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October 30, 2006

Mr. John S. Nohrstedt
U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville
Attn: CEHNC-FS-IS
4820 University Square
Huntsville, Alabama 35816-1822

Subject: **Submittal of Final Record of Decisions for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17); Contract DACA87-95-D-0031, Task Order 03 Seneca Army Depot Activity; File No. 1017A**

Dear Mr. Nohrstedt:

Parsons is pleased to submit signed paper and electronic copies of the Final Record of Decision (ROD) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at the Seneca Army Depot Activity (SEDA) located in Romulus, New York.

This work was performed in accordance with the Scope of Work (SOW) for Task Order 03 to Parsons Contract DACA87-95-D-0031. Parsons appreciates the opportunity to provide you with these documents. Should you have any questions, please do not hesitate to call me at (617) 449-1405 to discuss them.

Sincerely,

for

Todd Heino, P.E.
Program Manager

Enclosures

cc: Mr. S. Absolom, SEDA
Mr. R. Battaglia, CENAN
Mr. K. Hoddinott, USACHPPM (PROV)
Mr. C. Boes, USAEC

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October 30, 2006

Mr. Julio F. Vazquez, Project Manager
U.S. Environmental Protection Agency, Region II
Superfund Federal Facilities Section
290 Broadway, 18th Floor
New York, NY 10007-1866

Mr. Kuldeep K. Gupta, P.E.
NYSDEC
Division of Environmental Remediation
Remedial Bureau A, Section C
625 Broadway
Albany, NY 12233-7015

Mr. Mark Sergott
Bureau of Environmental Exposure Investigation, Room 300
New York State Department of Health
Flanigan Square, 547 River Street
Troy, New York 12180

Subject: **Submittal of Final Record of Decision for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17); Seneca Army Depot Activity; NYS ID#8-50-006; CERCLIS ID# NY0213820830**

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

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit signed paper and electronic copies of the Final Record of Decision (ROD) for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at the Seneca Army Depot Activity (SEDA) located in Romulus, New York.

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

Sincerely,

for

Todd Heino, P.E.
Program Manager

Enclosures

cc: Mr. J. Nohrstedt, CEHNC
Mr. S. Absolom, SEDA
Mr. K. Hoddinott, USACHPPM (PROV)
Mr. C. Boes, USAEC
Mr. R. Battaglia, CENAN
Mr. J. Fellinger, USEPA Contractor

US Army, Engineering & Support Center
Huntsville, AL

Seneca Army Depot Activity
Romulus, NY

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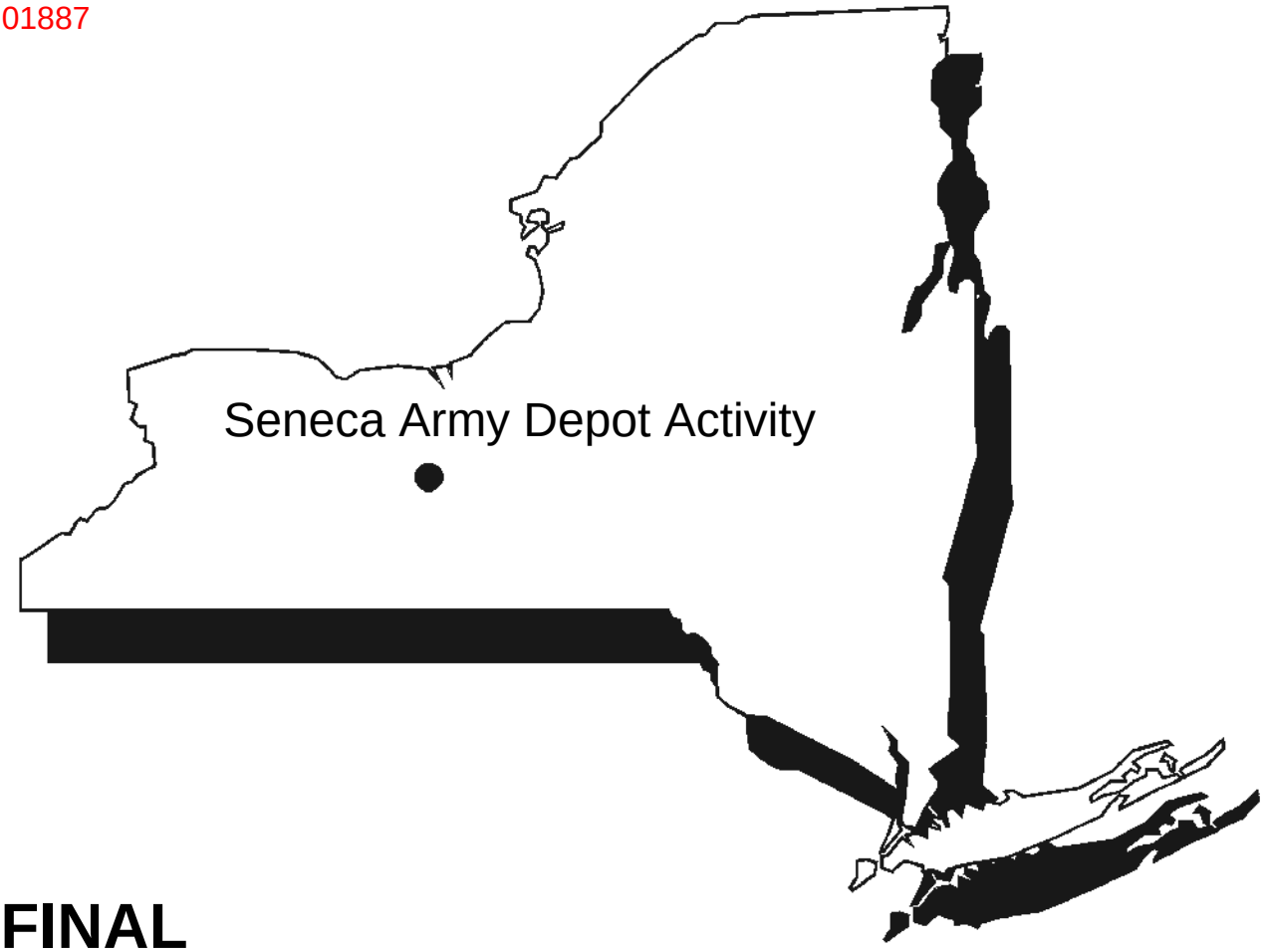

FINAL

RECORD OF DECISION (ROD)
THE ABANDONED DEACTIVATION FURNACE (SEAD-16) AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17)

SENECA ARMY DEPOT ACTIVITY

EPA Site ID# NY0213820830
NY Site ID# 8-50-006
CONTRACT NO. DACA87-95-D-0031
DELIVERY ORDER NO. 0003

March 2006

FINAL
RECORD OF DECISION

FOR

THE ABANDONED DEACTIVATION FURNACE (SEAD-16) AND

THE ACTIVE DEACTIVATION FURNACE (SEAD-17)

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared for:

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

and

UNITED STATES ARMY CORPS OF ENGINEERS
4820 UNIVERSITY SQUARE
HUNTSVILLE, ALABAMA

Prepared By:

PARSONS
150 Federal St.
4th Floor
Boston, Massachusetts

Contract Number: DACA87-95-D-0031 **March 2006**
Delivery Order 003
USEPA Site ID: NY0213820830; NY Site ID: 8-50-006

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ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
AWQS	Ambient Water Quality Standard
BCT	BRAC Closure Team
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
cy	Cubic yard or cubic yards (based on context)
DDESB	Department of Defense Explosive Safety Board
DoD	Department of Defense
DQO	Data Quality Objective
ECL	Environmental Conservation Law
EPC	Exposure Point Concentration
EQ	Ecological Quotient
ES	Engineering Science, Inc.
ESI	Expanded Site Investigation
FFA	Federal Facilities Agreement
FS	Feasibility Study
GA	NYSDEC ground water classification for a source that is suitable for drinking water
HI	Hazard Index
HQ	Hazard Quotient
IAG	Interagency Agreement
IC	Institutional Control
LDR	Land Disposal Restriction
LRA	Seneca Army Depot Local Redevelopment Authority
LTTD	Low Temperature Thermal Desorption
LUC	Land Use Control
MCL	Maximum Contaminant Level
mg	milligram
mg/L	milligrams per liter
mg/Kg	milligrams per kilogram
mL	milliliter
NA	Not Available
NCP	National Contingency Plan
NPL	National Priorities List
NYCRR	New York Code of Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation

ACRONYMS AND ABBREVIATIONS
(Continued)

NYSDOH	New York State Department of Health
O&M	Operations and Maintenance
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Planned Industrial/Office Development
ppb	part per billion or parts per billion (based on context)
ppm	part per million or parts per million (based on context)
PP	Proposed Plan
RAB	Restoration Advisory Board
RD/RA	Remedial Design / Remedial Action
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SEAD	Former acronym for the Seneca Army Depot used to designate SWMU numbers
SEDA	Seneca Army Depot Activity
SF	Slope Factor
SVOC(s)	Semivolatile Organic Compound(s)
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TBC	To be Considered
TCLP	Toxicity Characteristic Leaching Procedure
TRV	Toxicity reference value
TSDF	Treatment, Storage, and Disposal Facility
UCL	Upper Confidence Limit
µg/L	micrograms per liter
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC(s)	Volatile Organic Compound(s)

1.0 DECLARATION OF THE RECORD OF DECISION

Site Name and Location

The Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17)
Seneca Army Depot Activity
CERCLIS ID# NY0213820830
Romulus, Seneca County, New York

Statement of Basis and Purpose

This decision document presents the U.S. Army's (Army's) and the U.S. Environmental Protection Agency's (USEPA's) selected remedy for SEAD-16 and SEAD-17, located at the Seneca Army Depot Activity (SEDA or the Depot) near Romulus, New York. The decision was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended, 42 U.S.C. §9601 et seq., and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300. The Base Realignment and Closure (BRAC) Environmental Coordinator, the Director of the National Capital Region Field Office, and the USEPA Region II have been delegated the authority to approve this Record of Decision (ROD). The New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH) have concurred with the selected remedy.

This ROD is based on the Administrative Record that has been developed in accordance with Section 113(k) of CERCLA. The Administrative Record is available for public review at the Seneca Army Depot Activity, 5786 State Route 96, Building 123, Romulus, NY 14541. The Administrative Record Index identifies each of the items considered during the selection of the remedial action. This index is included in **Appendix A**.

The State of New York, through the NYSDEC and NYSDOH, has concurred with the selected remedy. The NYSDEC Declaration of Concurrence is provided in **Appendix B** of this ROD.

Site Assessment

The response action selected in this ROD is necessary to protect human health or the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from SEAD-16 and SEAD-17, which may present an imminent and substantial endangerment to public health or welfare.

Description of the Selected Remedy

The selected remedy for SEAD-16 and SEAD-17 addresses contaminated soil, building debris, and groundwater. The selected remedy will result in the removal of soil and groundwater as a pathway

for potential receptors. Groundwater will be monitored to ensure that soil contamination left on-site does not further degrade groundwater quality.

The elements that compose this remedy include:

- Conduct additional sampling as part of the pre-design sampling program to further delineate the areas of excavation;
- Remove, test, and dispose of the SEAD-16 building debris off-site;
- Excavate approximately 275 cubic yards (cy) of ditch soil to a depth of 1 foot (ft.) with lead concentrations greater than 1250 mg/Kg until cleanup standards are achieved;
- Excavate approximately 1760 cy of surface soils to a depth of 1 ft. at SEAD-16 with lead concentrations greater than 1250 mg/Kg, and polycyclic aromatic hydrocarbon (PAH) and metal concentrations greater than risk-based derived cleanup standards listed below and in **Table 1-1**;
- Excavate approximately 67 cy of subsurface soils to a depth of 2 ft. to 3 ft. at SEAD-16 (areas around SB16-2, SB16-4, and SB16–5) with lead concentrations greater than 1250 mg/Kg, and PAH and metal concentrations greater than risk-based derived cleanup standards listed below and in **Table 1-1** (**Figure 1-1**);
- Excavate approximately 2590 cy of surface soils to a depth of 1 ft. at SEAD-17 with lead concentrations greater than 1250 mg/Kg and metal concentrations greater than risk-based derived cleanup standards listed below (**Table 1-1**) (**Figure 1-2**);
- Stabilize excavated soils from SEAD-16 and SEAD-17 and building debris from SEAD-16 exceeding the toxicity characteristic leaching procedure (TCLP) criteria in order to attain Land Disposal Restrictions (LDR);
- Dispose of the excavated material in an off-site landfill;
- Backfill the excavated areas with clean backfill;
- Conduct groundwater monitoring at SEAD-16 and SEAD-17 until concentrations are below the GA criteria;
- Remediate material potentially presenting an explosive hazard and munitions and explosives of concern to meet the Department of Defense Explosive Safety Board (DDESB) requirements for unrestricted use or to put into place land use restrictions as may be required by DDESB;
- Submit a Completion Report following the remedial action;
- Establish and maintain land use controls (LUCs) to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Complete a review of the selected remedy every 5 years (at minimum), in accordance with Section 121(c) of the CERCLA.

Cleanup Standards for Industrial Use at SEAD-16 and SEAD-17

COMPOUNDS	SOIL CLEANUP GOAL
Polycyclic Aromatic Hydrocarbons (PAHs)	
Benzo(a)anthracene (µg/Kg)	20,417
Benzo(a)pyrene (µg/Kg)	2,042
Benzo(b)fluoranthene (µg/Kg)	20,417
Benzo(k)fluoranthene (µg/Kg)	50,000
Chrysene (µg/Kg)	50,000
Dibenz(a,h)anthracene (µg/Kg)	2,042
Indeno(1,2,3-cd)pyrene (µg/Kg)	20,417
Metals	
Antimony (mg/Kg)	29
Arsenic (mg/Kg)	20
Cadmium (mg/Kg)	14
Copper (mg/Kg)	331
Lead (mg/Kg)	1250
Mercury (mg/Kg)	0.54
Thallium (mg/Kg)	2.6
Zinc (mg/kg)	773

To complete Resource Conservation and Recovery Act (RCRA) closure of the deactivation furnace at SEAD-17, the Army will either further decontaminate or demolish and dispose off-site the structures that failed to meet closure standards during the interim closure (i.e., concrete slabs and block walls).

SEAD-16 AND SEAD-17 Land Use Control (LUC) Performance Objectives

The LUC performance objectives for SEAD-16 and SEAD-17 are to:

- Prevent access to or use of the groundwater until cleanup levels are met; and
- Prevent residential housing, elementary and secondary schools, childcare facilities and playgrounds activities.

The LUCs would be implemented over the area bounded by the boundary at SEAD-16 (**Figure 1-1**) and SEAD-17 (**Figure 1-2**). The boundary of SEAD-16 is defined as the fence; SEAD-17 is bounded by the fence to the east and by natural boundaries, such as ditches. It should be noted that land within the Planned Industrial/Office Development (PID) area, which includes SEAD-16 and SEAD-17, is also subject to a separate Proposed Plan and ROD that include institutional controls (ICs) [“Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas” (Parsons, 2004)]. Groundwater use restrictions will continue until groundwater constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. With USEPA approval, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated.

To implement the Army's remedy, which includes the imposition of LUCs, a LUC Remedial Design for SEAD-16 and SEAD-17 will be prepared which is consistent with Paragraphs (a) and (c) of the New York State Environmental Conservation Law (ECL) Article 27, Section 1318: Institutional and Engineering Controls. In addition, the Army will prepare an environmental easement for SEAD-16 and SEAD-17, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of the property's transfer from federal ownership and which will require the owner and/or any person responsible for implementing the LUCs set forth in this ROD will periodically certify that such institutional controls are in place. A schedule for completion of the draft SEAD-16 and SEAD-17 LUC Remedial Design Plan (LUC RD) will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA).

The Army shall implement, inspect, report, and enforce the LUCs described in this ROD in accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity.

State Concurrence

NYSDOH forwarded a letter of concurrence regarding the selection of a remedial action to NYSDEC, and NYSDEC, in turn, forwarded to USEPA a letter of concurrence regarding the selection of a remedial action in the future. This letter of concurrence has been placed in **Appendix B**.

Declaration

CERCLA and the NCP require each selected remedy to be protective of human health, public welfare, and the environment; be cost effective, comply with other statutory laws; and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent possible. CERCLA and the NCP also state a preference for treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The selected remedy is consistent with CERCLA and the NCP and is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions. This remedy also reduces the toxicity, mobility, or volume of hazardous substances, pollutants, or contaminants.

Because this remedy may result in hazardous substances, pollutants, or contaminants remaining on-site above levels that allow for unlimited use and unrestricted exposure for an indeterminate period, a statutory review will be conducted every 5 years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment.

The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

Stephen M Absolom 16 MAR 06

STEPHEN M. ABSOLOM Date

BRAC Environmental Coordinator

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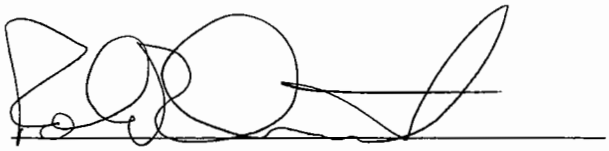
The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:



18 Aug 06

ROBERT R. DERRICK Date
Colonel, GS
Chief, Base Realignment & Closure Division

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The foregoing represents the selection of a remedial action by the U.S. Department of the Army and the U.S. Environmental Protection Agency, with the concurrence of the New York State Department of Environmental Conservation.

Concur and recommend for immediate implementation:

George Pavlou — Date 9/29/06

Director, Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region II

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2.0 SITE NAME, LOCATION, AND DESCRIPTION

SEDA is a 10,587-acre military facility located in Seneca County near Romulus, New York, which has been owned by the United States Government and operated by the Department of the Army since 1941. A location map for SEDA is provided as **Figure 2-1**. As shown in **Figure 2-1**, SEDA is located between Seneca Lake and Cayuga Lake. **Figure 2-1** also shows that SEDA is bordered by New York State Highway 96 on the east, New York State Highway 96A on the west, and sparsely populated farmland on the north and south.

The Abandoned Deactivation Furnace (SEAD-16) is located in the east-central portion of SEDA (**Figure 2-2**). SEAD-16 consists of 2.6 acres of fenced land with grasslands in the north, east, and west, a storage area for empty boxes and wooden debris, and an unpaved roadway in the south. Also on-site is the building which housed the deactivation furnace, a smaller abandoned building known as the Process Support Building, two sets of SEDA railroad tracks, and some utilities. Two underground storage tanks previously existed at SEAD-16 but have been removed. A map of SEAD-16 is included as **Figure 1-1.**

The Active Deactivation Furnace (SEAD-17) is located in the east-central portion of SEDA (**Figure 2-2**). SEAD-17 consists of a deactivation furnace building that is surrounded by a crushed shale road. Beyond the perimeter of the crushed shale road is grassland. Two small sheds are located in the eastern portion of SEAD-17, and there is vehicular access to SEAD-17 from an unpaved road to the north. Access to SEAD-17 is restricted because it is located in the former ammunition storage area. A map of SEAD-17 is included as **Figure 1-2**.

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

3.1 LAND USE

Prior to construction of SEDA in 1941, much of the land was used for farming. Since construction, SEDA has been owned by the United States Government and operated by the Department of the Army. SEDA's primary mission was the receipt, storage, maintenance, and supply of military items.

Both SEAD-16 and SEAD-17 were used for the demilitarization of various small arms munitions. The process of deactivation of munitions involved heating the munitions within a rotating steel kiln, which caused the munitions to detonate. The byproducts produced during this detonation were then swept out of the kiln through the stack.

SEAD-16 has been inactive and abandoned since the 1960s. SEAD-17 was constructed to replace the operation of the deactivation furnace at SEAD-16. However, SEAD-17 has been inactive since 1989 as a result of RCRA permitting issues. Details of the regulatory history and status of the deactivation furnace at SEAD-17 are provided in **Section 3.3**.

To address employment and economic impacts associated with the SEDA's closure, the Seneca County Board of Supervisors established the Seneca Army Depot Local Redevelopment Authority (LRA) in October 1995. The primary responsibility assigned to the LRA was to prepare a plan for redevelopment of the SEDA property. Following a comprehensive planning process, a *Reuse Plan and Implementation Strategy for Seneca Army Depot* was completed and adopted by the LRA on October 8, 1996. The Seneca County Board of Supervisors subsequently approved this *Reuse Plan* on October 22, 1996. **Figure 3-1** depicts the intended future land uses for SEDA, as proposed by the LRA. As indicated on **Figure 3-1**, the proposed future land use for SEAD-16 and SEAD-17 is for Planned Industrial/Office Development (PID). It should be noted that land within the PID area is also subject to a separate Proposed Plan and ROD, which include ICs ["Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004) signed on September 30, 2004].

3.2 RESPONSE AND ENFORCEMENT HISTORY

SEDA was proposed for the National Priorities List (NPL) in July 1989. In August 1990, SEDA was finalized and listed in Group 14 on the Federal Section of the NPL. The USEPA, NYSDEC, and the Army entered into an agreement, called the FFA, also known as the Interagency Agreement (IAG). This agreement determined that future investigations were to be based on CERCLA guidelines, and RCRA was considered to be an Applicable or Relevant and Appropriate Requirement (ARAR) pursuant to Section 121 of CERCLA. In October 1995, SEDA was designated as a facility to be closed under the provisions of the BRAC process. As required for sites on the NPL, a Remedial Investigation/Feasibility Study (RI/FS) was completed for SEAD-16 and SEAD-17. The Final RI

was completed and submitted to USEPA and NYSDEC in March 1999, and the FS was completed and submitted in July 2001.

3.3 RCRA COMPLIANCE HISTORY AT SEAD-17

All facilities that engage in the treatment, storage, and/or disposal of hazardous wastes are required to obtain a RCRA permit. The Deactivation Furnace at SEAD-17, which operated until 1989, was used to incinerate and deactivate or destroy small munitions and other materials associated with munitions or explosives. With the enactment of RCRA in 1976, waste explosives were classified as hazardous wastes, and thus the deactivation unit was classified as a hazardous waste treatment process. Because of the historical ongoing operations at the deactivation furnace at SEAD-17, the furnace at SEAD-17 was subject to RCRA permitting and is subject to RCRA closure requirements. The deactivation furnace at SEAD-16 is not subject to RCRA requirements since it was not active subsequent to the enactment of RCRA in 1976. The State of New York has been delegated the RCRA program by the USEPA for oversight and closure of the RCRA unit.

SEAD-17 consists of two distinct units: (1) contamination in the surrounding soils and groundwater, and (2) contamination of the deactivation furnace, building, and equipment. Contamination in the soil and groundwater is being addressed under CERCLA, and remediation of these media is covered in this ROD. The FFA details the relationship between CERCLA and RCRA, and under the FFA, remediation of releases under CERCLA "obviate the need for further corrective actions under RCRA for those releases (i.e. no further corrective action shall be required) . . . and RCRA shall be considered an applicable or relevant and appropriate requirement." Therefore, in performing the remedy outlined in this ROD in a manner approved by USEPA and NYSDEC, the substantive requirements of RCRA will be met for the soil and groundwater at SEAD-17.

The deactivation furnace, building, and equipment at SEAD-17 have been addressed during RCRA interim closure actions as outlined below.

The following summarizes the regulatory history of the deactivation furnace at SEAD-17:

- 1962-1980 - Deactivation Furnace operated to destroy small arms ammunition.
- 1976 – RCRA enacted; legislation allowed owners and operators of hazardous waste treatment, storage, and disposal facilities (TSDFs) that were in existence as of November 19, 1980 to operate under Interim Status until their RCRA permit was issued or their request was denied.
- 1980-1989 - The Army submitted a 6 New York State Codes Rules and Regulations (NYCRR) Part 373 Part A and a Part B permit application to permit the Seneca Army Depot as a TSDF. The Deactivation Furnace at SEAD-17 was listed as a hazardous waste incinerator for small arms ammunition. As was customary at the time, all facilities that submitted Part A permit applications were allowed to continue to operate under Interim Status.
- 1980-1989 - Deactivation Furnace continued to operate under Interim Status.

- 1989 - Deactivation Furnace was shutdown to allow for the addition of a new air pollution control device system. As part of the upgrade, NYSDEC required that the furnace be closed in accordance with RCRA Interim Status requirements.
- November 6, 1989 - RCRA Interim Closure Plan for the deactivation furnace was approved by NYSDEC.
- 1989-1991 - The Army undertakes interim closure actions at SEAD-17, which included the following:
    - Removal of all hazardous waste residues, containers, and removal of the baghouse filters, and dust.
    - Sampling the building, equipment, drains, and soils and subsequent decontamination and removal of releases.
- August 21, 1991 - Interim Closure of the Deactivation Furnace was approved by NYSDEC in a letter, pending an independent certification by a NYS Professional Engineer (see **Appendix C**). The letter noted the following:
    - Interim closure measures were completed and accepted for equipment, drains, walls, and concrete.
    - The soil sampling determined contamination existed in and around the facility as a result of past operations. The Army, USEPA, and NYSDEC agreed to address this contamination as an Area of Concern under the FFA. As a result of the potential of recontamination of the building, the fact that contamination in soils will remain, and wipe samples of walls and floors failed to meet the criteria that was set, clean closure could not be achieved.
- March 3, 1992 - Independent certification by NYS Professional Engineer submitted to NYSDEC, on behalf of the Army, stating that the deactivation furnace was “dirty closed” (See Appendix C).
- 1995 - Base closure is announced. Army withdraws its RCRA permit application.
- 1989-present - The furnace was not used for wastes, test material was processed for the upgrade equipment prove-out, and a pilot study was performed to evaluate its use as a Low Temperature Thermal Desorption (LTTD) system for lightly contaminated soil, which was not considered hazardous.

To achieve closure, the Army will either further decontaminate or demolish and dispose off-site the structures that failed to meet closure standards during the interim closure (i.e., concrete slabs and block walls). After cleaning, chip samples will be submitted for analytical analysis and compared to the cleanup goals outlined in this ROD.

4.0 COMMUNITY PARTICIPATION

The U.S. Army relies on public input to ensure that community concerns are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS report, the Proposed Plan and the supporting documentation have been made available to the public for a public comment period, which began on December 15, 2003 and concluded on January 13, 2004. Copies of the RI/FS report, the Proposed Plan, the Record of Decision, and supporting documentation are available at the following repository:

Seneca Army Depot Activity
Building 123
Romulus, NY 14541
(607) 869-1309
Hours are Mon-Fri 8:30 am to 4:30 pm

A public meeting was held during the public comment period at the Seneca County Office Building on December 16, 2003 at 7 pm to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedial option, and to receive public comments. Comments received at the public meeting, as well as written comments, are documented in the Responsiveness Summary Section of the ROD, **Appendix D**.

