65-09

BCT Agenda
20 January 2004
Seneca Army Depot Activity
1330-1600 Hours

IC ROD for PID Area - Discuss responsiveness summary comments

Review Attachment 5
- Identify further changes
- Discuss upcoming document submissions

ATTACHMENT 5
SCHEDULES

The schedule of IRP work at SEDA is as follows:

RELEVANT MILESTONES

ASH LANDFILL (SEAD-003, 006, 008, 014, and 015) OU1

Draft Work Plan	(04 Dec 90)
Draft RI	(20 Oct 93)
Draft FS	(19 Sep 94)
Draft PRAP	(07 Mar 97)
Draft Treatability Study Work Plan	(04 Nov 98)
Treatability Study Start	(07 Dec 00)
Draft Treatability Memorandum Report	(01 May 02)
Draft ROD	(30 Aug 98)
Final ROD	(30 Mar 03)
Draft RD/RA Schedule	21 days after ROD
Draft Remedial Design	21 days after ROD
Remedial Action Completion Report	21 days after ROD
Draft-Final PRAP	(03 Aug 03)
Draft ROD	(07 Apr 03)
Draft-Final ROD	(15 Sep 03)

Ash Landfill Status: The Draft PRAP was submitted 7 Mar 1997 the Revised-Draft Final PRAP was submitted July 2002 and revised again and submitted 27 Aug 03. The Draft ROD was submitted 7 Apr 03, revised and submitted 15 Sep 03. DEC comments are included in the 15 Sep 03 revision. EPA comments are pending. Public comments and responsiveness summary were submitted as Appendix c of the Draft-Final ROD 27 Aug 03.

OPEN BURNING GROUNDS (SEAD-023) OU2

Draft Work Plan	(29 Aug 91)
Draft RI	(28 Jan 94)
Draft FS	(09 Mar 94)
Draft PRAP	(04 Jul 96)
Draft ROD	(14 Nov 97)
Final ROD	(14 Jun 99)
Draft Rd/RA Schedule	
Draft Remedial Design	
Draft-Remedial Action Completion Report	29 Feb 04

OB Grounds Status: Technical specs, RA Workplan submitted 5 Jul 99. Comments were received and incorporated in the Final RA Workplan.

The contract to complete the OB Grounds project was awarded 7 Aug 01. Sampling of soils previously stockpiled was initiated 13 Aug 01. Excavations, one-foot cut areas, and Reeder Creek are complete. Final OE site clearance is accomplished. Draft-Final RA Completion Report is pending acceptance of Final Confirmatory Sampling Report (FCSR). FCSR to be submitted by 30 Jan 04.

REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES
FIRE TRAINING AREAS (SEAD-025, 026) OU3

Draft RI/FS Work Plan	(29 Mar 95)
Draft RI Submission	(27 Jun 96)
Draft FS Submission	(05 Dec 97)
Draft PRAP	(17 Aug 01)
Draft ROD	(29 Oct 02)
Draft RD/RA Schedule	21 days after ROD
Draft Remedial Design	21 days after ROD
Remedial Action Completion Report	21 days after ROD

Fire Training Areas Status: : A preliminary version of the Draft Final ROD and the Army's response to comments on the Draft ROD were emailed to the Army, USEPA, and NYSDEC on 2/28/03. Comments on the preliminary Draft Final were received electronically from NYSDEC on 3/31/03 and from USEPA on 4/4/03 and 4/24/03. These comments have been incorporated into the Draft Final ROD formally submitted on May 19, 2003. Comments from EPA were received 18 Dec 03, and comments from NYSDEC are pending.

DEACTIVATION FURNACES (SEAD-016, 017) OU4

Draft RI/FS Work Plan	(29 Mar 95)
Draft RI Submission	(08 May 97)
Draft FS Submission	(21 Nov 97)
Draft PRAP	(05 Sep 01)
Draft ROD	14 Feb 04

Deactivation Furnaces Status: Revised-final PRAP was submitted 5 Dec 03. A public meeting was held on 16 Dec 03. Regulator comments will be addressed in the responsiveness summary. No regulator comments have been received. Date for draft ROD assumes all comments on PRAP are received by 15 Jan 04.

RAD SITES (SEAD-012/63) OU5

Draft RI/FS Work Plan	(19 Dec 95)
Draft RI Submission	(22 May 00)
Draft FS Submission	(25 May 02
Draft PRAP	15 Sep 02
Draft ROD	29 Mar 03

RAD Sites Status: Note: Contract modification to fund and conduct fieldwork for the supplemental RI has been awarded. Dates for submission of the Draft PRAP and Draft ROD will be adjusted when the supplemental RI is accepted and the FS is updated to reflect the RI findings.

SEAD-12 RI: Revised final RI response to comments submitted 27 Aug 02. A supplemental investigation to address TCE contamination near Bldg. 813/814 will be required before the draft FS can be updated.

SEAD-12 Supplemental RI, TCE Investigation: A draft workplan to detail the investigation of the TCE plume near Building 813/814 was submitted on 21 May 03. EPA comments were received 7 Aug 03. NYSDEC has informed the Army that they have no comments. Awaiting comments from NYSDOH.

SEAD-12 FS: A draft FS was submitted 24 May 02. Received EPA comments of 15 Aug 02 and additional comments of 10 Sep 02. NYSDEC comments received 22 Aug 02. Comments identified the need for further investigation of TCE contamination. The completion of the FS will continue following supplemental RI investigations.

SEAD-12 Radiological Survey Report: Submitted 3 Aug 02 with updated information on 13 Aug 02. EPA comments received 24 Sep 02. NYSDEC comments received 6 February 03. Army response to regulator comments and final Radiological Survey report for the phase I and phase ii building survey update pages submitted 24 March 03. Regulator comments were due 23 April 03. No regulator comments have been received to date.

SEAD-059, 071 Fill Area/Paint Disposal

Draft RI/FS Work Plan	(30 Jan 96)
Draft RI Submission	(16 Jul 98)
Draft Action Memorandum	(29 Jun 01)
Draft Workplan	(28 Aug 02)
Removal Action-initiation of fieldwork	(09 Sep 02)
Removal Action Report	(06 Dec 02)
Draft PRAP	30 Sep 04
Draft ROD	30 Dec 04

Fill Area/Paint Disposal Status: Fieldwork for the SEAD-59, 71 Time Critical Removal Action is complete and a Removal Report has been submitted. The RI/FS fieldwork has resumed and groundwater sampling will be performed in January 2004.

SEAD-004 Munitions Washout Facility

Draft RI/FS Work Plan	(25 Oct 95)
Draft RI Submission	(15 Nov 99)
Draft FS Submission	(31 Jul 01)
Draft PRAP	15 Jun 03
Draft ROD	24 Mar 04

Munitions Washout Facility Status: Revised Ecological Risk Assessment and response to regulator comments was sent on 12 February 03 for regulator review and to seek general agreement to the comments responses prior to submitting the final FS for formal review/comment. EPA comments received 3 June 03. Awaiting NYSDEC comments prior to submitting FS.

SEAD-011 Old Construction Debris Landfill

Draft RI/FS Work Plan	(15 Jun 95)
Draft RI Submission	(06 Nov 98)
Draft Action Memorandum	(20 Jul 01)
Draft Workplan	28 Jul 05
Removal Action	28 Oct 05
Removal Action Report	28 Apr 06
Draft PRAP	28 Jul 06
Draft ROD	28 Sep 06

Old Construction Debris Status: The Final Action Memorandum/Decision Document was submitted on April 10, 2003. A public meeting was held on May 20, 2003 and a Non-Time-Critical Removal Action is planned for 2005. NYSDEC comments are pending.

SEAD-013 IRFNA Disposal Site

Draft RI/FS Work Plan	(14 Nov 95)
Draft RI Submission	29 Aug 99
Draft FS Submission	22 Jan 00
Draft PRAP	11 May 00
Draft ROD	22 Nov 00

IRFNA Disposal Site Status: Above schedule is on hold pending outcome of the Decision Document. Draft Final Decision Document received 4 Nov 02. Revised document/comment responses sent 28 March 03. Awaiting NYSDEC comments on the Final DD. Schedule dates to be adjusted following outcome of DD..

SEAD-052, 060 Bldg 612 Complex

Draft RI/FS Work Plan (19 Jan 96)

Bldg 612 Complex Status: Final Completion Report for the Prison Parcel was submitted on 4 May 01. Comments from EPA and NYSDEC are pending. This OU is included in the No Further Action ROD.

SEAD 52 status is that it was deleted from the NFA ROD due to EPA issues in March 03. EPA commented that there is no groundwater data, therefore there should be a groundwater restriction on this site. The Army position was that there was no risk. Soil and surface soils were sampled. This site is in informal consultation.

SEAD-046 and 057 EOD/Small Arms Range

Draft RI/FS Work Plan SEAD-046, 057	(26 Feb 96)
Draft RI/FS Work Plan SEAD-046	(09 May 96)
Draft RI Submission	20 May 03
Draft FS Submission	25 Feb 04
Draft PRAP	22 Jun 04
Draft ROD	06 Feb 05
Draft RD/RA Schedule	21 days after ROD
Draft Remedial Design	21 days after ROD
Remedial Action Completion Report	21 days after ROD

EOD/Small Arms Range Status: Fieldwork for Phase I RI complete. A Draft RI Report as a Preliminary Site Characterization Report was submitted 19 Dec 01.

EPA commented on the 19 Dec 01 Draft RI Report, comments dated 14 Feb 02, and DEC commented on this same report on 4 Feb 02.

