 649 | | | 1250 | | | | |
| Selenium | 2 | | | | | 0.79 U | | | 18.6 u | | | | |
| Silver | 0.763 | | | | | 0.16 U | | | 0.41 J | | | | |
| Sodium | 170.3 | | | | | 56.4 | | | 82.8 J | | | | |
| Thallium | 0.67 | | | | | 0.98 U | | | 25.5 u | | | | |
| Vanadium | 150 | | | | | 18.5 | | | 20.1 | | | | |
| Zinc | 108.9 | 64.7 | 72.8 | 51.7 | 68.1 | 55 | 69.9 | 61.7 | 66.3 | 64.6 | 54.6 | 44.1 | 49.2 |
| | | | | | | | | | | | | | |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | | | | | 34 U | | | 420 u | | | | |
| Acenaphthene | 50,000 | | | | | 18 U | | | 420 u | | | | |
| Acenaphthylene | 41,000 | | | | | 13 U | | | 27 J | | | | |
| Anthracene | 50,000 | | | | | 21 J | | | 40 J | | | | |
| Benzo(a)anthracene | 224 | | | | | 57 J | | | 160 J | | | | |
| Benzo(a)pyrene | 61 | | | | | 53 | | | | | | | |
| Benzo(b)fluoranthene | 1,100 | | | | | 47 U | | | 130 J | | | | |
| Benzo(ghi)perylene | 50,000 | | | | | 30 J | | | | | | | |
| Benzo(k)fluoranthene | 1,100 | | | | | 51 J | | | 160 J | | | | |
| Chrysene | 400 | | | | | 60 J | | | 190 J | | | | |
| Dibenzo(a,h)anthracene | 14 | | | | | 11 M | | | 37 J | | | | |
| Fluoranthene | 50,000 | | | | | 110 J | | | 340 J | | | | |
| Fluorene | 50,000 | | | | | 24 U | | | 420 u | | | | |
| Indeno(1,2,3-cd)pyrene | 3,200 | | | | | 29 J | | | 97 J | | | | |
| Naphthalene | 13,000 | | | | | 39 U | | | 420 u | | | | |
| Phenanthrene | 50,000 | | | | | 87 J | | | 260 J | | | | |
| Pyrene | 50,000 | | | | | 110 J | | | 400 J | | | | |
| Benzo(a)pyrene TEQ[4] | 10,000 | | | | | 78.41 | | | 79.2 | | | | |

**Confirmatory Sampl... Results for Area 1 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-PX-A1-SS-005-FS | SEAD67-PX-A1-SS-006-FS | SEAD67-PX-A1-SS-007-FS | SEAD67-PX-A1-SS-008-FS | SEAD67-PX-A1-SS-009-FS | SEAD67-PX-A1-SS-010-FS | SEAD67-PX-A1-SS-011-FS | SEAD67-PX-A1-SS-012-FS | SEAD67-PX-A1-SS-013-FS | SEAD67-PX-A1-SS-014-FS | SEAD67-PX-A1-SS-015-FS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) | (mg/Kg) |
| Aluminum | 19,200 | 9220 | | | | | 16000 | | | | | 13800 |
| Antimony | 5.9 | 0.62 U | | | | | 0.52 U | | | | | 0.68 U |
| Arsenic | 8.24 | 3.7 B | 4 B | 4.6 | 5.4 | 4.1 B | 7.1 | 4 B | 5.1 | 5.2 | 5.1 | 5.8 |
| Barium | 300 | 99.5 | | | | | 79.2 | | | | | 67.6 |
| Beryllium | 1.1 | 0.55 B | | | | | 1.2 | | | | | 0.68 B |
| Cadmium | 2.3 | 0.55 U | | | | | 0.46 U | | | | | 0.59 U |
| Calcium | 120,500 | 3160 | | | | | 2160 | | | | | 3440 |
| Chromium | 29 | 13.3 | | | | | 25.6 | | | | | 20.1 |
| Cobalt | 30 | 5.2 | | | | | 15.7 | | | | | 12 |
| Copper | 29.6 | 16 | | | | | 36.6 | | | | | 20.1 |
| Iron | 35,550 | 16100 | | | | | 35300 | | | | | 25500 |
| Lead[2] | 400 | 25.8 | | | | | 18 | | | | | 24.2 |
| Magnesium | 21,500 | 2410 | | | | | 5200 | | | | | 4150 |
| Manganese | 1,056 | 320 | | | | | 959 | | | | | 436 |
| **Mercury** | 0.1 | 0.075 B | 0.082 B | 0.095 B | 0.32 | 0.2 | 0.046 B | 0.061 B | 0.056 B | 0.067 B | 0.11 | 0.063 B |
| Nickel | 48.9 | 15.2 | | | | | 41.9 | | | | | 27.4 |
| Potassium | 2,343 | 720 | | | | | 1080 | | | | | 1290 |
| Selenium | 2 | 0.87 U | | | | | 0.73 U | | | | | 1 B |
| Silver | 0.763 | 0.17 U | | | | | 0.15 U | | | | | 0.19 U |
| Sodium | 170.3 | 41.8 B | | | | | 34.7 B | | | | | 58 |
| Thallium | 0.67 | 1.1 U | | | | | 0.91 U | | | | | 1.2 U |
| Vanadium | 150 | 17 | | | | | 24.9 | | | | | 21.9 |
| Zinc | 108.9 | 49.6 | 60.6 | 78.4 | 67.2 | 66.5 | 85.1 | 47.9 | 63.9 | 69.9 | 64 | 70.6 |
| | | | | | | | | | | | | |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | 83 U | | | | | 34 U | | | | | 160 U |
| Acenaphthene | 50,000 | 44 U | | | | | 18 U | | | | | 90 J |
| Acenaphthylene | 41,000 | 130 J | | | | | 32 J | | | | | 380 J |
| Anthracene | 50,000 | 200 J | | | | | 46 J | | | | | 500 J |
| Benzo(a)anthracene | 224 | 440 J | | | | | 110 J | | | | | 1100 J |
| Benzo(a)pyrene | 61 | 420 | | | | | 110 | | | | | 1100 |
| Benzo(b)fluoranthene | 1,100 | 460 J | | | | | 100 | | | | | 910 J |
| Benzo(ghi)perylene | 50,000 | 280 J | | | | | 60 | | | | | 630 J |
| Benzo(k)fluoranthene | 1,100 | 460 J | | | | | 110 | | | | | 1300 J |
| Chrysene | 400 | 540 J | | | | | 130 J | | | | | 1400 J |
| Dibenzo(a,h)anthracene | 14 | 96 M | | | | | 21 M | | | | | 220 |
| Fluoranthene | 50,000 | 1100 | | | | | 250 J | | | | | 2700 |
| Fluorene | 50,000 | 59 U | | | | | 25 U | | | | | 190 J |
| Indeno(1,2,3-cd)pyrene | 3,200 | 260 J | | | | | 58 J | | | | | 620 J |
| Naphthalene | 13,000 | 94 U | | | | | 39 U | | | | | 180 U |
| Phenanthrene | 50,000 | 870 J | | | | | 210 J | | | | | 2200 |
| Pyrene | 50,000 | 900 J | | | | | 220 | | | | | 2300 |
| Benzo(a)pyrene TEQ[4] | 10,000 | 642 | | | | | 160.2 | | | | | 1,610 |