The primary responsibility assigned to the LRA was the preparation of a plan for the redevelopment of the Depot. During the BRAC process, monthly presentations have been given to the LRA. In addition, the SEDA Restoration Advisory Board (RAB) was established to facilitate the exchange of information between SEDA and the community. RAB members include the representatives from the Army, USEPA, NYSDEC, NYSDOH, and the community. After a comprehensive planning process, a Reuse Plan and Implementation Strategy for Seneca Army Depot was completed and adopted by the LRA on October 8, 1996. The Reuse Plan was subsequently approved by the Seneca County Board of Supervisors on October 22, 1996.

During the BRAC process there have been, and continue to be, monthly presentations to the RAB regarding the progress of SEAD-16 and SEAD-17 and other investigations related to the closure of SEDA.

5.0 SCOPE AND ROLE

At SEAD-16 and SEAD-17, the contaminated soils [surface (0-2 inches below ground surface (bgs), subsurface (0-12 ft. bgs), and ditch soils], building debris, and the groundwater will be addressed under the selected remedy. This alternative was selected as the preferred alternative since it eliminates source soils from further impacting SEAD-16 and SEAD-17 by preventing contact with receptors and migration of contaminants to surface water and groundwater. It is a cost-effective, readily available alternative that will provide an effective and efficient solution that does not require any long-term maintenance aside from groundwater monitoring, which reduces the long-term costs associated with maintaining and enforcing LUCs. Finally, it is a solution that will significantly reduce the mobility of the contaminants and potential for exposure at SEAD-16 and SEAD-17.

The selected remedies are discussed in greater detail in **Section 11.0**.

6.0 SITE CHARACTERISTICS

This section provides an overview of impacts to SEAD-16 and SEAD-17 and also identifies the actual and potential routes of exposure posed by site conditions. A complete description of SEAD-16 and SEAD-17 characteristics is included in Section 4.0 of the RI report.

Based on the results of the Expanded Site Investigation (ESI), a RI Work Plan was prepared and the RI field program was conducted. At SEAD-16, the RI field program consisted of site surveys, soil sampling [surface (0-2 inches bgs) and subsurface (0-12 ft. bgs)], groundwater investigations in the overburden aquifer, surface water/sediment investigations, a building investigation, and an ecological investigation. The RI at SEAD-17 was similar to that at SEAD-16, with the exception that soil boring samples and building investigation were not part of the field program at SEAD-17. The remedial investigations were designed to meet site-specific data quality objectives (DQOs).

6.1 SEAD-16

The primary constituents of concern at the Abandoned Deactivation Furnace (SEAD-16) are arsenic, copper, lead, and zinc in surface soils and copper, lead, and zinc in surface water. PAHs were detected in surface soils and sediments; and metals, PAHs, and nitroaromatics were detected in the building samples. The most impacted soils are those adjacent to the abandoned deactivation furnace. Many of these compounds were present in concentrations that exceeded their respective site-specific cleanup standards presented in **Table 1-1**. All the constituents of concern are believed to have been released to the environment during the former deactivation furnace's period of operation (approximately 1945 to the mid 1960s).

Seismic profiles performed on the flanks of SEAD-16 were successful in determining that the bedrock surface slopes to the southwest or west, generally following the slope of the ground surface, and that groundwater flow is also likely to be in this direction.

6.1.1 Impacts to Soil

Arsenic, copper, lead, and zinc were detected in all 43 surface soil samples. Copper and lead were detected at concentrations above their respective site-specific cleanup standards in 25% and 35% of the samples, respectively. Arsenic and zinc were detected in every surface soil sample and exceeded their respective site-specific cleanup goal values in 3 and 4 of the 43 samples, respectively. The soil analysis results for SEAD-16 are presented in **Tables 6-1a** and **6-1b**. Copper, lead, and mercury were found to be pervasive in the subsurface soil samples. Copper and lead were detected in all six subsurface samples, and they exceeded their site-specific cleanup goal values once in the same sample, which is adjacent to the northeastern side of the Abandoned Deactivation Furnace Building. Mercury, which was detected four times in the subsurface soils, exceeded its site-specific cleanup goal in one sample. The highest concentrations of PAHs were detected in the surface soil samples collected adjacent to the northwestern corner of the Abandoned Deactivation Furnace Building.

The highest concentrations of soil contamination resulted from the operations that were performed within and in close proximity to the Abandoned Activation Furnace Building and the Process Support Building.

6.1.2 Impacts to Groundwater

Five metals (i.e., antimony, iron, lead, sodium, and thallium) were detected in groundwater samples at concentrations that exceeded the NYSDEC Ambient Water Quality Criteria (AWQS) Class GA or Federal Maximum Contaminant Level (MCL) standards. The groundwater analysis results for SEAD-16 are presented in **Table 6-1c**. The SEDA-wide mean concentrations for aluminum, iron, manganese, and sodium are not statistically different than their background mean concentrations. Antimony and lead concentrations exceeded their respective standards in only one well, which is located adjacent to the southern portion of the Abandoned Deactivation Furnace Building. Thallium was detected at elevated concentrations in three groundwater monitoring wells, which are also located close to the Abandoned Deactivation Furnace Building. These data indicate that the source of the antimony, lead, and thallium in groundwater is likely located in or near the building, though no obvious distribution pattern in groundwater for any of these elements is apparent. Sodium exceeded the groundwater standard in a single well. The source of this single exceedance is unknown.

An additional round of groundwater sampling and analysis was performed to confirm whether thallium is present in the groundwater at both SEAD-16 and SEAD-17. The analytical results indicated that thallium was not detected in any of the monitoring wells. The detection limit for analyses conducted using furnace, atomic absorption techniques for thallium analyses was 1.5 μg/L, which is less than its MCL criteria of 2 μg/L. The prior results were likely due to laboratory errors from aluminum interference (the presence of aluminum in a sample can falsely elevate the reported concentration of thallium). Elevated thallium concentrations may also have been the result of high turbidity in the samples. Based on these results, it has been determined that thallium is not considered a parameter that is present in the groundwater.

6.1.3 Impacts to Surface Water

Many metals, including aluminum, cadmium, copper, iron, lead, selenium, and zinc, were detected in more than one of the surface water samples collected at SEAD-16. The surface water results for SEAD-16 are presented in **Table 6-1d**. In general, the highest metal concentrations in the surface water samples were collected from the two drainage ditches that are closest to, and south of, the Abandoned Deactivation Furnace Building. The distribution of metals in SEAD-16 surface waters, as well as the wide distribution of metals in surface soil samples, indicates that the surface soils at SEAD-16 are the likely source area for the metals found in the surface water samples. Surface water is not considered a media of concern.

6.1.4 Impacts to Sediment

Metals (antimony, copper, lead, mercury, and zinc) were found at concentrations greater than the site-specific cleanup standards for soils in all of the drainage ditches that were investigated at SEAD-16. The sediment (ditch soil) results for SEAD-16 are presented in **Table 6-1e**. Carcinogenic PAHs (cPAHs) were detected in 5 to 7 of the 11 ditch soil samples collected; however, no cPAHs exceeded their respective site-specific cleanup standards. The maximum concentration of all five metals detected above the site-specific cleanup standards were collocated in one ditch soil sample, SD16-3, in the southeast portion of SEAD-16.

6.2 SEAD-17

The primary constituents of concern at the Active Deactivation Furnace (SEAD-17) are the metals, antimony, arsenic, copper, lead, mercury, and zinc, in soils. PAH and pesticide compounds found in sediments are also of significance. All of these compounds are likely to have been released to the environment during the active deactivation furnace's period of operation (approximately 1962 to 1989).

Seismic profiles performed on the flanks of SEAD-17 were successful in determining that the bedrock surface slopes to the southwest or west, generally following the slope of the ground surface, and that groundwater is also likely to flow in this direction. At SEAD-17 water table elevations indicate that groundwater flow is essentially to the west.

6.2.1 Impacts to Soil

Antimony, copper, lead, and zinc were detected in almost all of the surface soil samples. Lead was detected at concentrations exceeding the site-specific cleanup standard of 1250 mg/Kg in 11 of the 37 surface soil samples. Copper was detected above its site-specific cleanup standard in 10 out of the 38 surface soil samples collected. Furthermore, antimony was detected above its site-specific cleanup standard in 3 out of 38 surface samples, and mercury exceeded its site-specific cleanup standard twice. Zinc and cadmium both exceeded their respective site-specific cleanup standards in four samples. None of the metals detected in the subsurface soil exceeded their respective site-specific cleanup standards. The soil analytical results for SEAD-17 are presented in **Tables 6-2a** and **6-2b**. In all instances, the detected concentrations of metals were found to be highest in those samples collected closest to the Active Deactivation Furnace Building, and some of the highest concentrations were located to the southwest of the building. A drainage pipe, which drains the heating vessel (retort) inside the Active Deactivation Furnace Building, discharges to the southwest of the building, and may explain the presence of the high metal concentrations found in the nearby surface soils. Because the Active Deactivation Furnace Building has very few points where materials can enter and exit the building (such as drainage pipes), and since the most significant impacts from metals are generally

equally distributed around the building, it is likely that fallout of emissions from the kiln's stack is a source of the metals.

6.2.2 Impacts to Groundwater

Generally, few chemical constituents were detected in the groundwater at SEAD-17. Groundwater analytical results are presented in **Table 6-2c**. Low concentrations of SVOCs were detected, and thallium exceeded its respective MCL criteria values by a multiple of 3.5 during the first sampling round. Iron and sodium exceeded their respective NYSDEC AWQS Class GA standard. No volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), or nitroaromatics were detected in the samples. As discussed in groundwater results for SEAD-16, the results of the additional groundwater sampling and analysis program indicated that thallium was not detected in any of the wells at SEAD-17, and thus it is not considered a parameter that is present in the groundwater.

6.2.3 Impacts to Surface Water

Surface water analytical results are presented in **Table 6-2d**. In general, most of the elevated concentrations of metals in the surface water samples were found in the drainage ditch located south of the Active Deactivation Furnace Building. This drainage ditch also collects the overland runoff from the deactivation furnace's retort drainage pipe. The finding of high metals in the surface waters to the south of SEAD-17, as well as the wide distribution of metals in the SEAD-17 surface soil samples, indicates that the on-site surface soils are the likely source for the inorganic elements found in the surface water samples. Surface water is not considered a media of concern.

6.2.4 Impacts to Sediment

PAHs, pesticides, and metals were found in the drainage ditches that were investigated at SEAD-17. Sediment (ditch soil) analytical results are presented in **Table 6-2e**. None of the ditch soil samples exceeded the site-specific cleanup standards. Noted impacts from PAHs were most significant in one sample collected from the drainage ditch in the northeastern corner of SEAD-17. All elevated pesticide compound concentrations were detected in the sediment samples collected from the northern and western most drainage ditches. None of the pesticides were detected at elevated concentrations at locations in close proximity to the Active Deactivation Furnace Building. This spatial distribution pattern indicates that the pesticide compound most likely occur from pesticide applications at SEAD-17 and not from past operating processes in the Abandoned Deactivation Furnace Building.

7.0 SUMMARY OF SEAD-16 AND SEAD-17 RISKS

A baseline risk assessment (BRA) was conducted using data collected during the RI to estimate the risks associated with current and future conditions and anticipated uses at SEAD-16 and SEAD-17. The BRA estimated the human health and ecological risk that could result if no remedial action were taken at SEAD-16 and SEAD-17.

7.1 HUMAN HEALTH RISK ASSESSMENT

The reasonable maximum human exposure to chemicals was evaluated. The methodology is shown in **Figure 7-1**. A four-step process was used for assessing SEAD-16 and SEAD-17 related human health risks for a reasonable maximum exposure scenario:

- *Hazard Identification*--identified the contaminants of concern based on several factors such as toxicity, frequency of occurrence, and concentration. This is covered in the Data Collection and Evaluation Box in **Figure 7-1**.
- *Exposure Assessment*--estimated the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed.
- *Toxicity Assessment*--determined the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response).
- *Risk Characterization*--summarized and combined the outputs of the exposure and toxicity assessments to provide a quantitative assessment of the related risks (for example, one-in-a-million excess cancer risk).

The primary constituents of concern at the Abandoned Deactivation Furnace (SEAD-16) are four metals (i.e., arsenic, copper, lead, and zinc), PAHs, and nitroaromatics. At the Active Deactivation Furnace (SEAD-17) the primary constituents of concern are six metals (i.e., antimony, arsenic, copper, lead, mercury, and zinc), PAHs, and pesticide compounds. Several of these compounds, including some PAHs and pesticides, are known to cause cancer in laboratory animals and are suspected to be human carcinogens.

The BRA evaluated the health effects that may result from exposure for the following six receptor groups:

1. Current site worker,
2. Future on-site industrial worker,
3. Future on-site construction worker,
4. Future child trespasser,
5. Future child at an on-site day care center (for comparison purposes), and
6. Future worker at an on-site day care center (for comparison purposes).

Figures 7-2 and **7-3** show the exposure pathways considered for the media of concern.

The following exposure pathways were considered:

1. Inhalation of dust in ambient air (current site worker, future on-site construction worker, future child–trespasser, future day care center child, future day care center worker, future industrial worker at SEAD-17 only);
2. Ingestion of soils (current site worker, future on-site construction worker, future child trespasser, future day care center child, future day care center worker, future industrial worker at SEAD-17 only);
3. Dermal contact to soils (current site worker, future on-site construction worker, future child trespasser, future day care center child, future day care center worker, future industrial worker at SEAD-17 only);
4. Ingestion of groundwater (daily) (future industrial worker, future day care center child, future day care center worker);
5. Dermal contact to surface water (future child trespasser);
6. Ingestion of sediment (future child trespasser);
7. Dermal contact to sediment (future child trespasser);
8. Inhalation of dust in indoor air (future industrial worker at SEAD-16 only);
9. Ingestion of indoor dust/dirt (future industrial worker at SEAD-16 only);
10. Dermal Contact to indoor dust/dirt (future industrial worker at SEAD-16 only).

(Note: The SEAD-16 industrial worker receptor is assumed to be an office worker who works indoors only; the office worker's exposure to the outdoor air pathway is assumed to be minimal. The SEAD-17 industrial worker receptor is assumed to be a yard worker whose primary exposure is to ambient concentrations of contaminants. These exposure scenarios are consistent with the historic structures and expected future buildings that are anticipated at SEAD-16 and SEAD-17.)

Under current USEPA guidelines, the likelihood of carcinogenic and non-carcinogenic effects as a result of exposure to chemicals at SEAD-16 and SEAD-17 are considered separately. Non-carcinogenic risks were assessed by calculation of a Hazard Index (HI), which is an expression of the chronic daily intake of a chemical divided by its safe or Reference Dose (RfD). An HI that exceeds 1.0 indicates the potential for non-carcinogenic effects to occur. Carcinogenic risks were evaluated using a cancer slope factor (SF), which is a measure of the cancer-causing potential of a chemical. SFs are multiplied by daily intake estimates to generate an upper-bound estimate of excess lifetime cancer risk above natural or background cancer levels. For known or suspected carcinogens, USEPA has established an acceptable cancer risk range of 10^{-4} to 10^{-6} (one-in-ten thousand to one-in-one million).

SEAD-16

A summary of the chemicals of concern for potential human health receptors based on the risk assessment are presented in **Table 7-1**. **Table 7-2** summarizes the results for the total carcinogenic and non-carcinogenic risks, and **Table 7-3** provides a summary of the primary contributors to unacceptable risk levels. The results of the BRA at SEAD-16 indicate that the HI is above the USEPA target of 1.0 for the future industrial worker (HI=20) and the future on-site construction worker (HI=1). For comparison purposes, risk to a future day care center child and future day care center worker were evaluated, and the HI is above the USEPA target of 1.0, with values of HI=6and HI=2, respectively. The total hazard index for the future industrial worker is due to (in decreasing order) ingestion of indoor dust, dermal contact with indoor dust, and ingestion of groundwater. The total hazard index for the future on-site construction worker is primarily due to ingestion of soils. The total hazard index for the future day care child is due to (in decreasing order) ingestion of groundwater and ingestion of soil. The total hazard index for the future day care center worker is primarily due to ingestion of groundwater.

The cancer risk is within the target risk range of 10^{-4} to 10^{-6} for all receptors except the future industrial worker ($5x10^{-3}$). The total cancer risk for the future industrial worker is due primarily to the ingestion of indoor dust.

The elevated hazard indices for the ingestion of indoor dust exposure pathway are primarily due to the SVOC, 2,4-dinitrotoluene, and metals (antimony and copper). The elevated hazard index for the dermal contact with indoor dust exposure pathway is primarily due to cadmium. The elevated hazard index for the ingestion of groundwater exposure pathway results primarily from thallium. An additional discussion of thallium in groundwater is presented below in the section entitled, *Additional Information on SEAD-16 and SEAD-17 Human Health Risk Assessment*.

SEAD-17

A summary of the chemicals of concern for potential human health receptors based on the risk assessment are presented in **Table 7-4**. **Table 7-5** summarizes the results for the total carcinogenic and non-carcinogenic risks, and **Table 7-3** provides a summary of the primary contributors to unacceptable risk levels. The results of the BRA at SEAD-17 indicate that the cancer risks for all receptors evaluated were within the USEPA target risk range and that the HI for all but one receptor was below the target value. The exception was the future day care center child, which was evaluated for comparison purposes, which had a HI equal to the acceptable USEPA level of 1. The HI for the future day care center child is primarily due to the ingestion of soil due to the presence of metals (antimony, arsenic, and cadmium) in those soils. Since a day care center will be prohibited at SEAD-17, the quantitative risk assessment indicates that there is no unacceptable risk to human health at SEAD-17 for the intended future use. The section below discusses potential risk due to lead, which was not quantified in the risk assessment.

Additional Information on SEAD-16 and SEAD-17 Human Health Risk Assessment

It should be noted that lead, which was found at elevated levels in soil at both SEAD-16 and SEAD-17, was not considered in the quantitative risk assessment because an allowable RfD is not available. In the absence of a formal quantitative risk assessment for lead, other means were used to determine how to evaluate risk posed by lead in the soils. Based on discussions between the Army and the USEPA and NYSDEC and review of the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996), a value of 1250 mg/Kg was selected as a cleanup level for the site for future industrial use. It was agreed by all three parties that the 1250 mg/Kg value would be protective of human health under an industrial scenario. Therefore, lead detected at SEAD-16 and SEAD-17 at concentrations above 1250 mg/Kg could pose unacceptable risk to human health and will require remedial action.

Because of the risks produced by the presence of thallium in groundwater and because there is no historical use of thallium at SEAD-16 and SEAD-17, an additional sampling round for thallium alone was performed (October 1999) to confirm the presence of thallium at these sites. The confirmatory sampling used an analytical procedure with a detection limit below the USEPA allowable concentration for thallium. The October 1999 results indicate that thallium is not present and that the earlier inconsistent detections of thallium were due to either laboratory analytical error or matrix interference effects. Therefore, it has been determined that thallium does not contribute to non-carcinogenic risk in groundwater at SEAD-16 or SEAD-17.

7.2 ECOLOGICAL RISK ASSESSMENT

The reasonable maximum ecological exposure was also evaluated. A four-step process was used for assessing site-related ecological risks for a reasonable maximum exposure scenario:

- *Characterization of the Site and the Ecological Communities*—Includes ecological conditions observed at the unit, habitat characterization, wildlife resources present in the area, and the importance of ecological resources to wildlife and to humans.
- *Exposure Assessment*—Discusses contaminants of potential concern (COPC) and exposure point concentrations (EPCs) and it presents exposure assessments. Chemical distribution of COPCs and their uptake through various pathways are also discussed in this section. Daily intakes of COPCs through environmental media are quantified as well.
- *Effects Assessment*—Assesses ecological effects that potentially may result from receptor exposure to COPCs. Evaluates potential toxicity of each COPC in each medium and defines toxicity benchmark values that will be used to calculate the ecological hazard quotient.
- *Risk Characterization*—Integrates the results of the preceding elements of the assessment. It estimates risk with respect to the assessment endpoints, based on the predicted exposure to and toxicity of each COPC.

Ecological risk is then presented in terms of a hazard quotient (HQ), which is defined as the ratio of the expected exposure point concentration to an appropriate toxicity reference value (TRV). In general, ratios of exposure point concentrations to TRV that are greater than 1 are considered indicative of a potential risk. However, because of the uncertainties associated with using this approach, safety factors are considered in interpreting the findings. HQs between 1 and 10 are interpreted as having some potential for adverse effects, whereas, HQs between 10 and 100 indicate a significant potential for adverse effects. HQs greater than 100 indicate that adverse impacts can be expected.

Potential risk was calculated for both the deer mouse (terrestrial receptor) and the creek chub (aquatic receptor) at SEAD-16. Seven COPCs in soil, six COPCs in surface water, and 15 COPCs in ditch sediment/soils were identified as having HQs equal to or greater than 1. The following compounds are considered ecological contaminants of concern (COCs) because of HQs that are greater than 10: In surface and subsurface soils, lead and mercury both have HQs greater than 10; in surface water, iron and lead have HQs greater than 10; in ditch sediment/soils, endosulfan-I, antimony, lead, and mercury have HQs greater than 10; and copper in ditch sediment/soils has an HQ greater than 100.

At SEAD-17, potential risk was also calculated for the deer mouse and the creek chub. Of the COPCs at SEAD-17 having an HQ equal to or greater than 1, six were identified in soil, three in surface water, and 11 in ditch sediment/soils. There is a low likelihood of risk to the deer mouse from the concentrations of COPCs found in soils, therefore none of these compounds are considered to be COCs. The COPCs in surface water and ditch sediment/soils are also not likely to adversely impact populations of creek chub in the surface water bodies at the Depot. With HQs for most of the surface water and ditch sediment/soil COPCs of less than 10, and based on very conservative assumptions, none was considered a COC.

The results of the ecological risk assessment presented in the RI report (Parsons ES, March 1999) concluded that there is negligible risk to the ecosystems of the SEAD-16 and SEAD-17 study areas. During the field evaluation, no overt acute toxic impacts were noted. In addition, there are no threatened, endangered, or sensitive species that would be expected to inhabit or frequent either SEAD-16 or SEAD-17. The quantitative ecological risk evaluation initially suggested that a possibility exists for the COPCs to present a small potential for environmental effects because of soil, surface water, and ditch sediment/soils at both SEAD-16 and SEAD-17. However, given the conservative nature of the assessment, the poor quality of the SEAD-16 and SEAD-17 habitat, and the future land use designation as industrial, it is not likely that SEAD-16 and SEAD-17 support or will support a significant portion of the community of species that occupy the area surrounding and including these areas.

8.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives have been developed that consist of media-specific objectives for protection of human health and the environment. These objectives are based on available information and standards such as Applicable or Relevant and Appropriate Requirements (ARARs) and risk-based levels established in the risk assessment. These objectives are also based upon current and intended future land use, which is industrial use for both SEAD-16 and SEAD-17.

Residential land use was only considered at SEAD-16 and SEAD-17 to compare the cost of remediating SEAD-16 and SEAD-17 for this land use versus the cost to implement a more restricted land use. Future residential use was also considered to comply with Army guidance, which states that alternatives consistent with property use without any restriction should be considered to compare life-cycle institutional control costs with more conservative clean-up alternatives (DAIM-BO, "Army Guidance for Using Institutional Controls in the CERCLA Process").

Remedial action objectives are specific goals to protect human health and the environment; they specify the contaminant(s) of concern, the exposure route(s), receptor(s), and acceptable contaminant level(s) for each exposure route. These objectives are based on risk levels established in the risk assessment and should comply with ARARs, unless a waiver is necessitated. A list of ARARs is provided in **Appendix E**. The remedial action objectives for SEAD-16 and SEAD-17 are as follows:

- Prevent public or other persons from direct contact with contaminated soils, sediments, solid waste, and surface water that present an unacceptable health risk.
- Eliminate or minimize the migration of hazardous constituents from soil to groundwater.
- Prevent ingestion of groundwater containing constituents in excess of federal and state drinking water standards or criteria, or which pose a threat to public health.
- Restore groundwater, soil, surface water, and sediments to levels that are protective of public health and the environment.

Remedial actions are required at SEAD-16 and SEAD-17 due to elevated lead levels in the surface soils (0-2 inches bgs) at both sites and due to risk to human health resulting from other metals (e.g., antimony, cadmium, and copper) at SEAD-16. Remediation goals were developed for soil and building materials at SEAD-16 and SEAD-17. The cleanup standards for surface, subsurface, and ditch soils for SEAD-16 and SEAD-17 are presented in **Table 1-1** and listed below. Initially, lead was selected as the indicator metal for soil since the presence of lead is the most geographically dispersed over the two areas, and by remediating lead-contaminated soil, other compounds that contribute risk would also be remediated. A remedy-specific cleanup standard level for lead under a future industrial use scenario of 1250 mg/Kg was established based on discussions between the USEPA, NYSDEC, and the Army (September 14, 1998 letter from the Army to USEPA and NYSDEC). However, available soils data were reviewed, and there were exceedances of other metals of concern (antimony, arsenic, cadmium, copper, mercury, thallium, and zinc), which were located

outside of the area delineated by lead greater than 1250 mg/Kg. In addition, there were elevated PAHs detected in the soils at SEAD-16. As a result, risk-based cleanup standards were developed for metals and cPAHs, as well.

Cleanup Standards for Industrial Use at SEAD-16 and SEAD-17

COMPOUNDS	SOIL CLEANUP GOAL
Polycyclic Aromatic Hydrocarbons (PAHs)	
Benzo(a)anthracene (µg/Kg)	20,417
Benzo(a)pyrene (µg/Kg)	2,042
Benzo(b)fluoranthene (µg/Kg)	20,417
Benzo(k)fluoranthene (µg/Kg)	50,000
Chrysene (µg/Kg)	50,000
Dibenz(a,h)anthracene (µg/Kg)	2,042
Indeno(1,2,3-cd)pyrene (µg/Kg)	20,417
Metals	
Antimony (mg/Kg)	29
Arsenic (mg/Kg)	20
Cadmium (mg/Kg)	14
Copper (mg/Kg)	331
Lead (mg/Kg)	1250
Mercury (mg/Kg)	0.54
Thallium (mg/Kg)	2.6
Zinc (mg/kg)	773

Although lead was found in the soils and ditch soils at both SEAD-16 and SEAD-17, it was not included in the risk assessment since no allowable RfD value is available for lead. However, as previously stated, based on discussions between the USEPA, NYSDEC, and the Army, a cleanup level of 1250 mg/Kg for lead at these areas was proposed (September 14, 1998 letter from the Army to USEPA and NYSDEC). This value was derived in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996). This publication suggests a range of lead cleanup levels (750 mg/Kg to 1750 mg/Kg) that may result in an acceptable residual risk under an industrial use scenario. Based on discussions held at a BRAC Cleanup Team (BCT) meeting, as well as several correspondences between the Army, NYSDEC, and USEPA, the Army has proposed adopting the midpoint of this range (1250 mg/Kg) as the industrial soil cleanup goal at SEAD-16 and SEAD-17.