The Army plans to perform OE removal activities at these sites, and address contaminants of concern under CERCLA incidental to the OE removal. The results of sampling of potential contaminants incidental to the OE removal will determine the next step in the CERCLA process, namely, a Completion Report versus a risk assessment/RI report. Final decision regarding OE effort is pending DDESB review. Geophysical surveys for OE have been conducted IAW the workplan. Partial clearance was conducted. Fieldwork was demobilized 17 Dec 03 due to winter weather.

SEAD-048 Pitchblende Storage Area

Draft RI/FS Work Plan	(19 Dec 95)
Revised Draft MARSSIM Work Plan	(01 Mar 02)
Draft RI Submission	05 Nov 00
Draft FS Submission	30 Mar 01
Draft PRAP	18 Jul 01
Draft ROD	29 Jan 02

Pitchblende Storage Area Status: The MARSSIM based Final Status Survey fieldwork began May 5, 2003 and was completed in October 2003. Following receipt of validated data, the draft report is planned to be submitted by early March 04.

SEAD-063 Miscellaneous Components Burial Site Removal Action

Draft EE/CA Approval Memorandum Document	(05 Oct 98)
Draft EE/CA Document	(23 Oct 99)
Draft EE/CA Action Memorandum Document	(23 Oct 99)
Release for Public Comment	(19 Feb 02)
Draft Removal Work Plans	20 Mar 04
Removal Action Begins	05 May 04
Draft Removal Report	03 Dec 04

Miscellaneous Components Burial Site Status: Contract was awarded and workplan is being prepared. Fieldwork is scheduled to start 05 May 05.

No Further Action ROD Sites:

The No Action/No Further Action ROD for 20 sites was signed 22 Nov 03.

The sites included are:

SEADs-7, 9,10,18,19,20,21,22,23,35,36,37,42,47,49,51,53,55,65,68 (No Action) and

SEADs-28, 29,30,31,32,34,60,61 (No Further Action).

Removal Metals Sites SEAD-24, -50, -54, and –67:

Fieldwork	start	30 Sep 03
	complete	30 Nov 04

The metal sites are addressed as a time critical removal action and are currently was awarded Oct 31, 2002. SEADs –50/54 are associated with the site and designated to be reused for the County public safety building and jail. The site was to be ready for construction of the new facility, however this has been postponed by the county. SEAD 50/54 is complete pending the regulatory acceptance of a variance to the agreed to confirmatory sampling. The Army submitted its rationale for this on March 31, 2003 by email. NYSDEC response was received April 25, 2003. Removal of soils at SEADs 24 and 67 are complete under this project. DEC has concurred that the response is complete for 50/54. EPA has raised new statistical issues. Confirmatory Sampling data needs to be submitted for 24 and 67. Submission is on hold pending resolution of statistical issues associated with SEAD 50/54.

VOC sites SEAS-38, -39, and -40 and SEAD 5 Sludge Piles:

Fieldwork	start	May 03
	complete	Dec 03

The VOC sites are proceeding on a similar path as the metals sites. There is renewed interest in reuse and property transfer which continues to drive these sites to take a time critical action to prevent and insure incidental exposure does not occur. NYSDEC had expressed a concern that site 38 should be addressed with SEAD 4. The Army agreed and will include this in SEAD 4 O.U. conducted with 39 and 40. Soils have been removed at all sites and confirmatory sampling data is to be submitted.

OU 12 SEAD-66, -64A, -27 PID ROD Institutional Control ROD for the Industrial Area

Draft PRAP	27 Aug 03
Draft ROD	27 Aug 03

A public meeting was held 16 Sep 03 with no comments received in the comment period. EPA commented 14 Nov 03. The Army and EPA are in informal consultation regarding the revisions to the responsiveness summary regarding the EPA comments.

BCT Agenda

21 September 2004: 1300-1630
22 September 2004: 0830-Noon

Tuesday, September 14th

1. Status review of all projects.

2. SEAD 4 "Knee of the Curve" discussion

3. Performance Based Contracting initiative by AEC

4. Ash Landfill ROD variation

5. Open discussion

Wednesday, September 22nd

Tour of sites
SEAD 4 (test Pitting if approved by contracting)
SEAD 23 (See ongoing progress of Oversize material pile)
Tank Removal at Airfield

Soil Excavation Quantities - Sensitivity Analysis

Munitions Washout Facility (SEAD-4)

Seneca Army Depot Activity

September 21, 2004

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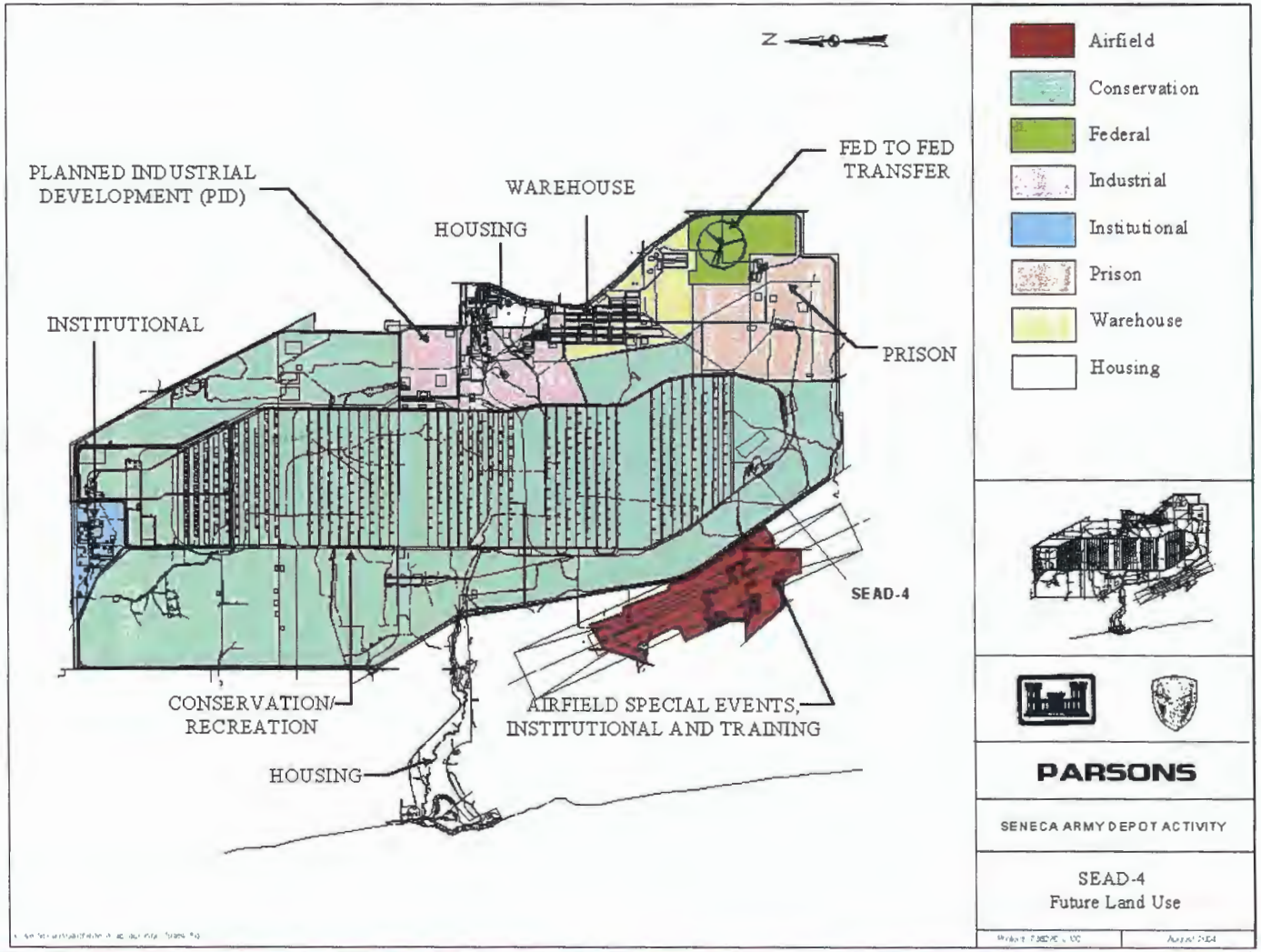
Topics for Tonight's Presentation

- SEAD-4 Overview
- Regulatory History
- Description of Sensitivity Analysis
- Results and Conclusions of Analysis