**Confirmatory Sampl... ...sults for Area 2 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-FX-P3-SS-001-FS | SEAD67-PX-P4-SS-001-FS | SEAD67-FX-P5-SS-003-FS | SEAD67-FX-P5-SS-004-FS | SEAD67-FX-P5-SS-007-FS | SEAD67-PX-P5-SS-003-FS | SEAD67-PX-P6-SS-003-FS | SEAD67-PX-P7-SS-002-FS | SEAD67-PX-P7-SS-003-FS | SEAD67-PX-P7-SS-004-FS | SEAD67-FX-A2-SS-001-FS | SEAD67-FX-A2-SS-002-FS | SEAD67-FX-A2-SS-003-FS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Aluminum | 19,200 | 13700 | 13700 | 12700 | | 12300 | 13800 | 13700 | | 12400 | | | | |
| Antimony | 5.9 | 16.9 u | 15.6 u | 1.6 u | | 14.5 u | 14.6 u | 14.8 u | | 17.2 u | | | | |
| Arsenic | 8.24 | 6.7 J | 5.3 J | 5.8 | | 4.8 J | 8.7 j | 6 J | | 5.6 J | | 4.4 | 4.6 | 5.7 |
| Barium | 300 | 145 | 140 | 102 | | 91.2 | 111 | 104 | | 118 | | | | |
| Beryllium | 1.1 | 0.84 J | 0.79 J | 0.7 | | 0.74 J | 0.83 j | 0.81 J | | 2.9 u | | | | |
| Cadmium | 2.3 | 4.3 u | 4 u | 1.3 u | | 3.7 u | 3.7 u | 3.8 u | | 4.4 u | | | | |
| Calcium | 120,500 | 7520 | 3860 | 6310 | | 9750 | 11000 | 5970 | | 4630 | | | | |
| Chromium | 29 | 21.3 | 20.4 | 21.3 | | 19.9 | 24 | 23.5 | | 17.9 | | | | |
| Cobalt | 30 | 10.9 | 8.5 | 11.7 | | 10.2 | 12.9 | 12.9 | | 7.9 | | | | |
| Copper | 29.6 | 23.9 | 19.6 | 52.5 | | 22.6 | 78.8 | 44.5 | | 20.3 | | | | |
| Iron | 35,550 | 25600 | 23300 | 25100 | | 23000 | 32800 | 28000 | | 20700 | | | | |
| Lead[2] | 400 | 34.5 | 20.6 | 24.1 | | 17.7 | 36.2 | 22 | | 24 | | | | |
| Magnesium | 21,500 | 4400 | 3760 | 4760 | | 4710 | 6540 | 5330 | | 3230 | | | | |
| Manganese | 1,058 | 799 | 456 | 632 | | 379 | 510 | 403 | | 475 | | | | |
| **Mercury** | 0.1 | | 0.08 | | 0.082 | 0.071 J | | | 0.1 | | 0.098 J | 0.041 B | 0.028 B | 0.042 B |
| Nickel | 48.9 | 30 | 24 | 31.1 | | 28.8 | 35.9 | 35.4 | | 20.4 | | | | |
| Potassium | 2,343 | 2330 | 1660 | 1680 | | 1750 | 1720 | 1710 | | 1770 | | | | |
| Selenium | 2 | 23.1 u | 21.3 u | 2.1 u | | 19.9 u | 20 u | 20.2 u | | 23.6 u | | | | |
| Silver | 0.763 | 4.3 u | 4 u | 3.4 | | 3.7 u | 2.2 j | 4.7 | | 4.4 u | | | | |
| Sodium | 170.3 | 99.1 J | 72.1 J | 83.9 | | 89.2 J | 97.1 j | 76.3 J | | 72.8 J | | | | |
| Thallium | 0.67 | 31.8 u | 29.3 u | 4 u | | 27.3 u | 27.4 u | 27.8 u | | 32.4 u | | | | |
| Vanadium | 150 | 23.3 | 23 | 19 | | 18 | 21.6 | 20.4 | | 21.6 | | | | |
| Zinc | 108.9 | 106 | 77.6 | 107 | | 86 | 127 | 118 | | 68.3 | | 57.6 | 58.6 | 76.2 |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | 470 u | 450 u | 37 u | | 430 u | 450 u | 440 u | | 500 u | | | | |
| Acenaphthene | 50,000 | 25 J | 450 u | 20 u | | 430 u | 450 u | 32 J | | 500 u | | | | |
| Acenaphthylene | 41,000 | 110 J | 25 J | 15 u | | 430 u | 450 u | 440 u | | 500 u | | | | |
| Anthracene | 50,000 | 130 J | 26 J | 25 J | | 430 u | 41 j | 43 J | | 500 u | | | | |
| Benzo(a)anthracene | 224 | | 97 J | 90 J | | 33 J | 200 J | 180 J | | 32 J | | | | |
| Benzo(a)pyrene | 61 | | | | | 34 J | | | | 35 J | | | | |
| Benzo(b)fluoranthene | 1,100 | 330 J | 91 J | 76 J | | 430 u | 200 J | 130 J | | 500 u | | | | |
| Benzo(ghi)perylene | 50,000 | 170 J | 50 J | 49 J | | 430 u | 47 J | 75 J | | 500 u | | | | |
| Benzo(k)fluoranthene | 1,100 | 460 J | 93 J | 82 J | | 430 u | 200 J | 210 J | | 500 u | | | | |
| Chrysene | 400 | | 120 J | 100 J | | 39 J | 230 J | 210 J | | 43 J | | | | |
| Dibenzo(a,h)anthracene | 14 | | | | | | | | | | | | | |
| Fluoranthene | 50,000 | 890 | 190 J | 150 J | | 57 J | 270 J | 340 J | | 67 J | | | | |
| Fluorene | 50,000 | 57 J | 450 u | 27 u | | 36 J | 450 u | 440 u | | 500 u | | | | |
| Indeno(1,2,3-cd)pyrene | 3,200 | 180 J | 56 J | 52 J | | 430 u | 59 J | 84 J | | 500 u | | | | |
| Naphthalene | 13,000 | 470 u | 450 u | 43 u | | 430 u | 450 u | 440 u | | 500 u | | | | |
| Phenanthrene | 50,000 | 720 | 150 J | 120 J | | 38 J | 150 J | 250 J | | 45 J | | | | |
| Pyrene | 50,000 | 1300 | 250 J | 210 J | | 78 J | 340 J | 420 J | | 77 J | | | | |
| Benzo(a)pyrene TEQ[4] | | 56 | 27 | 24 | | 128 | 50 | 44 | | 144 | | | | |

**Confirmatory Sample Results for Area 2 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-FX-A2-SS-004-FS | SEAD67-FX-A2-SS-005-FS | SEAD67-FX-A2-SS-006-FS | SEAD67-FX-A2-SS-007-FS | SEAD67-FX-A2-SS-008-FS | SEAD67-FX-A2-SS-009-FS | SEAD67-FX-A2-SS-010-FS | SEAD67-FX-A2-SS-011-FS | SEAD67-FX-A2-SS-012-FS | SEAD67-FX-A2-SS-013-FS | SEAD67-FX-A2-SS-014-FS | SEAD67-FX-A2-SS-015-FS | SEAD67-FX-A2-SS-016-FS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Aluminum | 19,200 | | 11900 | | | | | 12000 | | | | | 13600 | |
| Antimony | 5.9 | | 0.52 U | | | | | 0.5 U | | | | | 0.55 U | |
| Arsenic | 8.24 | 6.3 | 4.9 | 5.1 | 4.2 B | 5.1 | 3.3 B | 5.3 | 5.5 | 6.8 | 4.6 | 5.9 | 6 | 6.2 |
| Barium | 300 | | 122 | | | | | 146 | | | | | 113 | |
| Beryllium | 1.1 | | 0.79 B | | | | | 0.7 B | | | | | 0.89 B | |
| Cadmium | 2.3 | | 0.46 U | | | | | 0.44 U | | | | | 0.48 U | |
| Calcium | 120,500 | | 2400 | | | | | 3190 | | | | | 3550 | |
| Chromium | 29 | | 18.1 | | | | | 18.8 | | | | | 22 | |
| Cobalt | 30 | | 12.6 | | | | | 11.6 | | | | | 11.4 | |
| Copper | 29.6 | | 19.5 | | | | | 23.6 | | | | | 26.5 | |
| Iron | 35,550 | | 25500 | | | | | 26200 | | | | | 29800 | |
| Lead[2] | 400 | | 13.4 | | | | | 11.6 | | | | | 13.2 | |
| Magnesium | 21,500 | | 3900 | | | | | 4620 | | | | | 4790 | |
| Manganese | 1,056 | | 928 | | | | | 729 | | | | | 645 | |
| **Mercury** | 0.1 | 0.044 B | 0.067 B | 0.12 | 0.077 B | 0.055 B | 0.099 B | 0.036 B | 0.058 B | 0.099 B | 0.081 B | 0.027 B | 0.065 B | 0.046 B |
| Nickel | 48.9 | | 28.5 | | | | | 33 | | | | | 35.6 | |
| Potassium | 2,343 | | 727 | | | | | 687 | | | | | 748 | |
| Selenium | 2 | | 0.73 U | | | | | 0.7 U | | | | | 0.77 U | |
| Silver | 0.763 | | 0.15 U | | | | | 0.14 U | | | | | 0.15 U | |
| Sodium | 170.3 | | 24.4 B | | | | | 32.4 B | | | | | 29.9 B | |
| Thallium | 0.67 | | 0.9 U | | | | | 0.87 U | | | | | 0.95 U | |
| Vanadium | 150 | | 20 | | | | | 20.4 | | | | | 23.7 | |
| Zinc | 108.9 | 55.2 | 62.7 | 68.9 | 81.4 | 66.7 | 47.9 | 60.4 | 64.2 | 79.2 | 71.4 | 59.4 | 71.7 | 77.7 |
| | | | | | | | | | | | | | | |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | | 34 U | | | | | 34 U | | | | | 76 U | |
| Acenaphthene | 50,000 | | 18 U | | | | | 18 U | | | | | 41 U | |
| Acenaphthylene | 41,000 | | 13 U | | | | | 13 U | | | | | 30 U | |
| Anthracene | 50,000 | | 15 U | | | | | 15 U | | | | | 41 J | |
| Benzo(a)anthracene | 224 | | 18 U | | | | | 18 U | | | | | 86 J | |
| Benzo(a)pyrene | 61 | | 10 U | | | | | 10 U | | | | | 87 | |
| Benzo(b)fluoranthene | 1,100 | | 47 U | | | | | 46 U | | | | | 100 U | |
| Benzo(ghi)perylene | 50,000 | | 21 U | | | | | 21 U | | | | | 51 J | |
| Benzo(k)fluoranthene | 1,100 | | 48 U | | | | | 47 U | | | | | 110 U | |
| Chrysene | 400 | | 21 U | | | | | 21 U | | | | | 95 J | |
| Dibenzo(a,h)anthracene | 14 | | 10 U | | | | | 10 U | | | | | 23 UM | |
| Fluoranthene | 50,000 | | 27 U | | | | | 27 U | | | | | 190 J | |
| Fluorene | 50,000 | | 25 U | | | | | 24 U | | | | | 54 U | |
| Indeno(1,2,3-cd)pyrene | 3,200 | | 22 U | | | | | 22 U | | | | | 49 U | |
| Naphthalene | 13,000 | | 39 U | | | | | 39 U | | | | | 87 U | |
| Phenanthrene | 50,000 | | 29 U | | | | | 29 U | | | | | 170 J | |
| Pyrene | 50,000 | | 23 U | | | | | 23 U | | | | | 170 J | |
| Benzo(a)pyrene TEQ[4] | | | 29 | | | | | 29 | | | | | 135.55 | |