To address all COCs at SEAD-16 and SEAD-17, risk-based cleanup standards were derived for metals and carcinogenic PAHs that are consistent with the method presented in NYSDEC TAGM 4046: *Determination of Soil Cleanup Objectives and Cleanup Levels*. The risk-based standards were based on a future construction worker receptor under an industrial scenario, since it is the most conservative receptor under the intended future use scenario, which is industrial (daycare facility use would be restricted). The cleanup standards for metals were derived by back calculating

concentrations of metals that, combined, would yield a non-carcinogenic risk less than 1. To account for the fact that each metal COC is only a partial contributor to total risk, the post-remediation HI for each COC was normalized to reflect the magnitude of risk of one metal in comparison to the total risk from all the metals of concern. It should be noted that the use of the term *post-remediation* assumes that all surface soil samples located within the boundary of the area delineated by concentrations of lead greater than 1250 mg/Kg have been removed. The extent of the remedial area for SEAD-16 and SEAD-17 are shown on **Figure 1-1** and **Figure 1-2**, respectively. Once the remedial action is completed, confirmatory samples would be collected to ensure that the extent of contamination had been properly delineated.

Five metals (antimony, barium, lead, mercury, and thallium) in soil and sediment/soil found in the ditches pose potential risks to the deer mouse after remediation to the above cleanup levels. The HQs are very close to the soil HQs calculated using background concentrations, therefore, soil is not expected to pose significant adverse effects to the environment after remediating soils with lead concentration exceeding 1250 mg/Kg. In addition, there are no endangered or threatened species in the vicinity that are likely to be dependent on or affected by the habitat at SEAD-16 or SEAD-17. The geographic area of SEAD-16 and SEAD-17 is small, the habitat it provides appears to be relatively low in diversity and productivity, and the future land use is intended to be industrial, therefore, in general, the proposed soil cleanup goal of 1250 mg/Kg will be protective of the environment. A Completion Report, which will demonstrate that the remedial actions are protective of human health and the environment in an industrial future use scenario, will be submitted after the remedial actions have been conducted.

Soil in Ditches

The soil found in the ditches does not support an aquatic ecosystem, nor does it provide quality habitat for benthic organisms. There is no unacceptable human health risk by ingestion of or dermal contact with the ditch soil. Therefore, the cleanup goal for the ditch soils will be the same as that for the surface and subsurface soils, which is 1250 mg/Kg for lead. It should be noted that other metal and PAH concentrations in ditch soils did not exceed the risk-based derived cleanup standards for other metals and PAHs.

Building Material and Debris

The material and debris in Buildings S-311 and 366, which are both located at SEAD-16, is a media of concern. This is based on the human health risk associated with the ingestion of and dermal contact with indoor dust by a future industrial worker. In addition, metals, SVOCs, and nitroaromatics were detected above the respective TAGM values in the building samples collected from both buildings. Asbestos was detected at 13 locations in the two buildings in materials including pipe insulation, roofing material, and floor tiles. The remedial action objective is to remediate the buildings to reduce the risk for a future industrial worker.

9.0 DESCRIPTION OF ALTERNATIVES

CERCLA and the NCP require that each selected remedy be protective of human health and the environment, be cost effective, comply with other statutory laws, and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent possible. In addition, there is a statutory preference for the treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

Six remedial alternatives were identified for SEAD-16 and SEAD-17. These remedial alternatives consider SEAD-16 and SEAD-17 as one unit, and they have been evaluated as such. The alternatives, along with the technologies and processes that make up each alternative, are:

- Alternative 1: No-Action.
- Alternative 2: On-Site Containment (Institutional Controls/Soil Cover).
- Alternative 3: In-Situ Treatment (Consolidate/In-situ stabilization/Soil Cover).
- Alternative 4: Off-Site Disposal (Excavate/Stabilize/ Off-site Disposal).
- Alternative 4P: Off-Site Disposal under Pre-Disposal Condition.
- Alternative 5: On-Site Disposal (Excavate/On-site stabilization/On-site Subtitle D Landfill).
- Alternative 6: Ex-Situ (Innovative) Treatment (Excavate/Wash/Backfill coarse fraction/Treat and dispose fine fraction/Treat and dispose fine fraction in off-site Subtitle D Landfill).

In the Proposed Plan, all alternatives were evaluated against the NCP's nine criteria, and Alternative 3 and Alternative 5 were screened out since they received the lowest scores. Therefore, the detailed discussion of alternatives presented below is limited to addressing Alternatives 1, 2, 4, 4P, and 6.

As requested by NYSDEC and to comply with the Army guidance (see **Section 8.0** above), the unrestricted use condition was also evaluated for Alternative 4 to weigh the costs and advantages of restoring SEAD-16 and SEAD-17 to pre-disposal conditions. The full details of the evaluation of this alternative (Alternative 4P) were presented in Appendix A of the Proposed Plan. This additional evaluation was conducted only for Alternative 4 to avoid the redundancy of evaluating each alternative multiple times. The costs for each alternative presented below correspond to the cleanup standards of 1250 mg/Kg lead, and risk-based derived cleanup goals for carcinogenic PAHs and metals. The cost associated with each specific cleanup goal is presented in **Table 10-1**.

All alternatives for SEAD-16 and SEAD-17 include interim LUCs as part of the remedy, including a groundwater use restriction to prevent access or use of the groundwater until USEPA concurs that groundwater cleanup standards are achieved. In addition, all alternatives (except Alternative 4P) include institutional controls to prevent residential land use and future use as a day care center. The LUCs would be implemented over the geographic area of SEAD-16 (**Figure 1-1**) and SEAD-17 (**Figure 1-2**). It should be noted that land within the PID area, which includes SEAD-16 and

SEAD-17, is also subject to a separate Proposed Plan and ROD, which includes ICs ["Draft Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004)]. Groundwater use restrictions will continue until groundwater constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. With USEPA approval, once groundwater cleanup standards are achieved, groundwater use restrictions may be eliminated.

To implement the Army's remedy, which includes LUCs, a LUC Remedial Design for SEAD-16 and SEAD-17 will be prepared which is consistent with Paragraphs (a) and (c) of ECL Article 27, Section 1318: Institutional and Engineering Controls. In addition, the Army will prepare an environmental easement for SEAD-16 and SEAD-17, consistent with ECL Article 27, Section 27-1318(b) and ECL Article 71, Title 36, in favor of the State of New York and the Army, which will be recorded at the time of the property's transfer from federal ownership and which will require the owner and/or any person responsible for implementing the LUCs set forth in this ROD will periodically certify that such institutional controls are in place. A schedule for completion of the draft SEAD-16 and SEAD-17 LUC RD will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the FFA.

The frequency of long-term monitoring, which is a component of operations and maintenance (O&M) in many alternatives for SEAD-16 and SEAD-17, will be detailed in the RD plan.

Alternative 1 – No Action

Alternative 1 is the No Action alternative. This alternative allows SEAD-16 and SEAD-17 to remain as it currently is, with no further consideration given to any remedial action.

Alternative 2 – On-Site Containment

Capital Cost Range: $847,600
O & M Cost: $81,500 – ditch soil sampling and groundwater monitoring + $5000-$7000 (cover maintenance)
Present Worth Cost: $2,343,600
Construction Time: 2 to 7 months depending on location of stabilization activities.

As part of the pre-design sampling program, additional sampling would be conducted to further delineate the limits of containment and establish the limit of the institutional controls for SEAD-16 and SEAD-17. Alternative 2 consists of imposing LUCs (such as signage), excavating ditch soils found in the drainage swales with lead concentrations greater than 1250 mg/Kg, and metal and PAH concentrations greater than the risk-based derived cleanup standards, disposing of them in an off-site landfill, backfilling the excavated drainage ditches with clean fill, and placing a clean soil cover over surface and subsurface soils with lead concentrations greater than 1250 mg/Kg, and metal and PAH concentrations greater than cleanup standards.

Based on data from other SEDA AOCs having similar lead concentrations, it is assumed that 15% of excavated ditch soils would exceed the TCLP criteria. Excavated ditch soil will be stockpiled and tested by the TCLP prior to being disposed. Ditch soil passing the TCLP criteria will be transported and disposed of in a Subtitle D landfill. Ditch soil exceeding the TCLP criteria will be stabilized either at SEDA or elsewhere in order to attain LDRs. Stabilization involves mixing an additive such as cement, quick lime, fly ash, pozzolans, or a proprietary agent with the soil. Because of the relatively small volume of ditch soil to be treated at SEAD-16 and SEAD-17, it is expected that off-site treatment will be more cost effective than on-site treatment. On-site treatment of excavated ditch soils would require a treatability study, site permitting, and a specialty contractor, which would increase the cost. Therefore, for screening purposes, this alternative assumes that all excavated ditch soil is transported off-site for both treatment and disposal. It should be noted that TCLP is not a cleanup level, rather it determines whether the soils are a characteristic waste and the type of disposal the waste requires.

Material and debris from Buildings S-311 and 366 will also be removed, stockpiled, and tested for TCLP prior to being disposed. Material passing the TCLP criteria will be transported and disposed off-site in a Subtitle D landfill. Material exceeding the TCLP criteria will be stabilized either on-site or off-site. Debris and dust will also be removed from the surface of the furnace and boiler stacks and disposed and stabilized as appropriate.

A soil cover will be placed over the surface and subsurface soil areas with lead concentrations greater than 1250 mg/Kg and metal and PAH concentrations greater than the risk-based derived cleanup standards. The soil cover will consist of the following, from top to bottom:

- 6 inches topsoil;
- 6 inches common fill, and
- Filter fabric (i.e. separation layer).

Regrading of SEAD-16 and SEAD-17 and imposition of LUCs will be required prior to placement of the soil cover. Drainage swales and ditches will be backfilled to their original grade, and topsoil and vegetative growth will be established.

The intent of this alternative is to isolate the waste from receptors and to prevent migration of surface soil to surface water via soil erosion. This alternative has little effect in preventing groundwater deterioration from potential contaminant leaching from soil. However, groundwater quality is not expected to exceed USEPA MCL or NYS GA standards for groundwater in the future. Long-term groundwater monitoring and O&M will be required.

LUCs, which are an element of this alternative, would include a groundwater use restriction until groundwater ARARs were achieved and a LUC preventing residential or day care land use. Information regarding implementation and enforcement of LUCs would be included in the RD/RA Work Plan.

Alternative 4 – Off-Site Disposal

Capital Cost Range: $1,699,900
O & M Cost: $81,500– ditch soil sampling, groundwater monitoring, and LUCs
Present Worth Cost: $3,109,400
Construction Time: 2 to 8 months depending on location of stabilization activities

As part of the pre-design sampling program, additional sampling would be conducted to further delineate the limits of excavation and establish the limit of the institutional controls for SEAD-16 and SEAD-17. Alternative 4 involves excavating surface, subsurface, and ditch soils with lead concentrations greater than 1250 mg/Kg and with metal and PAH concentrations greater than the risk-based derived cleanup standards, and disposing the excavated material in an off-site landfill (**Figures 1-1** and **1-2**). The excavation of soils would extend up to the railroad tracks and would not disrupt the railroad tracks. Excavated soil and ditch soil will be stockpiled and tested prior to being transported off-site for disposal. Excavated material passing the TCLP criteria will be transported and disposed of in a Subtitle D landfill. Excavated soil and ditch soil that exceed the TCLP criteria will be stabilized either on-site or off-site in order to attain LDRs. Stabilization processes are described above. Based on conversations with stabilization contractors, it is expected that off-site treatment may be more cost effective than on-site treatment. Therefore, for screening purposes and for conservative cost comparison purposes, this alternative assumes all excavated soil is transported off-site for both treatment and disposal.

Material and debris from Buildings S-311 and 366 will also be removed, stockpiled and tested for TCLP prior to disposal. Material passing the TCLP criteria will be transported and disposed of in a Subtitle D landfill. Material exceeding the TCLP criteria will be stabilized either on-site or off-site. Debris and dust will also be removed from the surface of the furnace and boiler stacks and disposed and stabilized as appropriate.

Excavated areas will be backfilled to restore the area to original conditions and to provide proper storm water control. Common fill and topsoil will be placed and vegetative growth will be established. The intent of this alternative is to remove the waste from SEAD-16 and SEAD-17 to prevent contact with receptors and migration to surface water and groundwater. Long-term groundwater monitoring will be necessary; however, long-term operations and maintenance will not be required.

LUCs, which are an element of this alternative, would include a groundwater use restriction until groundwater ARARs were achieved and a LUC preventing residential or day care land use. Information regarding implementation and enforcement of LUCs would be included in the RD/RA Work Plan.

Alternative 4P – Off-Site Disposal under Pre-Disposal Scenario

Capital Cost: $3,604,200
O & M Cost: $40,400 – ditch soil sampling and groundwater monitoring
Present Worth Cost: $4,303,400
Construction Time: 2 to 8 months depending on location of stabilization activities

As part of the pre-design sampling program, additional sampling would be conducted to further delineate the limits of excavation and establish the limit of the institutional controls for SEAD-16 and SEAD-17. Alternative 4P addresses future unrestricted use of SEAD-16 and SEAD-17, which would restore SEAD-16 and SEAD-17 to the pre-disposal condition, even though the intended future use of SEAD-16 and SEAD-17 is industrial. Restoring SEAD-16 and SEAD-17 to the pre-disposal condition is in accordance with 6 NYCRR 375-1.10, which establishes a remediation goal to "restore the site to pre-disposal conditions, to the extent feasible and authorized by law." As a result, to be protective of human health under a residential scenario, the cleanup standards for soil have been revised to 400 mg/Kg for lead and TAGM values antimony, arsenic, cadmium, copper, mercury, thallium, and zinc.

This alternative would be implemented in exactly the same manner as Alternative 4, except that the excavation volume would increase. This alternative would include excavating surface, subsurface, and ditch soils with lead concentrations greater than 400 mg/Kg and concentrations of the other five metals at levels exceeding their respective TAGM value, and disposing the excavated material in an off-site landfill. Excavated soils would be stockpiled and tested prior to being transported off-site for disposal. Excavated soils and ditch soils that exceed the TCLP limits will be stabilized prior to disposal in order to attain LDRs.

Long-term groundwater monitoring will be necessary; however, long-term O&M will not be required.

LUCs, which are an element of this alternative, would include a groundwater use restriction until groundwater ARARs were achieved. Information regarding implementation and enforcement of LUCs would be included in the RD/RA Work Plan.

Alternative 6 – Innovative Treatment – Soil Washing

Capital Cost Range: $3,711,600
O & M Cost: $81,500 – ditch soil sampling and groundwater monitoring
Present Worth Cost: $5,121,000
Construction Time: 6 to 11 months (depending on amount of time necessary for treatability studies and soil washing activities)

As part of the pre-design sampling program, additional sampling would be conducted to further delineate the limits of excavation and establish the limit of the institutional controls for SEAD-16 and

SEAD-17. Alternative 6 involves excavating soil in drainage swales and ditches with lead concentrations greater than 1250 mg/Kg, excavating surface and subsurface soils with lead concentrations greater than 1250 mg/Kg and with metal and PAH concentrations greater than the risk-based derived cleanup standards, stockpiling the material, and washing it to separate the coarse fraction of soil from the fine fraction. The coarse fraction will be backfilled as clean fill, provided it meets remedial action objectives. The fine fraction is expected to contain the majority of the target constituents of concern, e.g., lead, and can be further treated for off-site disposal, if necessary.

Material and debris from Buildings S-311 and 366 will also be removed, stockpiled and tested for TCLP prior to being disposed. Debris and dust will also be removed from the surface of the furnace and boiler stacks and disposed and stabilized as appropriate.

Treatment of the fine fraction to remove any toxicity characteristics, if necessary, can be performed at SEDA or elsewhere. On-site treatment can include stabilization, acid leaching, or other methods. However, because of the relatively small volume of fine grain material to be treated, it is expected that off-site treatment will be more cost-effective than on-site treatment. Therefore, for screening purposes presented later in this section, this alternative assumes all treatment of the fine grain material is performed off-site.

Soil washing has been identified as an effective technology because the soils at SEAD-16 and SEAD-17 are made-up of a large quantity of coarse particles (crushed shale imported from a SEDA borrow pit) and a small quantity of fine particles (soil particles less than the #200 sieve). Based on several grain size distribution curves, the fine fraction in the soil varies from 24 to 67 percent with median of approximately 36 percent. The fine fraction in ditch soil varies from 5 to 95 percent with median of approximately 56 percent. The inorganic constituents tend to bind chemically or physically to the fine-grained particles. The fine-grained particles, in turn, are attached to sand and gravel particles by physical processes, primarily compaction and adhesion. The washing process separates the smaller fine-grained fraction from the larger coarse-grained fraction and thus effectively separates chemical constituents into a smaller volume, which can then be further treated or disposed. The clean, coarse fraction can be used as clean backfill. The fine fraction can either be transported off-site for treatment and off-site disposal or treated further to remove the inorganic components and then off-site disposal. The water associated with the process is collected and treated.

The technology of soil washing varies from vendor to vendor and may consist of varying combinations of physical and chemical separation unit operations including the following:

Physical Separation Unit Operations

- dry screening (grizzly screen)
- dry screening (vibratory screen)
- dry trommel screen
- wet sieves
- attrition scrubber (wet)

- dense media separator (wet)
- hydrocyclone separators
- flotation separator
- gravity separators
- dewatering equipment
- clarifiers
- filter presses

Chemical Extraction Unit Operations

- wash water treatment/recycle
- residual treatment and disposal
- treated water discharge

Long-term groundwater monitoring will be necessary; however, long-term operations and maintenance will not be required.

LUCs, which are an element of this alternative, would include a groundwater use restriction until groundwater ARARs were achieved and a LUC preventing residential or day care land use. Information regarding implementation and enforcement of LUCs would be included in the RD/RA Work Plan.

10.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy, several factors set out in CERCLA § 121, 42 U.S.C. §9621, were considered. Based on these specific statutory mandates, the NCP, Title 40 CFR §300.430(e)(9), and OSWER Directive 9355.3-01, nine evaluation criteria were used in assessing the individual alternatives.

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

A detailed alternative analysis using the nine NCP evaluation criteria was performed to select a site remedy. This section presents a summary of the comparison of each alternative's strengths and weaknesses with respect to the nine evaluation criteria. Because this ROD addresses alternatives for both SEAD-16 and SEAD-17 as a combined unit, the evaluation discussion is presented jointly.

10.1 SUMMARY OF EVALUATION CRITERIA

The nine NCP criteria are summarized as follows:

Threshold Criteria - The following two threshold criteria must be met for the alternatives to be eligible for selection in accordance with the NCP:

1. **Overall protection of human health and the environment** addresses whether or not the remedy provides adequate protection and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether a remedy will meet all of the ARARs of other federal and state environmental laws and/or will provide grounds for invoking a waiver.

Primary Balancing Criteria - Once an alternative satisfies the threshold criteria, the following five criteria are used to compare and evaluate the elements of the alternative.

1. **Long-term effectiveness and permanence** addresses the criteria that are used to assess alternatives for the long-term effectiveness and permanence they afford, along with the degree of certainty that they will prove successful.

2. **Reduction of toxicity, mobility, or volume through treatment** addresses the degree to which alternatives use recycling or treatment that reduces toxicity, mobility, or volume, including how treatment is used to address the principle threats posed by SEAD-16 and SEAD-17.

3. **Short-term effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until cleanup standards are achieved.

4. **Implementability** addresses the technical and administrative feasibility of a remedy, including availability of materials and services to implement a particular option.

5. **Cost** includes estimated capital, O&M, and present-worth costs.

Modifying Criteria - The modifying criteria are used in the final evaluation of remedial alternatives generally after the lead agency has received public comment on the RI/FS and Proposed Plan.

1. **State acceptance** addresses the state's position and key concerns related to the Selected Remedy and other alternatives, and the state's comments on ARARs or the proposed use of waivers. State acceptance of the preferred alternative should be addressed in the Record of Decision following review of the State comments received on the RI/FS Report and the Proposed Plan.

2. **Community acceptance** addresses the public's general response to the alternatives described in the Proposed Plan and RI/FS. Community acceptance of the preferred alternative will be assessed in the Record of Decision following review of the public comments received on the RI/FS and the Proposed Plan.

The assembled alternatives were screened as described in the USEPA guidance.

10.2 ALTERNATIVES EVALUATION PROCESS

Each of the six proposed remedial alternatives was initially evaluated in the FS using a two-step screening process to reduce the number of alternatives that would undergo detailed assessment under the identified criteria. The first step was to evaluate the alternatives against the two remedy selection threshold factors (overall protection of human health and the environment; ARAR compliance) for a pass/fail/waiver decision. In the second step, the retained alternatives were evaluated against the five primary balancing criteria (long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; cost). This initial evaluation is a general and qualitative screening.

During the performance of the second step, each of the six alternatives was evaluated on the basis that the future land use of SEAD-16 and SEAD-17 was planned industrial development. This future use was identified by the community representative group, the Local Redevelopment Authority, during

the BRAC process. The results of preliminary screening and alternative evaluations are presented below.

Results of Preliminary Alternatives Screening

Alternative 1, No Action, is the only alternative that will not comply with the two threshold factors (overall protection of human health and the environment; ARAR compliance) evaluated in Step 1. It was, however, retained to provide a baseline comparison with other alternatives throughout the screening process. The Step 2 analysis assigned a score to each alternative for each balancing criteria discussed above. As a result of this portion of the two-step process, Alternatives 3 and 5 received the lowest total scores and were screened out. The remaining four alternatives (Alternatives 1, 2, 4, and 6) were retained for a more detailed analysis and assessment.

10.3 COMPARISON OF ALTERNATIVES

Overall Protectiveness of Human Health and the Environment

Each alternative was assessed against the threshold criterion of overall protection of human health and the environment. The alternative must satisfy these criteria for it to be eligible for selection.

All of the alternatives, except Alternative 1, provide protection of human health and the environment. The building material and debris from SEAD-16 will be removed and disposed off-site. Ditch soil with lead concentrations above 1250 mg/Kg will be removed and disposed of. Soil with metal and PAH concentrations above the proposed cleanup standards would either be treated, removed, or covered. Removing or covering these materials will prevent dermal contact and ingestion, which have been identified by the BRA as the major exposure pathways for dust, soil and ditch soil at SEAD-16 and SEAD-17. Alternatives 2, 4, 4P, or 6 will each reduce risk to acceptable levels.

Removal of soils found in the drainage ditches will protect environmental receptors by preventing migration of contaminated ditch soils to Kendaia Creek, which is downgradient of SEAD-16 and SEAD-17. Additionally, removing contaminated surface and subsurface soil (Alternatives 4, 4P, and 6) will decrease any potential for migration to groundwater and placing a soil cover over these areas (Alternative 2) will decrease the potential for erosion and migration to nearby areas.

LUCs would aid in the protection of human health and the environment by limiting access to any remaining identified contaminants and preventing the use of groundwater as a drinking water source.

Compliance with ARARs

Compliance with ARARs was a threshold criterion because each alternative must meet this to be carried through the ranking process. With the exception of the Alternative 1 (No-Action), which was retained for comparative purposes, all the alternatives were rated highly for ARAR compliance. All alternatives are expected to fully comply with ARARs.

Long-Term Effectiveness and Permanence

The criterion of long-term effectiveness addresses the long-term protection of human health and the environment, permanence of the remedial alternative, magnitude of remaining risk, and adequacy and reliability of controls.

Alternatives 2, 4, 4P, and 6 demonstrate long-term effectiveness because they rely on disposal, containment, and treatment to reduce the hazardous constituents in the soils and ditch soils. Alternative 4P is the most effective in eliminating the long-term threats since it would involve excavation and removal of the most contaminants, which is required to allow unrestricted use. Alternative 6 is highly effective in eliminating the long-term threats because soil washing segregates the coarse and fine fractions of the soil. Most of the hazardous contaminants are contained in the fines fraction, which would be disposed of off-site. This coarse fraction would no longer contain concentrations of lead above the proposed cleanup level and would be backfilled. Alternative 4 is the next most effective because it involves possible treatment and disposal of soils and ditch soils in an off-site landfill. Alternative 2 is also considered effective because it involves possible treatment and disposal of the ditch soil in an off-site landfill, as well as a soil cover for the surface soils. The soil cover would prevent contact with the underlying soil and reduce risk to acceptable levels. This alternative has little effect in preventing groundwater deterioration by potential contaminant leaching from soil. However, groundwater quality is not expected to exceed USEPA MCL or NYS GA standards for groundwater in the future. This alternative may also limit the future land use. All alternatives are considered to be technically feasible and provide effective long-term protection. Alternative 1, the no action alternative, does not provide long-term protection of human health and the environment.

The goal of all the remedial alternatives (except Alternative 4P) is to have no residual contamination in soils above 1250 mg/Kg for lead and above the risk-based derived cleanup standards for metals and carcinogenic PAHs (**Table 1-1**). These concentrations are considered to be protective of human health in the future industrial use scenario. After the remedial action at SEAD-16, the maximum concentrations of antimony, copper, lead, mercury, and thallium are expected to be below the cleanup value determined to be protective of human health (**Table 10-1**). Although the maximum concentration of zinc exceeds the clean up value of 773 mg/Kg, the EPC for zinc is expected to be below the clean up value. After remediation at SEAD-17, the maximum concentrations of the metals (antimony, copper, lead, mercury, thallium, and zinc) are expected to be below the respective cleanup values (**Table 10-2**).

Although no residual contamination is expected after the remedial action, residual contamination would be assessed, with the aim that the remaining concentrations are protective of human health and the environment in the future industrial use scenario.