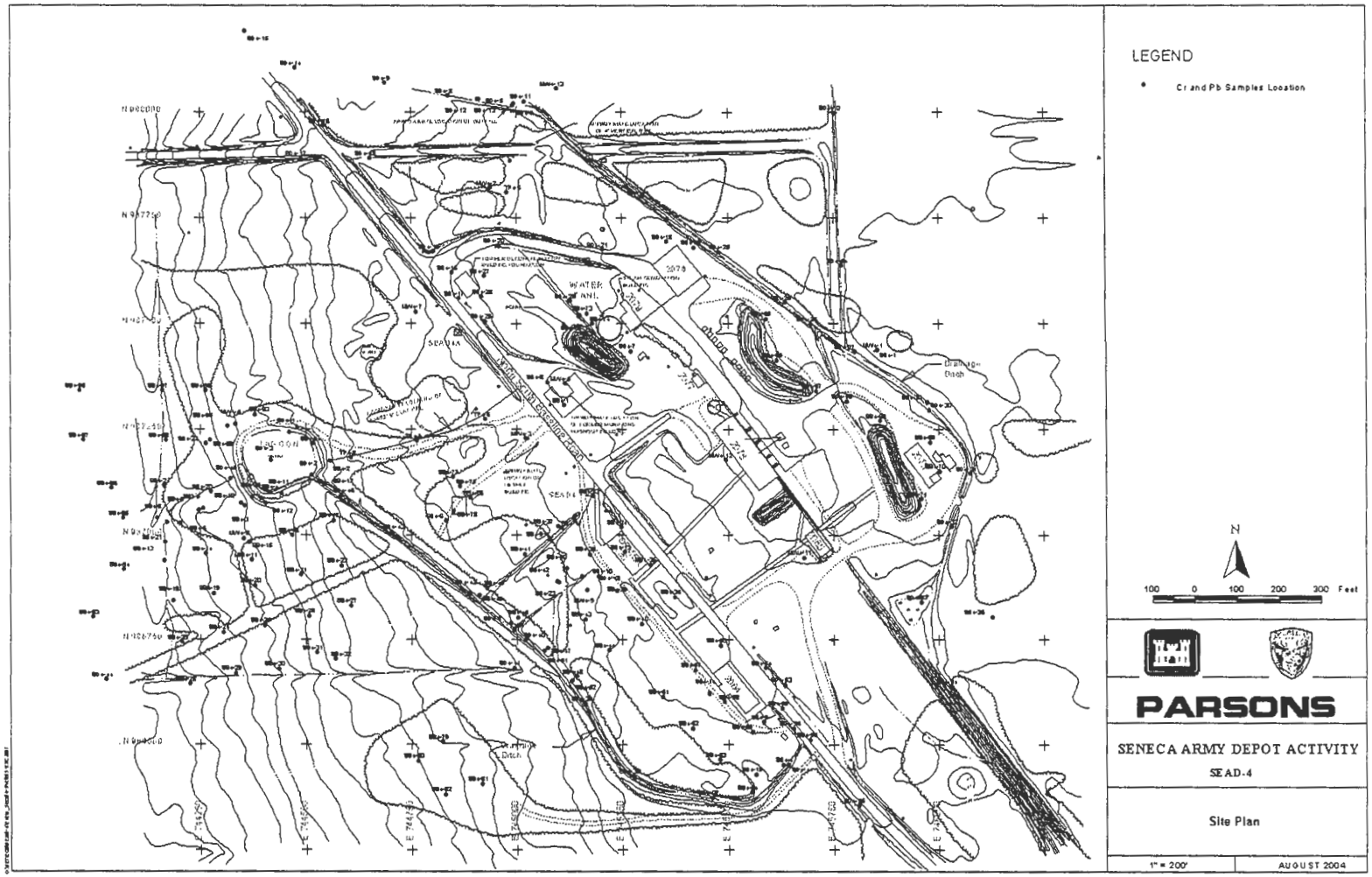
SEAD-4 Overview

- Munitions Washout Facility is located in the southwestern portion of SEDA
- Site features include:
  - numerous drainage ditches within the site
  - 150-ft. diameter man-made pond
  - seven remaining buildings
- Operations involved the dismantling of munitions and removing the explosives by steam cleaning
- Soils contaminated by heavy metals, principally chromium

SEAD-4 Future Use



SEAD-4 Site Plan



Regulatory History

- Expanded Site Investigation completed in 1993
- Final RI completed in January 2001
- Draft Final FS submitted in January 2002
  - Excavation of soils and sediments exceeding soil cleanup goals
  - Ecological cleanup goals recommended
    [Cr > 324 mg/Kg, Pb > 167 mg/Kg]
  - EPA approved these goals; NYSDEC has rejected them
  - NYSDEC requested sensitivity analysis

Sensitivity Analysis

- Graph remediation costs vs. contaminant mass removed for five CUG scenarios
- Determine where "knee of curve" occurs
- Knee of curve shows where large increased remediation costs do not justify small increases in contaminant mass removed
- Balance remediation costs versus lead (Pb) and chromium (Cr) mass removed
- Select most appropriate cleanup goals for Pb and Cr

Sensitivity Analysis
Cleanup Goal Scenarios

Scenario A: Cr > 60 mg/Kg; Pb > 167 mg/Kg

Scenario B: Cr > 30 mg/Kg; Pb > 30 mg/Kg
(pre-activity conditions)

Scenario C: Cr > 60 mg/Kg; Pb > 400 mg/Kg

Scenario D: Cr > 324 mg/Kg; Pb > 167 mg/Kg
(ecological risk assessment)

Scenario E: Cr > 324 mg/Kg; Pb > 400 mg/Kg

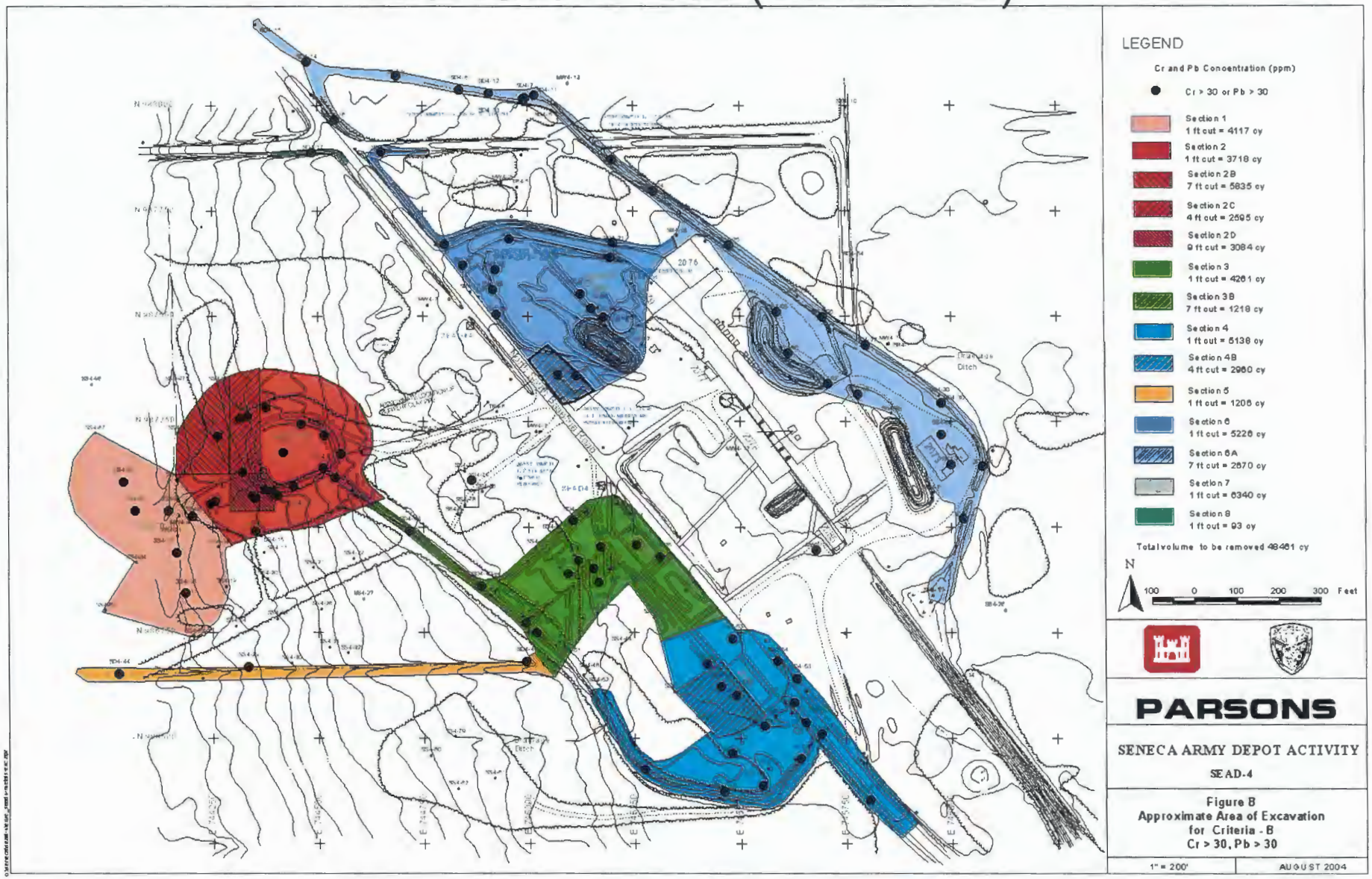
Sensitivity Analysis Method

- Calculate volumes of soil to be removed under each scenario and determine average Cr and Pb concentration
- Calculate mass of contaminant removed under each scenario and resulting remediation cost
  - contaminant mass:

    volume (cy) x 1.5 tons/cy x 2000 lbs/ton x 0.454 kg/lb x Cr conc. (mg/Kg) = Cr mass (mg)
- Determine percentage of contaminant removed based on 100% removed under most stringent CUG scenario

Excavation Areas (Scenario A)

Excavation Areas (Scenario B)



Excavation Areas (Scenario C)