**Confirmatory Sample Results for Area 2 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-FX-A2-SS-017-FS | SEAD67-FX-A2-SS-018-FS | SEAD67-FX-A2-SS-019-FS | SEAD67-FX-A2-SS-020-FS | SEAD67-FX-A2-SS-021-FS | SEAD67-FX-A2-SS-022-FS | SEAD67-FX-A2-SS-023-FS | SEAD67-FX-A2-SS-024-FS | SEAD67-FX-A2-SS-025-FS | SEAD67-PX-A2-SS-001-FS | SEAD67-PX-A2-SS-002-FS | SEAD67-PX-A2-SS-003-FS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Aluminum | 19,200 | | | | 11700 | | | | | 10300 | | | |
| Antimony | 5.9 | | | | 0.54 U | | | | | 0.57 U | | | |
| Arsenic | 8.24 | 4.4 B | 6.1 | 4.7 | 5.1 | 5.5 | 6.7 | 5.8 | 4.5 B | 5 | 5.2 | 4.4 | 5.2 |
| Barium | 300 | | | | 76.3 | | | | | 96.1 | | | |
| Beryllium | 1.1 | | | | 0.73 B | | | | | 0.71 B | | | |
| Cadmium | 2.3 | | | | 0.48 U | | | | | 0.5 U | | | |
| Calcium | 120,500 | | | | 2440 | | | | | 2530 | | | |
| Chromium | 29 | | | | 19.3 | | | | | 17.1 | | | |
| Cobalt | 30 | | | | 10.3 | | | | | 12.3 | | | |
| Copper | 29.6 | | | | 19.8 | | | | | 19.8 | | | |
| Iron | 35,550 | | | | 25300 | | | | | 24700 | | | |
| Lead[2] | 400 | | | | 11.5 | | | | | 14.6 | | | |
| Magnesium | 21,500 | | | | 4290 | | | | | 3420 | | | |
| Manganese | 1,056 | | | | 433 | | | | | 577 | | | |
| **Mercury** | 0.1 | 0.042 B | 0.036 B | 0.046 B | 0.038 B | 0.036 B | 0.091 B | 0.033 B | 0.053 B | 0.044 B | 0.091 B | 0.094 B | 0.082 B |
| Nickel | 48.9 | | | | 29 | | | | | 25.7 | | | |
| Potassium | 2,343 | | | | 587 | | | | | 529 | | | |
| Selenium | 2 | | | | 0.76 U | | | | | 0.8 U | | | |
| Silver | 0.763 | | | | 0.15 U | | | | | 0.16 U | | | |
| Sodium | 170.3 | | | | 27.9 B | | | | | 25.4 B | | | |
| Thallium | 0.67 | | | | 0.94 U | | | | | 0.99 U | | | |
| Vanadium | 150 | | | | 20 | | | | | 19.5 | | | |
| Zinc | 100.3 | 61.3 | 66.3 | 65.2 | 59.7 | 50.9 | 82.6 | 64.3 | 59.3 | 52 | 72.2 | 76.2 | 78.3 |
| | | | | | | | | | | | | | |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | | | | 34 U | | | | | 35 U | | | |
| Acenaphthene | 50,000 | | | | 18 U | | | | | 19 U | | | |
| Acenaphthylene | 41,000 | | | | 13 U | | | | | 14 U | | | |
| Anthracene | 50,000 | | | | 14 U | | | | | 15 U | | | |
| Benzo(a)anthracene | 224 | | | | 18 U | | | | | 19 U | | | |
| Benzo(a)pyrene | 61 | | | | 10 U | | | | | 10 U | | | |
| Benzo(b)fluoranthene | 1,100 | | | | 45 U | | | | | 48 U | | | |
| Benzo(ghi)perylene | 50,000 | | | | 20 U | | | | | 21 U | | | |
| Benzo(k)fluoranthene | 1,100 | | | | 47 U | | | | | 49 U | | | |
| Chrysene | 400 | | | | 20 U | | | | | 21 U | | | |
| Dibenzo(a,h)anthracene | 14 | | | | 10 U | | | | | 10 U | | | |
| Fluoranthene | 50,000 | | | | 26 U | | | | | 28 U | | | |
| Fluorene | 50,000 | | | | 24 U | | | | | 25 U | | | |
| Indeno(1,2,3-cd)pyrene | 3,200 | | | | 22 U | | | | | 23 U | | | |
| Naphthalene | 13,000 | | | | 38 U | | | | | 40 U | | | |
| Phenanthrene | 50,000 | | | | 29 U | | | | | 30 U | | | |
| Pyrene | 50,000 | | | | 23 U | | | | | 24 U | | | |
| Benzo(a)pyrene TEQ[4] | | | | | 29 | | | | | 30 | | | |

**Confirmatory Sampl[illegible]esults for Area 2 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-PX-A2-SS-004-FS | SEAD67-PX-A2-SS-005-FS | SEAD67-PX-A2-SS-006-FS | SEAD67-PX-A2-SS-007-FS | SEAD67-PX-A2-SS-008-FS | SEAD67-PX-A2-SS-009-FS | SEAD67-PX-A2-SS-010-FS | SEAD67-PX-A2-SS-011-FS | SEAD67-PX-A2-SS-012-FS | SEAD67-PX-A2-SS-013-FS | SEAD67-PX-A2-SS-014-FS | SEAD67-PX-A2-SS-015-FS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Aluminum | 19,200 | | 11500 | | | | | 11700 | | | | | 8720 |
| Antimony | 5.9 | | 0.69 U | | | | | 0.65 U | | | | | 0.69 U |
| Arsenic | 8.24 | 5.6 | 4.1 B | 4.3 B | 4.3 | 5 | 5 | 4.4 B | 4.3 B | 4.1 B | 3.7 B | 4.8 B | 3.8 B |
| Barium | 300 | | 121 | | | | | 164 | | | | | 72.3 |
| Beryllium | 1.1 | | 0.72 B | | | | | 0.81 B | | | | | 0.51 B |
| Cadmium | 2.3 | | 0.61 U | | | | | 0.57 U | | | | | 0.61 U |
| Calcium | 120,500 | | 5260 | | | | | 4520 | | | | | 3860 |
| Chromium | 29 | | 16.2 | | | | | 17 | | | | | 12.6 |
| Cobalt | 30 | | 7.3 | | | | | 7.4 | | | | | 7 |
| Copper | 29.6 | | 25.1 | | | | | 19.7 | | | | | 15.2 |
| Iron | 35,550 | | 19300 | | | | | 21100 | | | | | 16700 |
| Lead[2] | 400 | | 29.9 | | | | | 18.4 | | | | | 21.7 |
| Magnesium | 21,500 | | 3410 | | | | | 3110 | | | | | 2590 |
| Manganese | 1,056 | | 450 | | | | | 485 | | | | | 530 |
| **Mercury** | 0.1 | 0.11 B | 0.1 B | 0.13 | 0.13 B | 0.1 B | 0.093 B | 0.093 B | 0.072 B | 0.071 B | 0.099 B | 0.089 B | 0.069 B |
| Nickel | 48.9 | | 21.1 | | | | | 20.4 | | | | | 15.9 |
| Potassium | 2,343 | | 914 | | | | | 735 | | | | | 807 |
| Selenium | 2 | | 1 B | | | | | 0.91 U | | | | | 0.97 U |
| Silver | 0.763 | | 0.19 U | | | | | 0.18 U | | | | | 0.19 U |
| Sodium | 170.3 | | 45.3 B | | | | | 36.8 B | | | | | 26 B |
| Thallium | 0.67 | | 1.2 U | | | | | 1.1 U | | | | | 1.2 U |
| Vanadium | 150 | | 18.7 | | | | | 19.8 | | | | | 15.6 |
| Zinc | 108.9 | 76.9 | 76.6 | 71.4 | 69.7 | 76.9 | 68.6 | 57.8 | 57.2 | 59.5 | 56.5 | 98.3 | 53.5 |
| | | | | | | | | | | | | | |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | | 42 U | | | | | 41 U | | | | | 85 U |
| Acenaphthene | 50,000 | | 22 U | | | | | 22 U | | | | | 46 U |
| Acenaphthylene | 41,000 | | 16 U | | | | | 16 U | | | | | 33 U |
| Anthracene | 50,000 | | 23 | | | | | 17 U | | | | | 36 U |
| Benzo(a)anthracene | 224 | | 62 | | | | | 29 | | | | | 58 J |
| Benzo(a)pyrene | 61 | | 63 | | | | | 29 | | | | | 66 |
| Benzo(b)fluoranthene | 1,100 | | 57 U | | | | | 55 U | | | | | 120 U |
| Benzo(ghi)perylene | 50,000 | | 38 | | | | | 25 U | | | | | 52 U |
| Benzo(k)fluoranthene | 1,100 | | 75 | | | | | 57 U | | | | | 120 U |
| Chrysene | 400 | | 79 | | | | | 35 | | | | | 80 J |
| Dibenzo(a,h)anthracene | 14 | | 12 UM | | | | | 12 UM | | | | | 25 UM |
| Fluoranthene | 50,000 | | 140 | | | | | 61 | | | | | 130 J |
| Fluorene | 50,000 | | 30 U | | | | | 29 U | | | | | 61 U |
| Indeno(1,2,3-cd)pyrene | 3,200 | | 35 | | | | | 26 U | | | | | 55 U |
| Naphthalene | 13,000 | | 48 U | | | | | 47 U | | | | | 97 U |
| Phenanthrene | 50,000 | | 110 | | | | | 43 | | | | | 100 J |
| Pyrene | 50,000 | | 130 | | | | | 55 | | | | | 130 J |
| Benzo(a)pyrene TEQ[4] | | | 92 | | | | | 53 | | | | | 116 |