The relative rankings of the alternatives based on permanence are the same as the rankings for long-term protectiveness. Since Alternatives 4, 4P, and 6 reduce the volume of contaminated soil at

SEAD-16 and SEAD-17, they are more permanent than Alternative 2, which requires soil to remain at SEAD-16 and SEAD-17. All alternatives would require temporary groundwater use restrictions until ARARs are achieved. Alternatives 2, 4, and 6 would require permanent LUCs restricting SEAD-16 and SEAD-17 to industrial use only and prohibiting future use as a daycare facility. Details regarding implementation and enforcement of LUCs will be provided in the Remedial Design Plan. The Army believes that LUCs are effective and can be permanent if monitored and enforced until such restrictions can be removed. Alternative 4P ranks higher for permanence since permanent LUCs would not be required because this alternative would allow for unrestricted use. Alternative 1, the no action alternative, is not permanent because no treatment or soil cover is used.

Reduction in Toxicity, Mobility or Volume

The alternatives were compared with respect to the relative decreases in the toxicity, mobility, and volume of the hazardous constituents present at SEAD-16 and SEAD-17. Alternative 6 yields the greatest reduction in the toxicity by separating the coarse material from the fine material, treating the latter if necessary, and disposing it in an off-site landfill. The hazardous constituents are normally concentrated in the fine fraction of the soil, which could be treated using stabilization or acid leaching. Once the fine grain material is landfilled, the hazardous constituents are essentially immobile. Alternative 6 also provides the greatest volume reduction of the contaminated soils. Soil washing reduces the volume of the contaminated soil to approximately one-third of the original volume.

Under Alternative 2, ditch soil toxicity would decrease if it were stabilized after failing TCLP test. Under Alternatives 4 and 4P, both soil and ditch soil toxicity would decrease if they fail TCLP and are stabilized. The stabilization process decreases the toxicity of the metals because the metals are converted to less soluble forms. Once the soil is treated and landfilled in Alternatives 2, 4, and 4P the hazardous constituents are essentially immobile. Alternative 2 also decreases the mobility of the surface and subsurface soils through the placement of the soil cover, which will contain the soil and prevent migration to surface water via erosion.

Alternatives 4 and 4P, which rely on stabilization and disposal, rank the poorest on the volume reduction. The treated soils typically have a greater volume than the initial untreated soil. Furthermore, the remaining soils, which will be excavated and landfilled, will increase in volume by approximately 30 percent as a result of the excavation process.

Short-Term Effectiveness

Alternative 2 does not involve a large amount of excavation and can be implemented relatively quickly because it does not require specialized equipment or vendors. Off-site transportation is limited and includes transportation of soil excavated from the drainage ditches, building material and debris, and materials for the cap (topsoil, common fill, and filter fabric). The latter factor can be decreased through the use of borrow soils at SEDA. Alternatives 4 and 4P do not require additional

handling for treatment or specialized equipment, but it does require off-site disposal. It can, however, be performed efficiently and quickly. Alternative 6 requires the same amount of excavation but the off-site transportation of a lesser volume of material than Alternative 4. However, Alternative 6 requires the excavated material to be handled more than Alternatives 2, 4, and 4P. This extra handling is required to consolidate and treat the material and increases the on-site worker's exposure to the material through direct contact and dust. Alternative 6 also requires specialized equipment to treat the soils.

Implementability

All of the alternatives score well on implementability. Alternative 1 requires only monitoring, which is easily achieved. Alternative 2 can be constructed most easily since it involves leaving soils in place and constructing a soil cover. Construction of the soil cover involves routine earthmoving tasks, such as hauling, spreading and compacting soils. Numerous contractors are available and qualified to perform these tasks. Alternatives 4 and 4P can also be constructed easily, though it involves more excavation, stockpiling, testing, and transportation. In addition, off-site stabilization may be necessary prior to disposal. Alternative 4P is advantageous since no permanent LUCs would be required since the alternative would allow for unrestricted land use. Alternative 6 is also relatively easy to implement, however, it requires a specialized soil washing contractor, treatability program, and additional handling. In addition, for all the alternatives an off-site landfill capable of accepting and treating, if necessary, the SEAD-16 or SEAD-17 material will be needed.

Cost

Capital costs, operating costs, and administrative costs were estimated for the four remedial action alternatives. Capital costs include those costs for professional labor, treatability studies, construction and equipment, site work, monitoring and testing, and treatment and disposal. Operating costs include costs for administrative and professional labor, monitoring, and utilities. Administrative costs include the costs for restricting future land use to non-residential. All costs discussed are present worth estimates using a common discount rate of 4%. The capital and operating costs for Alternatives 2, 4, 4P, and 6 are summarized in **Table 10-3**.

Alternative 1 (No-Action) is not considered to have any associated capital or operating costs. This alternative is used as a basis of comparison for all other alternatives. Alternative 2 is the least expensive alternative at a cost of $2,343,600. Alternative 4 would cost $3,109,400, and Alternative 4P would cost $4,303,400. Alternative 6 is the most expensive alternative and varies in cost depending on the final lead cleanup level, with a cost of $5,121,000 for a lead cleanup level of 1250 mg/Kg.

State Acceptance

State acceptance addresses technical and administrative concerns of the State with regard to remediation. The NYSDEC has provided input during the preparation of the Proposed Plan and ROD and their concurrence with the selected remedy is given in **Appendix B**.

Community Acceptance

Community acceptance addresses public comments received on the Administrative Record and the Proposed Plan. Community comments to the selected remedy were evaluated following the public comment period and are discussed in the Responsiveness Summary, **Appendix C**.

11.0 SELECTED REMEDY

Remedial action alternatives were prepared together for the removal of contaminated materials at the Abandoned Deactivation Furnace (SEAD-16) and at the Active Deactivation Furnace (SEAD-17). The baseline human health risk assessment indicates that the current human health risk and ecological risk exceed acceptable levels for SEAD-16 and SEAD-17. Alternatives 2, 4, 4P, and 6 address remediating the soil, ditch soil, and building material and debris and would all be effective in reducing the human health and ecological risk as well as meeting the remedial action objectives. In summary, the goal of the remedial action is to prevent ingestion of and dermal contact with soils and ditch soils with lead concentrations above 1250 mg/Kg and with metals and PAH concentrations greater than the risk-based derived cleanup standards (based on future industrial use scenario) shown in **Table 1-1**, and prevent ingestion and dermal contact with dust caused by excess debris and materials that are currently inside the abandoned buildings at SEAD-16.

Based on the evaluation of various options, the preferred alternative of the U.S. Army for SEAD-16 and SEAD-17 is Alternative 4 (Excavation, Stabilization, and Off-site Disposal). The unrestricted use alternative was considered for Alternative 4 to weigh the advantages of restoring SEAD-16 and SEAD-17 to pre-disposal conditions versus the cost this would incur. Alternative 4P, which has a present worth value of over $1 million more than Alternative 4, was not selected as the preferred alternative because of the significant cost increase compared to its industrial use counterpart. Because SEAD-16 and SEAD-17 do not pose an unacceptable human health risk for the intended future use, industrial, under Alternative 4, the additional health risk reductions achieved by the unrestricted use alternative, Alternative 4P, does not warrant an additional $1 million.

The elements that compose the Army's selected remedy include:

- Conducting additional sampling as part of the pre-design sampling program to further delineate the areas of excavation;
- Removing, testing, and disposing off-site of the SEAD-16 building debris;
- Excavating approximately 275 cy of ditch soil to a depth of 1 ft. with lead concentrations greater than 1250 mg/Kg to until cleanup standards are achieved;
- Excavating approximately 1760 cy of surface soils to a depth of 1 ft. at SEAD-16 with lead concentrations greater than 1250 mg/Kg, and PAH and metal concentrations greater than risk-based cleanup standards (**Table 1-1**);
- Excavating approximately 67 cy of subsurface soils to a depth of 2 ft. to 3 ft. at SEAD-16 (areas around SB16-2, SB16-4, and SB16–5) with lead concentrations greater than 1250 mg/Kg, and PAH and metal concentrations greater than risk-based cleanup standards (**Table 1-1**) (**Figure 1-1**);
- Excavating approximately 2590 cy of surface soils to a depth of 1 ft. at SEAD-17 with lead concentrations greater than 1250 mg/Kg and metal concentrations greater than risk-based cleanup standards (**Table 1-1**) (**Figure 1-2**);

- Stabilizing excavated soils from SEAD-16 and SEAD-17 and building debris from SEAD-16 exceeding the TCLP criteria in order to attain LDRs;
- Disposing of the excavated material from both SEAD-16 and SEAD-17 in an off-site landfill;
- Backfilling the excavated areas at both SEAD-16 and SEAD-17 with clean backfill;
- Conducting groundwater monitoring at both SEAD-16 and SEAD-17 until concentrations are below the GA criteria;
- Remediating material potentially presenting an explosive hazard and munitions and explosives of concern to meet the Department of Defense Explosive Safety Board (DDESB) requirements for unrestricted use or to put into place land use restrictions as may be required by DDESB;
- Submitting a Completion Report after completion of the remedial action;
- Establish and maintain LUCs to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Implementing LUCs and completing 5-year reviews to evaluate whether the response action remains protective of public health and the environment.

The frequency of long term monitoring will be detailed in the RD plan. In addition, to complete RCRA closure of the deactivation furnace at SEAD-17, the Army will either further decontaminate or demolish and dispose off-site the structures that failed to meet closure standards during the interim closure (i.e., concrete slabs and block walls).

The proposed areas of excavation for SEAD-16 and SEAD-17 under Alternative 4 are shown in **Figures 1-1** and **1-2**.

In accordance with the FFA and CERCLA §121(c), the remedial action (including the monitoring program) will be reviewed no less often than every 5 years. After such reviews, modifications may be implemented to the remedial program, if appropriate.

Until the contaminant levels in the groundwater meet the cleanup standards, a LUC in the form of a groundwater use restriction and a residential/daycare land use restriction will be a part of the remedy, as specified in the discussion of the remedy for SEAD-16 and SEAD-17. The LUC performance objectives for SEAD-16 and SEAD-17 are to:

- Prevent access or use of the groundwater until cleanup levels are met; and
- Prevent residential housing, elementary and secondary schools, childcare facilities and playgrounds activities.

The LUCs would be implemented over the geographic area of SEAD-16 (**Figure 1-1**) and SEAD-17 (**Figure 1-2**). It should be noted that land within the PID area, which includes SEAD-16 and SEAD-17, is also subject to a separate Proposed Plan and ROD, which include ICs ["Draft Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004)]. Groundwater use restrictions will continue until groundwater

constituent concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use. With USEPA approval, once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated.

To implement the Army's remedy, which includes LUCs, a LUC RD for SEAD-16 and SEAD-17 will be prepared which is consistent with Paragraphs (a) and (c) of ECL Article 27, Section 1318: Institutional and Engineering Controls. In addition, the Army will prepare an environmental easement for SEAD-16 and SEAD-17, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of SEAD-16's and SEAD-17's transfer from federal ownership and which will require the owner and/or any person responsible for implementing the LUCs set forth in this ROD will periodically certify that such institutional controls are in place. A schedule for completion of the draft SEAD-16 and SEAD--17 LUC RD will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the FFA.

The present worth cost of this alternative is $3,109,400. The capital cost and the present worth O&M cost of Alternative 4 are $1,699,900 and $1,409,500, respectively.

In comparison to other remedies considered in the FS, Alternative 4 has the highest overall ranking. While it does not rank highest for any single evaluation criterion, as Alternatives 2 and 6 do, neither does it rank the lowest for any evaluation criteria considered, which each of the other intrusive alternatives did. Alternative 4 ranks second of all the alternatives for long-term effectiveness and permanence and reduction of mobility of contaminants. It also ranks highest of the three alternatives (2, 4, and 6) for technical feasibility and overall cost. The preferred alternative will eliminate source soils from further impacting SEAD-16 and SEAD-17 by preventing contact with receptors and migration of contaminants to surface water and groundwater. It is a cost-effective, readily available alternative that does not require long-term maintenance aside from groundwater monitoring and maintenance of LUCs, such as groundwater restrictions, and residential/daycare land use restrictions; and, the alternative can be implemented quickly to provide short-term effectiveness. Finally, it is a permanent solution that would significantly reduce the mobility of the contaminants and potential for exposure at SEAD-16 and SEAD-17.

12.0 STATUTORY DETERMINATIONS

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that a remedial action must be protective of human health and the environment, cost effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions that employ treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants, or contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a degree of cleanup that satisfies ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

For reasons discussed below, the remedial action selected for implementation at SEAD-16 and SEAD-17 is consistent with CERCLA §121, 42 U.S.C. §9621 and the NCP. The selected remedy is protective of human health and the environment, attains ARARs, and is cost effective.

12.1 THE SELECTED REMEDY IS PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy is protective of human health and the environment through source removal, off-site disposal, and long-term monitoring of the groundwater. Alternative 4 reduces human health risks by excavating the soil and ditch soil that could cause a potential human health risk under a future industrial site usage. Alternative 4 also provides long-term monitoring of the groundwater until ARARs are achieved and requires groundwater use restrictions to prevent the use of the groundwater and residential/daycare land use restrictions.

12.2 THE SELECTED REMEDY ATTAINS ARARS

Alternative 4 will comply with ARARs. In the short-term, a groundwater use restriction will be imposed at SEAD-16 and SEAD-17 until ARARs for groundwater are achieved. Once ARARs are achieved, no groundwater use restriction would be required. Additionally, access to the deactivation furnace at SEAD-17 will be prevented as part of the RCRA closure process.

12.3 THE SELECTED REMEDY IS COST EFFECTIVE

Capital costs include construction costs for the excavation of soils, ditch soils, and building debris, site work, design, professional labor, treatment of excavated groundwater, and transportation and off-remedial disposal of material. Capital costs for Alternative 4 were higher than those projected for Alternative 2, but lower than those estimated for Alternative 6. The operating costs for Alternative 4 were estimated using a planned life of 30 years for monitoring; semi-annual monitoring would occur during the first few years, while annual monitoring would be conducted for the remainder of the monitoring period. While Alternative 4 is not the least expensive, it will provide an effective solution requiring the least amount of operation and maintenance. Time to implement and elimination of

future operating systems have gained increased importance because property transfer at SEDA has become a higher priority. This alternative provides overall protectiveness to human health and the environment, and the simple implementability justifies the selection of Alternative 4 despite its higher cost than Alternative 2.

12.4 THE SELECTED REMEDY UTILIZED PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT OR RESOURCE RECOVER TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The selected remedy will be considered permanent when the concentrations of contaminants in soils, ditch soil, and groundwater are reduced to the remedy-specific cleanup standards. Alternative 4 meets the statutory requirement for permanence by disposing of the excavated soils, ditch soils, and building debris off-site in a landfill. The selected remedy affords the best balance of criteria as compared to other alternatives, since Alternative 4 has a reasonable cost and the best implementability in light of the importance of future land transfer, while nevertheless providing the required level of overall protectiveness of human health and the environment.

12.5 THE SELECTED REMEDY CONSIDERED THE PREFERENCE FOR TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCES THE TOXICITY, MOBILITY, OR VOLUME OF HAZARDOUS SUBSTANCES AS A PRINCIPAL ELEMENT

The selected remedy relies on excavation and disposal of contaminated media. Remedies that included treatment as a primary element were considered during this evaluation. In overall rankings, the off-site disposal option ranked higher when all evaluation criteria, and not just preference for treatment, were taken into account. Although the selected remedy does not rely on treatment as the principal element for soils, ditch soils, and building debris, it does address the principle threats posed by these materials. The selected remedy provides the most easily implementable alternative that can achieve the maximum extent of overall protection of human health and the environment at a reasonable cost.

13.0 DOCUMENTATION OF SIGNIFICANT CHANGES

(Reserved)

14.0 STATE ROLE

(Reserved)

LIST OF TABLES

TABLE 1-1
CLEANUP STANDARDS FOR SOILS FOR INDUSTRIAL USE
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Compounds	Soil Cleanup Goal [1]
Polycyclic Aromatic Hydrocarbons (PAHs)	
Benzo(a)anthracene (ug/kg)	20,417
Benzo(a)pyrene (ug/kg)	2,042
Benzo(b)fluoranthene (ug/kg)	20,417
Benzo(k)fluoranthene [2] (ug/kg)	50,000
Chrysene [2] (ug/kg)	50,000
Dibenz(a,h)anthracene (ug/kg)	2,042
Indeno(1,2,3-cd)pyrene (ug/kg)	20,417
Metals	
Antimony (mg/kg)	29
Arsenic (mg/kg)	20
Cadmium (mg/kg)	14
Copper (mg/kg)	331
Lead [3] (mg/kg)	1250
Mercury (mg/kg)	0.54
Thallium (mg/kg)	2.6
Zinc (mg/kg)	773

Notes:

1. Soil cleanup goals (CUGs) are derived human health risk-based values. These values are protective of the most conservative receptor under an industrial use scenario, a future construction worker (a daycare facility is prohibited), unless otherwise noted. The CUG values for metals are normalized according to the post-remediation HQ distribution for a future construction worker. Soil cleanup goals are for surface, subsurface, and ditch soils. Refer to Page 8-2 for a more detailed discussion on the derivation of the CUGs.
2. The total value for SVOCs cannot exceed 50,000 ug/kg (TAGM 4046).
3. This value was selected as the cleanup goal for lead in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996). Refer to the *Remedial Action Objectives* section in the Proposed Plan for a more detailed discussion.

TABLE 6-1a
SEAD-16 SURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Unit	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detects	No. of Analyses
VOLATILE ORGANICS								
1,1,2,2-Tetrachloroethane	UG/KG	10	6.3	2.3%		NA	1	43
Acetone	UG/KG	17	6.5	4.7%		NA	2	43
Benzene	UG/KG	5	6.1	9.3%		NA	4	43
Carbon Disulfide	UG/KG	2	6.0	7.0%		NA	3	43
Chloroform	UG/KG	2	4.8	4.7%		NA	2	43
Methylene Chloride	UG/KG	3	6.1	7.0%		NA	3	43
Toluene	UG/KG	10	5.6	39.5%		NA	17	43
Xylene (total)	UG/KG	3	6.2	2.3%		NA	1	43
SEMIVOLATILE ORGANICS								
2,4-Dinitrotoluene	UG/KG	85000	4936	39.5%		NA	17	43
2,6-Dinitrotoluene	UG/KG	8000	1966	25.6%		NA	11	43
2-Methylnaphthalene	UG/KG	19000	1314	20.9%		NA	9	43
3,3'-Dichlorobenzidine	UG/KG	850	591	2.3%		NA	1	43
3-Nitroaniline	UG/KG	2100	1435	2.3%		NA	1	43
Acenaphthene	UG/KG	72000	2593	18.6%		NA	8	43
Acenaphthylene	UG/KG	310	464	16.3%		NA	7	43
Anthracene	UG/KG	120000	3767	27.9%		NA	12	43
Benzo(a)anthracene	UG/KG	220000	6169	46.5%	20,417	1	20	43
Benzo(a)pyrene	UG/KG	200000	5774	51.2%	2,042	2	22	43
Benzo(b)fluoranthene	UG/KG	200000	5830	51.2%	20,417	1	22	43
Benzo(g,h,i)perylene	UG/KG	100000	3422	34.9%		NA	15	43
Benzo(k)fluoranthene	UG/KG	170000	4942	44.2%	50,000	0	19	43
Carbazole	UG/KG	89000	3008	25.6%		NA	11	43
Chrysene	UG/KG	220000	6153	62.8%	50,000	0	27	43
Di-n-butylphthalate	UG/KG	16000	2269	39.5%		NA	17	43
Dibenz(a,h)anthracene	UG/KG	49000	1862	20.9%	2,042	1	9	43
Dibenzofuran	UG/KG	50000	2054	20.9%		NA	9	43
Diethylphthalate	UG/KG	19	488	4.7%		NA	2	43
Fluoranthene	UG/KG	530000	13831	65.1%		NA	28	43
Fluorene	UG/KG	78000	2763	11.6%		NA	5	43
Indeno(1,2,3-cd)pyrene	UG/KG	100000	3396	27.9%	20,417	1	12	43
N-Nitrosodiphenylamine	UG/KG	25000	2425	41.9%		NA	18	43
Naphthalene	UG/KG	66000	2464	16.3%		NA	7	43
Pentachlorophenol	UG/KG	1200	1218	2.3%		NA	1	43
Phenanthrene	UG/KG	490000	12704	53.5%		NA	23	43
Pyrene	UG/KG	360000	9678	65.1%		NA	28	43
bis(2-Ethylhexyl)phthalate	UG/KG	2100	605	25.6%		NA	11	43
PESTICIDES/PCB								
4,4'-DDD	UG/KG	23	4.6	18.6%		NA	8	43
4,4'-DDE	UG/KG	1400	72.9	76.7%		NA	33	43
4,4'-DDT	UG/KG	340	41.5	79.1%		NA	34	43
Aldrin	UG/KG	5	1.9	4.7%		NA	2	43
Aroclor-1254	UG/KG	1100	68.9	4.7%		NA	2	43
Aroclor-1260	UG/KG	340	59.4	20.9%		NA	9	43
Dieldrin	UG/KG	26	3.8	4.7%		NA	2	43
Endosulfan I	UG/KG	33	4.8	41.9%		NA	18	43
Endosulfan II	UG/KG	5	3.7	11.6%		NA	5	43
Endosulfan sulfate	UG/KG	2.1	3.5	2.3%		NA	1	43
Endrin	UG/KG	9.9	4.0	9.3%		NA	4	43
Endrin aldehyde	UG/KG	14	4.1	14.0%		NA	6	43
Endrin ketone	UG/KG	3.6	3.7	9.3%		NA	4	43
Heptachlor	UG/KG	1.8	1.8	2.3%		NA	1	43
Heptachlor epoxide	UG/KG	6.7	2.1	14.0%		NA	6	43
Toxaphene	UG/KG	180	184	2.3%		NA	1	43

TABLE 6-1a
SEAD-16 SURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Unit	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detects	No. of Analyses
alpha-Chlordane	UG/KG	170	7.7	30.2%		NA	13	43
beta-BHC	UG/KG	2.3	1.9	4.7%		NA	2	43
gamma-BHC (Lindane)	UG/KG	2.3	1.9	2.3%		NA	1	43
gamma-Chlordane	UG/KG	200	8.3	30.2%		NA	13	43
NITROAROMATICS						NA		
2,4-Dinitrotoluene	UG/KG	74000	4936	62.79%		NA	27	43
2,6-Dinitrotoluene	UG/KG	320	1966	6.98%		NA	3	43
2-amino-4,6-Dinitrotoluene	UG/KG	430	109	2.33%		NA	1	43
Tetryl	UG/KG	220	104	2.33%		NA	1	43
METALS								
Aluminum	MG/KG	17200	10066.0	90.7%		NA	39	43
Antimony	MG/KG	1930	59.0	62.8%	29	3	27	43
Arsenic	MG/KG	32.2	7.6	100.0%	20	3	43	43
Barium	MG/KG	9340	554	97.7%		NA	42	43
Beryllium	MG/KG	0.91	0.4	97.7%		NA	42	43
Cadmium	MG/KG	16.6	1.2	60.5%	14	1	26	43
Calcium	MG/KG	260000	55821	100.0%		NA	43	43
Chromium	MG/KG	47.5	22.1	97.7%		NA	42	43
Cobalt	MG/KG	17.8	10.3	100.0%		NA	43	43
Copper	MG/KG	37900	1204	100.0%	331	11	43	43
Cyanide	MG/KG	1.5	0.3	2.3%		NA	1	43
Iron	MG/KG	36500	22620	100.0%		NA	43	43
Lead	MG/KG	140000	4707	100.0%	1,250	15	43	43
Magnesium	MG/KG	56000	10687	100.0%		NA	43	43
Manganese	MG/KG	4140	510.5	100.0%		NA	43	43
Mercury	MG/KG	11.4	0.8	76.7%	0.54	12	33	43
Nickel	MG/KG	148	34.9	100.0%		NA	43	43
Potassium	MG/KG	2300	1330	100.0%		NA	43	43
Selenium	MG/KG	1.5	0.4	44.2%		NA	19	43
Silver	MG/KG	11.1	0.7	39.5%		NA	17	43
Sodium	MG/KG	1830	149	88.4%		NA	38	43
Thallium	MG/KG	16.6	0.9	32.6%	2.6	1	14	43
Vanadium	MG/KG	61.9	23.1	100.0%		NA	43	43
Zinc	MG/KG	14600	625	100.0%	773	4	43	43
HERBICIDES								
2,4,5-T	UG/KG		3.4	13.0%		NA	2	16
MCPP	UG/KG		3641	6.0%		NA	1	16

Notes:
1) The cleanup goals are site-specific values listed in Table 1-1

TABLE 6-1b
SEAD-16 SUBSURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detect	No. of Analyses
VOLATILE ORGANICS								
2-Butanone	UG/KG	5	4.8	16.7%		NA	1	6
Acetone	UG/KG	46	13.3	33.3%		NA	2	6
Benzene	UG/KG	2	4.4	33.3%		NA	2	6
Toluene	UG/KG	6	4.1	66.7%		NA	4	6
SEMIVOLATILE ORGANICS								
2,4-Dinitrotoluene	UG/KG	1700	666	33.3%		NA	2	6
2,6-Dinitrotoluene	UG/KG	160	427	16.7%		NA	1	6
2-Methylnaphthalene	UG/KG	190	432	16.7%		NA	1	6
Acenaphthene	UG/KG	1100	465	16.7%		NA	1	6
Acenaphthylene	UG/KG	300	323	16.7%		NA	1	6
Anthracene	UG/KG	2000	484	50.0%		NA	3	6
Benzo(a)anthracene	UG/KG	6600	1258	66.7%	20,417	0	4	6
Benzo(a)pyrene	UG/KG	6200	1341	83.3%	2,042	1	5	6
Benzo(b)fluoranthene	UG/KG	6000	1178	83.3%	20,417	0	5	6
Benzo(g,h,i)perylene	UG/KG	11000	2744	83.3%		NA	5	6
Benzo(k)fluoranthene	UG/KG	5600	1113	83.3%	50,000	0	5	6
Butylbenzylphthalate	UG/KG	18	406	16.7%		NA	1	6
Carbazole	UG/KG	730	403	16.7%		NA	1	6
Chrysene	UG/KG	7000	1318	83.3%	50,000	0	5	6
Di-n-butylphthalate	UG/KG	240	418	33.3%		NA	2	6
Dibenz(a,h)anthracene	UG/KG	2500	803	66.7%	2,042	1	4	6
Dibenzofuran	UG/KG	270	303	33.3%		NA	2	6
Fluoranthene	UG/KG	13000	2335	83.3%		NA	5	6
Fluorene	UG/KG	800	415	16.7%		NA	1	6
Indeno(1,2,3-cd)pyrene	UG/KG	7100	1966	83.3%	20,417	0	5	6
N-Nitrosodiphenylamine	UG/KG	530	488	16.7%		NA	1	6
Naphthalene	UG/KG	120	420	16.7%		NA	1	6
Pentachlorophenol	UG/KG	120	994	16.7%		NA	1	6
Phenanthrene	UG/KG	7600	1373	83.3%		NA	5	6
Pyrene	UG/KG	11000	2002	83.3%		NA	5	6
bis(2-Ethylhexyl)phthalate	UG/KG	110	418	16.7%		NA	1	6
PESTICIDES/PCB								
4,4'-DDE	UG/KG	8.3	8.6	16.7%		NA	1	6
4,4'-DDT	UG/KG	3.4	7.7	33.3%		NA	2	6
Dieldrin	UG/KG	12	9.2	16.7%		NA	1	6
Endosulfan I	UG/KG	7.3	4.9	33.3%		NA	2	6
Endrin	UG/KG	2.9	7.6	16.7%		NA	1	6
NITROAROMATICS								
2,4-Dinitrotoluene	UG/KG	500	666.2	0.5		NA	3	6
METALS								
Aluminum	MG/KG	12800	6808	16.7%		NA	1	6
Antimony	MG/KG	135	24.5	50.0%	29	1	3	6
Arsenic	MG/KG	6.9	5.6	100.0%	20	0	6	6
Barium	MG/KG	302	143	100.0%		NA	6	6
Beryllium	MG/KG	0.51	0.4	100.0%		NA	6	6
Cadmium	MG/KG	0.45	0.2	83.3%	14	0	5	6
Calcium	MG/KG	97900	45767	100.0%		NA	6	6
Chromium	MG/KG	21.1	18.4	100.0%		NA	6	6
Cobalt	MG/KG	12.2	10.7	100.0%		NA	6	6
Copper	MG/KG	736	179	100.0%	331	1	6	6
Cyanide	MG/KG	0.52	0.3	16.7%		NA	1	6

TABLE 6-1b
SEAD-16 SUBSURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detect	No. of Analyses
Iron	MG/KG	31400	24433	100.0%		NA	6	6
Lead	MG/KG	35400	6099	100.0%	1,250	1	6	6
Magnesium	MG/KG	13300	9715	100.0%		NA	6	6
Manganese	MG/KG	650	471	100.0%		NA	6	6
Mercury	MG/KG	1.9	0.5	66.7%	0.54	1	4	6
Nickel	MG/KG	37	29.9	100.0%		NA	6	6
Potassium	MG/KG	1990	1400	100.0%		NA	6	6
Selenium	MG/KG	1.2	0.6	50.0%		NA	3	6
Silver	MG/KG	1.2	0.3	33.3%		NA	2	6
Sodium	MG/KG	160	64.6	50.0%		NA	3	6
Thallium	MG/KG	0.91	7.8	16.7%	2.6	0	1	6
Vanadium	MG/KG	22.6	18.6	100.0%		NA	6	6
Zinc	MG/KG	183	114	100.0%	773	0	6	6

Notes:
1) The cleanup goals are site-specific values listed in Table 1-1.