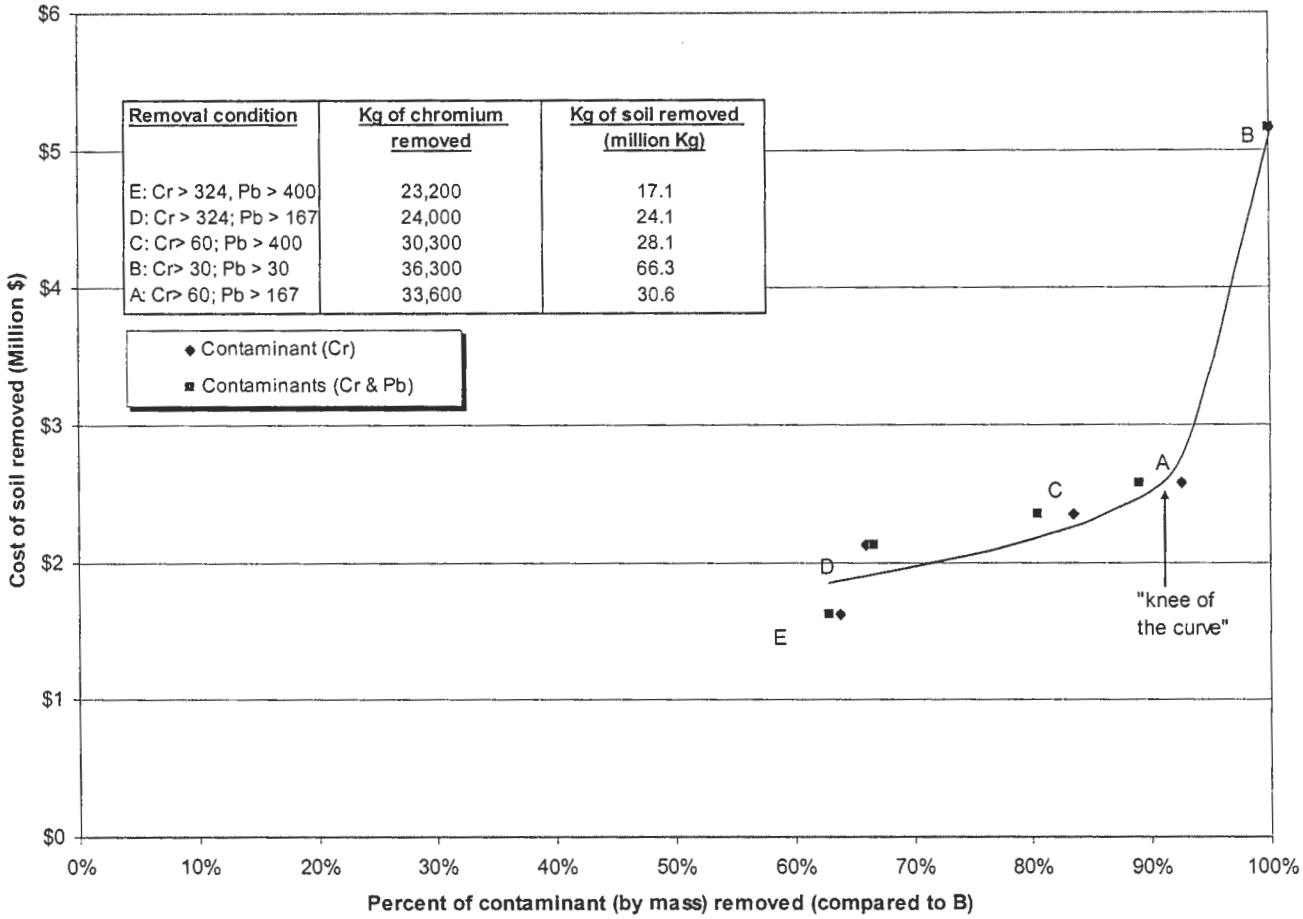
Excavation Areas (Scenario D)

Excavation Areas (Scenario E)

Mass Calculation

	Volume (cy)	Mass of soil (million Kg)	Cost ($mill)	Mass of Cr (Kg)	% Chromium removed	Mass of Pb (Kg)	% Lead removed
Scenario E	12,955	17.1	1.62	23,200	63.8%	3,700	57.7%
Scenario D	18,020	24.5	2.13	24,000	66.0%	4,500	70.3%
Scenario C	20,276	28.1	2.35	30,300	83.4%	4,100	64.3%
Scenario B	48,460	66.0	5.17	36,300	100.0%	6,400	100.0%
Scenario A	22,496	30.6	2.6	33,600	92.5%	4,400	69.4%
Notes:							
A: Cr > 60 Pb > 167							
B: Cr> 30; Pb > 30							
C: Cr> 60; Pb > 400							
D: Cr > 324; Pb > 167							
E: Cr > 324, Pb > 400							

Sensitivity Analysis - Chromium



Removal condition	Kg of chromium removed	Kg of soil removed (million Kg)
E: Cr > 324, Pb > 400	23,200	17.1
D: Cr > 324; Pb > 167	24,000	24.1
C: Cr> 60; Pb > 400	30,300	28.1
B: Cr> 30; Pb > 30	36,300	66.3
A: Cr> 60; Pb > 167	33,600	30.6

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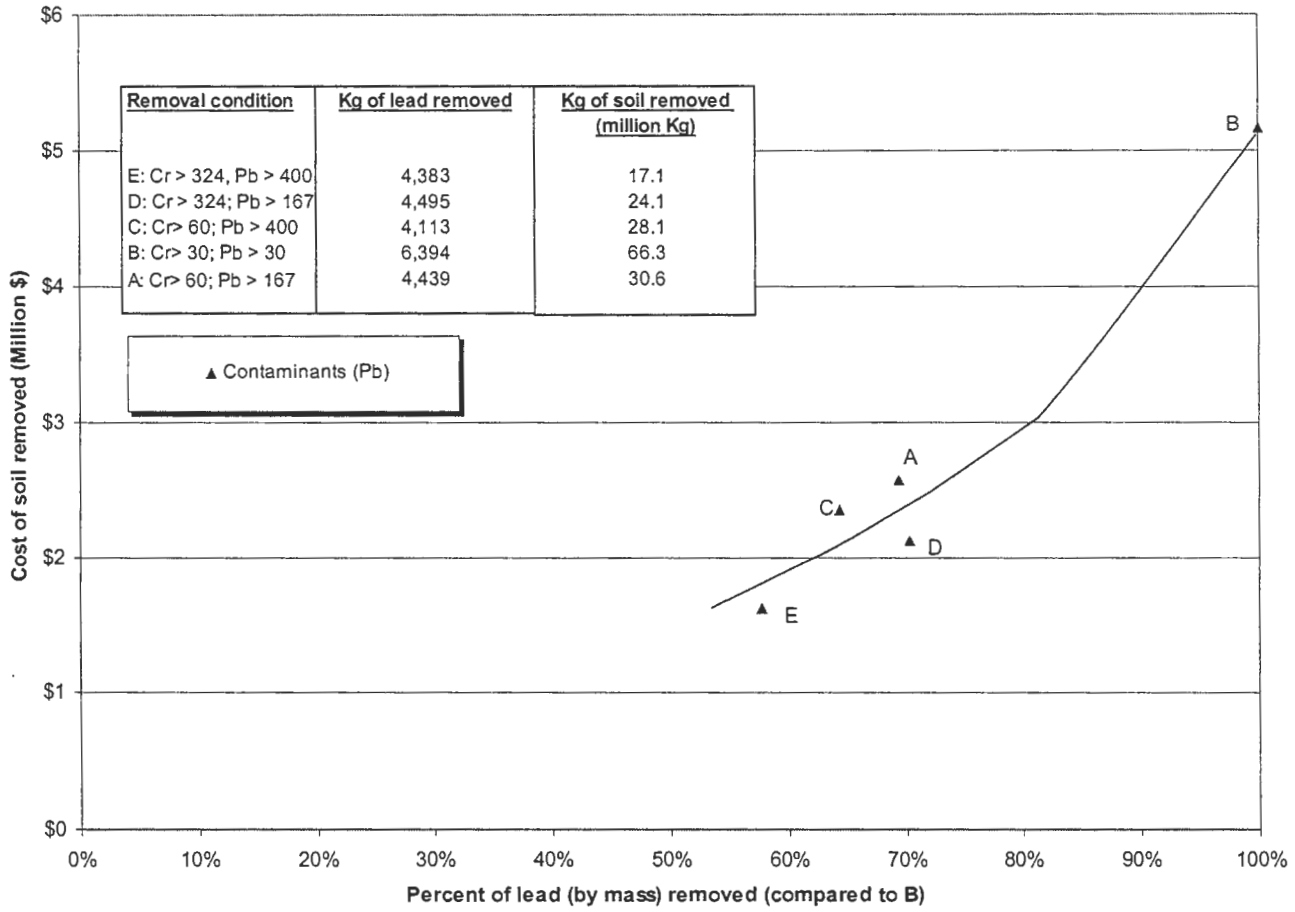
Sensitivity Analysis - Lead



Removal condition	Kg of lead removed	Kg of soil removed (million Kg)
E: Cr > 324, Pb > 400	4,383	17.1
D: Cr > 324; Pb > 167	4,495	24.1
C: Cr> 60; Pb > 400	4,113	28.1
B: Cr> 30; Pb > 30	6,394	66.3
A: Cr> 60; Pb > 167	4,439	30.6

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Conclusions

- Sensitivity analysis is conclusive
- Scenario A results in 93% chromium removed and 70% lead removed.
- Costs increase by 100% ($2.6m to $5.2m) to remove all contaminants (Scenario B)
- Army recommends Scenario A for cleanup goals based on analysis.
  - Pb < 167 ppm, Cr < 60 ppm

Questions

PARSONS

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September 17, 2004

Mr. Scott Bradley
U.S. Army Corps of Engineers
Engineering and Support Center, Huntsville
4820 University Square
Huntsville, AL 35816-1822

SUBJECT: **Seneca Army Depot Activity – Status Report - Preliminary Mini Risk Assessment Results Based on Soil Data Collected at SEAD-59/71, Delivery Order 13, DACA87-02-D-0005**

Dear Mr. Bradley:

This memorandum presents the preliminary human health mini risk assessment results based on available in-place soil data from the Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71) (hereafter referred to as the sites) and SEAD-59 stockpile data. The purpose of conducting the mini risk assessment was to assess whether or not the soils that currently remain at the sites and the stockpile soils at the sites after the Time Critical Removal Action (TCRA) conducted in 2002, exhibit any risk to current or future users of the sites. The results of the mini risk assessment indicate that the risks for potential receptors under the industrial scenario exceed the USEPA target risk limits when the maximum values of constituents remaining at the sites are used. In addition, carcinogenic Polycyclic Aromatic Hydrocarbon (PAH) concentrations at certain locations within the sites were above the New York State Department of Environmental Conservation (NYSDEC) cleanup goal (i.e., benzo(a)pyrene equivalent concentration of 10 mg/kg). Therefore, a baseline risk assessment is proposed to evaluate potential threats to human health and the environment in the absence of any remedial action and provide the basis for determining whether or not additional remedial action is necessary. Parsons would like to request that Option Task 2 (Baseline Risk Assessment) under contract DACA87-02-D-0005, Delivery Order 13 be made available for the purpose of conducting the baseline risk assessment.