**Confirmatory Sampl... ...sults for Area 2 Soil**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Compound | Cleanup Goal[1] | SEAD67-PX-A2-SS-016-FS | SEAD67-PX-A2-SS-017-FS | SEAD67-PX-A2-SS-018-FS | SEAD67-PX-A2-SS-019-FS | SEAD67-PX-A2-SS-020-FS | SEAD67-PX-A2-SS-021-FS |
|---|---|---|---|---|---|---|---|
| **Depth (inches)** | | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" | 2"-6" |
| **Metals** | | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) | (mg/kg) |
| Aluminum | 19,200 | | | | | 9900 | |
| Antimony | 5.9 | | | | | 0.62 U | |
| Arsenic | 6.24 | 4.8 B | 5.4 | 6.2 | 5.2 B | 4.8 | 5.5 |
| Barium | 300 | | | | | 240 | |
| Beryllium | 1.1 | | | | | 0.67 B | |
| Cadmium | 2.3 | | | | | 0.54 U | |
| Calcium | 120,500 | | | | | 6020 | |
| Chromium | 29 | | | | | 15.4 | |
| Cobalt | 30 | | | | | 9 | |
| Copper | 29.6 | | | | | 20.8 | |
| Iron | 35,550 | | | | | 20100 | |
| Lead[2] | 400 | | | | | 56.9 | |
| Magnesium | 21,500 | | | | | 3370 | |
| Manganese | 1,056 | | | | | 775 | |
| **Mercury** | 0.1 | 0.098 B | 0.071 B | 0.093 B | 0.092 B | 0.16 | 0.1 B |
| Nickel | 48.9 | | | | | 22.5 | |
| Potassium | 2,343 | | | | | 1340 | |
| Selenium | 2 | | | | | 0.86 U | |
| Silver | 0.763 | | | | | 0.17 U | |
| Sodium | 170.3 | | | | | 29.7 B | |
| Thallium | 0.67 | | | | | 1.1 U | |
| Vanadium | 150 | | | | | 17.4 | |
| Zinc | 108.9 | 68.9 | 75 | 106 | 91.7 | 91.7 | 78.7 |
| | | | | | | | |
| **PAHs[3]** | | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) | (µg/kg) |
| 2-Methylnaphthalene | 36,400 | | | | | 78 U | |
| Acenaphthene | 50,000 | | | | | 42 U | |
| Acenaphthylene | 41,000 | | | | | 47 J | |
| Anthracene | 50,000 | | | | | 50 J | |
| Benzo(a)anthracene | 224 | | | | | 120 J | |
| Benzo(a)pyrene | 61 | | | | | 120 | |
| Benzo(b)fluoranthene | 1,100 | | | | | 120 J | |
| Benzo(ghi)perylene | 50,000 | | | | | 75 J | |
| Benzo(k)fluoranthene | 1,100 | | | | | 140 J | |
| Chrysene | 400 | | | | | 150 J | |
| Dibenzo(a,h)anthracene | 14 | | | | | 27 M | |
| Fluoranthene | 50,000 | | | | | 240 J | |
| Fluorene | 50,000 | | | | | 56 U | |
| Indeno(1,2,3-cd)pyrene | 3,200 | | | | | 73 J | |
| Naphthalene | 13,000 | | | | | 89 U | |
| Phenanthrene | 50,000 | | | | | 190 J | |
| Pyrene | 50,000 | | | | | 230 J | |
| Benzo(a)pyrene TEQ[4] | | | | | | 181 | |

## Maximum Confirmatory Sa[illegible]le Results for SEAD 67 Soil

Time Critical [illegible]emoval Action

SENECA Army Depot

| AREA 1 | | | Floor Samples | | | Perimeter Samples | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Cleanup Goal[1] | Total No. of Samples Analyzed | No. of Samples Analyzed | No. of Exceedences | Max Result | No. of Samples Analyzed | No. of Exceedences | Max Result |
| Metals (mg/kg) | | | | | | | | |
| Aluminum | 19,200 | 5 | 2 | 0 | 13,200 | 3 | 0 | 16,000 |
| Antimony | 5.9 | 5 | 2 | **1** | 13.6 U | 3 | 0 | 0.68 U |
| Arsenic | 8.24 | 23 | 8 | 0 | 5.8 | 15 | 0 | 7.1 |
| Barium | 300 | 5 | 2 | 0 | 71.8 | 3 | 0 | 99.5 |
| Beryllium | 1.1 | 5 | 2 | 0 | 0.69 J | 3 | **1** | 1.2 |
| Cadmium | 2.3 | 5 | 2 | **1** | 3.5 U | 3 | 0 | 0.6 U |
| Calcium | 120,500 | 5 | 2 | 0 | 3,080 | 3 | 0 | 3,440 |
| Chromium | 29 | 5 | 2 | 0 | 19.8 | 3 | 0 | 25.6 |
| Cobalt | 30 | 5 | 2 | 0 | 11 | 3 | 0 | 15.7 |
| Copper | 29.6 | 5 | 2 | 0 | 19.5 | 3 | **1** | 36.6 |
| Iron | 35,550 | 5 | 2 | 0 | 24,500 | 3 | 0 | 35,300 |
| Lead[2] | 400 | 5 | 2 | 0 | 19.3 | 3 | 0 | 25.8 |
| Magnesium | 21,500 | 5 | 2 | 0 | 3,890 | 3 | 0 | 5,200 |
| Manganese | 1,056 | 5 | 2 | 0 | 445 | 3 | 0 | 959 |
| **Mercury** | 0.1 | 22 | 7 | 0 | 0.079 B | 15 | **3** | 0.32 |
| Nickel | 48.9 | 5 | 2 | 0 | 26.3 | 3 | 0 | 41.9 |
| Potassium | 2,343 | 5 | 2 | 0 | 1250 | 3 | 0 | 1,290 |
| Selenium | 2 | 5 | 2 | **1** | 18.6 U | 3 | 0 | 1.0 B |
| Silver | 0.763 | 5 | 2 | 0 | 0.41 J | 3 | 0 | 0.19 U |
| Sodium | 170.3 | 5 | 2 | 0 | 82.8 J | 3 | 0 | 58.0 |
| Thallium | 0.67 | 5 | 2 | **2** | 25.5 U | 3 | **3** | 1.2 U |
| Vanadium | 150 | 5 | 2 | 0 | 20.1 | 3 | 0 | 24.9 |
| Zinc | 108.9 | 23 | 8 | 0 | 72.8 | 15 | 0 | 85.1 |
| PAHs (ug/Kg) | | | | | | | | |
| 2-Methylnaphthalene | 36,400 | 5 | 2 | 0 | 420 U | 3 | 0 | 160 |
| Acenaphthene | 50,000 | 5 | 2 | 0 | 420 U | 3 | 0 | 90 U |
| Acenaphthylene | 41,000 | 5 | 2 | 0 | 27 U | 3 | 0 | 380 J |
| Anthracene | 50,000 | 5 | 2 | 0 | 40 J | 3 | 0 | 500 J |
| Benzo(a)anthracene | 224 | 5 | 2 | 0 | 160 J | 3 | **2** | 1,100 J |
| Benzo(a)pyrene | 61 | 4 | 1 | 0 | 53 | 3 | **3** | 1,100 J |
| Benzo(b)fluoranthene | 1,100 | 5 | 2 | 0 | 130 U | 3 | 0 | 910 |
| Benzo(g,h,i)perylene | 50,000 | 4 | 1 | 0 | 30 J | 3 | 0 | 630 J |
| Benzo(k)fluoranthene | 1,100 | 5 | 2 | 0 | 160 J | 3 | **1** | 1,300 J |
| Chrysene | 400 | 5 | 2 | 0 | 190 J | 3 | **2** | 1,400 J |
| Dibenzo(a,h)anthracene | 14 | 5 | 2 | **1** | 37 J | 3 | **3** | 220 J |
| Fluoranthene | 50,000 | 5 | 2 | 0 | 340 J | 3 | 0 | 2,700 |
| Fluorene | 50,000 | 5 | 2 | 0 | 420 U | 3 | 0 | 190 |
| Indeno(1,2,3-cd)pyrene | 3,200 | 5 | 2 | 0 | 97 J | 3 | 0 | 620 J |
| Naphthalene | 13,000 | 5 | 2 | 0 | 420 U | 3 | 0 | 180 J |
| Phenanthrene | 50,000 | 5 | 2 | 0 | 260 J | 3 | 0 | 2,200 U |
| Pyrene | 50,000 | 5 | 2 | 0 | 400 J | 3 | 0 | 2,300 |