TABLE 6-1c
SEAD-16 GROUNDWATER ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Action Level [1]	Source	No. Above Action Level	No. of Detects	No. of Analyses
SEMIVOLATILE ORGANICS									
3-Nitroaniline	UG/L	25	25	6.7%			0	1	15
4-Chloroaniline	UG/L	10	10	6.7%	5	a	1	1	15
Benzo[ghi]perylene	UG/L	1	1	6.7%			0	1	15
Dibenz[a,h]anthracene	UG/L	0.7	0.7	6.7%			0	1	15
Indeno[1,2,3-cd]pyrene	UG/L	0.6	0.6	6.7%			0	1	15
NITROAROMATICS									
1,3-Dinitrobenzene	UG/L	1.8	1.03	13.3%	5	a	0	2	15
2,4-Dinitrotoluene	UG/L	0.68	0.68	6.7%	5	a	0	1	15
METALS									
Aluminum	UG/L	1850	675.163	53.3%			0	8	15
Antimony	UG/L	12.3	9.9	13.3%	6	c	2	2	15
Arsenic	UG/L	3.2	3.2	6.7%	10	b	0	1	15
Barium	UG/L	97.4	76.243	46.7%	1000	a	0	7	15
Beryllium	UG/L	0.23	0.205	40.0%	4	c	0	6	15
Cadmium	UG/L	0.32	0.32	6.7%	5	c	0	1	15
Calcium	UG/L	193000	116960	100.0%			0	15	15
Chromium	UG/L	3.4	2.18	33.3%	50	a	0	5	15
Cobalt	UG/L	2.1	1.52	33.3%			0	5	15
Copper	UG/L	56.8	14.557	46.7%	200	a	0	7	15
Iron	UG/L	2400	640.471	93.3%	300	a	5	14	15
Lead	UG/L	24.1	10.057	46.7%	15	c	1	7	15
Magnesium	UG/L	23700	16791.33	100.0%			0	15	15
Manganese	UG/L	1380	215.2	93.3%			0	14	15
Nickel	UG/L	11	4.757	46.7%	100	c	0	7	15
Potassium	UG/L	18800	5216.25	53.3%			0	8	15
Selenium	UG/L	2.8	2.8	6.7%	10	a	0	1	15
Sodium	UG/L	409000	70347.86	93.3%	20000	a	3	14	15
Thallium	UG/L	11	7.65	26.7%	2	c	4	4	15
Vanadium	UG/L	3.8	2.82	33.3%			0	5	15
Zinc	UG/L	42	42	6.7%			0	1	15

Notes:

1. Promulgated action levels for groundwater are listed.
a) NY State Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
b) US EPA Maximum Contaminant Limit announced 10/31/01. Source http://www.epa.gov/safewater/arsenic.html
c) US EPA National Primary Drinking Water Standards, EPA 816-F-01-007 March 2001

TABLE 6-1d
SEAD-16 SURFACE WATER ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	No. of Detects	No. of Analyses
SEMIVOLATILE ORGANICS						
Di-n-butylphthalate	UG/L	0.5	0.5	7.7%	1	13
Pentachlorophenol	UG/L	4	1.9	23.1%	3	13
bis(2-Ethylhexyl)phthalate	UG/L	3	2.3	23.1%	3	13
METALS						
Aluminum	UG/L	261	206.5	15.4%	2	13
Antimony	UG/L	124	30.4	84.6%	11	13
Arsenic	UG/L	5.7	4.0	61.5%	8	13
Barium	UG/L	348	118.0	100.0%	13	13
Cadmium	UG/L	2	0.8	53.8%	7	13
Calcium	UG/L	89900	72223.1	100.0%	13	13
Chromium	UG/L	3	2.4	23.1%	3	13
Cobalt	UG/L	4.1	3.4	15.4%	2	13
Copper	UG/L	424	58.8	100.0%	13	13
Iron	UG/L	3650	964.4	84.6%	11	13
Lead	UG/L	813	112.0	100.0%	13	13
Magnesium	UG/L	11400	9125.4	100.0%	13	13
Manganese	UG/L	252	52.4	100.0%	13	13
Mercury	UG/L	0.9	0.4	23.1%	3	13
Nickel	UG/L	5.5	4.2	61.5%	8	13
Potassium	UG/L	4590	2980.8	100.0%	13	13
Selenium	UG/L	4.3	2.7	30.8%	4	13
Silver	UG/L	5.2	5.2	7.7%	1	13
Sodium	UG/L	9220	5642.3	100.0%	13	13
Vanadium	UG/L	4.9	3.0	53.8%	7	13
Zinc	UG/L	380	126.4	100.0%	13	13

TABLE 6-1e
SEAD-16 SEDIMENT ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No of Detects	No. of Analyses
VOLATILE ORGANICS								
2-Butanone	UG/KG	12	12.00	9.1%		NA	1	11
Acetone	UG/KG	36	24.83	54.5%		NA	6	11
SEMIVOLATILE ORGANICS								
2,4-Dinitrotoluene	UG/KG	5400	2087.67	27.3%		NA	3	11
2-Methylnaphthalene	UG/KG	55	47.50	18.2%		NA	2	11
Acenaphthene	UG/KG	32	32.00	9.1%		NA	1	11
Acenaphthylene	UG/KG	54	44.00	27.3%		NA	3	11
Anthracene	UG/KG	100	74.50	36.4%		NA	4	11
Benzo(a)anthracene	UG/KG	570	237.71	63.6%	20,417	0	7	11
Benzo(a)pyrene	UG/KG	600	316.67	54.5%	2,042	0	6	11
Benzo(b)fluoranthene	UG/KG	1200	523.33	54.5%	20,417	0	6	11
Benzo(g,h,i)perylene	UG/KG	530	244.43	63.6%		NA	7	11
Benzo(k)fluoranthene	UG/KG	780	373.33	54.5%	50,000	0	6	11
Carbazole	UG/KG	110	72.00	27.3%		NA	3	11
Chrysene	UG/KG	1200	442.29	63.6%	50,000	0	7	11
Di-n-butylphthalate	UG/KG	250	195.00	36.4%		NA	4	11
Dibenz(a,h)anthracene	UG/KG	170	101.00	45.5%	2,042	0	5	11
Fluoranthene	UG/KG	1600	463.00	72.7%		NA	8	11
Indeno(1,2,3-cd)pyrene	UG/KG	500	228.29	63.6%	20,417	0	7	11
N-Nitrosodiphenylamine	UG/KG	600	600.00	9.1%		NA	1	11
Phenanthrene	UG/KG	420	188.13	72.7%		NA	8	11
Pyrene	UG/KG	1400	461.38	72.7%		NA	8	11
bis(2-Ethylhexyl)phthalate	UG/KG	270	128.88	72.7%		NA	8	11
PESTICIDES/PCBs								
4,4'-DDD	UG/KG	730	116.30	72.7%		NA	8	11
4,4'-DDE	UG/KG	570	103.30	100.0%		NA	11	11
4,4'-DDT	UG/KG	420	83.78	72.7%		NA	8	11
Aroclor-1254	UG/KG	670	160.29	63.6%		NA	7	11
Aroclor-1260	UG/KG	130	71.00	45.5%		NA	5	11
Endosulfan I	UG/KG	26	10.00	63.6%		NA	7	11
Endosulfan II	UG/KG	6.8	5.23	27.3%		NA	3	11
Endosulfan sulfate	UG/KG	18	11.30	18.2%		NA	2	11
Endrin aldehyde	UG/KG	3.2	3.20	9.1%		NA	1	11
Heptachlor epoxide	UG/KG	2.8	2.80	9.1%		NA	1	11
alpha-Chlordane	UG/KG	12.1	8.77	27.3%		NA	3	11
gamma-Chlordane	UG/KG	3.8	3.35	18.2%		NA	2	11
NITROAROMATICS								
2,4-Dinitrotoluene	UG/KG	910	550.00	18.2%		NA	2	11
METALS								
Aluminum	MG/KG	22900	13470.00	100.0%		NA	11	11
Antimony	MG/KG	50.3	13.73	90.9%	29	2	10	11
Arsenic	MG/KG	9.6	5.94	100.0%	20	0	11	11
Barium	MG/KG	3980	555.76	100.0%		NA	11	11
Beryllium	MG/KG	0.93	0.56	100.0%		NA	11	11

TABLE 6-1e
SEAD-16 SEDIMENT ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No of Detects	No. of Analyses
Cadmium	MG/KG	7.6	1.44	100.0%	14	0	11	11
Calcium	MG/KG	75700	37316.36	100.0%		NA	11	11
Chromium	MG/KG	43.5	26.96	100.0%		NA	11	11
Cobalt	MG/KG	15.6	10.07	100.0%		NA	11	11
Copper	MG/KG	17500	1777.58	100.0%	331	4	11	11
Iron	MG/KG	46400	27545.46	100.0%		NA	11	11
Lead	MG/KG	4480	1363.64	100.0%	1,250	4	11	11
Magnesium	MG/KG	15100	7873.64	100.0%		NA	11	11
Manganese	MG/KG	447	277.09	100.0%		NA	11	11
Mercury	MG/KG	2.5	0.56	100.0%	0.54	2	11	11
Nickel	MG/KG	50.9	33.73	100.0%		NA	11	11
Potassium	MG/KG	3870	2047.91	100.0%		NA	11	11
Selenium	MG/KG	4.9	3.15	18.2%		NA	2	11
Silver	MG/KG	0.35	0.35	9.1%		NA	1	11
Sodium	MG/KG	782	240.70	100.0%		NA	11	11
Thallium	MG/KG	1.6	1.30	18.2%	2.6	0	2	11
Vanadium	MG/KG	39.8	24.96	100.0%		NA	11	11
Zinc	MG/KG	952	335.76	100.0%	773	1	11	11

Notes:
1) The cleanup goals are site-specific values listed in Table 1-1

TABLE 6-2a
SEAD-17 SURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detects	No. of Analyses
VOLATILE ORGANICS								
Acetone	UG/KG	15	7.54	7.9%		NA	3	38
Benzene	UG/KG	2	6.22	2.6%		NA	1	38
Methylene Chloride	UG/KG	4	6.26	2.6%		NA	1	38
Toluene	UG/KG	8	6.23	7.9%		NA	3	38
SEMIVOLATILE ORGANICS								
2,4-Dinitrotoluene	UG/KG	1400	251	10.5%		NA	4	38
2,6-Dinitrotoluene	UG/KG	70	226	2.6%		NA	1	38
2-Methylnaphthalene	UG/KG	130	229	2.6%		NA	1	38
3,3'-Dichlorobenzidine	UG/KG	410	235	2.6%		NA	1	38
3-Nitroaniline	UG/KG	990	569	2.6%		NA	1	38
4-Nitroaniline	UG/KG	990	569	2.6%		NA	1	38
Anthracene	UG/KG	23	225	2.6%		NA	1	38
Benzo(a)anthracene	UG/KG	72	180	28.9%	20,417	0	11	38
Benzo(a)pyrene	UG/KG	58	178	28.9%	2,042	0	11	38
Benzo(b)fluoranthene	UG/KG	70	173	34.2%	20,417	0	13	38
Benzo(g,h,i)perylene	UG/KG	82	195	21.1%		NA	8	38
Benzo(k)fluoranthene	UG/KG	49	184	26.3%	50,000	0	10	38
Butylbenzylphthalate	UG/KG	46	223	5.3%		NA	2	38
Carbazole	UG/KG	410	235	2.6%		NA	1	38
Chrysene	UG/KG	78	140	52.6%	50,000	0	20	38
Di-n-butylphthalate	UG/KG	1200	234	50.0%		NA	19	38
Dibenz(a,h)anthracene	UG/KG	59	218	7.9%	2,042	0	3	38
Fluoranthene	UG/KG	190	126	65.8%		NA	25	38
Indeno(1,2,3-cd)pyrene	UG/KG	62	207	13.2%	20,417	0	5	38
N-Nitrosodiphenylamine	UG/KG	71	222	5.3%		NA	2	38
Naphthalene	UG/KG	37	226	2.6%		NA	1	38
Pentachlorophenol	UG/KG	990	568	5.3%		NA	2	38
Phenanthrene	UG/KG	120	166	39.5%		NA	15	38
Pyrene	UG/KG	170	131	63.2%		NA	24	38
bis(2-Chloroisopropyl) ether	UG/KG	410	208	7.1%		NA	1	14
bis(2-Ethylhexyl)phthalate	UG/KG	1300	332	31.6%		NA	12	38
PESTICIDES/PCB								
4,4'-DDD	UG/KG	15	2.49	10.5%		NA	4	38
4,4'-DDE	UG/KG	37	6.16	44.7%		NA	17	38
4,4'-DDT	UG/KG	16	3.18	23.7%		NA	9	38
Aldrin	UG/KG	1.9	1.08	2.6%		NA	1	38
Aroclor-1260	UG/KG	28	20.9	7.9%		NA	3	38
Dieldrin	UG/KG	80	7.16	15.8%		NA	6	38
Endosulfan I	UG/KG	2.4	1.08	5.3%		NA	2	38
Endrin	UG/KG	1.8	2.05	2.6%		NA	1	38
Heptachlor epoxide	UG/KG	1.1	1.04	2.6%		NA	1	38
NITROAROMATICS								
2,4-Dinitrotoluene	UG/KG	330	251	10.5%		NA	4	38
METALS								
Aluminum	MG/KG	18400	13288	100.0%		NA	38	38
Antimony	MG/KG	52	8.42	47.4%	29	3	18	38
Arsenic	MG/KG	16.1	6.34	100.0%	20	0	38	38
Barium	MG/KG	524	158.5	57.9%		NA	22	38
Beryllium	MG/KG	0.87	0.58	100.0%		NA	38	38

TABLE 6-2a
SEAD-17 SURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detects	No. of Analyses
Cadmium	MG/KG	25.5	4.7	86.8%	14	4	33	38
Calcium	MG/KG	209000	44334	100.0%		NA	38	38
Chromium	MG/KG	27.2	20.1	100.0%		NA	38	38
Cobalt	MG/KG	21.9	10.0	100.0%		NA	38	38
Copper	MG/KG	837	185	100.0%	331	10	38	38
Cyanide	MG/KG	1.5	0.33	5.3%		NA	2	38
Iron	MG/KG	28800	22269	100.0%		NA	38	38
Lead	MG/KG	6270	1092	97.4%	1,250	11	37	38
Magnesium	MG/KG	17300	5677	100.0%		NA	38	38
Manganese	MG/KG	996	529	100.0%		NA	38	38
Mercury	MG/KG	1	0.1	97.4%	0.54	2	37	38
Nickel	MG/KG	47.8	27.3	100.0%		NA	38	38
Potassium	MG/KG	2260	1406	100.0%		NA	38	38
Selenium	MG/KG	1.7	0.5	68.4%		NA	26	38
Silver	MG/KG	9	1.6	44.7%		NA	17	38
Sodium	MG/KG	249	95.1	73.7%		NA	28	38
Thallium	MG/KG	1.5	0.4	18.4%	2.6	0	7	38
Vanadium	MG/KG	30.1	22.8	100.0%		NA	38	38
Zinc	MG/KG	1530	335	100.0%	773	4	38	38
HERBICIDES								
MCPA	UG/KG	34000	6752	16.7%		NA	4	24

Notes:
1) The cleanup goals are site-specific values listed in Table 1-1.

TABLE 6-2b
SEAD-17 SUBSURFACE SOIL ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detects	No. of Analyses
SEMIVOLATILE ORGANICS								
bis(2-Ethylhexyl)phthalate	UG/KG	490	132	80.0%		NA	8	10
PESTICIDES/PCB								
Aroclor-1254	UG/KG	61	26.1	10.0%		NA	1	10
METALS								
Aluminum	MG/KG	19300	14494	100.0%		NA	10	10
Arsenic	MG/KG	6.9	4.98	100.0%	20	0	10	10
Barium	MG/KG	158	91.9	100.0%		NA	10	10
Beryllium	MG/KG	0.99	0.68	100.0%		NA	10	10
Cadmium	MG/KG	2.8	0.61	10.0%	14	0	1	10
Calcium	MG/KG	115000	28183	100.0%		NA	10	10
Chromium	MG/KG	27.9	21.5	100.0%		NA	10	10
Cobalt	MG/KG	21.7	11.5	100.0%		NA	10	10
Copper	MG/KG	85.1	33.1	100.0%	331	0	10	10
Iron	MG/KG	38700	28167	100.0%		NA	10	10
Lead	MG/KG	686	117	100.0%	1250	0	10	10
Magnesium	MG/KG	18100	7601	100.0%		NA	10	10
Manganese	MG/KG	1160	553	100.0%		NA	10	10
Mercury	MG/KG	0.06	0.037	70.0%	0.54	0	7	10
Nickel	MG/KG	42	30.9	100.0%		NA	10	10
Potassium	MG/KG	1750	1301	100.0%		NA	10	10
Sodium	MG/KG	239	100	100.0%		NA	10	10
Vanadium	MG/KG	30.7	23.4	100.0%		NA	10	10
Zinc	MG/KG	172	84.5	100.0%	773	0	10	10

Notes:
1) The cleanup goals are site-specific values listed in Table 1-1.

TABLE 6-2c
SEAD-17 GROUNDWATER ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	Action Level[1]	Source	No. Above Action Level	No. of Detects	No. of Analyses
SEMIVOLATILE ORGANICS									
Benzo[a]pyrene	UG/L	0.7	0.7	12.5%	ND	a	0	1	8
Benzo[ghi]perylene	UG/L	2	1.5	25.0%			0	2	8
Dibenz[a,h]anthracene	UG/L	1	0.95	25.0%			0	2	8
Indeno[1,2,3-cd]pyrene	UG/L	2	1.5	25.0%			0	2	8
METALS									
Aluminum	UG/L	386	142.725	50.0%			0	4	8
Barium	UG/L	92.5	88.167	37.5%	1000	a	0	3	8
Beryllium	UG/L	0.26	0.233	37.5%	4	b	0	3	8
Cadmium	UG/L	0.31	0.31	12.5%	5	b	0	1	8
Calcium	UG/L	118000	103637.5	100.0%			0	8	8
Chromium	UG/L	1.5	1.5	12.5%	50	a	0	1	8
Cobalt	UG/L	1.4	1.4	12.5%			0	1	8
Copper	UG/L	4.3	3.567	37.5%	200	a	0	3	8
Iron	UG/L	572	197.733	75.0%	300	a	1	6	8
Magnesium	UG/L	23000	17975	100.0%			0	8	8
Manganese	UG/L	73.8	45.467	75.0%			0	6	8
Nickel	UG/L	2.4	2.133	37.5%	100	b	0	3	8
Potassium	UG/L	5320	1804.75	50.0%			0	4	8
Silver	UG/L	2.3	2.3	12.5%	50	a	0	1	8
Sodium	UG/L	30100	14858.75	100.0%	20000	a	2	8	8
Thallium	UG/L	7.1	5.4	37.5%	2	b	3	3	8
Vanadium	UG/L	1.4	1.4	12.5%			0	1	8
Zinc	UG/L	63.9	63.9	12.5%			0	1	8

Notes:

1. Promulgated action levels for groundwater are listed.
a) NY State Class GA Groundwater Standard (TOGS 1.1.1, June 1998)
b) US EPA National Primary Drinking Water Standards, EPA 816-F-01-007 March 2001

TABLE 6-2d
SEAD-17 SURFACE WATER ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency of Detection	No. of Detects	No. of Analyses
SEMIVOLATILE ORGANICS						
bis(2-Ethylhexyl)phthalate	UG/L	2	1.5	20.0%	2	10
METALS						
Antimony	UG/L	23.6	11.425	40.0%	4	10
Arsenic	UG/L	4.6	3.733	60.0%	6	10
Barium	UG/L	100	47.01	100.0%	10	10
Cadmium	UG/L	1.3	0.632	50.0%	5	10
Calcium	UG/L	73500	53640	100.0%	10	10
Chromium	UG/L	1	1	10.0%	1	10
Copper	UG/L	32.7	13.04	100.0%	10	10
Iron	UG/L	322	146.3	100.0%	10	10
Lead	UG/L	37.1	11.45	60.0%	6	10
Magnesium	UG/L	9280	5904	100.0%	10	10
Manganese	UG/L	19.6	8.43	100.0%	10	10
Nickel	UG/L	1.7	1.7	10.0%	1	10
Potassium	UG/L	4380	3007	100.0%	10	10
Selenium	UG/L	3.5	3.14	50.0%	5	10
Sodium	UG/L	9460	5209	100.0%	10	10
Vanadium	UG/L	1.8	1.8	10.0%	1	10
Zinc	UG/L	61.7	24.13	100.0%	10	10

TABLE 6-2e
SEAD-17 SEDIMENT ANALYSIS RESULTS
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	Maximum Concentration	Average	Frequency	Cleanup Goal (CUG)[1]	No. Above CUG	No. of Detects	No. of Analyses
VOLATILE ORGANICS								
Acetone	UG/KG	26	17	30.0%		NA	3	10
Toluene	UG/KG	8	8	10.0%		NA	1	10
SEMIVOLATILE ORGANICS								
2,4-Dimethylphenol	UG/KG	32	32	10.0%		NA	1	10
2,4-Dinitrotoluene	UG/KG	450	450	10.0%		NA	1	10
Benzo(a)anthracene	UG/KG	25	25	10.0%	20,417	0	1	10
Benzo(a)pyrene	UG/KG	30	30	10.0%	2,042	0	1	10
Benzo(b)fluoranthene	UG/KG	43	43	10.0%	20,417	0	1	10
Benzo(g,h,i)perylene	UG/KG	31	31	10.0%		NA	1	10
Benzo(k)fluoranthene	UG/KG	33	33	10.0%	50,000	0	1	10
Chrysene	UG/KG	48	48	10.0%	50,000	0	1	10
Fluoranthene	UG/KG	70	53	20.0%		NA	2	10
Indeno(1,2,3-cd)pyrene	UG/KG	24	24	10.0%	20,417	0	1	10
Phenanthrene	UG/KG	35	35	10.0%		NA	1	10
Pyrene	UG/KG	47	36.5	20.0%		NA	2	10
bis(2-Ethylhexyl)phthalate	UG/KG	77	55.667	30.0%		NA	3	10
PESTICIDES/PCB								
4,4'-DDD	UG/KG	13	8	30.0%		NA	3	10
4,4'-DDE	UG/KG	62	19.2	60.0%		NA	6	10
4,4'-DDT	UG/KG	12	7.5	20.0%		NA	2	10
Dieldrin	UG/KG	5	5	10.0%		NA	1	10
Endosulfan I	UG/KG	1.6	1.6	10.0%		NA	1	10
Endosulfan II	UG/KG	3.8	3.75	20.0%		NA	2	10
METALS								
Aluminum	MG/KG	22100	16370	100.0%		NA	10	10
Antimony	MG/KG	5.5	3.45	40.0%	29	0	4	10
Arsenic	MG/KG	7.5	5.29	100.0%	20	0	10	10
Barium	MG/KG	162	111.77	100.0%		NA	10	10
Beryllium	MG/KG	0.99	0.642	100.0%		NA	10	10
Cadmium	MG/KG	4.8	1.573	100.0%	14	0	10	10
Calcium	MG/KG	25000	6031	100.0%		NA	10	10
Chromium	MG/KG	27.7	22.16	100.0%		NA	10	10
Cobalt	MG/KG	17.8	10.81	100.0%		NA	10	10
Copper	MG/KG	309	73.32	100.0%	331	NA	10	10
Iron	MG/KG	35000	26540	100.0%		0	10	10
Lead	MG/KG	1050	270.32	100.0%	1,250	0	10	10
Magnesium	MG/KG	6490	4890	100.0%		NA	10	10
Manganese	MG/KG	768	445.1	100.0%		NA	10	10
Mercury	MG/KG	0.16	0.078	40.0%	0.54	0	4	10
Nickel	MG/KG	31.6	27.2	100.0%		NA	10	10
Potassium	MG/KG	2630	1899	100.0%		NA	10	10
Selenium	MG/KG	1.9	1.487	30.0%		NA	3	10
Sodium	MG/KG	452	214	80.0%		NA	8	10
Thallium	MG/KG	1.3	1.15	20.0%	2.6	0	2	10
Vanadium	MG/KG	33.8	26.77	100.0%		NA	10	10
Zinc	MG/KG	278	130.03	100.0%	773	0	10	10

Notes:
1) The cleanup goals are site-specific values listed in Table 1-1.