1. Background

SEAD-59/71 is located within the industrial area in the east-central portion of the Seneca Army Depot Activity (SEDA) in Romulus, New York. SEAD-59 was used for the disposal of construction debris and oily sludges. SEAD-71 is designated as the Alleged Paint Disposal Area.

The investigations conducted at SEAD-59 and SEAD-71 included the 1994 Expanded Site Inspection (Parsons, 1995a,b), the 1997 Phase I Remedial Investigation (Parsons, 2002a,b,c), and the 2002 TCRA (ENSR, 2002). The results of the Expanded Site Inspection (ESI) and Remedial Investigation (RI) identified significant releases of benzene, toluene, ethyl benzene, and xylenes (BTEX) and PAH compounds in the materials comprising the fill area and disposal pits at SEAD-59. Both PAHs and heavy metals were detected above their associated NYSDEC criteria levels in surface soils at SEAD-71. In addition, the results of the test pitting investigation confirmed the presence of drums, paint cans, and other containers at SEAD-59/71 (Parsons, 2002a). As a result, the Army prepared an Action Memorandum (Parsons, 2002a) and a Decision Document (Parsons, 2002b) recommending that a Time-Critical Removal Action be conducted to remove the source of potential risks to human health, the environment, and groundwater quality.

The TCRA was conducted at the sites between September and November, 2002 by ENSR Corporation (ENSR, 2002). An estimated 14,105 and 663 in-place cubic yards of soil were excavated at SEAD-59 and SEAD-71, respectively. A total of 7,360 estimated in-place cubic yards of soil were backfilled. Approximately 3,852 tons of excavated soil and debris were shipped off-site for disposal, among which 479 tons of excavated soil were stabilized before they were shipped off-site for disposal. An estimated 5,428 in-place cubic yards of soil were left stockpiled at SEAD-59. After excavation, confirmatory soil samples (grab samples) were collected on the excavation floor and from each wall of the excavation. In addition, all excavated materials were staged in windrows of 500 to 600 cubic yards each and composite soil samples were collected from each windrow. The Final Draft Removal Report (ENSR, 2002) documents this effort and Table 1 in this report summarizes the samples collected during the TCRA and their final disposition (i.e., backfill, stockpile, or off-site disposal).

Groundwater monitoring wells had been installed at the sites during the ESI, Phase I RI, and TCRA and groundwater samples were collected during the ESI and Phase I RI. Groundwater monitoring is an on-going investigation at the sites and exposure to groundwater is not evaluated in this mini risk assessment.

2. Human Health Mini Risk Assessment Introduction

A mini risk assessment was conducted to evaluate potential human health risks associated with exposure to soil at the sites. This section presents a brief summary of the identification of chemicals of potential concern (COPCs), exposure assessment, toxicity assessment, and risk characterization.

2.1 Identification of Chemicals of Potential Concern

2.1.1 Data Used in Mini Risk Assessment

Three data sets were used for the mini risk assessment: (1) in-place SEAD-59 data, (2) in-place SEAD-71 data, and (3) data from the stockpiles that remain at SEAD-59.

For the SEAD-59 and SEAD-71 in-place data sets, soil data collected from all historical site investigations/activities were evaluated to determine whether or not the associated soils are still in-place at the sites. Soil data associated with soil still in-place were included in the risk assessment. Figures 1 and 2 show the locations of all the in-place samples included in the risk assessment for SEAD-59 and SEAD-71, respectively. Tables 1A and 1B summarize the samples included in the risk assessment for SEAD-59 and SEAD-71, respectively. In summary, the following data were included in the in-place data sets for the risk assessment:

- In-place (i.e., not excavated during the TCRA) soil data collected during the 1994 Expanded Site Inspection by Parsons;
- In-place (i.e., not excavated during the TCRA) soil data collected during the 1997 Phase I Remedial Investigation by Parsons;
- Final confirmatory soil data and backfilled windrow soil data collected during the 2002 TCRA; and
- Fill material samples.

Soil data collected during the Expanded Site Inspection and Phase I Remedial Investigation were evaluated to decide whether the associated soil had been excavated during the 2002 TCRA. These samples were designated as in-place or excavated based on the sample information (i.e., ground elevation, sample depth, and sample location), TCRA excavation information provided in the ENSR 2002 Final Draft Removal Report, and professional judgment. For cases where a clear-cut decision could not be made, the samples were assumed to be in-place as a conservative (i.e., human health protective) approach. Only samples designated as in-place were included in the mini risk assessment.
All confirmatory samples collected during the 2002 TCRA activity and listed in Table 1 of the ENSR 2002 Final Draft Removal Report were designated as final (i.e., in-place) and were included in the mini risk assessment, with the exception of the following five samples: CL-59-OTHERC-WE1, CL-71-B-WE1, CL-71-C-WW1, CL-71-D-WW1, and CL-71-D-WW2. These five samples were eliminated from the in-place database based on notations made in the ENSR 2002 Final Draft Removal Report that additional excavation took place at these locations based on elevated levels over NYSDEC Soil Cleanup Criteria presented in the Technical and Administrative Guidance Memorandum 4046 (referred to as TAGM).

All TCRA windrow samples marked as backfilled in Table 1 of the ENSR 2002 Final Draft Removal Report were considered in-place. It should be noted that Sample WS-71-E1-009-3 was designated as

stockpile in Table 1 of the ENSR report; however, the 10/31/02 note presented in the report indicated that the referenced windrow was backfilled. Based on the fact that no excavated material was observed stockpiled at SEAD-71 and the 10/31/02 note, Sample WS-71-E1-009-3 was assumed backfilled. The windrow samples designated in-place were included in the mini risk assessment.

Fill material from an off-site borrow pit was sampled to determine if it met TAGM. Fill material samples presented in Table 1 of the ENSR 2002 Final Draft Removal Report were included in the mini risk assessment.

For the SEAD-59 stockpile data set, all windrow samples collected from stockpiles currently located at SEAD-59 were evaluated. Table 1C summarizes the stockpile samples included in the mini risk assessment for the SEAD-59 stockpile data set.

All the data used in the risk assessment have been validated in accordance with the EPA Region II Standard Operating Procedures.

2.1.2 COPC Screening

To streamline the mini risk assessment, a risk screening was conducted to reduce the number of chemicals to be evaluated in the quantitative risk assessment. This approach is consistent with the previous USEPA comments dated August 3, 2001 on the Draft Action Memorandum for Removal Actions at SEAD-59 and SEAD-71. Chemicals of potential concern were identified by screening the maximum detected concentrations (MDCs) for all compounds with detects against the Region III Risk-Based Concentrations that were normalized to a cancer risk of 10^{-6} and a noncancer hazard quotient of 0.1. The Region III Risk-Based Concentrations (RBCs) were used for the screening as they are updated quarterly and generally consistent with the USEPA Risk Assessment Guidance for Superfund. For nutrients such as calcium, magnesium, potassium, and sodium, the recommended dietary reference values (Wright, 2001) were used as the screening values. For lead, the USEPA soil hazard standard for children's play areas, 400 mg/kg (Federal Register, 2001), was used as the screening value. Tables 2A, 2B, and 2C present the screening process for the SEAD-59 in-place, SEAD-71 in-place, and SEAD-59 stockpile data sets, respectively. In general, chemicals with the MDCs greater than 0.1 times of the Region III RBCs, nutrients with the MDCs greater than the recommended dietary references, and lead with the MDC greater than 400 mg/kg were retained as COPCs. Chemicals with no screening values were retained as COPCs unless they were detected at a low frequency (i.e. <10%). As a result, SVOCs (mainly PAHs), Aroclor-1260, pesticides, and metals were identified as chemicals of potential concern for the mini risk assessment. It should be noted that background levels were not used in the COPC screening.

2.1.3 Exposure Point Concentration (EPC)

For the purpose of this mini risk assessment, the maximum detected concentrations for all the soil samples in the respective data sets were used as a conservative estimate of exposure point concentrations for surface soil and subsurface soil. No distinction was made between surface soil and subsurface soil (i.e., all soil was assumed to be accessible). Duplicate samples were treated as discrete samples in deriving the maximum detected concentrations. Tables 3A, 3B, 3C present the exposure point concentrations for the identified COPCs for the SEAD-59 in-place, SEAD-71 in-place, and SEAD-59 stockpile data sets, respectively.