## Maximum Confirmatory Sa[illegible]le Results for SEAD 67 Soil

Time Critical Removal Action

SENECA Army Depot

| AREA 2 | | | Floor Samples | | | Perimeter Samples | | |
|---|---|---|---|---|---|---|---|---|
| Compound | Cleanup Goal1 | Total No. of Samples Collected | No. of Samples Collected | No. of Exceedences | Max Result | No. of Samples Collected | No. of Exceedences | Max Result |
| **Metals (mg/Kg)** | | | | | | | | |
| Aluminum | 19,200 | 16 | 12 | 0 | 13,800 | 4 | 0 | 11,700 |
| Antimony | 5.9 | 16 | 12 | **6** | 17.2 U | 4 | 0 | 0.7 U |
| Arsenic | 8.2 | 53 | 32 | **1** | 8.7 J | 21 | 0 | 6.2 |
| Barium | 300 | 16 | 12 | 0 | 146 | 4 | 0 | 240 |
| Beryllium | 1.1 | 16 | 12 | **1** | 2.90 U | 4 | 0 | 0.8 B |
| Cadmium | 2.3 | 16 | 12 | **6** | 4.4 U | 4 | 0 | 0.6 U |
| Calcium | 120,500 | 16 | 12 | 0 | 11,000 | 4 | 0 | 6,020 |
| Chromium | 29 | 16 | 12 | 0 | 24 | 4 | 0 | 17 |
| Cobalt | 30 | 16 | 12 | 0 | 12.9 | 4 | 0 | 9.0 |
| Copper | 30 | 16 | 12 | **3** | 78.8 | 4 | 0 | 25.1 |
| Iron | 35,550 | 16 | 12 | 0 | 32,800 | 4 | 0 | 21,100 |
| Lead[2] | 400 | 16 | 12 | 0 | 36.2 | 4 | 0 | 56.9 |
| Magnesium | 21,500 | 16 | 12 | 0 | 6,540 | 4 | 0 | 3,410 |
| Manganese | 1,056 | 16 | 12 | 0 | 928 | 4 | 0 | 775 |
| Mercury | 0.1 | 51 | 30 | **1** | 0.12 | 21 | **4** | 0.16 |
| Nickel | 48.9 | 16 | 12 | 0 | 35.9 | 4 | 0 | 22.5 |
| Potassium | 2,343 | 16 | 12 | 0 | 2,330 | 4 | 0 | 1,340 |
| Selenium | 2 | 16 | 12 | **7** | 23.6 U | 4 | 0 | 1.0 B |
| Silver | 0.763 | 16 | 12 | **7** | 4.7 | 4 | 0 | 0.2 U |
| Sodium | 170.3 | 16 | 12 | 0 | 99.1 J | 4 | 0 | 45.3 B |
| Thallium | 0.67 | 16 | 12 | **12** | 32.4 U | 4 | **4** | 1.2 U |
| Vanadium | 150 | 16 | 12 | 0 | 23.7 | 4 | 0 | 20 |
| Zinc | 108.9 | 53 | 32 | **2** | 127 | 21 | 0 | 106 |
| **PAHs (ug/Kg)** | | | | | | | | |
| 2-Methylnaphthalene | 36,400 | 16 | 12 | 0 | 500 | 4 | 0 | 85 |
| Acenaphthene | 50,000 | 16 | 12 | 0 | 500 U | 4 | 0 | 46 U |
| Acenaphthylene | 41,000 | 16 | 12 | 0 | 500 U | 4 | 0 | 47 U |
| Anthracene | 50,000 | 16 | 12 | 0 | 500 U | 4 | 0 | 50 J |
| Benzo(a)anthracene | 224 | 15 | 11 | 0 | 200 U | 4 | 0 | 120 J |
| Benzo(a)pyrene | 61 | 11 | 7 | **1** | 87 J | 4 | **3** | 120 J |
| Benzo(b)fluoranthene | 1,100 | 16 | 12 | 0 | 500 | 4 | 0 | 120 |
| Benzo(g,h,i)perylene | 50,000 | 16 | 12 | 0 | 500 U | 4 | 0 | 75 J |
| Benzo(k)fluoranthene | 1,100 | 16 | 12 | 0 | 500 U | 4 | 0 | 140 J |
| Chrysene | 400 | 15 | 11 | 0 | 230 U | 4 | 0 | 150 J |
| Dibenzo(a,h)anthracene | 14 | 9 | 5 | **1** | 23 J | 4 | **2** | 27 J |
| Fluoranthene | 50,000 | 16 | 12 | 0 | 890 UM | 4 | 0 | 240 M |
| Fluorene | 50,000 | 16 | 12 | 0 | 500 | 4 | 0 | 61 J |
| Indeno(1,2,3-cd)pyrene | 3,200 | 16 | 12 | 0 | 500 U | 4 | 0 | 73 U |
| Naphthalene | 13,000 | 16 | 12 | 0 | 500 U | 4 | 0 | 97 J |
| Phenanthrene | 50,000 | 16 | 12 | 0 | 720 U | 4 | 0 | 190 U |
| Pyrene | 50,000 | 16 | 12 | 0 | 1,300 | 4 | 0 | 230 J |

## Maximum Confirmatory Sa[illegible]e Results for SEAD 67 Soil

Time Critical [illegible]moval Action

SENECA Army Depot

**Table Notes:**

1. The Cleanup goal is based on the New York Technical Administrative Cuidance Memorandum (TACM) No. 4046 Recommended Soil Cleanup Objectives. Values denoted as Site Background ("SB") in TACM were compared with the highlighted values (95th percentile of Seneca Army Depot (SEDA) in lieu of the TACM "SB" since no background cleanup objectives exist for certain parameters.

2. U.S. Environmental Protection Agency Risk Based Residential Cleanup Coal for lead

3. Where exceedances for individual PAHs exist, evaluation of the Benzo(a)pyrene Toxicity Equivalent for total carcinogenic PAHs (cPAHs) would not exceed the 10,000 µg/kg limit for total cPAHs for any The cPAHs include: benzo(a)pyrene; dibenzo(a,h)anthracene; benzo(a,h)anthracene; indeno(1,2,3-cd)pyrene; benzo(k)fluouranthene; and chrysene.

95th percentile of SEDA Site Background

Result Exceeds Cleanup Criteria

**mg/kg=** milligram per kilogram

**µg/kg=** microgram per kilogram

**J=** Result is less than the reporting limit (RL), but greater than or equal to the MDL.

**U=** Analyte was not detected at or above the RL.

**M=** Manually integrated compound.

**Average Confirmatory Sample Results for SEAD 67 Soil**
Time Critical Removal Action
SENECA Army Depot

| Compound | Cleanup Goal[1] | Area 1 Floor | Area 1 Perimeter | Area 1 All | Area 2 Floor | Area 2 Perimeter | Area 2 All |
|---|---|---|---|---|---|---|---|
| **Metals (mg/kg)** | | | | | | | |
| Aluminum | 19,200 | 12,650 | 13,007 | 12,864 | 12,650 | 10,455 | 12,101 |
| Antimony | 5.9 | 7.1 | 0.6 | 3.2 | 8.2 | 0.7 | 6.3 |
| Arsenic | 8.24 | 5.09 | 4.77 | 4.88 | 5.46 | 4.77 | 5.18 |
| Barium | 300 | 63 | 82 | 74 | 114 | 149 | 123 |
| Beryllium | 1.1 | 0.7 | 0.8 | 0.8 | 1.0 | 0.7 | 0.9 |
| Cadmium | 2.3 | 2.0 | 0.5 | 1.1 | 2.3 | 0.6 | 1.9 |
| Calcium | 120,500 | 2,425 | 2,920 | 2,722 | 5,263 | 4,915 | 5,176 |
| Chromium | 29 | 19 | 20 | 19 | 20 | 15 | 19 |
| Cobalt | 30 | 11 | 11 | 11 | 11 | 8 | 10 |
| Copper | 29.6 | 17.7 | 24 | 21.6 | 31.0 | 20 | 28.3 |
| Iron | 35,550 | 24,300 | 25,633 | 25,100 | 25,833 | 19,300 | 24,200 |
| Lead[2] | 400 | 15 | 23 | 20 | 20 | 32 | 23 |
| Magnesium | 21,500 | 3,850 | 3,920 | 3,892 | 4,479 | 3,120 | 4,139 |
| Manganese | 1,056 | 442 | 572 | 520 | 581 | 560 | 575 |
| Mercury | 0.1 | 0.05 | 0.10 | 0.08 | 0.06 | 0.10 | 0.08 |
| Nickel | 48.9 | 26.2 | 28.2 | 27.4 | 29.8 | 20.0 | 27.3 |
| Potassium | 2,343 | 950 | 1,030 | 998 | 1,325 | 949 | 1,231 |
| Selenium | 2 | 10 | 1 | 4 | 11 | 1 | 9 |
| Silver | 0.763 | 0.285 | 0.170 | 0.216 | 2.288 | 0.183 | 1.761 |
| Sodium | 170.3 | 69.6 | 45 | 54.7 | 60.9 | 34 | 54.3 |
| Thallium | 0.67 | 13.24 | 1.1 | 5.9 | 15.4 | 1.2 | 11.8 |
| Vanadium | 150 | 19 | 21 | 20 | 21 | 18 | 20 |
| Zinc | 108.9 | 63.8 | 62.4 | 62.9 | 72.2 | 74.4 | 73.1 |
| **PAHs (µg/kg)** | | | | | | | |
| 2-Methylnaphthalene | 36,400 | 227 | 92 | 146 | 249 | 62 | 202 |
| Acenaphthene | 50,000 | 219 | 51 | 118 | 168 | 33 | 135 |
| Acenaphthylene | 41,000 | 20 | 181 | 116 | 171 | 28 | 135 |
| Anthracene | 50,000 | 31 | 249 | 161 | 108 | 32 | 89 |
| Benzo(a)anthracene | 224 | 109 | 550 | 373 | 72 | 67 | 71 |
| Benzo(a)pyrene | 61 | 53 | 543 | 421 | 28 | 70 | 43 |
| Benzo(b)fluoranthene | 1,100 | 89 | 490 | 329 | 170 | 88 | 150 |
| Benzo(ghi)perylene | 50,000 | 30 | 323 | 250 | 121 | 48 | 103 |
| Benzo(k)fluoranthene | 1,100 | 106 | 623 | 416 | 190 | 98 | 167 |
| Chrysene | 400 | 125 | 690 | 464 | 84 | 86 | 84 |
| Dibenzo(a,h)anthracene | 14 | 24 | 112 | 77 | 13 | 19 | 15 |
| Fluoranthene | 50,000 | 225 | 1,350 | 900 | 189 | 143 | 177 |
| Fluorene | 50,000 | 222 | 91 | 144 | 176 | 44 | 143 |
| Indeno(1,2,3-cd)pyrene | 3,200 | 63 | 313 | 213 | 125 | 47 | 106 |
| Naphthalene | 13,000 | 230 | 104 | 154 | 252 | 70 | 207 |
| Phenanthrene | 50,000 | 174 | 1,093 | 725 | 147 | 111 | 138 |
| Pyrene | 50,000 | 255 | 1,140 | 786 | 245 | 136 | 218 |
| Benzo(a)pyrene TEQ[3] | 10,000 | 105.3 | 804 | 598 | 60.4 | 111 | 73 |