TABLE 7-1
SEAD-16 EXPOSURE POINT CONCENTRATION SUMMARY FOR CHEMICALS OF CONCERN
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	No. of Valid Analyses	No. of Rejected SQLs	No. of Hits	Freq. (%)	Mean	Std. Dev.	Max. Hit	Normal?	95% UCL of Mean	EPC
Surface Soil											
Antimony	MG/KG	51	0	33	64.7%	4.75E+01	2.70E+02	1.93E+03	FALSE	4.77E+01	4.77E+01
Copper	MG/KG	51	0	51	100.0%	9.71E+02	5.30E+03	3.79E+04	FALSE	5.85E+02	5.85E+02
Total Soil											
Antimony	MG/KG	57	0	36	63.0%	4.51E+01	2.55E+02	1.93E+02	FALSE	5.12E+01	5.12E+01
Groundwater											
Thallium	MG/L	11	0	4	36.0%	4.07E-03	2.40E-03	9.20E-03	FALSE	6.14E-03	6.14E-03
Indoor Dust											
2,4-Dinitrotoluene	MG/KG	11	0	8	73.0%	2.07E+03	5.72E+03	1.90E+04	FALSE	2.62E+11	1.90E+04
Antimony	MG/KG	11	0	10	91.0%	3.11E+02	5.53E+02	1.56E+03	FALSE	1.29E+04	1.56E+03
Cadmium	MG/KG	8	3	7	88.0%	3.26E+01	4.77E+01	1.27E+02	FALSE	7.16E+04	1.27E+02
Copper	MG/KG	11	0	11	100.0%	1.31E+04	2.56E+04	8.14E+04	FALSE	4.70E+06	8.14E+04

Notes
1. EPC = Exposure Point Concentration

TABLE 7-2
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-16 (Pre-Remediation)
Record of Decision - SEAD-16/17
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
CURRENT SITE WORKER	Inhalation of Dust in Ambient Air	3E-02	2E-11
	Ingestion of Onsite Soils	1E-02	1E-06
	Dermal Contact to Onsite Soils	2E-03	3E-08
	TOTAL RECEPTOR RISK (Nc & Car)	*5E-02*	*1E-06*
FUTURE INDUSTRIAL WORKER	Inhalation of Dust in Indoor Air	3E-01	NQ
	Ingestion of Indoor Dust	2E+01	5E-03
	Dermal Contact to Indoor Dust	2E+00	6E-06
	Ingestion of Groundwater	2E+00	4E-05
	TOTAL RECEPTOR RISK (Nc & Car)	*2E+01*	*5E-03*
FUTURE ON-SITE CONSTRUCTION WORKERS	Inhalation of Dust in Ambient Air	5E-01	9E-11
	Ingestion of Onsite Soils	9E-01	3E-06
	Dermal Contact to Onsite Soils	2E-02	1E-08
	TOTAL RECEPTOR RISK (Nc & Car)	*1E+00*	*3E-06*
FUTURE TRESSPASSER	Inhalation of Dust in Ambient Air	1E-02	2E-12
	Ingestion of Onsite Soils	9E-02	2E-06
	Dermal Contact to Onsite Soils	5E-03	2E-08
	Dermal Contact to Surface Water while Wading	7E-03	8E-07
	Ingestion of Onsite Sediment	2E-01	4E-07
	Dermal Contact to Sediment while Wading	1E-02	3E-08
	TOTAL RECEPTOR RISK (Nc & Car)	*3E-01*	*3E-06*
FUTURE DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	8E-01	1E-10
	Ingestion of Onsite Soils	2E+00	4E-05
	Dermal Contact to Onsite Soils	4E-02	1E-07
	Ingestion of Groundwater	4E+00	2E-05
	TOTAL RECEPTOR RISK (Nc & Car)	*6E+00*	*6E-05*
FUTURE DAY CARE CENTER WORKER	Inhalation of Dust in Ambient Air	3E-01	2E-10
	Ingestion of Onsite Soils	2E-01	2E-05
	Dermal Contact to Onsite Soils	2E-02	3E-07
	Ingestion of Groundwater	2E+00	4E-05
	TOTAL RECEPTOR RISK (Nc & Car)	*2E+00*	*6E-05*

NQ = Not Quantified due to lack of toxicity data.

Table 7-3
SEAD-16/17 PRIMARY CONTRIBUTORS TO UNACCEPTABLE RISK
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

SEAD-16

Receptor / Exposure Route	Primary Contributors to Unacceptable Risk	HI	Cancer Risk
FUTURE DAY CARE CENTER CHILD			
Ingestion of soil	antimony	1E+00	
	copper	1E-01	
	thallium	1E-01	
Ingestion of groundwater	thallium	4E+00	
FUTURE DAY CARE CENTER WORKER			
Ingestion of groundwater	thallium	2E+00	
FUTURE CONSTRUCTION WORKER			
Ingestion of soil	antimony	6E-01	
FUTURE INDUSTRIAL WORKER			
Ingestion of indoor dust	2,4-dinitrotoluene	9.E+00	5.E-03
	antimony	4.E+00	
	copper	2.E+00	
Dermal contact to indoor dust	cadmium	1.E+00	
Ingestion of groundwater	thallium	2.E+00	

SEAD-17

Receptor / Exposure Route	Primary Contributors to Unacceptable Risk	HI	Cancer Risk
FUTURE DAY CARE CENTER CHILD			
Ingestion of soil	antimony	3E-01	
	arsenic	2E-01	8E-06
	cadmium	2E-01	

NOTES:

1. These values are based on risk calculations presented in the FS Report (Parsons ES, Revised July 2001).
2. An additional discussion of thallium in groundwater is presented in Section 7. The results of the October 1999 sampling of groundwater indicated that thallium is not present and that the earlier detections of thallium were due to either laboratory analytical error or matrix interference effects. Therefore, thallium is not considered to contribute to non-carcinogenic risk in groundwater at SEAD-16.

TABLE 7-4
SEAD-17 EXPOSURE POINT CONCENTRATION SUMMARY FOR CHEMICALS OF CONCERN
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Parameter	Units	No. of Valid Analyses	No. of Rejected SQLs	No. of Hits	Freq. (%)	Mean	Std. Dev.	Max. Hit	Normal?	95% UCL of Mean	EPC [(1)]
Surface Soil											
Antimony	MG/KG	47	0	26	55%	6.65E+00	1.03E+01	5.20E+01	FALSE	1.15E+01	1.15E+01
Arsenic	MG/KG	47	0	47	100%	6.00E+00	2.13E+00	1.61E+01	FALSE	6.44E+00	6.44E+00
Cadmium	MG/KG	47	0	42	89%	3.71E+00	4.98E+00	2.55E+01	FALSE	8.82E+00	8.82E+00

Notes
1. EPC = Exposure Point Concentration

TABLE 7-5
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-17 (Pre-Remediation)
Record of Decision - SEAD-16 and 17
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX	CANCER RISK
CURRENT SITE WORKER	Inhalation of Dust in Ambient Air	1E-04	7E-09
	Ingestion of Onsite Soils	8E-03	4E-07
	Dermal Contact to Onsite Soils	8E-03	3E-08
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-02*	*5E-07*
FUTURE INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	2E-03	9E-08
	Ingestion of Onsite Soils	1E-01	5E-06
	Dermal Contact to Onsite Soils	1E-01	3E-07
	Ingestion of Groundwater	2E-04	9E-05
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-01*	*1E-04*
FUTURE ON-SITE CONSTRUCTION WORKERS	Inhalation of Dust in Ambient Air	2E-02	3E-08
	Ingestion of Onsite Soils	4E-01	1E-06
	Dermal Contact to Onsite Soils	9E-02	2E-08
	TOTAL RECEPTOR RISK (Nc & Car)	*5E-01*	*1E-06*
FUTURE TRESSPASSER	Inhalation of Dust in Ambient Air	7E-05	6E-10
	Ingestion of Onsite Soils	6E-02	6E-07
	Dermal Contact to Onsite Soils	2E-02	1E-08
	Dermal Contact to Surface Water while Wading	1E-03	1E-08
	Ingestion of Onsite Sediment	5E-02	3E-07
	Dermal Contact to Sediment while Wading	3E-03	5E-09
	TOTAL RECEPTOR RISK (Nc & Car)	*1E-01*	*9E-07*
FUTURE DAY CARE CENTER CHILD	Inhalation of Dust in Ambient Air	4E-03	4E-08
	Ingestion of Onsite Soils	1E+00	1E-05
	Dermal Contact to Onsite Soils	2E-01	1E-07
	Ingestion of Groundwater	4E-04	5E-05
	TOTAL RECEPTOR RISK (Nc & Car)	*1E+00*	*6E-05*
FUTURE DAY CARE CENTER WORKER	Inhalation of Dust in Ambient Air	2E-03	7E-08
	Ingestion of Onsite Soils	1E-01	5E-06
	Dermal Contact to Onsite Soils	1E-01	3E-07
	Ingestion of Groundwater	2E-04	9E-05
	TOTAL RECEPTOR RISK (Nc & Car)	*2E-01*	*1E-04*

TABLE 10-1
SEAD-16 RESIDUAL CONTAMINATION
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

Compound	Risk-Based Derived Cleanup Goal[1] (mg/kg)	Max Hit (mg/kg)
	Industrial Use Construction Worker	Post Remediation
Antimony	29	17
Arsenic	20	9.9
Cadmium	14	0.61
Copper	331	192
Mercury	0.54	0.4
Thallium	2.6	1.8
Zinc	773	219

Notes:

1. The maximum concentrations to be protective of human health under an industrial use scenario for a construction worker (most conservative receptor when there is a restriction against a daycare facility).

TABLE 10-2
SEAD-17 RESIDUAL CONTAMINATION
Record of Decision for SEAD-16/17
Seneca Army Depot

Compound	Risk-Based Derived Cleanup Goal[1] (mg/kg)	Max Hit (mg/kg)
	Industrial Use Construction Worker	Post Remediation
Antimony	29	5.0
Arsenic	20	8.9
Cadmium	14	5.6
Copper	331	182
Mercury	0.54	0.36
Thallium	2.6	1.50
Zinc	773	488

Notes:

1. The maximum concentrations to be protective of human health under an industrial use scenario for a construction worker (most conservative receptor when there is a restriction against a daycare facility).

TABLE 10-3
DETAILED COST ESTIMATES
Record of Decision for SEAD-16/17
Seneca Army Depot Activity

	ALTERNATIVE 2 On-site Containment				ALTERNATIVE 4 Off-site Disposal				ALTERNATIVE 6 Soil Washing			
Soil with Cleanup Goals [8]	**>1250 mg/kg lead, PAHs, + metals [6]**	**>1000 mg/kg [6]**	**>400 mg/kg [6]**	**>400 mg/kg +TAGM [6]**	**>1250 mg/kg lead, PAHs, + metals [6]**	**>1000 mg/kg [6]**	**>400 mg/kg [6]**	**>400 mg/kg +TAGM [6] (Alt. 4P) [7]**	**>1250 mg/kg lead, PAHs, + metals [6]**	**>1000 mg/kg [6]**	**>400 mg/kg [6]**	**>400 mg/kg +TAGM [6]**
Cost to Prime [1]	$392,509	$406,090	$554,726	$732,593	$782,244	$750,751	$1,175,792	$1,653,011	$1,702,119	$1,631,914	$2,923,498	$4,974,951
Cost to Owner [2]	$535,440	$554,200	$759,520	$1,005,220	$1,073,810	$1,030,300	$1,617,447	$276,670	$2,344,510	$2,247,530	$4,031,690	$6,865,530
Capital Cost	$847,640	$876,880	$1,202,380	$1,591,350	$1,699,930	$1,631,060	$2,560,555	$3,604,160	$3,711,550	$3,557,930	$6,382,510	$10,868,710
Annual O&M Costs [3]	$5,000	$6,000	$7,000	$8,000	NA	NA	NA	NA	NA	NA	NA	NA
Annual Post Remediation Monitoring Costs	$81,510	$81,510	$81,510	$40,440	$81,510	$81,510	$81,510	$40,440	$81,510	$81,510	$81,510	$40,440
Present Worth O&M and Monitoring Cost (30 year) [4]	$1,495,934	$1,513,226	$1,530,518	$837,626	$1,409,474	$1,409,474	$1,409,474	$699,290	$1,409,474	$1,409,474	$1,409,474	$699,290
Total Evaluated Price [5]	**$2,343,574**	**$2,390,106**	**$2,732,898**	**$2,428,976**	**$3,109,404**	**$3,040,534**	**$3,970,029**	**$4,303,450**	**$5,121,024**	**$4,967,404**	**$7,791,984**	**$11,568,000**

NOTES:

1. Cost to Prime (Contractor) is the sum of the direct costs plus any sales tax, subcontractor markups, and adjust pricing that have been applied in the project.
2. Cost to Owner is the sum of the Cost to Prime plus prime contractor Indirect Cost. Also known as the bid amount or construction contract cost.
3. Annual Costs are costs that will occur yearly due to activities such as maintenance, monitoring, and, for restricted use scenarios, land use controls.
4. Present Worth Cost is based on a 4% interest rate over a 30-year time interval compounded annually.
5. Total Evaluated Price is the sum of the Project Cost and Present Worth Cost.
6. Soil remediated to concentrations as noted.
7. Alternative 4P, the unrestricted use scenario, is Alternative 4 with cleanup goals of 400 ppm for lead and TAGMs for other metals.
8. It should be noted that costs have been revised since the FS. Major changes are based on (1) revised hazardous disposal assumptions, (2) revised volume of soils to be excavated based on new cleanup goals, and (3) O&M costs which include costs of land use controls, such as signage and development of a deed restriction.or restricted use scenarios.

LIST OF FIGURES

	SURFACE SOILS	SUBSURFACE SOILS	DITCH SOILS
AREA (S.F.)	47,516	675	7420
DEPTH (FT)	1	2 FT – 3 FT (3)	1
VOLUME (C.Y.)	1760	67	275

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT
- SEAD AND LAND USE CONTROL BOUNDARY

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

- ▲ SOIL BORING LOCATION — SB16-4
- MONITORING WELL LOCATION — MW16-7
- ▲ SURFACE SOIL SAMPLE LOCATION — SS16-5
- SEDIMENT SAMPLE LOCATION — SW/SD16-6

- CASE 2 SURFACE SOILS WITH LEAD CONCENTRATION > 1250 mg/kg OR EXCEEDING OTHER CLEANUP GOALS (SEE NOTE 2)
- CASE 2 SUBSURFACE SOILS WITH LEAD CONCENTRATION > 1250 mg/kg OR EXCEEDING OTHER CLEANUP GOALS (SEE NOTE 2)
- CASE 2 DITCH SOILS WITH LEAD CONCENTRATION > 1250 mg/kg OR EXCEEDING OTHER CLEANUP GOALS (SEE NOTE 2)

0 100 200

SCALE IN FEET

NOTE:

1. LIMIT OF THE PROPOSED REMEDIATION AREA BASED ON THE DATA PRESENTED IN THE REMEDIAL INVESTIGATION REPORT. (PARSONS ES, MARCH 1999)
2. LIMIT OF THE PROPOSED REMEDIATION AREA INCLUDES SOIL EXCEEDING METAL (ANTIMONY, ARSENIC, CADMIUM, COPPER, LEAD, MERCURY, THALLIUM, ZINC) AND PAH CLEANUP GOALS FOR THE INDUSTRIAL USE SCENARIO.
3. THE AREAS SURROUNDING SB16-4 AND SB16-5 ARE TO BE REMEDIATED TO A DEPTH OF 3 FT. THE AREA SURROUNDING SB16-2 IS TO BE REMEDIATED TO A DEPTH OF 2 FT.
4. TRACKS WITHIN LIMITS OF EXCAVATION WILL NOT DISTURBED DURING REMEDIAL ACTION.

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
SEAD-16 AND
SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No. 729895-01002

FIGURE 1-1
SEAD-16 REMEDIATION AREA

SCALE 1" = 100'-0" | DATE JUNE 2005 | REV A

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	SURFACE AND DITCH SOILS
AREA	69,900 S.F.
DEPTH	1 FT
VOLUME	2590 C.Y.

N 998500
N 998250
N 998000
E 748750
E 749000
E 749250
E 749500

Unnamed Road
Unnamed Road
Abandoned Furnace (S-

SS17-500-N
SS17-24
SS17-25
SS17-8
SS17-26
SS17-5
SS17-12
SS17-27
SS17-4
SS17-17
MW17-2/SB17-2
SS17-9
SS17-6
SS17-21
SS17-28
SS17-13
Deactivation Furnace Building 367
SS17-29
MW17-1/SB17-1
SS17-30
SS17-2
SS17-22
SS17-19
SS17-15
SS17-10
SS17-7
SS17-31
SS17-3
MW17-3/SB17-3
SS17-18
SS17-14
SS17-20
SS17-32
SS17-23
SS17-34
SS17-35
SS17-16
MW17-5
SS17-11
SS17-36
SS17-38
SS17-39
SS17-1

SW/SD17-1D
SW/SD17-9
SW/SD17-8
SW/SD17-1
SW/SD17-4
SW/SD17-7
SW/SD17-3
MW17-4/SB17-4
SW/SD17-5
SW/SD17-6
SW/SD17-2

Number 2 Fuel Oil Tank
Liquid Propane Gas Tank
APPROXIMATE LOCATION OF DISCHARGE PIPE
Concrete Pad With Process Equipment
Building 307T
SEAD17A

726
728
730

0 100 200
SCALE IN FEET

N

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- REMEDIATION LIMIT
- SEAD AND LAND USE CONTROL BOUNDARY

- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- CORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- SOIL BORING LOCATION — SB16-4
- MONITORING WELL LOCATION — MW16-7
- SURFACE SOIL SAMPLE LOCATION — SS16-5
- SEDIMENT SAMPLE LOCATION — SW/SD16-6
- CASE 1 SURFACE SOILS WITH LEAD CONCENTRATION > 1250 mg/kg OR EXCEEDING OTHER CLEANUP GOALS (SEE NOTE 2)
- CASE 1 DITCH SOILS WITH LEAD CONCENTRATION > 1250 mg/kgOR EXCEEDING OTHER CLEANUP GOALS (SEE NOTE 2)

NOTE:
1. LIMIT OF THE PROPOSED REMEDIATION AREA BASED ON THE DATA PRESENTED IN THE REMEDIAL INVESTIGATION REPORT. (PARSONS ES, MARCH 1999)
2. LIMIT OF THE PROPOSED REMEDIATION AREA INCLUDES SOIL EXCEEDING METAL (ANTIMONY, ARSENIC, CADMIUM, COPPER, LEAD, MERCURY, THALLIUM, ZINC) AND PAH CLEANUP GOALS FOR THE INDUSTRIAL USE SCENERIO.

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
SEAD-16 AND
SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No. 729895-01002

FIGURE 1-2
SEAD-17 REMEDIATION AREA

SCALE 1" = 100'-0" | DATE JUNE 2005 | REV A

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PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

RECORD OF DECISION
SEAD-16 AND 17

DEPT.	DWG NO.
ENVIRONMENTAL ENGINEERING	734516-01001

FIGURE 2-1

LOCATION MAP

SCALE	DATE
1"= 8 MILES APPROX.	JUNE 2005

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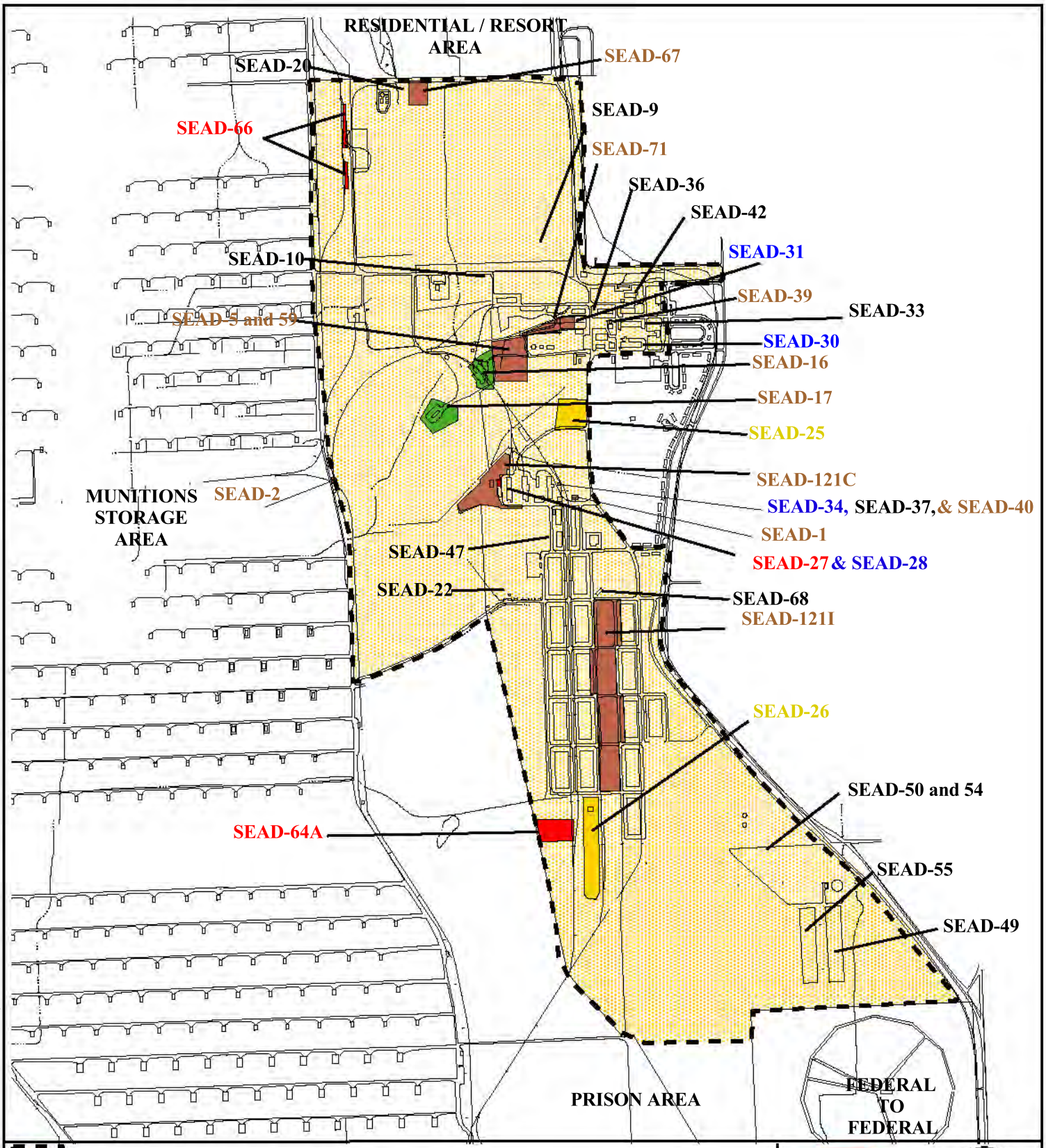


Area Covered by PID-wide Land Use Restrictions
- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.
- Prevent access to or use of the groundwater until the Class GA Groundwater Standards are met.

SEADs subject of this ROD

SEADs prompting PID-wide LUCs

Army Retained Property - No Unauthorized Access

ROD in-place, Remedial Action ongoing

700 0 700 1400 2100 Feet

SEAD-16 - SEADs subject of this ROD

SEAD-27 - Land Use Restriction Site

SEAD-25 - ROD in-place, Remedial Action ongoing

SEAD-121I- Army Retained Site

SEAD-55 - No Action Site

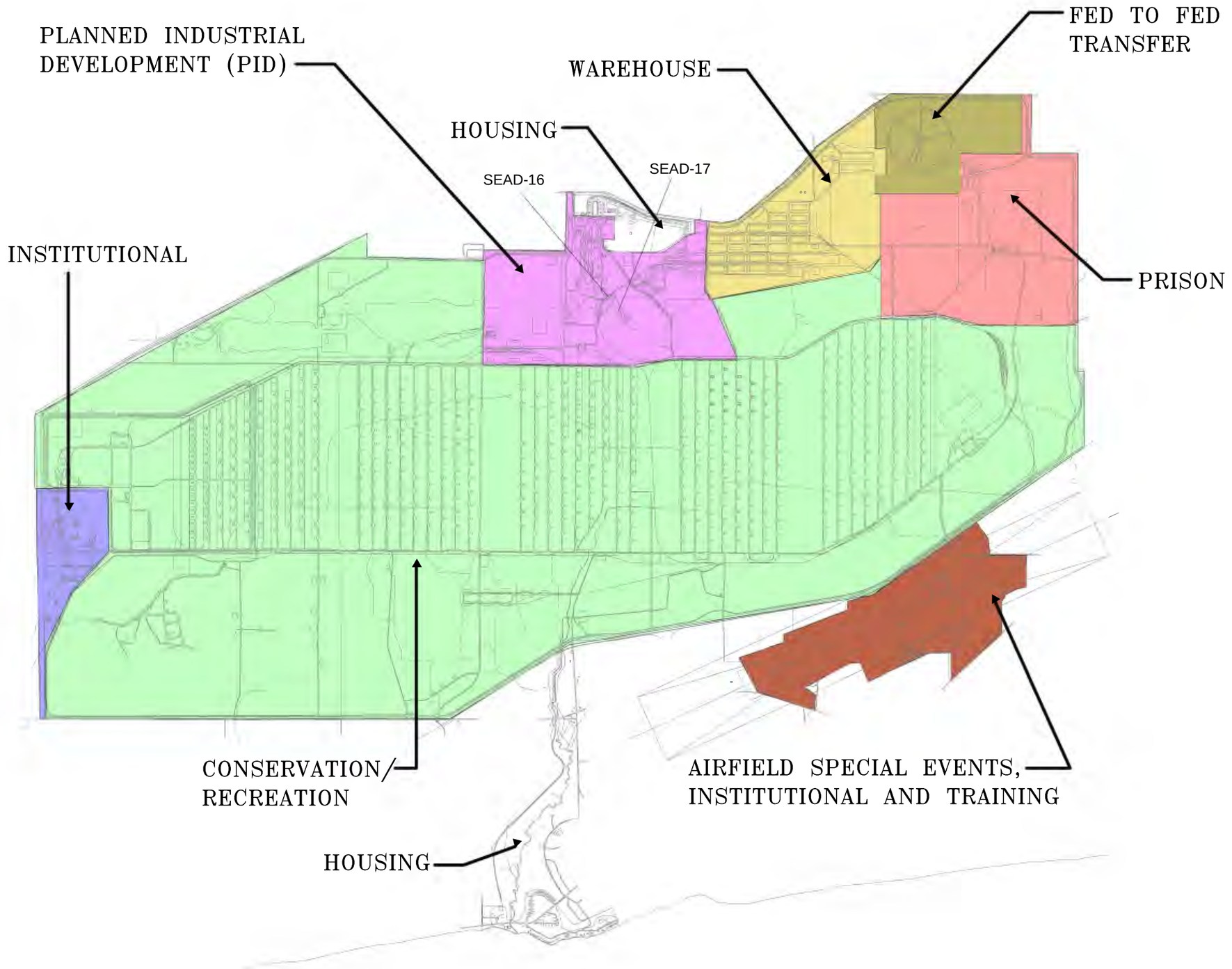
SEAD-28 - No Further Action Site

PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
SEAD-16 and SEAD-17

FIGURE 2-2
LOCATION OF SEAD-16 AND SEAD-17
AT SENECA ARMY DEPOT ACTIVITY

o:\seneca\pid luc\seneca depot survey rod sept 2006.apr\S 16 17 ROD Figure 2-2.