2.2 Exposure Assessment

Currently, the sites are not in use. The Seneca Army Depot is fenced with limited access and patrolled by security personnel. Both SEAD-59 and SEAD-71 are located in the planned industrial development area. Based on the current and future land use at the sites, the following receptors were identified for the mini risk assessment: industrial worker, construction worker, and child at an on-site day care center. This last receptor was included as a conservative receptor and serves as a surrogate in place of a trespasser receptor.

All the receptors were assumed to be exposed to the COPCs via the following exposure pathways: inhalation of dust in ambient air, ingestion of soil, and dermal contact with soil. It should be noted that groundwater exposure was not evaluated in this mini risk assessment. Table 4 presents a summary of exposure assumptions used for this mini risk assessment.

Quantification of exposure (i.e., calculation of average daily dose) was performed following methods recommended in the USEPA Risk Assessment Guidance for Superfund (USEPA, 1989 and updates). The equations and parameters for calculating exposure via inhalation of dust in ambient air and ingestion of soil were presented in Final Decision Document – Mini Risk Assessment, SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B (Parsons, 2002d). The evaluation of exposure via dermal contact was consistent with the USEPA Supplemental Guidance for Dermal Risk Assessment (USEPA, 2001a).

2.3 Toxicity Assessment

Human health toxicity values such as reference doses (RfDs) and cancer slope factors were identified in accordance with the recent USEPA guidance. In a memorandum issued to Superfund Regions 1-10 National Policy Managers in December 2003, the USEPA Office of Solid Waste and Emergency

Response (OSWER) provided a revised recommended human health toxicity value hierarchy as follows:

- Tier 1 – EPA's IRIS
- Tier 2 – EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs)
- Tier 3 – Other Toxicity Values.

Table 5 presents the human health toxicity values identified for this mini risk assessment. The toxicity values were identified in accordance with the revised OSWER recommended hierarchy. The toxicity values identified for dermal exposure were consistent with the USEPA Supplemental Guidance for Dermal Risk Assessment (USEPA, 2001a).

2.4 Risk Characterization

2.4.1 Non-carcinogenic Effects

To evaluate non-cancer risks, the ratio of the average daily dose to the reference dose (RfD), or for inhalation exposure pathways, the ratio of the average daily exposure to the reference concentration (RfC), was calculated. This ratio, referred to as a "Hazard Quotient or HQ," indicates whether an exposure to certain COPC is likely to result in adverse health effects. If the calculated value of HQ is less than 1.0, no adverse health effects associated with that COPC are expected. The sum of hazard quotients for all COPCs was calculated as a screening Hazard Index (HI) for a specific exposure route. A cumulative HI for a receptor was calculated by summing the exposure route-specific HI, as a conservative (i.e., human health protective) step.

2.4.2 Carcinogenic Health Risks

Cancer risks are expressed as a unitless probability (*e.g.,* one in a million or 10^{-6}) of an individual developing cancer over a lifetime, above the background risk, as a result of the exposure. This risk is referred to as the lifetime incremental excess cancer risk. For each pathway, cancer risk was calculated by multiplying the lifetime average daily dose by the cancer slope factor or for inhalation exposure pathways, by multiplying the lifetime average daily exposure by the unit risk. The total risks for a given receptor were then calculated by summing risks for the different complete pathways for a given receptor.

2.4.3 Risk Associated with Exposure to Lead

It should be noted that risk associated with exposure to lead was not evaluated in this mini risk assessment. The maximum lead concentration of 3,470 mg/kg was detected in SS71-16 at SEAD-71. Lead concentrations in all the other SEAD-59 or SEAD-71 in-place samples were below 1,250 mg/kg.

For the SEAD-59 stockpile samples, the maximum lead concentration of 1,440 mg/kg was detected in WS-59-01-016-10. Lead concentrations in all the other stockpile samples were below 400 mg/kg.

3. Human Health Mini Risk Assessment Results for SEAD-59

Tables 6A, 7A, 8A, and 9A present the risk calculation for receptors exposed to COPCs at SEAD-59. Table 10A presents a summary of the potential risks for receptors at SEAD-59.

Table 10A indicates that total potential non-cancer risks (represented by the hazard index) are above the USEPA non-cancer risk limit of 1 for all receptors. The hazard indices are: 2 for industrial worker; 8 for construction worker; and 10 for child at an on-site day care center. Ingestion of soil, dermal contact with soil, and inhalation of dust in ambient air contribute 98.6%, 0.9%, and 0.5%, respectively, to the total HI for child at an on-site day care center. The EPCs of antimony, iron, and arsenic are the most significant contributors to the elevated non-cancer risks.

Table 10A indicates that total potential cancer risks are above or at the USEPA cancer risk range of $1x10^{-6}$ to $1x10^{-4}$ for industrial worker and child at an on-site day care center. The total excess lifetime cancer risk is 1×10^{-4} for industrial worker; 1×10^{-5} for construction worker; and 2×10^{-4} for child at an on-site day care center. Ingestion of soil, dermal contact with soil, and inhalation of dust in ambient air contribute 77%, 23%, and 0%, respectively, to the total cancer risk for child at an on-site day care center. Benzo(a)pyrene, arsenic, and dibenz(a,h)anthracene are the predominant contributors to the elevated cancer risks.

Figure 1 presents the risk-driving sample locations and risk-driving COPC concentrations at SEAD-59. These include the maximum hit of benzo(a)pyrene, arsenic, antimony, and iron. Benzo(a)pyrene was selected as a representative COPC for carcinogenic PAHs. The second and the third highest concentrations for benzo(a)pyrene and the second highest concentration for arsenic are also shown in Figure 1. In addition, sample locations with benzo(a)pyrene equivalent concentrations greater than 10 mg/kg are illustrated in Figure 1. Benzo(a)pyrene equivalent concentration results are discussed in Section 6.

4. Human Health Mini Risk Assessment Results for SEAD-71

Tables 6B, 7B, 8B, and 9B present the risk calculation for receptors exposed to COPCs at SEAD-71. Table 10B presents a summary of the potential risks for receptors at SEAD-71.

Table 10B indicates that total potential non-cancer risks (represented by the hazard index) are at or above the USEPA non-cancer risk limit of 1 for all receptors. The hazard indices are: 1 for industrial

worker; 5 for construction worker; and 6 for child at an on-site day care center. Ingestion of soil, dermal contact with soil, and inhalation of dust in ambient air contribute 93.5%, 5.2%, and 1.3%, respectively, to the total HI for a child at an on-site day care center. The metals such as iron, arsenic, antimony, manganese, thallium, and vanadium are the most significant contributors to the elevated non-cancer risks.

Table 10B indicates that total potential cancer risks are above the USEPA cancer risk range of $1x10^{-6}$ to $1x10^{-4}$ for industrial worker and child at an on-site day care center. The total excess lifetime cancer risk is 9×10^{-4} for industrial worker; 9×10^{-5} for construction worker; and 1×10^{-3} for child at an on-site day care center. Ingestion of soil, dermal contact with soil, and inhalation of dust in ambient air contribute 74%, 26%, and 0%, respectively, to the total cancer risk for child at an on-site day care center. Benzo(a)pyrene, arsenic, and dibenz(a,h)anthracene are the predominant contributors to the elevated cancer risks.

It should be noted that lead was not included in this mini risk assessment. A high hit of 3,470 mg/kg was detected in a surface soil sample (SS71-16) at SEAD-71. Further evaluation for lead is warranted.

Figure 2 presents the risk-driving sample locations and risk-driving COPC concentrations at SEAD-71. These include the maximum hit of arsenic, antimony, iron, manganese, thallium, and vanadium. Benzo(a)pyrene equivalent concentrations greater than 10 mg/kg are shown to represent the carcinogenic PAH results. Benzo(a)pyrene equivalent concentration results are discussed in Section 6.

5. Human Health Mini Risk Assessment Results for SEAD-59 Stockpile Samples

Tables 6C, 7C, 8C, and 9C present the risk calculation for receptors exposed to COPCs present in the SEAD-59 stockpile samples. Table 10C presents a summary of the potential risks for receptors at SEAD-59.

Table 10C indicates that total potential non-cancer risks (represented by the hazard index) are above the USEPA non-cancer risk limit of 1 for construction worker and child at an on-site day care center. The hazard indices are: 0.7 for industrial worker; 4 for construction worker; and 3 for child at an on-site day care center. Ingestion of soil, dermal contact with soil, and inhalation of dust in ambient air contribute 97.2%, 0.7%, and 2.1%, respectively, to the total HI for construction worker. The EPCs of antimony, iron, and vanadium are the most significant contributors to the elevated non-cancer risks.

Table 10C indicates that total potential cancer risks are above or at the USEPA cancer risk range of $1x10^{-6}$ to $1x10^{-4}$ for industrial worker and child at an on-site day care center. The total excess lifetime

cancer risk is 1×10^{-4} for industrial worker; 1×10^{-5} for construction worker; and 2×10^{-4} for child at an on-site day care center. Ingestion of soil, dermal contact with soil, and inhalation of dust in ambient air contribute 73%, 27%, and 0%, respectively, to the total cancer risk for child at an on-site day care center. Benzo(a)pyrene, arsenic, and dibenz(a,h)anthracene are the predominant contributors to the elevated cancer risks.

Table 11 presents a summary of the risk-driving COPC concentrations for the SEAD-59 stockpile samples. These include the maximum hit of lead, iron, and vanadium and the top three highest hits of antimony. Benzo(a)pyrene equivalent concentrations greater than 10 mg/kg are presented to represent the carcinogenic PAH results. Benzo(a)pyrene equivalent concentration results are discussed in Section 6.