**Notes:**

**1.** The Cleanup goal is based on the New York Technical Administrative Guidance Memorandum (TAGM) No. 4046 Recommended Soil Cleanup Objectives.
Values denoted as Site Background ("SB") in TAGM 4046 were compared with the highlighted values (95th percentile of Seneca Army Depot (SEDA) Site Background) in lieu of the TAGM "SB" since no background cleanup objectives exist

**2.** U.S. Environmental Protective Agency Risk Based Residential Cleanup Goal for lead

**3.** Benzo(a)pyrene TEQ for carcinogenic PAHs is calculated by multiplying the individual cPAH results by the applicable factor from the list below, and then summing the results:

| | | |
|---|---|---|
| Benzo(a)pyrene = 1.0 | Benzo(b)fluoranthene = 0.1 | Chrysene = 0.01 |
| Dibenzo(a,h)anthracene = 1.0 | Indeno(1,2,3-cd)pyrene = 0.1 | |
| Benzo(a)anthracene = 0.1 | Benzo(k)fluoranthene = 0.01 | |

95th percentile of SEDA Site Background

Result Exceeds Cleanup Criteria

**mg/kg** = milligrams per kilogram
**µg/kg** = micrograms per kilogram

**Waste Characterization Data**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Parameter | Regulatory Limits | Units | SEAD67-SP-SS-001-FS | SEAD-67-SP-SS-002-FS | SEAD-67-SP-SS-003-FS |
|---|---|---|---|---|---|
| **Inorganics** | | | | | |
| Corrosivity (pH Solid) | | yes/no | no | no | no |
| Ignitability | | Pos/Neg | Neg | Neg | Neg |
| pH | 2 to 2.5 | pH Units | 7.95 | 7.05 | 7.49 |
| Reactivity, Cyanide | 250000 | µg/kg | 500 u | 500 u | 500 u |
| Reactivity, Sulfide | 500000 | mg/kg | 20 u | 20 u | 20 u |
| % Moisture | | % | 22.9 | 23 | 26.6 |
| % Solids | >20 | % | 77.1 | 77 | 73.4 |
| | | | | | |
| **Metals** | | | | | |
| Aluminum | | mg/L | 0.5 u | 0.343 j | 0.315 j |
| Antimony | | mg/L | 0.02 u | 0.1 u | 0.1 u |
| Arsenic | 5 | mg/L | 0.04 u | 0.2 u | 0.2 u |
| Barium | 100 | mg/L | 0.117 | 0.17 | 0.534 |
| Beryllium | | mg/L | 0.005 u | 0.025 u | 0.025 u |
| Cadmium | 1 | mg/L | 0.01 u | 0.05 u | 0.05 u |
| Calcium | | mg/L | 147 b | 46.8 | 196 |
| Chromium | 5 | mg/L | 0.01 u | 0.05 u | 0.05 u |
| Cobalt | | mg/L | 0.01 u | 0.05 u | 0.05 u |
| Copper | | mg/L | 0.0024 j | 0.05 u | 0.0196 j |
| Iron | | mg/L | 0.2 u | 1 u | 1 u |
| Lead | 5 | mg/L | 0.01 u | 0.05 u | 0.05 u |
| Magnesium | | mg/L | 4.54 b | 6.17 | 46.9 |
| Manganese | | mg/L | 0.0233 | 0.796 | 1.77 |
| Mercury | 0.2 | mg/L | 10 u | 10 u | 10 u |
| Nickel | | mg/L | 0.01 u | 0.05 u | 0.0122 j |
| Potassium | | mg/L | 1.83 b | 5.9 | 3.39 |
| Selenium | 1 | mg/L | 0.03 u | 0.15 u | 0.15 u |
| Silver | 5 | mg/L | 0.006 u | 0.03 u | 0.03 u |
| Sodium | | mg/L | 137 b | 740 | 784 |
| Thallium | | mg/L | 0.04 u | 0.2 u | 0.2 u |
| Vanadium | | mg/L | 0.006 u | 0.03 u | 0.03 u |
| Zinc | | mg/L | 0.05 u | 0.25 u | 0.144 j |
| | | | | | |
| **PCBs** | | | | | |
| Aroclor 1016 | | µg/kg | 22 u | 22 u | 23 u |
| Aroclor 1221 | | µg/kg | 43 u | 42 u | 45 u |
| Aroclor 1232 | | µg/kg | 22 u | 22 u | 23 u |
| Aroclor 1242 | | µg/kg | 22 u | 22 u | 23 u |
| Aroclor 1248 | | µg/kg | 22 u | 22 u | 23 u |
| Aroclor 1254 | | µg/kg | 22 u | 22 u | 23 u |
| Aroclor 1260 | | µg/kg | 22 u | 22 u | 17 j |
| Total | 1000 | µg/kg | 66 | 66 | 63 |
| | | | | | |
| **Pesticides** | | | | | |
| 4,4'-DDD | | µg/kg | 4.3 u | 8.3 ud | 9 d |
| 4,4'-DDE | | µg/kg | 13 | 13 d | 5.3 jd |

**Waste Characterization Data**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Parameter | Regulatory Limits | Units | SEAD67-SP-SS-001-FS | SEAD-67-SP-SS-002-FS | SEAD-67-SP-SS-003-FS |
|---|---|---|---|---|---|
| 4,4'-DDT | | µg/kg | 14 | 1.2 jd | 9.2 d |
| Aldrin | | µg/kg | 2.6 u | 5.1 ud | 5.4 ud |
| alpha-BHC | | µg/kg | 2.2 u | 4.3 ud | 4.6 ud |
| alpha-Chlordane | | µg/kg | 2.2 u | 4.3 ud | 13 d |
| beta-BHC | | µg/kg | 2.2 u | 4.3 ud | 4.6 ud |
| delta-BHC | | µg/kg | 0.98 j | 1.5 jd | 0.94 jd |
| Dieldrin | | µg/kg | 4.3 u | 8.3 ud | 8.9 ud |
| Endosulfan I | | µg/kg | 2.2 u | 4.3 ud | 5 d |
| Endosulfan II | | µg/kg | 4.3 u | 8.3 ud | 8.9 ud |
| Endosulfan sulfate | | µg/kg | 4.3 u | 8.3 ud | 8.9 ud |
| Endrin | 400 | µg/kg | 6.4 u | 13 ud | 14 ud |
| Endrin aldehyde | | µg/kg | 4.3 u | 8.3 ud | 8.9 ud |
| Endrin ketone | | µg/kg | 4.3 u | 8.3 ud | 8.9 ud |
| gamma-BHC (Lindane) | 8000 | µg/kg | 2.2 u | 1.9 jd | 1.2 jd |
| gamma-Chlordane | 600 | µg/kg | 2.2 u | 4.3 ud | 7.5 d |
| Heptachlor | 160 | µg/kg | 2.2 u | 2.2 jd | 4.6 ud |
| Heptachlor epoxide | | µg/kg | 2.2 u | 2.1 jd | 4.6 ud |
| Methoxychlor | 200000 | µg/kg | 22 u | 43 ud | 46 ud |
| Toxaphene | 10000 | µg/kg | 110 u | 210 ud | 220 ud |
| | | | | | |
| **SVOCs** | | | | | |
| 1,2,4-Trichlorobenzene | | µg/kg | 420 u | 820 u | 900 u |
| 1,2-Dichlorobenzene | | µg/kg | 420 u | 820 u | 900 u |
| 1,3-Dichlorobenzene | | µg/kg | 420 u | 820 u | 900 u |
| 1,4-Dichlorobenzene | 150000 | µg/kg | 420 u | 820 u | 900 u |
| 2,2-oxybis (1-chloropropane) | | µg/kg | 420 u | 820 u | 900 u |
| 2,4,5-Trichlorophenol | 8000000 | µg/kg | 2000 u | 4000 u | 4400 u |
| 2,4,6-Trichlorophenol | 40000 | µg/kg | 420 u | 820 u | 900 u |
| 2,4-Dichlorophenol | | µg/kg | 420 u | 820 u | 900 u |
| 2,4-Dimethylphenol | | µg/kg | 420 u | 820 u | 900 u |
| 2,4-Dinitrophenol | | µg/kg | 2000 u | 4000 u | 4400 u |
| 2,4-Dinitrotoluene | 2600 | µg/kg | 420 u | 820 u | 900 u |
| 2,6-Dinitrotoluene | | µg/kg | 420 u | 820 u | 900 u |
| 2-Chloronaphthalene | | µg/kg | 420 u | 820 u | 900 u |
| 2-Chlorophenol | | µg/kg | 420 u | 820 u | 900 u |
| 2-Methylnaphthalene | | µg/kg | 420 u | 820 u | 900 u |
| 2-Methylphenol | 4000000 | µg/kg | 420 u | 820 u | 900 u |
| 2-Nitroaniline | | µg/kg | 2000 u | 4000 u | 4400 u |
| 2-Nitrophenol | | µg/kg | 420 u | 820 u | 900 u |
| 3,3-Dichlorobenzidine | | µg/kg | 840 u | 1600 u | 1800 u |
| 3-Nitroaniline | | µg/kg | 2000 u | 4000 u | 4400 u |
| 4,6-Dinitro-2-methylphenol | | µg/kg | 2000 u | 4000 u | 4400 u |
| 4-Bromophenyl-phenylether | | µg/kg | 420 u | 820 u | 900 u |
| 4-Chloro-3-methylphenol | | µg/kg | 420 u | 820 u | 900 u |
| 4-Chloroaniline | | µg/kg | 420 u | 820 u | 900 u |
| 4-Chlorophenyl-phenylether | | µg/kg | 420 u | 820 u | 900 u |
| 4-Methylphenol | 4000000 | µg/kg | 420 u | 820 u | 900 u |
| 4-Nitroaniline | | µg/kg | 840 u | 1600 u | 1800 u |