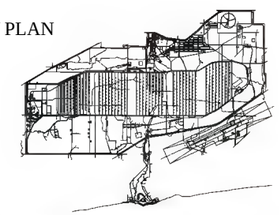


LEGEND

- Airfield
- Conservation
- Federal
- Industrial
- Institutional
- Prison
- Warehouse
- Housing

N

KEY PLAN

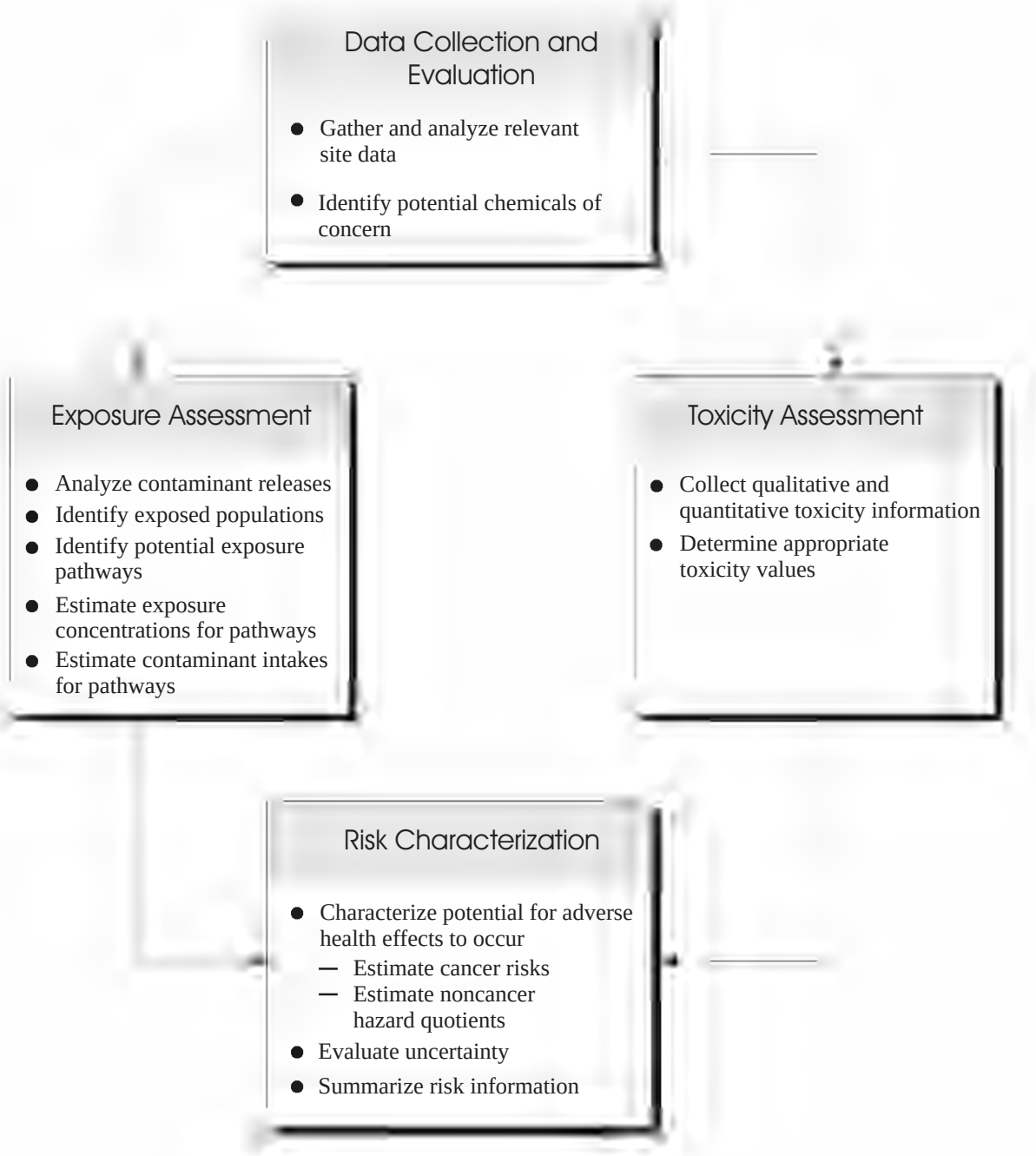


PARSONS

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
SEAD-16 and SEAD-17

FIGURE 3-1
LAND REUSE MAP

DATE: JUNE 2005



Source: USEPA, 1989a

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

RECORD OF DECISION
SEAD-16 AND 17

DEPT. ENVIRONMENTAL ENGINEERING | DWG NO. 729895

FIGURE 7-1

BASELINE RISK ASSESSMENT PROCESS

SCALE Not Applicable | DATE JUNE 2005

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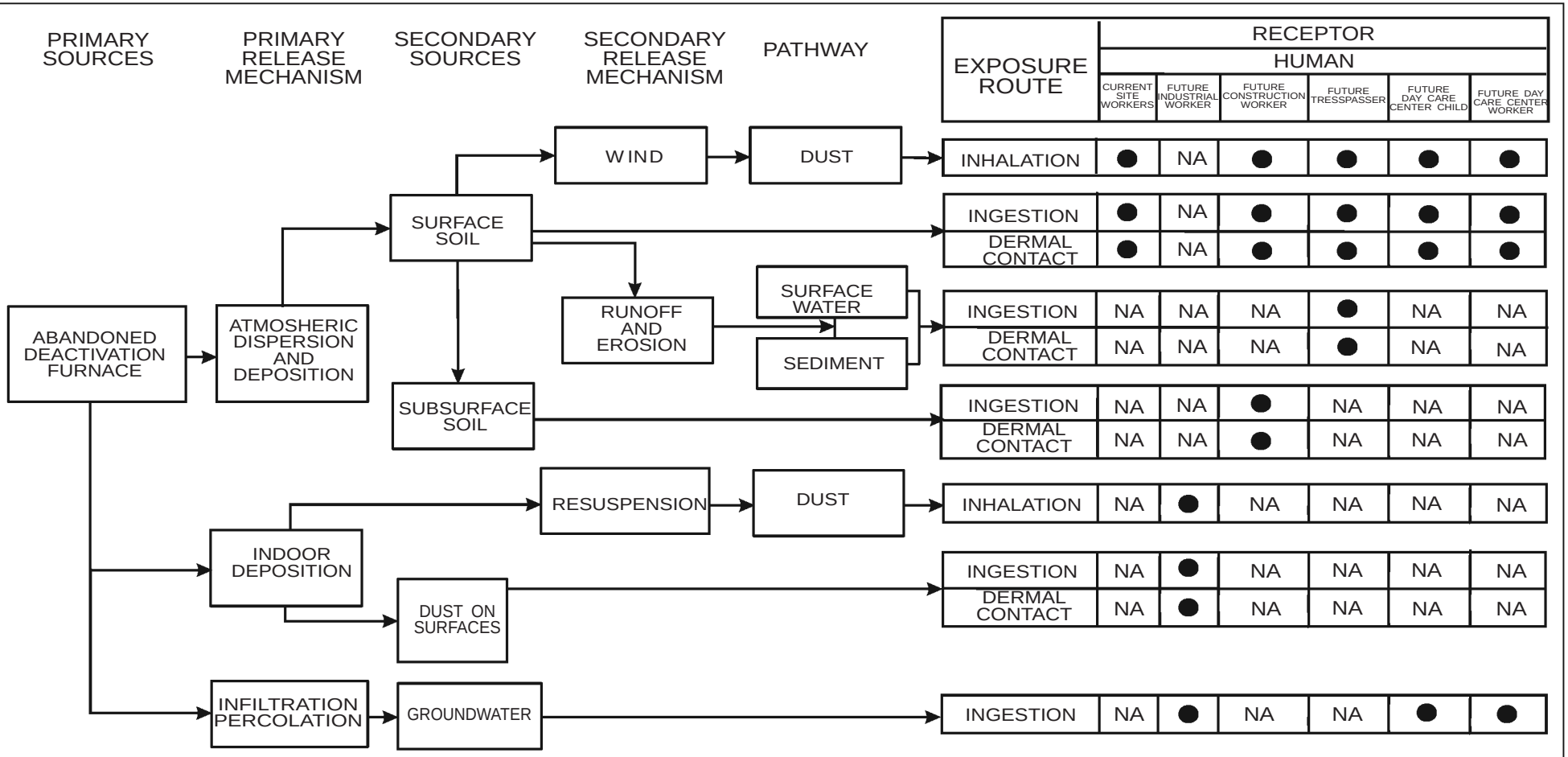


● PATHWAY CONSIDERED TO POSE POTENTIAL RISK

NA NOT APPLICABLE RECEPTOR

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
SEAD-16 AND 17

DEPT. ENVIRONMENTAL ENGINEERING

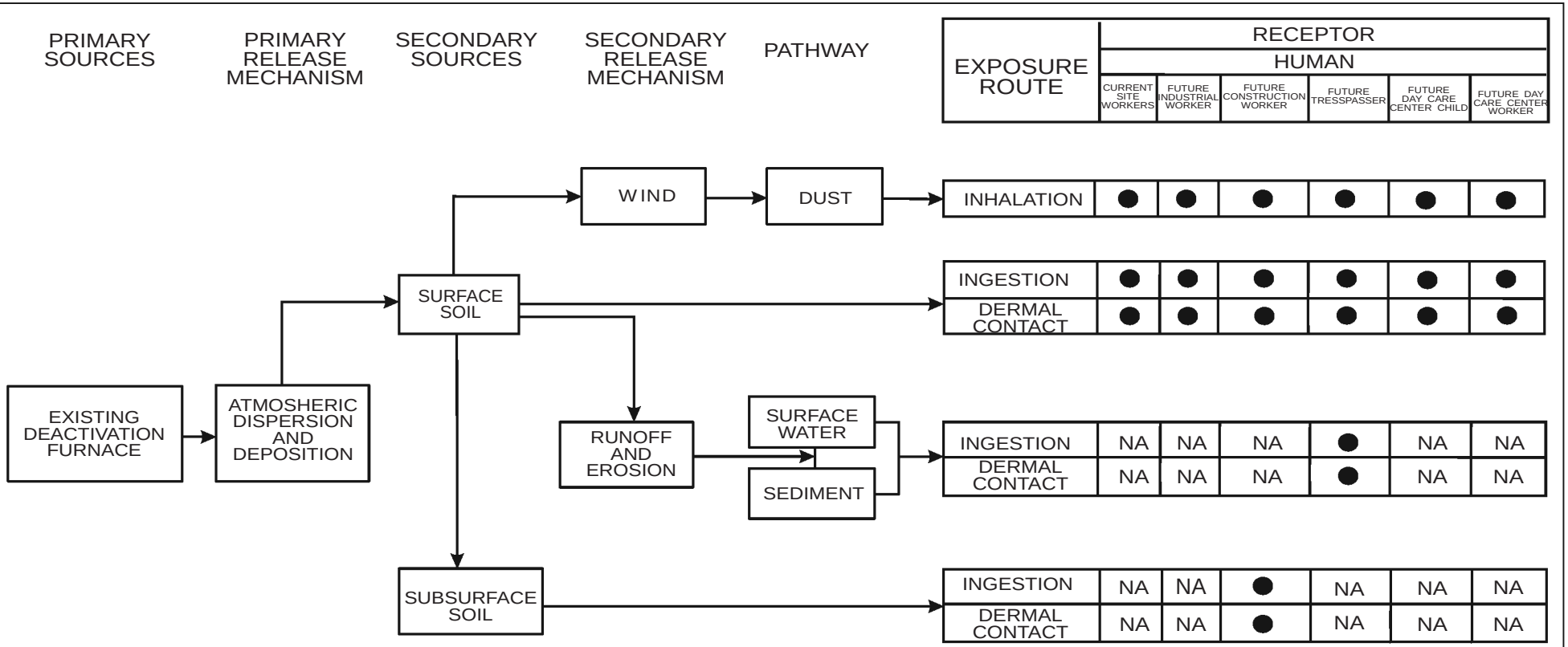
DWG NO. 729895-01002

FIGURE 7-2
EXPOSURE PATHWAY SUMMARY
FOR SEAD-16

SCALE NA

DATE JUNE 2005

P:\PIT\Projects\SENECA\S1617rod\Final\figures\SD16EXSM.CDR



● PATHWAY CONSIDERED TO POSE POTENTIAL RISK

NA NOT APPLICABLE RECEPTOR

PARSONS

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION
SEAD-16 AND 17

DEPT. ENVIRONMENTAL ENGINEERING

DWG NO. 729895-01002

FIGURE 7-3
EXPOSURE PATHWAY SUMMARY
FOR SEAD-17

SCALE NA

DATE JUNE 2005

P:\PIT\Projects\SENECA\S1617rod\Final\figures\SD17EXPRSM.CDR

LIST OF APPENDICES

APPENDIX A

ADMINISTRATIVE RECORD INDEX

APPENDIX A: ADMINISTRATIVE RECORD

Parsons Engineering Science, Inc., Remedial Investigation Report at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17). Final. March, 1999.

Parsons Engineering Science, Inc., Expanded Site Inspection Seven High Priority SWMUs, SEADs 4, 16, 17, 24, 25, 26, 45. December, 1995.

Parsons Engineering Science, Inc., May 1995, Draft Final Report, Expanded Site Inspections of Seven High Priority Solid Waste Management Units.

Parsons Engineering Science, Inc. Feasibility Study Report at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17). Revised Final. July 2001

Parsons. Proposed Plan at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17). Revised Final. December, 2003.

Parsons Main, Inc., Work Plan for CERCLA ESI of Ten Solids Waste Management Units, January, 1993.

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

APPENDIX B

NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION DECLARATION OF CONCURRENCE

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, Albany, New York 12233-7011
Phone: (518) 402-9706 • **FAX:** (518) 402-9020
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

JAN 18 2005

Mr. George Pavlou
Director
Emergency and Remedial Response Division
United States Environmental Protection
Agency, Region II
290 Broadway
Floor 19 - No. E38
New York, New York 10007-1866

RE: Seneca Army Depot, Site No. 850006 - Record of Decision
Abandoned Deactivation Furnace (SEAD 16) and the Active
Deactivation Furnace (SEAD17)

Dear Mr. Pavlou:

The New York State Department of Environmental Conservation has reviewed the above-referenced Record of Decision (ROD). The State concurs with this selected remedy as stated in the ROD, which is:

- Conduct additional sampling as part of the pre-design sampling program to further delineate the areas of excavation;
- Remove, test, and dispose of the SEAD-16 building debris off-site;
- Excavate approximately 275 cubic yards (cy) of ditch soil with lead concentrations greater than 1250 mg/Kg until cleanup standards are achieved;
- Excavate approximately 1760 cy of surface soils at SEAD-16 with lead concentrations greater than 1250 mg/Kg, and polycyclic aromatic hydrocarbon (PAH) and metal concentrations greater than risk-based derived cleanup standards;
- Excavate approximately 67 cy of subsurface soils at SEAD-16 with lead concentrations greater than 1250 mg/Kg, and PAH and metal concentrations greater than risk-based derived cleanup standards;
- Excavate approximately 2590 cy of surface soils at SEAD-17 with lead concentrations greater than 1250 mg/Kg and metal concentrations greater than risk-based derived cleanup standards;

- Stabilize soils from SEAD-16 and 17 and building debris from SEAD-16 exceeding the toxicity characteristic leaching procedure (TCLP) criteria in order to attain Land Disposal Restrictions;
- Dispose of the excavated material in an off-site landfill;
- Backfill the excavated areas with clean backfill;
- Conduct groundwater monitoring at both sites until concentrations are below the GA criteria;
- Submit a Completion Report following the remedial action;
- Establish and maintain land use controls to prevent access to or use of the groundwater and to prevent residential use until cleanup standards are met; and
- Complete a review of the selected remedy every five years (5) (at minimum), in accordance with Section 121(c) of the CERCLA.

To complete Resource Conservation and Recovery Act (RCRA) closure of the deactivation furnace at SEAD-17, a post-closure care plan will be developed as part of the Remedial Action/Remedial Design (RA/RD) Plan.

SEAD 16 AND 17 Land Use Control (LUC) Performance Objectives

- Prevent access or use of the groundwater until cleanup levels are met;
- Prevent future use of the site as a daycare facility or for residential use; and
- Maintain the integrity of any current or future remedial or monitoring system.

If you have any questions, please contact Dr. Chittibabu Vasudevan at (518) 402-9625.

Sincerely,

Dale A. Desnoyers
Director
Division of Environmental Remediation

cc: J. Vasquez, USEPA
S. Absolom, SEAD

APPENDIX C

Correspondence Relating to Interim RCRA Closure of Deactivation Furnace (SEAD-17)

New York State Department of Environmental Conservation
6274 East Avon-Lima Road, Avon, NY 14414

Thomas C. Jorling
Commissioner

August 21, 1991

Mr. Stephen Absolom, Chief
Engineering/Environmental Management
Division
Seneca Army Depot (SEAD)
Route 96
Romulus, NY 14541-5001

Dear Mr. Absolom:

Re: Interim Closure of SEAD's Hazardous Waste Incinerator

In accordance with the RCRA Interim Closure Plan approved by the Department on November 6, 1989 for SEAD's APE 1236 Deactivation Furnace, interim closure was to be completed within 90 days of the approval of the plan with Interim Closure Certification to be performed by an independent professional engineer within 60 days of the closure completion date.

Due to the extent of contaminated soils surrounding the incinerator area, SEAD has not been able to meet the closure criteria set forth in the plan despite repeated efforts as outlined in the closure decontamination section of the plan. SEAD has suggested that upon completion of these decontamination procedures, soil displacement due to wind occurrence takes place and the incinerator is once again spoiled by the disturbance of lead and barium laden soils and hence recontaminated.

Seneca Army Depot has recently been included on the Federal Facilities National Priorities list. In order to compensate for the inadequate closure of the unit under the RCRA program due to lack of funds for the major remediation required and in order to avoid duplication in remedial actions performed at the Depot, the area surrounding the unit will be listed as one of the "areas of concern" in the interagency agreement (IAG) between the Army, the Department, and EPA detailing CERCLA clean-up. The agreement integrates the Depot's CERCLA response obligations and RCRA corrective action obligations which relate to the release(s) of hazardous wastes and constituents to the environment. Therefore, the Department requests the closure of the hazardous waste management unit be certified as "dirty". The owner/operator must submit to the Department, by registered mail, a notice of closure certificatio
An independent professional engineer registered in New York

State should certify the attempts made by the owner/operator to perform interim closure as prescribed by the approved closure plan, including decontamination procedures, sampling, and results and the reasons for the failed attempt in meeting the criteria required by the plan. A statement of certification should be included as per 6 NYCRR Part 373-1.4(a)(5)(iv). The notice should be signed by both the owner/operator and the engineer. In addition, SEAD should outline the steps planned to remediate the area, including procedures and a clean-up schedule. SEAD must submit to the Department a certification of closure as described in this letter by September 1, 1991.

Please note that this certification of interim closure does not exclude SEAD from future remediation under the RCRA program should the clean-up not be resolved under CERCLA.

If you should have any questions in regards to this matter, please contact directly Denise Gurtler at 518/457-7269.

Sincerely,

Robert K. Scott

Robert K. Scott
Deputy Regional Permit Administrator
Regulatory Affairs

mm
cc: J. Middelkoop, DHSR
J. Dolen, DHSR
P. Counterman, DHSR
D. Gurtler, DHSR
D. Nevel, DHSR
A. Bellina, EPA RII
M. Jon, EPA RII
D. Rollins, R8

Campbell Design Group, P.C.

March 3, 1992

New York State Department of
Environmental Conservation
6274 East Avon-Lima Road
Avon, New York 14414

Attn: Mr. Robert K. Scott
Deputy Regional Permit Administrator
Regulatory Affairs

Re: Interim Closure of Hazardous Waste Incinerator
Seneca Army Depot
CDG File No.: 60-9423

Dear Mr. Scott,

Campbell Design Group, P.C. has been retained by the New York District of the Army Corps of Engineers to provide professional consulting engineering services at the Seneca Army Depot in Romulus, New York. With this letter, Campbell Design Group, P.C. will certify the attempts made by the Seneca Army Depot to provide interim closure of the hazardous waste incinerator.

Reference is made to the Interim Closure Plan approved on November 6, 1989:

Part 1 Schedule:

Subpart A -

All hazardous waste incineration operation ceased by November 8, 1989. No hazardous or non-hazardous waste has been incinerated since November 8, 1989. However, upgraded equipment has been "Fired-Up" to test the function of the new equipment, but no materials were incinerated.

Subpart B -

Within 90 days of approval of the Interim Closure Plan, all hazardous waste stored at the incinerator area had been removed from the area including filters, dust and residues. Final disposal sites are subject to competitive bids and government procurement regulations. A probable, commonly used facility is:

Frontier Chemical Waste Process, Inc.
4626 Royal Avenue
Niagara Falls, New York 14303
NYD043815703

Subpart C -

Within 180 days of the approval of the Closure Plan, waste produced during closure operations were removed, but the interim closure measures were not completed because the approved allowable limits of hazardous constituents on the concrete and equipment could not be achieved.

Subpart D -

Seneca Army Depot is aware of the requirements for submitting a permit application prior to any new incineration activities.

Subpart E -

Reasonable progress towards incinerator permitting has progressed by the $800,000.00 upgrade of the equipment at the incinerator facility. On October 16, 1990 a site permit application based on the upgraded equipment was submitted. Some of the upgraded equipment includes:

1. Computerized monitoring of emissions
2. Elimination of the emergency relief stack
3. Automatic waste feed cutoff
4. Control of fugitive emissions

Reference is made to the NYSDEC letter of August 21, 1991.

The Seneca Army Depot has attempted, by decontamination and sampling, to perform interim closure as prescribed by the approved Closure Plan. After decontamination procedures, samples were taken on January 23, 1990, May 2, 1990, June 1, 1990 and September 7, 1990. In addition soil testing of 29 samples occurred on November 1, 1989 to determine the extent of soil contamination. Soils removed from the sampling area were successfully excavated and sampling of the underlying soil indicated acceptable hazardous limits.

Interim closure limits of hazardous constituents were not achieved on the concrete slabs and block walls as indicated in the sampling results. Reasons for the recontamination may be as follows:

1. The background concentrations of the concrete and block may contain amounts of hazardous constituents at these levels or above.

2. Contaminated soils may be underlying the concrete pad and may be seeping up through existing cracks in the slab therefore, recontaminating the slab

3. Background concentrations of soils outside of the sampled soil area may allow the release of wind blown dust to recontaminate the slab and walls.

Clean-up Agreement:

RCRA corrective action and CERCLA remediation action at SEAD are being accomplished under a pending, legally binding interagency agreement between the Army (SEAD), NYSDEC, and the EPA. The hazardous waste incinerator is one of the major areas of concern being addressed under this agreement. The interagency agreement in no way releases SEAD from its obligation to clean up the area under the RCRA program.

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Respectfully submitted,

CAMPBELL DESIGN GROUP, P.C.

Robert J. Frascella, P.E.
Vice President

License No.: 062441

Date: MARCH 3, 1992

SENECA ARMY DEPOT

By: GARY W. KITTELL

Title: Director of Engineering & Housing

APPENDIX D

RESPONSIVENESS SUMMARY AND PUBLIC COMMENTS

PUBLIC COMMENTS AND RESPONSIVENESS SUMMARY

The ABANDONED DEACTIVATION FURNACE (SEAD-16) and the ACTIVE DEACTIVATION FURNACE (SEAD-17)

SENECA ARMY DEPOT SUPERFUND SITE

INTRODUCTION

A responsiveness summary is required by Superfund policy. It provides a summary of citizen's comments and concerns received during the public comment period, and the Army's responses to those comments and concerns.

OVERVIEW

Since the inception of this project, the Army has implemented an active policy of involvement with the local community. This involvement has occurred through the public forum provided by regular meetings of the Base Clean-up Team (BCT). During these meetings, representatives of the community, the Army and the regulators are brought together in a forum where ideas and concerns are voiced and addressed. The BCT has been routinely briefed by the Army in regards to the progress and the results obtained during both the investigation and remedial alternative selection process. In addition to regular project specific briefings, the Army has provided experts in various fields related to the CERCLA program that have provided lectures intended to educate the general public in the various technical aspects of the CERCLA program at SEDA. Lectures have been conducted on risk assessments, both human health and ecological, remedial alternatives, such as bioventing and natural attenuation, institutional controls, and the feasibility study process.