6. Comparison to NYSDEC's Clean up Goal for Carcinogenic PAHs

In addition to conducting a mini risk assessment, the carcinogenic PAH (cPAH) concentrations for samples were compared to a level of 10 mg/kg, a cleanup goal for carcinogenic PAHs recommended by NYSDEC at a different site at SEDA. In performing the comparison, the benzo(a)pyrene (BAP) toxicity equivalent concentrations of cPAHs was calculated for each sample. There are seven PAHs that are considered as carcinogenic PAHs by NYSDEC and New York State Department of Health (NYSDOH): benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. As a screening tool, a benzo(a)pyrene toxicity equivalence can be used to screen PAHs in soil. This toxicity equivalence is based on the relative toxicity of the cPAHs, as cited by USEPA Integrated Risk Information System (IRIS) Database. The benzo(a)pyrene toxicity equivalent concentration is calculated by multiplying the concentration of the individual cPAHs in each sample by the following factors (based on IRIS):

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

A higher multiplier represents a greater carcinogenic health risk.

At SEAD-59, three samples exceeded the 10 mg/kg benchmark with values of 20.9 mg/kg, 11.5 mg/kg, and 10.2 mg/kg benzo(a)pyrene equivalent concentrations (see table below). All these samples were

stockpile windrow samples and the associated stockpiles were later backfilled at SEAD-59. The maximum toxicity equivalent value (20.9 mg/kg benzo(a)pyrene equivalent) was calculated for sample FD-59-WS-07, which is a duplicate of sample WS-59-01-015-13. The toxicity equivalence of the average concentrations of cPAHs for the duplicate pair is 11.9 mg/kg. It should be noted that there is a great degree of variance between the concentrations detected in the field sample and the concentrations detected in the field duplicate.

Sample Location	BaP conc (ppb)	BaP Equiv	Is it a duplicate?	BaP conc. of duplicate (ppb)	Equiv of duplicate pair (ppb)
FD-59-WS-07	14000 J	**20,860**	Y (WS-59-01-015-13)	2100 J	**11,943**
FD-59-WS-6	8400 J	**11,530**	Y (WS-59-01-012-1)	2100 J	**7,254**
WS-59-01-013-1	7000	**10,201**	N	NA	**NA**

At SEAD-71, the benzo(a)pyrene equivalent concentrations exceeded the benchmark of 10 mg/kg in ten samples. Two of the samples (CL-71-C-WS1 and CL-71-E2-WE1) were collected during the TCRA (with benzo(a)pyrene equivalent concentrations of 13.3 mg/kg and 13.2 mg/kg, respectively). The remaining eight samples (SS71-6, -11, -12, -13, -15, -16, -17, and TP71-1) are from historical samples collected during the RI or ESI, and these sample locations were not within the excavation limit of the TCRA. The maximum benzo(a)pyrene equivalent concentration at SEAD-71 was 178.1 mg/kg in sample SS71-11. The benzo(a)pyrene equivalent concentration was greater than 100 mg/kg in four samples that were collected during the RI effort (i.e., SS71-11, -13, -16, -17). Figure 2 shows the locations of the ten samples with BAP equivalent concentrations above 10 mg/kg.

For SEAD-59 stockpile samples, the benzo(a)pyrene equivalent concentrations exceeded the benchmark of 10 mg/kg in 15 samples. Table 11 presents a summary of carcinogenic PAH concentrations for these 15 samples. The maximum benzo(a)pyrene equivalent concentration for SEAD-59 stockpile samples was 22.4 mg/kg in WS-59-01-011-7.

7. Preliminary Analysis of Risk-Driving COPCs and Locations

7.1 SEAD-59

Based on the mini risk assessment results, benzo(a)pyrene and other carcinogenic PAHs, arsenic, antimony, and iron are the predominant risk contributors.

The maximum benzo(a)pyrene concentration (14 mg/kg) was detected at FD-59-WS-07 (a duplicate of backfilled windrow sample WS-59-01-015-13). The benzo(a)pyrene was detected at 2.1 mg/kg in WS-

59-01-015-13. The next highest benzo(a)pyrene concentration (8.4 mg/kg) was detected in FD-59-WS-6 (a duplicate of backfilled windrow sample WS-59-01-013-1).

The maximum arsenic concentration (32.2 mg/kg) was detected in a TCRA confirmatory sample CL-59-01-WN2. The next highest arsenic concentration (16.7 mg/kg) was detected in another TCRA confirmatory sample CL-59-01-WN3. The maximum Seneca background concentration for arsenic is 21.5 mg/kg and the average background concentration is 5.2 mg/kg.

An antimony hit of 424 mg/kg in a historical subsurface sample at location SB59-4 contributes to the elevated noncancer risk at the site. The maximum Seneca background concentration for antimony is 6.55 mg/kg.

The BAP equivalent concentrations for the following samples at SEAD-59 exceeded the NYSDEC cleanup goal of 10 mg/kg: FD-59-WS-07 (a duplicate of backfilled windrow sample WS-59-01-015-13), FD-59-WS-6 (a duplicate of backfill sample WS-59-01-012-1), and a backfill sample WS-59-01-013-1. The BAP equivalent concentrations were 20.9 mg/kg, 11.5 mg/kg, and 10.2 mg/kg, respectively.

7.2 SEAD-71

Based on the mini risk assessment results, benzo(a)pyrene and other PAHs are the predominant contributors to the cancer risks and iron, antimony, arsenic, manganese, thallium, vanadium and other metals are the predominant contributors to the noncancer risks. Although risks associated with lead exposure were not evaluated in this mini risk assessment, it should be noted that lead concentration was 3,470 mg/kg at SS71-16. Lead concentrations were below 1250 mg/kg at all the other locations.

The BAP equivalent concentrations for two TCRA confirmatory samples (CL-71-C-WS1 and CL-71-E2-WE1) exceeded the NYSDEC cleanup goal (13 mg/kg vs. 10 mg/kg). In addition, the BAP equivalent concentrations for eight historical samples (SS71-6, -11, -12, -13, -15, -16, -17, and TP71-1) at SEAD-71 exceeded the NYSDEC cleanup goal of 10 mg/kg. The BAP equivalent concentrations ranged from 24.3 mg/kg to 178 mg/kg for these referenced historical samples. Most of these referenced samples were within the fenced area at the east portion of the site. It should be noted that the reporting limits for some of these samples were elevated (e.g., reporting limits as high as 72 mg/kg were observed). The locations of the samples with BAP equivalent concentrations above 10 mg/kg are presented in Figure 2.

7.3 SEAD-59 Stockpile

Based on the mini risk assessment results, benzo(a)pyrene and other PAHs are the predominant contributors to the cancer risks and iron, antimony, vanadium, and other metals are the predominant contributors to the noncancer risks. Although risks associated with lead exposure were not evaluated in this mini risk assessment, it should be noted that lead concentration was 1,440 mg/kg at WS-59-01-016-10. Lead concentrations were below 400 mg/kg for all the other stockpile samples.

The BAP equivalent concentrations for 15 stockpile samples (Table 11) were above the NYSDEC cleanup goal of 10 mg/kg. The BAP equivalent concentrations ranged from 10.0 mg/kg to 22.4 mg/kg for these stockpile samples.

The maximum iron concentration (26,500 mg/kg) was detected in the stockpile sample WS-59-01-008-2. It should be noted that the average background iron concentration for Seneca is 24,700 mg/kg. Therefore, the iron concentrations observed in the stockpile samples might be consistent with Seneca background.

An antimony hit of 43.9 mg/kg for stockpile sample WS-59-01-015-14 contributes to the elevated noncancer risk at the site. The next two highest antimony concentrations of 15.6 mg/kg and 12 mg/kg were observed for WS-59-01-011-5 and WS-59-01-015-16. The maximum Seneca background concentration for antimony is 6.55 mg/kg.

A vanadium hit of 35.4 mg/kg for stockpile sample WS-59-01-007-10 contributes to the elevated noncancer risk at the site. It should be noted that the maximum Seneca background concentration for vanadium is 32.7 mg/kg.

Table 11 presents a summary of the risk-driving COPC concentrations for the SEAD-59 stockpile samples.

8. Conclusions

The following conclusions can be made based on the results of the data analysis and mini-risk assessment performed.

(1) There are potentially elevated risks (i.e. compared with the USEPA target risk limits and NYSDEC BAP toxicity equivalent limit of 10 mg/kg) at SEAD-59 and SEAD-71 due primarily to the presence of benzo(a)pyrene and other carcinogenic PAHs, and metals.

(2) There are potentially elevated risks due primarily to benzo(a)pyrene and other PAHs, and metals (i.e. compared with the USEPA target risk limits and NYSDEC BAP equivalent limit of 10 mg/kg) associated with samples located in four of the five stockpiles staging areas located at SEAD-59.

(3) It is difficult to determine the location of some samples driving the risk assessment, especially the vertical location and stockpile sample locations.

(4) Completing a baseline risk assessment could show that risk is within acceptable levels at SEAD-59 and determine what portions of the stockpiles may be backfilled.

(5) PAH concentrations within the fenced area at SEAD-71 are elevated; BAP toxicity equivalent concentrations exceed 100 mg/kg in several samples. This area was not included in the TCRA at SEAD-71. Railroad tracks exist to the north, south and within this area. Levels of PAHs in this area most likely will cause unacceptable risk at this site, even if a baseline risk assessment is performed.