**Waste Characterization Data**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Parameter | Regulatory Limits | Units | SEAD67-SP-SS-001-FS | SEAD-67-SP-SS-002-FS | SEAD-67-SP-SS-003-FS |
|---|---|---|---|---|---|
| 4-Nitrophenol | | µg/kg | 2000 u | 4000 u | 4400 u |
| Acenaphthene | | µg/kg | 420 u | 820 u | 900 u |
| Acenaphthylene | | µg/kg | 130 j | 92 j | 900 u |
| Aniline | | µg/kg | 420 u | 820 u | 900 u |
| Anthracene | | µg/kg | 95 j | 130 j | 38 j |
| Benz(a)anthracene | | µg/kg | 280 j | 340 j | 130 j |
| Benzo(a)pyrene | | µg/kg | 300 j | 320 j | 140 j |
| Benzo(b)fluoranthene | | µg/kg | 260 j | 310 j | 140 j |
| Benzo(g,h,i)perylene | | µg/kg | 310 j | 180 j | 97 j |
| Benzo(k)fluoranthene | | µg/kg | 330 j | 370 j | 160 j |
| Benzoic acid | | µg/kg | 2000 u | 4000 u | 4400 u |
| Benzyl alcohol | | µg/kg | 420 u | 820 u | 900 u |
| Bis(2-chloroethoxy)methane | | µg/kg | 420 u | 820 u | 900 u |
| Bis(2-chloroethyl)ether | | µg/kg | 420 u | 820 u | 900 u |
| Bis(2-ethylhexyl)phthalate | | µg/kg | 96 j | 820 ub | 170 jb |
| Butyl benzyl phthalate | | µg/kg | 420 u | 820 u | 900 u |
| Chrysene | | µg/kg | 340 j | 440 j | 190 j |
| Dibenz(a,h)anthracene | | µg/kg | 130 j | 100 j | 900 u |
| Dibenzofuran | | µg/kg | 420 u | 820 u | 900 u |
| Diethyl phthalate | | µg/kg | 420 u | 820 u | 900 u |
| Dimethyl phthalate | | µg/kg | 420 u | 820 u | 900 u |
| Di-n-butyl phthalate | | µg/kg | 420 u | 820 ub | 900 ub |
| Di-n-octyl phthalate | | µg/kg | 420 u | 820 u | 900 u |
| Fluoranthene | | µg/kg | 410 j | 900 | 310 j |
| Fluorene | | µg/kg | 420 u | 68 j | 900 u |
| Hexachlorobenzene | 2600 | µg/kg | 420 u | 820 u | 900 u |
| Hexachlorobutadiene | 10000 | µg/kg | 420 u | 820 u | 900 u |
| Hexachlorocyclopentadiene | | µg/kg | 420 u | 820 u | 900 u |
| Hexachloroethane | 60000 | µg/kg | 420 u | 820 u | 900 u |
| Indeno(1,2,3-cd)pyrene | | µg/kg | 250 j | 190 j | 100 j |
| Isophorone | | µg/kg | 420 u | 820 u | 900 u |
| Naphthalene | | µg/kg | 420 u | 820 u | 900 u |
| Nitrobenzene | 40000 | µg/kg | 420 u | 820 u | 900 u |
| N-Nitroso-di-N-propylamine | | µg/kg | 420 u | 820 u | 900 u |
| n-Nitrosodiphenylamine | | µg/kg | 420 u | 820 u | 900 u |
| Pentachlorophenol | 2000000 | µg/kg | 2000 u | 4000 u | 4400 u |
| Phenanthrene | | µg/kg | 140 j | 640 j | 180 j |
| Phenol | | µg/kg | 420 u | 820 u | 900 u |
| Pyrene | | µg/kg | 460 | 740 j | 280 j |
| Pyridine | 100000 | µg/kg | 840 u | 1600 u | 1800 u |
| | | | | | |
| **VOCs** | | | | | |
| 1,1,1,2-Tetrachloroethane | | µg/kg | 260 u | 200 u | 250 u |
| 1,1,1-Trichloroethane | | µg/kg | 260 u | 200 u | 250 u |
| 1,1,2,2-Tetrachloroethane | | µg/kg | 260 u | 200 u | 250 u |
| 1,1,2-Trichloroethane | | µg/kg | 260 u | 200 u | 250 u |
| 1,1-Dichloroethane | | µg/kg | 260 u | 200 u | 250 u |
| 1,1-Dichloroethene | 14000 | µg/kg | 260 u | 200 u | 250 u |

**Waste Characterization Data**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Parameter | Regulatory Limits | Units | SEAD67-SP-SS-001-FS | SEAD-67-SP-SS-002-FS | SEAD-67-SP-SS-003-FS |
|---|---|---|---|---|---|
| 1,1-Dichloropropene | | µg/kg | 260 u | 200 u | 250 u |
| 1,2,3-Trichlorobenzene | | µg/kg | 260 u | 200 u | 250 u |
| 1,2,3-Trichloropropane | | µg/kg | 260 u | 200 u | 250 u |
| 1,2,4-Trichlorobenzene | | µg/kg | 420 u | 820 u | 900 u |
| 1,2,4-Trimethylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| 1,2-Dibromo-3-chloropropane | | µg/kg | 260 u | 200 u | 250 u |
| 1,2-Dibromoethane (EDB) | | µg/kg | 260 u | 200 u | 250 u |
| 1,2-Dichlorobenzene | | µg/kg | 260 u | 200 u | 250 u |
| 1,2-Dichloroethane | 10000 | µg/kg | 260 u | 200 u | 250 u |
| 1,2-Dichloroethene (total) | | µg/kg | 260 u | 200 u | 250 u |
| 1,2-Dichloropropane | | µg/kg | 260 u | 200 u | 250 u |
| 1,3,5-Trimethylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| 1,3-Dichlorobenzene | | µg/kg | 260 u | 200 u | 250 u |
| 1,3-Dichloropropane | | µg/kg | 260 u | 200 u | 250 u |
| 1,4-Dichlorobenzene | | µg/kg | 260 u | 200 u | 250 u |
| 2,2-Dichloropropane | | µg/kg | 260 u | 200 u | 250 u |
| Methyl Ethyl Ketone | 4000000 | µg/kg | 350 | 200 u | 250 u |
| 2-Chloro-1,3-butadiene (chloroprene) | | µg/kg | 260 u | 200 u | 250 u |
| 2-Chlorotoluene | | µg/kg | 260 u | 200 u | 250 u |
| 2-Hexanone | | µg/kg | 260 u | 200 u | 250 u |
| 3-Chloropropene (Allyl Chloride) | | µg/kg | 260 u | 200 u | 250 u |
| 4-Chlorotoluene | | µg/kg | 260 u | 200 u | 250 u |
| 4-Methyl-2-pentanone | | µg/kg | 260 u | 200 u | 250 u |
| Acetone | | µg/kg | 650 u | 500 u | 630 u |
| Benzene | 10000 | µg/kg | 260 u | 200 u | 250 u |
| Bromobenzene | | µg/kg | 260 u | 200 u | 250 u |
| Bromochloromethane | | µg/kg | 260 u | 200 u | 250 u |
| Bromodichloromethane | | µg/kg | 260 u | 200 u | 250 u |
| Bromoform | | µg/kg | 260 u | 200 u | 250 u |
| Bromomethane | | µg/kg | 260 u | 200 u | 250 u |
| Carbon disulfide | | µg/kg | 260 u | 200 u | 250 u |
| Carbon tetrachloride | 10000 | µg/kg | 260 u | 200 u | 250 u |
| Chlorobenzene | 2000000 | µg/kg | 41 j | 200 u | 250 u |
| Chloroethane | | µg/kg | 260 u | 200 u | 250 u |
| Chloroform | 120000 | µg/kg | 260 u | 200 u | 250 u |
| Chloromethane | | µg/kg | 260 u | 200 u | 250 u |
| cis-1,2-Dichloroethene | | µg/kg | 260 u | 200 u | 250 u |
| cis-1,3-Dichloropropene | | µg/kg | 260 u | 200 u | 250 u |
| Dibromochloromethane | | µg/kg | 260 u | 200 u | 250 u |
| Dibromomethane | | µg/kg | 260 u | 200 u | 250 u |
| Dichlorodifluoromethane | | µg/kg | 260 u | 200 u | 250 u |
| Ethylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| Ethylmethacrylate | | µg/kg | 260 u | 200 u | 250 u |
| Isopropylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| m&p-Xylenes | | µg/kg | 260 u | 200 u | 250 u |
| Methylene chloride | | µg/kg | 65 j | 200 u | 250 u |
| Methylmethacrylate | | µg/kg | 260 u | 200 u | 250 u |
| Methyl-tert-butyl-ether (MTBE) | | µg/kg | 260 u | 200 u | 250 u |