BACKGROUND ON COMMUNITY INVOLVEMENT

Initially, during the years from 1991 through 1995 the Army formed and solicited community involvement through quarterly meetings with the Technical Review Committee (TRC). The TRC was comprised of community leaders with an active interest in the on-goings of the CERCLA process at the depot. These meetings were open to the public and were announced in the local newspaper and the radio. Following inclusion of the depot on the final BRAC closure list in late 1995, the Army transitioned from the TRC and formed the Base Clean-up Team (BCT). The BCT was comprised of several of the TRC members with the addition of additional Army and regulatory representatives. The BCT increased the frequency of the meetings to a monthly basis. Since the formation of the TRC and the BCT, the Army has met with the local community

members on a regular basis and has discussed the finding of both the RI and the FS. In addition, the proposed plan has been presented to the BCT.

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The RI report, the FS report and the Proposed Plan for the site have been released to the public for comment. These documents were made available to the public in the administrative record file at the information repositories at Building 123 within the Seneca Army Depot Activity, 5786 State Route 96, Romulus, New York, 14541-0009. The public comment period on these documents was held from December 15, 2003 to January 13, 2004. The notice of availability for the above-referenced documents was published in the Finger Lake Times during this time period.

On December 16, 2003, the Army, the EPA and the NYSDEC conducted a public meeting at the Seneca County Board of Supervisors Room, located at the Seneca County Office Building in Waterloo, NY to inform local officials and interested citizens about the Superfund process, to review current and planned remedial activities at the site, and to respond to any questions from area residents and other attendees. The meeting included poster board presentations and provided an opportunity for the public to speak to Army, EPA and NYSDEC representatives involved in the process. The public was given the opportunity to provide formal comments that would be documented and become part of the official record for the selected remedy.

SUMMARY OF COMMENTS AND RESPONSES

No formal comments were received from the community during the public meeting. There is no official transcript since no comments were provided. In addition, no formal comments were received from the community during the public meeting or the public comment period.

APPENDIX E

SUMMARY OF ARARS, OTHER CRITERIA, ADVISORIES, AND GUIDANCES

APPENDIX E

SUMMARY OF ARARS, OTHER CRITERIA, ADVISORIES, OR GUIDANCES

The investigation and cleanup of SEAD-16 and SEAD-17 falls under the jurisdiction of both the State of New York regulations (administered by NYSDEC) and Federal regulations (administered by USEPA Region II).

The following is the generic list of ARARs, other criteria, advisories or guidances applicable to both, SEAD-16 and SEAD-17:

- 40 CFR Part 141 (applicable): National Primary Drinking Water Regulations. This part establishes primary drinking water regulators pursuant to Section 1412 of the Public Health Service Act as amended by the Safe Drinking Water Act.

- 40 CFR Part 141.11 (applicable): Maximum Inorganic Chemical Contaminant Levels. This section establishes maximum contaminant levels (MCLs) for inorganic chemicals in drinking water.

- 40 CFR Part 141.12 (applicable): Maximum Organic Chemical Contaminant Levels. This section establishes MCLs for organic chemicals in drinking water.

- 40 CFR Part 264 Subpart F (applicable): Releases from Solid Waste Management Units. Standards for protection of groundwater are established under this citation. This ARAR is applicable to long-term monitoring of the site.

- 6 NYCRR subparts 701 and 702 (applicable): These subparts provide classification definitions for surface water and groundwaters and describe procedures that may be used to obtain guidelines or standards that will be protective of human health and aquatic life.

- 6 NYCRR subpart 703 (applicable): This subpart establishes groundwater standards specified to protect groundwater for drinking water purposes.

- 6 NYCRR subpart 373-2.6 and 373-2.11 (applicable): This regulation requires groundwater monitoring for releases from solid waste management units.

- 6 NYCRR subpart 373-2 (relevant and appropriate): This regulation establishes post closure care and groundwater monitoring requirements. Consideration: This regulation applies after the SEAD-16 and SEAD-17 sites have been closed under CERCLA requirements.

- 6 NYCRR Part 5 (relevant and appropriate): This regulation establishes criteria for drinking water supplies. Specifically, NYSDOH has established MCLs for water. Consideration: These criteria are relevant and appropriate to drinking water sources in NY State.

- NYSDEC TOGS 1.1.1 (relevant and appropriate): This document compiles water quality standards and guidance values for use in NYSDEC programs.

- New York State Inactive Hazardous Waste Disposal Sites—Remedy Selection (6 NYCRR 375-1.10 ("goal of the program for a specific site is to restore that site to pre-disposal conditions, to the extent feasible and authorized by law.").

- TITLE 6. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
  CHAPTER IV. QUALITY SERVICES
  SUBCHAPTER B. SOLID WASTES
  PART 375. INACTIVE HAZARDOUS WASTE DISPOSAL SITES
  SUBPART 375-1. GENERAL PROVISIONS

  6 NYCRR § 375-1.10 (2005)

  § 375-1.10 Remedy selection

  (a) This section establishes the general rules for the selection of a remedy for an entire site, or for an operable unit of a site. For purposes of this Part, the term "operable unit" means a discrete portion of a program that may address geographical portions of a site, specific site problems, or initial phases of a program; and that manages migration or that eliminates or mitigates a release, threat of release, or pathway of exposure.

  (b) The goal of the program for a specific site is to restore that site to pre-disposal conditions, to the extent feasible and authorized by law. At a minimum, the remedy selected shall eliminate or mitigate all significant threats to the public health and to the environment presented by hazardous waste disposed at the site through the proper application of scientific and engineering principles.

  (c) The program for a site must not be inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 and must be selected upon due consideration of the following factors:

  (1) standards, criteria, and guidance.

(i) A site's program must be designed so as to conform to standards and criteria that are generally applicable, consistently applied, and officially promulgated, that are either directly applicable, or that are not directly applicable but are relevant and appropriate, unless good cause exists why conformity should be dispensed with. Such good cause exists if any of the following is present:

(a) The proposed action is only part of a complete program that will conform to such standard or criterion upon completion; or

(b) Conformity to such standard or criterion will result in greater risk to the public health or to the environment than alternatives; or

(c) Conformity to such standard or criterion is technically impracticable from an engineering perspective; or

(d) The program will attain a level of performance that is equivalent to that required by the standard or criterion through the use of another method or approach.

(ii) A site's program should be designed with consideration being given to guidance determined, after the exercise of engineering judgment, to be applicable on a case-specific basis. (Note: copies of such guidance are available from the Department at its offices located at 625 Broadway, Albany, NY 12233-7010.)

(iii) For purposes of this Part, the terms "standards and criteria" and "guidance" include both those of this State and those of the United States to the extent that they are more stringent than those of this State. (For informational purposes, those of the United States are set forth in a listing in the Response to Comments to the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990.)

(2) Overall protectiveness of public health and the environment.

(3) Short-term effectiveness.

(4) Long-term effectiveness.

(5) Reduction of toxicity, mobility, and volume with treatment. A site-specific remedy that permanently and significantly reduces the volume, toxicity, and/or mobility of the hazardous wastes and/or constituents thereof is to be preferred over a remedy that does not do so. The following is the hierarchy of remedial technologies ranked from most preferable to least preferable:

(i) Destruction, onsite or offsite.

(ii) Separation/treatment, onsite or offsite.

(iii) solidification/chemical fixation, onsite or offsite.

(iv) Control and isolation offsite or onsite.

(6) Feasibility. A feasible remedy is one that is suitable to site conditions, capable of being successfully carried out with available technology, and that considers, at a minimum, implementability and cost-effectiveness.

(7) Community acceptance.

(d) The remedy selection process will be documented in a Record of Decision (ROD), which will be signed by the Commissioner, and which will consist of the following:

(1) The location and a description of the site;

(2) A history of the operation of the site;

(3) The current environmental and public health status of the site;

(4) An enforcement history and current status of the site;

(5) The specific goals and objectives of the remedial action selected for the site in question;

(6) A description and evaluation of alternatives considered;

(7) A summary of the basis for the Department's decision; and

(8) A listing of the documents the Department used in its decisionmaking.

Statutory Authority:

Added 375-1.10 on 5/20/92; amended 375-1.10 (c) (1) (ii) on 7/03/01.

- RCRA Generator Requirements for Manifesting Waste for Off-site Disposal (40 CFR part 262, subpart B).

- RCRA Transporter Requirements for Off-Site Disposal (40 CFR part 263).

- RCRA, Subtitle D, Non-Hazardous Waste Management Standards (40 CFR part 257).

- RCRA Land Disposal Restrictions (40 CFR part 268) (on and off-site disposal of excavated soil).

- DOT Rules for Hazardous Materials Transport (49 CFR part 107, and 171.1-171.500).

- OSHA Standards for Hazardous Waste Operations and Emergency Response, and procedures for General Construction Activities (29 CFR parts 1919 and 1926).

- New York State Environmental Conservation Law (ECL) Article 27, Section 1318: Institutional and Engineering Controls.

- New York State Hazardous Waste Regulations—identification, generators, transportation, treatment/storage/disposal, land disposal restrictions, and minimum technology requirements (6 NYCRR 370-376).

- New York State Solid Waste Management and Siting Restrictions (6 NYCRR 360-361).

- New York State Hazardous Waste Generator and Transporter Requirements for Manifesting Waste for Off-Site Disposal (6 NYCRR 364 and 372).

- New York State Inactive Hazardous Waste Disposal Sites—Remedy Selection (6 NYCRR 375-10(b)("At a minimum, the remedy selected shall eliminate or mitigate all significant threats to the public health and to the environment presented by hazardous waste disposed at the site through the proper application of scientific and engineering principles.").

- NYSDEC Technical and Administrative Guidance Manuals (TAGMs) (TBCs): The New York State rules for inactive hazardous waste disposal sites are provided in these documents. Cleanup levels for hazardous constituents in soil have been proposed by the State of New York through Technical and Administrative Guidance Manuals (TAGMs) specifically, #HWR-92-4046.

- EPA OSWER 7/99 (TBC): A Guide to Preparing Superfund Proposed Plans, Records of Decision and Other Remedy Decision Documents.

- Sediment results were compared to the most conservative New York State guidelines for sediment, including: New York State lowest effect level (NYS LEL), New York State human

health bioaccumulation criteria (NYS HHB), New York State benthic aquatic life acute and chronic toxicity criteria (NYS BALAT and NYS BALCT, respectively), and New York State wildlife bioaccumulation criteria (NYS WB).

APPENDIX F

RESPONSE TO COMMENTS

Army's Response to Comments from the US Environmental Protection Agency

Subject: Draft ROD for SEAD-16, 17
Seneca Army Depot
Romulus, New York

Comments Dated: December 10, 2004

Date of Comment Response: March 4, 2005

Army's Response to Comments

Comment 1: Section 1.0, Page 1-1, ¶2: On the third sentence, after the "Environmental Coordinator" text, the punctuation mark should be a comma instead of a semi-colon.

Response 1: The text has been revised accordingly.

Comment 2: Section 1.0, Page 1-2: Please add the word "quality" at the end of the complete sentence at the top of this page.

In the second to last bullet, please add the following text after the word "groundwater," "until cleanup standards are met, and to prevent future residential use." Delete the rest of the existing text.

Response 2: The word quality has been added to the end of the sentence. The second to last bullet has been revised to read "Establish and maintain land use controls to prevent access to or use of the groundwater until cleanup standards are met, and to prevent future residential use."

Comment 3: Section 1.0, Page 1-3: In the first paragraph, second sentence, please add an "s" after "Groundwater use restriction," and add "the site" after the word "beneath."

At the first sentence under the "**Declaration**" section, please delete the word "preferred" or change to the word "selected."

Response 3: The sentence has been revised to state "Groundwater use restrictions will continue until groundwater constituent concentrations beneath the site have been reduced to levels that allow for unlimited exposure and unrestricted use." The word "preferred" has been changed to "selected".

Comment 4: Section 1.0, Page 1-4, ¶3: Revise the text by making the word "initiations" after "5 years" singular, and adding the article "the" before "remedial action."

Response 4: The sentence has been revised as follows: ". . . a statutory review will be conducted within 5 years after initiation of the remedial action to ensure that the remedy is, or will be, protective of human health and the environment."

Comment 5: Section 1.0, Page 1-9: Please update the EPA signature page by changing the name to Mr. William J. McCabe, who is Acting Director of the Region 2 Emergency and Remedial Response Division.

Response 5: Agreed. The name has been changed.

Comment 6: Figure 1-2: Institutional Controls for SEAD-17 require that the site be completely bound. Please establish the north and south boundaries, and revise the map accordingly.

Response 6: The proposed remedy includes additional sampling as part of the pre-design sampling program to further delineate the area of excavation. The pre-design sampling will also serve to define the boundaries of SEAD-17 and the boundaries upon which institutional controls will be required.

Comment 7: Tables: Please note that the tables included within this document do not present the data in our recommended format. We are accepting them as they are, but request that future documents reflect our RAGS Part D tables. You can refer to the following link for examples of such tables.
http://www.epa.gov/oerrpage/superfund/programs/risk/ragsd/tables.htm.

Response 7: Acknowledged. Tables presented in RODs for future projects will comply with the tables presented in RAGS Part D.

Army's Response to Comments from the US Environmental Protection Agency's Regional Counsel

Subject: Draft ROD for SEAD-16 and SEAD-17
Seneca Army Depot
Romulus, New York

Comments Dated: February 8, 2005

Date of Comment Response: March 4, 2005

A handwritten markup of the Draft ROD was provided to the Army by USEPA on February 8, 2005. Parsons has paraphrased the handwritten markups to formulate the comments below.

Responses have been drafted for all comments below. Responses which indicate that the USEPA's recommended change will not be implemented are *italicized*.

General Comments:

Comment 1: Refer to the operable units in a consistent manner throughout the text. Currently, the text references the units as "SEAD-16 and SEAD-17", "SEAD-16/17", "SEADs 16 and 17", "SEAD-16 and 17", etc. In addition, references to the operable unit should be to the "Site", and not "site". Distinguishing terms are needed to differentiate between references to SEDA as a whole, and to the operable unit or SWMU.

Response 1: The text has been standardized and the operable units will be referenced as "SEAD-16 and SEAD-17". The term "Site" has been capitalized and refers to the operable unit, not the entire Depot. The Depot is referred to as "the Depot" or SEDA.

Comment 2: There are grammar and style corrections requested throughout the document. All acronyms should be defined when they are first used, and subsequently, only the acronym should be used.

Response 2: The text has been revised in accordance with EPA's recommended comments.

Specific Comments:

Comment 1: Section 1, Site Assessment, Page 1-1: Replace "the public welfare" with "human health". This comment is also applicable to page 1-3.

Response 1: Agreed. The text has been revised.

Comment 2: Section 1, Description of Selected Remedy, Page 1-2: What is "RA/RD Plan"? We have never heard of such a plan. Please clarify, and address this issue on the following pages: Page 3-3, 9-5, and 11-2.

Response 2: The intended reference was a "Remedial Design / Remedial Action (RD/RA) Work Plan", as specified in EPA's "Remedial Design/Remedial Action Handbook" (EPA 540/R-95/059, June 1995). The text references have been revised accordingly. References to RA/RD Plan have been changed to RD/RA Plan.

Comment 3: *Section 1, SEAD 16 and 17 LUC Performance Objectives, Page 1-3: The first sentence at the top of the page states that "the land use controls would be implemented over the area bounded by the site boundary at SEAD-16 and SEAD-17." Does groundwater stop at the fence? Please explain why groundwater controls stop at the Site boundary.*

Response 3: *SEAD-16 and SEAD-17 are included in the property know as the PID Area. A groundwater use restriction has been imposed over the land within the PID Area, as documented in the signed "Final ROD for Sites Requiring Institutional Controls in the Planned Industrial/Office Development or Warehousing Areas" (Parsons, 2004). In effect, a groundwater use restriction currently applies to the area beyond the boundary of SEAD-16 and SEAD-17. Therefore, the groundwater restriction referenced in this Record of Decision only applies to the groundwater on these subject Sites.*

Comment 4: Page 1-4 and Page 12-2: Please explain how the selected remedy satisfies the statutory preference for treatment as a principle element of the remedy.

Response 4: Remedies that included treatment as a primary element were considered during this evaluation. In overall rankings, the off-site disposal option ranked higher when all evaluation criteria, and not just preference for treatment, were taken into account. The references in the text have been revised to reflect this point.

Comment 5: Section 3.1, Page 3-1: What is the regulatory status of the "Final ROD for Sites Requiring ICs"?

Response 5: The Final ROD for Sites Requiring ICs in the PID Areas was signed by the EPA on September 30, 2004. This detail has been added to the text.

Comment 6: Section 3.3, Page 3-2: RCRA was amended and then enacted in 1976, not in 1980. Revise the reference in the first paragraph of the section, and the second bullet at the bottom of the page. Please

revise the last sentence of the first paragraph in this section to state "The State of New York has been delegated the RCRA program by the USEPA . . . ".

Response 6: The text has been corrected.

Comment 7: Section 3.3, Page 3-2: Revise the last sentence of the second paragraph to state: "Therefore, in performing the remedy outlined in this ROD in a manner approved by USEPA and NYSDEC, the substantive . . ."

Response 7: The text has been corrected.

Comment 8: Section 3.3, Page 3-2, third bullet: The Army "submitted" the permit application; they did not "apply". Please revise.

Response 8: The text has been revised accordingly.

Comment 9: Section 3.3, Page 3-3, third bullet: Replace the word "executes" with "undertakes".

Response 9: The text has been revised accordingly.

Comment 10: *Section 6.1, Page 6-1: The text refers to the Abandoned Deactivation Furnace (SEAD-16). This implies that SEAD-16 and the Abandoned Deactivation Furnace are synonymous. It was indicated previously that the area of concern, SEAD-16, includes a larger area than just the Abandoned Deactivation Furnace.*

Response 10: *"The Abandoned Deactivation Furnace" is the name associated with the SEAD number designation, SEAD-16, and this name has historically been used in other primary documents. To be consistent with historical documents, the name will not be changed. It is understood that the actual deactivation furnace is only a part of the Site, and that "The Abandoned Deactivation Furnace" refers to the larger area including the furnace and the surrounding land.*

Comment 11: *Section 6.1.2, Page 6-2: The text states that sodium is the same as background, but further down in the same paragraph it states that sodium exceeded the groundwater standard in a single well. Please reconcile.*

Response 11: *While there is one exceedance of background, statistically, the data set is no different than the background dataset. It is not necessary to change the text.*

Comment 12: Section 6.1.2, Page 6-2: The use of the term "on-site" is confusing. What does it mean? Is the term referring to downgradient locations? This term is used throughout the document.

Response 12: The term "on-site" was used to note that the wells were located within the boundaries of the Site, SEAD-16. The term has been deleted from the text since it was not necessary.

Comment 13: Section 6.1.4, Page 6-3: The text is not clear whether PAHs and pesticides are SVOCs, or just the PAHs. Please clarify.

Response 13: The sentence has been reworded to clarify that only PAHs are SVOCs.

Comment 14: *Section 6.2, Page 6-3: Similar to comment 10, "Active Deactivation Furnace" is not synonymous with SEAD-17. SEAD-17 is bigger than ADF.*

Why is it called "active" if operations ceased 16 years ago, in 1989?

Response 14*: See the response to Comment 10. At the time that the SWMUs were assigned names, the furnace located within SEAD-17 was active.*

Comment 15: Section 6.2.2, Page 6-4: There appears to be a discrepancy. The first sentence says "generally, the groundwater at SEAD-17 has not been significantly impacted by any chemical constituents." Then the text goes on to mention 3.5 times MCL, 3 times MCL, 7 times MCL, etc. Please reconcile. Also, at the end of the second sentence, change the word "factor" to "multiple".

Response 15: It is a correct statement that the groundwater has not been *significantly* impacted. While there were exceedances in the groundwater, they were not of a magnitude that is of significant concern. The rest of the paragraph explains that the original groundwater results for thallium were not reliable and likely misrepresented the presence of the COC in the groundwater. For clarification, the sentence will be replaced with the following: "Generally, few chemical constituents were detected in the groundwater at SEAD-17."

Comment 16: Section 7.0, Page 7-1: At the end of the first sentence, add "and anticipated uses at SEAD-16 and SEAD-17." At the end of the second sentence, add "at SEAD-16 and SEAD-17."

Response 16: The text has been revised accordingly.

Comment 17: Section 7.1, Page 7-2: Why single out SEAD-17 for inhalation of dust in ambient air by a future industrial worker? Please explain why a SEAD-16 industrial worker is assumed to work only indoors, while the SEAD-17 industrial worker is assumed to work only outdoors.

Response 17: The pathway of ambient air was not evaluated for SEAD-16 since the future industrial worker would essentially be an office worker with negligible exposure to these pathways. It should be noted that the ambient air did not cause unacceptable risk to more sensitive receptors like the day care child (as presented in the table below); hence, the likelihood of these exposure pathways causing risk for an office worker is minute. Inhalation of indoor dust and dermal contact to indoor dust were not evaluated at SEAD-17 since the structure at SEAD-17, Building 367, is not considered a standard building. Building 367 consists of the deactivation furnace, surrounded by a cinder block barrier, 10 to 12 feet tall, with openings in the barrier to allow for entrance and egress.

To provide clarification in the text, the following note has been added under the list of exposure pathways:

> (Note: The SEAD-16 industrial worker receptor is assumed to be an office worker who works indoors only; the office worker's exposure to the outdoor air pathway is assumed to be minimal. The SEAD-17 industrial worker receptor is assumed to be a yard worker whose primary exposure is to ambient concentrations of contaminants. These exposure scenarios are consistent with the historic structures and expected future buildings that are anticipated at the two Sites.)

Comment 18: Section 7.2, Page 7-4: In the first sentence of the section, should the word "environmental" be changed to "ecological"?

Response 18: The word has been changed to "ecological."

Comment 19: Section 8.0, Page 8-1: In the second sentence of the third paragraph, delete "to the greatest extent possible" and replace with "unless a waiver is necessitated".

Response 19: The text has been revised accordingly.

Comment 20: *Section 8.0, Page 8-2: What is the "pre-disposal scenario"? Is it the same as background?*

Response 20: *In this case, the term "pre-disposal scenario" is synonymous with background. NYSDEC TAGM #4046 states that "the cleanup goal of the Department is to restore inactive hazardous waste sites to predisposal conditions." Pre-disposal conditions refer to the condition of the site before treatment, storage, or disposal of waste occurred. The pre-disposal scenario is evaluated to satisfy state requirements, and this terminology is consistent with previous NYSDEC requests.*

Comment 21: Section 9.0, Alternative 2, Page 9-2: The discussion of Alternative 2 does not sound like on-site containment, as the title indicates.

Response 21: In this alternative, only ditch soils are excavated and disposed off-site. All other soils (surface soil and subsurface soil) would remain on-site and a soil cover would be installed. The text has been revised to clarify that the first paragraph refers to the excavation of ditch soil only, and not all soils.

Comment 22: Section 10.3, Page 10-5: Why is the land use restriction limited to prohibiting future land use as a day care center? Why is a senior home or normal residences not listed? Is a day care center considered industrial?

Response 22: The designated future land use for SEAD-16 and SEAD-17 is industrial. A day care center could be housed within an industrial office park; therefore, a land use restriction prohibiting a day care center is required to protect human health. The restriction has been clarified to state that residential housing, elementary and secondary schools, childcare facilities, and playgrounds activities will be prohibited.

Comment 23: Section 11.0, Page 11-2: Revise the third paragraph after the bullets to state the following: "In accordance with the FFA and CERCLA §121(c), the remedial action (including the monitoring program) will be reviewed no less often than every 5 years. After such reviews, modifications may be implemented to the remedial program, if appropriate."

Response 23: The text has been revised accordingly.

Comment 24: *Section 11.0, Page 11-2: What is the basis for relating a daycare center to groundwater?*

Response 24: *The baseline risk assessment demonstrated that ingestion of groundwater by a daycare child caused a non-cancer risk. Therefore, the daycare center restriction is needed until the groundwater achieves ARARs.*

Comment 25: Section 11.0, Page 11-2: *Institutional controls* are not the same as *land use controls*. These terms should not be used interchangeably.

Response 25: Agreed. The text has been revised.

Comment 26: Section 12.5, Page 12-2: How is it that the *preference for treatment* is "satisfied" if the selected remedy does not "rely on treatment"? Refer to the first and second sentences. Please reconcile.

Response 26: Remedies that included treatment as a primary element were considered during this evaluation. In overall rankings, the off-site disposal option ranked higher when all evaluation criteria, and not just preference for treatment, were taken into account. The references in the text have been revised to reflect this point.

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To TODD HEINO	From Kuldeep Gupta
Co. Project Mgr, Parsons	Co. NYS-DEC
Dept.	Phone # 518-402-9620
Fax # 1-617-946 9777	Fax #

From: James Dolen
To: Palomino.Wilfredo@epamail.epa.gov
Date: 4/7/2005 7:27:32 PM
Subject: Re: Seneca deactivation furnace closu

Wilfredo:
I just came across your e-mail. Apparently I overlooked it when it came in, which I apologize for.

The citation given by the Army is the general post-closure care language for land disposal units, which is not applicable to an incinerator unit such as the deactivation furnace.

The unit and all associated equipment, waste storage and feed areas, waste discharge areas (which I recall had molten lead dropping on a pad without containment), buildings, and the surrounding property (which had lead contamination) must be closed clean.

They closure language for tanks is probably the best to use which I've paraphrased here: "They must remove or decontaminate all waste residues, contaminated containment system components, contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste. If they demonstrate that not all contaminated soils can be practicably removed or decontaminated as required, then the owner or operator must close and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (subdivision 373-3.14(d). In addition, for the purposes of closure, post-closure, and financial responsibility, such system is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in sections 373-3.7 and 3.8."

In other words, they must close clean. After their best efforts to do that, if it is still contaminated, they must close as a landfill which has many additional requirements, including GW monitoring.
Only after going through all of the landfill closure requirements, would the post closure requirements apply.

Alternatively, they could be handled under Corrective Action, which would still require the area to be cleaned up as much as possible.

>>> <Palomino.Wilfredo@epamail.epa.gov> 12/7/04 4:15:33 PM >>>
Jim, I need your opinion on this. If this is a dirty closure, wouldn't future SF remediation address soil and groundwater contamination?
Thanks.

----- Forwarded by Wilfredo Palomino/R2/USEPA/US on 12/07/2004 04:05 PM

Julio Vazquez
12/07/2004 02:30 PM
To: Wilfredo Palomino/R2/USEPA/US@EPA
cc:
Subject: Seneca

Wilfredo:

I am working on a Record of Decision that contains a "dirty" closure of a small arms deactivation furnace. The Army says that according to 6 NYCRR Section 373.7(g)-(j), maintenance and monitoring is all that is required, which they are planning to implement by preventing access into the building as there is not future intended use. Is this ok? Thanks.

Julio F. Vazquez, RPM
U. S. EPA, Region 2