**Waste Characterization Data**
SEAD 67 Time Critical Removal Action
Seneca Army Depot

| Parameter | Regulatory Limits | Units | SEAD67-SP-SS-001-FS | SEAD-67-SP-SS-002-FS | SEAD-67-SP-SS-003-FS |
|---|---|---|---|---|---|
| Naphthalene | | µg/kg | 420 u | 820 u | 900 u |
| n-Butylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| n-Propylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| o-Xylene | | µg/kg | 260 u | 200 u | 250 u |
| p-Isopropyltoluene | | µg/kg | 260 u | 200 u | 250 u |
| sec-Butylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| Styrene | | µg/kg | 260 u | 200 u | 250 u |
| tert-Butylbenzene | | µg/kg | 260 u | 200 u | 250 u |
| Tetrachloroethene | 14000 | µg/kg | 260 u | 200 u | 250 u |
| Tetrahydrofuran | | µg/kg | 260 u | 200 u | 250 u |
| Toluene | | µg/kg | 260 u | 200 u | 250 u |
| trans-1,2-Dichloroethylene | | µg/kg | 260 u | 200 u | 250 u |
| trans-1,3-Dichloropropene | | µg/kg | 260 u | 200 u | 250 u |
| trans-1,4-Dichloro-2-butene | | µg/kg | 260 u | 200 u | 250 u |
| Trichloroethene | 10000 | µg/kg | 260 u | 200 u | 250 u |
| Trichlorofluoromethane | | µg/kg | 260 u | 200 u | 250 u |
| Trichlorotrifluoroethane | | µg/kg | 260 u | 200 u | 250 u |
| VinylAcetate | | µg/kg | 260 u | 200 u | 250 u |
| VinylChloride | 4000 | µg/kg | 260 u | 200 u | 250 u |

**Notes:**
**mg/kg**= milligram per kilogram
**µg/kg**= microgram per kilogram

**SVOCs** = semi-volatile organic compounds
**VOCs** = volatile organic compounds
**PCBs** = polychlorinated bi-phenyls

**B**= Result is less than the CRDL/Reporting Limit (RL), but >/= to the Instrument Detection Limit/method
**J**= Result is less than the RL, but greater than or equal to the MDL.
**U**= Analyte was not detected at or above the RL.
**D** = Surrogate ormatrix spike recoveries not obtained because extract was diluted for ˜analysis

**Soil Disposal Summary**
SEAD 67
Time Critical Removal Action
SENECA Army Depot

| DATE | DESTINATION | SITE LOCATION | HAULER COMPANY NAME | TRUCK ID# | LANDFILL TARE WEIGHT (LBS) | LANDFILL SCALE (LBS) | LOAD (TONS) | MANIFEST NO. |
|---|---|---|---|---|---|---|---|---|
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 71 | 63000 | 35100 | 17.55 | 945 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 97 | 66400 | 38540 | 19.27 | 946 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 81 | 70440 | 42320 | 21.16 | 947 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 86 | 63620 | 35780 | 18.79 | 948 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 74 | 66520 | 38880 | 19.44 | 949 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1177 | 64420 | 36320 | 18.16 | 950 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 2477 | 63020 | 34860 | 17.43 | 951 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1477 | 64240 | 39840 | 19.92 | 952 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1077 | 62240 | 35940 | 17.97 | 953 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 377 | 66620 | 38720 | 19.36 | 955 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 71 | 55820 | 30860 | 15.43 | 954 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 97 | 66760 | 38900 | 19.45 | 956 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 86 | 66560 | 38720 | 19.36 | 957 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 81 | 68240 | 40100 | 20.05 | 958 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 74 | 67300 | 39660 | 19.83 | 959 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1177 | 64520 | 36420 | 18.21 | 960 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 2477 | 63620 | 35460 | 17.73 | 961 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1477 | 63820 | 39420 | 19.71 | 962 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1077 | 62970 | 36640 | 18.32 | 963 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 377 | 50980 | 26020 | 13.01 | 964 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 71 | 68380 | 40480 | 20.24 | 965 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 97 | 67540 | 39680 | 19.84 | 966 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 86 | 62080 | 34240 | 17.12 | 967 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 81 | 70340 | 42200 | 21.1 | 968 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 74 | 66100 | 38460 | 19.23 | 969 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1177 | 63960 | 35860 | 17.93 | 970 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 2477 | 65860 | 37700 | 18.85 | 971 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1477 | 65080 | 40680 | 20.34 | 972 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1077 | 64740 | 38440 | 19.22 | 973 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 377 | 59060 | 34100 | 17.05 | 974 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 71 | 72420 | 44520 | 22.26 | 975 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 97 | 67360 | 39500 | 19.75 | 976 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 86 | 70940 | 43100 | 21.55 | 977 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 74 | 71400 | 43760 | 21.88 | 978 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1177 | 72080 | 43980 | 21.99 | 979 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 81 | 73320 | 45180 | 22.59 | 980 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 2477 | RETURNED | LOAD | FLAT | TIRE |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1477 | 71760 | 47360 | 23.68 | 982 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 1077 | 66980 | 40680 | 20.34 | 983 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | 377 | 53060 | 28100 | 14.05 | 984 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 71 | 67280 | 39380 | 19.69 | 985 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 97 | 64800 | 36940 | 18.47 | 986 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 86 | 66300 | 38460 | 19.23 | 987 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 74 | 70480 | 42840 | 21.42 | 988 |
| 7/16/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli | 81 | 71200 | 43060 | 21.53 | 989 |
| 7/17/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | | 70620 | 42460 | 21.23 | 992 |
| 7/17/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | | 66640 | 42240 | 21.12 | 993 |
| 7/17/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | | 65120 | 37020 | 18.51 | 994 |
| 7/17/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | | 52740 | 27780 | 13.89 | 995 |
| 7/17/03 | Seneca Meadows Landfill | SEAD 67 | Seneca Pipe and Paving | | 62620 | 36320 | 18.16 | 996 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 71 | 69360 | 41460 | 20.73 | 997 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 74 | 65680 | 38040 | 19.02 | 998 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 97 | 65360 | 37500 | 18.75 | 999 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 95 | 68620 | 40700 | 20.38 | 1000 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 94 | 71080 | 43040 | 21.52 | 1001 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 86 | 68560 | 40720 | 20.36 | 1002 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 81 | 70300 | 42160 | 21.08 | 1003 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 71 | 71020 | 43120 | 21.56 | 1004 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 74 | 69080 | 41440 | 20.72 | 1005 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 97 | 67680 | 39800 | 19.9 | 1006 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 94 | 69760 | 41720 | 20.86 | 1007 |

* Per Load (Tons) column is based on the weights from the Seneca Meadows Landfill scale

**Soil Disposal Summary**
SEAD 67
Time Critical Removal Action
SENECA Army Depot

| DATE | DESTINATION | SITE LOCATION | HAULER COMPANY NAME | TRUCK ID# | LANDFILL TARE WEIGHT (LBS) | LANDFILL SCALE (LBS) | LOAD (TONS) | MANIFEST NO. |
|---|---|---|---|---|---|---|---|---|
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 81 | 70520 | 42680 | 21.19 | 1008 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 95 | 69720 | 41780 | 20.89 | 1009 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 86 | 67240 | 39400 | 19.7 | 1010 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 71 | 68460 | 40560 | 20.28 | 1011 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 74 | 67120 | 39480 | 19.74 | 1012 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 97 | 60200 | 32340 | 16.17 | 1013 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 94 | 66020 | 38580 | 19.29 | 1014 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 81 | 65820 | 37680 | 18.84 | 1015 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 95 | 68280 | 40340 | 20.17 | 1016 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 86 | 60460 | 32620 | 16.31 | 1017 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 71 | 63960 | 36060 | 18.03 | 1018 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 74 | 67200 | 39560 | 19.78 | 1019 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 97 | 64400 | 36540 | 18.27 | 1020 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 81 | 58980 | 30840 | 15.42 | 1021 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 86 | 71700 | 43860 | 21.93 | 1022 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 95 | 69620 | 41680 | 20.84 | 1023 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 71 | 66820 | 38920 | 19.46 | 1024 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 74 | 67380 | 39740 | 19.87 | 1025 |
| 7/30/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 71 | 71960 | 44060 | 22.03 | 1026 |
| 7/31/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 97 | 67960 | 40100 | 20.05 | 1027 |
| 7/31/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 94 | 72240 | 44200 | 22.1 | 1028 |
| 7/31/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 95 | 65800 | 37860 | 18.93 | 1029 |
| 7/31/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 86 | 65200 | 37360 | 18.68 | 1030 |
| 7/31/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 81 | 61660 | 33520 | 16.76 | 1031 |
| 7/31/03 | Seneca Meadows Landfill | SEAD 67 | Riccelli Enterprises | 74 | 70820 | 43180 | 21.59 | 1032 |

| Total | 1,653.61 Tons |
|---|---|

* Per Load (Tons) column is based on the weights from the Seneca Meadows Landfill scale