9. Recommendations

The Army's objective at these sites is to issue an Institutional Control Record of Decision (ROD) as soon as possible. The best chances of gaining regulatory approval for this action is to demonstrate that (1) there is no unacceptable risk at either site to future receptors; (2) the average BAP Toxicity Equivalent concentration at both sites is below 10 mg/kg, and 3) the stockpiles remaining at SEAD-59 do not contribute to risk at the site. The following summarizes Parsons recommendations to support the Army in this objective.

(1) Conduct baseline risk assessment at SEAD-59 to show that risks to future users of this site are within acceptable ranges. Although the mini-risk assessment results indicated that risks were unacceptable, many conservative assumptions were made. Review of the data indicates that in using more realistic assumptions in a baseline risk assessment, a substantial portion of the risks may be eliminated.

(2) Separate the portion of SEAD-71 that is fenced in from the area where the TCRA was conducted. Conduct a baseline risk assessment for the area where the TCRA was conducted to show that risks to future users of this site are within acceptable ranges. Although the mini risk assessment results indicated that risks were unacceptable, many conservative assumptions were made. In addition, most of the elevated PAH levels were from samples located within the fenced area at the eastern area of the site. By treating this area separately, site risks within the area excavated during the TCRA will be reduced considerably.

(3) Discuss alternatives for complying with the BAP Toxicity Equivalent with NYSDEC at these sites. Several confirmatory samples within the area that were excavated during the TCRA have a BAP Toxicity Equivalent greater than 10 mg/kg, the clean up goal recommended by NYSDEC for SEAD-11. In order to bring site concentrations below this level, a site average, rather than a point-by-point comparison may need to be used. Table 12 shows the average BAP Toxicity Equivalent for each site and stockpile. Alternatively, if NYSDEC would accept a higher clean up goal at this industrial site or allow the establishment of a background dataset for cPAHs, the BaP Toxicity Equivalent may be acceptable within the excavated area of the site.

(4) Discuss establishment of a PAH background concentration within the fenced area at SEAD-71 to use in comparison to levels of PAHs within the fenced area at the eastern end. Several locations within this area have BaP Toxicity Equivalent values over 100 mg/kg. Alternatively, hot spot removal of surficial PAHs within the fenced area could be considered if a reasonable clean up goal and excavation limits were agreed upon with NYSDEC and EPA.

(5) If specific windrow and lots within stockpiles can be identified at the site, identify those stockpiles from which risk driving constituents were identified. Separate and conduct additional sampling for disposal purposes. Conduct an alternate baseline risk assessment at SEAD-59 by adding samples from the remaining backfill dataset. If risk is acceptable, backfill remainder of stockpiles on site. If risk is unacceptable, review disposal options.

(6) Conduct a baseline risk assessment at SEAD-59 by adding the stockpile data to the SEAD-59 dataset.

Baseline Risk Assessment Components

Parsons recommends conducting a baseline risk assessment to support an IC ROD at SEAD-59/71. The baseline risk assessment will incorporate the following components to 1) represent more realistic conditions at the site; and 2) comply with USEPA risk assessment protocols. The baseline risk assessment will supplement the mini risk assessment in the following aspects:

1) site-specific assumptions will be used to evaluate potential risks;
2) the 95% upper confidence limit of the mean (rather than the maximum value) will be used as the exposure point concentration
3) separate exposure point concentrations will be determined for surface soils and subsurface soils, when possible. The lack of elevation information from the TCRA data limits Parsons ability to do this and could result in an overestimation of risk in surface soils if all soils must be considered.
4) exposure via groundwater contact will be included;
5) a residential scenario will be included for comparison purposes;
6) an ecological risk assessment will be included;

7) background concentrations of metals will be considered in the risk management stage for setting up cleanup goal or proposing further action for the sites; and
8) exposure to lead in soil will be included.

At this time, Parsons would like to request that Optional Task 2 (Baseline Risk Assessment) under contract DACA87-02-D-0005, Delivery Order 13 be made available for the purpose of conducting the baseline risk assessment and executing the recommendations made in this letter.

Should you have any questions, please do not hesitate to call me at (617) 457-7905 to discuss them.

Sincerely,

for Todd Heino

Todd Heino, P.E.
Program Manager

Enclosure

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Table 1A
In-Place Samples - SEAD-59
Seneca Army Depot Activity

TCRA Confirmatory Sample [1]		TCRA Backfilled Windrow Sample [2]		Historical Sample [3]	Fill Material [1]
CL-59-01-F01	CL-59-03-WN3	WS-59-01-004-7	WS-59-03-002-2	MW59-4 (59055)	FM-01
FD-71-CL-04	CL-59-03-WS1	WS-59-01-006-11	WS-59-03-002-3	SB59-1 (SB59-1-01)	FM-02
CL-59-01-F02	CL-59-03-WS2	WS-59-01-006-2	WS-59-03-002-4	SB59-1 (SB59-1-08)	
CL-59-01-F03	CL-59-03-WS3	WS-59-01-006-4	WS-59-04-010-1	SB59-1 (SB59-1-04)	
CL-59-01-F04	CL-59-03-WW1	WS-59-01-006-5	WS-59-04-010-10	SB59-1 (SB59-1-06)	
CL-59-01-F05	CL-59-04-F01	WS-59-01-006-6	WS-59-04-010-11	SB59-11 (59132)	
CL-59-01-F06	CL-59-04-F04	WS-59-01-006-8	WS-59-04-010-3	SB59-13 (59060)	
CL-59-01-F07	CL-59-04-WE1	WS-59-01-007-3	WS-59-04-010-4	SB59-15 (59061)	
CL-59-01-F08	CL-59-04-WN1	WS-59-01-007-4	WS-59-04-010-5	SB59-17 (59131)	
CL-59-01-F09	CL-59-04-WN2	WS-59-01-007-7	WS-59-04-010-6	SB59-17 (59068)	
CL-59-01-F10	CL-59-04-WS1	WS-59-01-007-9	WS-59-04-010-7	SB59-18 (59127)	
FD-59-CL-06	CL-59-04-WS2	WS-59-01-011-3	WS-59-04-010-9	SB59-2 (SB59-2-02)	
CL-59-01-F11	CL-59-04-WW1	WS-59-01-011-4	WS-59-OtherC-001-1	SB59-2 (SB59-2-04)	
CL-59-01-F12	CL-59-OTHERA-F01	WS-59-01-012-1		SB59-20 (59107)	
CL-59-01-F13	CL-59-OTHERA-WE1	FD-59-WS-6		SB59-20 (59066)	
CL-59-01-F14	CL-59-OTHERA-WN1	WS-59-01-013-1		SB59-21 (59067)	
CL-59-01-F15	CL-59-OTHERA-WS1	WS-59-01-013-3		SB59-3 (SB59-3-04)	
CL-59-01-F16	WW1	WS-59-01-013-4		SB59-4 (SB59-4-05)	
CL-59-01-F17	CL-59-OTHERB-F01	WS-59-01-013-5		SB59-4 (SB59-4-10)	
CL-59-01-F18	CL-59-OTHERB-WE1	WS-59-01-013-6		SB59-5 (SB59-5-03)	
CL-59-01-F19	CL-59-OTHERB-WN1	WS-59-01-013-7		SB59-5 (SB59-5-06)	
CL-59-01-F20	CL-59-OTHERB-WS1	WS-59-01-014-1		SB59-8 (59057)	
CL-59-01-F21	CL-59-OTHERB-WW1	WS-59-01-014-2		SB59-9 (59059)	
CL-59-01-F22	CL-59-OTHERC-F01	WS-59-01-014-3		SB59-9 (59089)	
CL-59-01-F23	CL-59-OTHERC-WE2	WS-59-01-014-4		SB59-9 (59085)	
FD-59-CL-7	CL-59-OTHERC-WN1	WS-59-01-015-1		TP59-11A-2 (59026)	
CL-59-01-F24	FD-59-CL-01	WS-59-01-015-10		TP59-13A-1 (59010)	
CL-59-01-F25	CL-59-OTHERC-WS1	WS-59-01-015-11		TP59-13C-1 (59015)	
CL-59-01-F26	CL-59-OTHERC-WW1	WS-59-01-015-13		TP59-15-5 (59035)	
CL-59-01-WE1		FD-59-WS-07		TP59-16-1 (59036)	
CL-59-01-WE2		WS-59-01-015-18		TP59-17-3 (59044)	
CL-59-01-WE3		WS-59-01-015-19		TP59-2 (TP59-2)	
CL-59-01-WE4		WS-59-01-015-2		TP59-5 (TP59-5)	
CL-59-01-WE5		WS-59-01-015-5		TP59-6-2 (59002)	
CL-59-01-WN1		WS-59-01-015-6		TP59-8-2 (59050)	
CL-59-01-WN2		WS-59-01-015-7		TP59-9-2 (59052)	
CL-59-01-WN3		WS-59-01-015-9			
CL-59-01-WN4		WS-59-01-016-11			
CL-59-01-WN5		WS-59-01-016-12			
CL-59-01-WN6		WS-59-01-016-15			
CL-59-01-WS1		FD-59-WS-8			
FD-59-CL-05		WS-59-01-016-16			
CL-59-01-WS2		WS-59-01-016-17			
CL-59-01-WS3		WS-59-01-016-7			
CL-59-01-WS4		WS-59-01-016-8			

Table 1A
In-Place Samples - SEAD-59
Seneca Army Depot Activity

TCRA Confirmatory Sample [1]		TCRA Backfilled Windrow Sample [2]		Historical Sample [3]	Fill Material [1]
CL-59-01-WS5		WS-59-01-017-1			
CL-59-01-WS6		WS-59-01-017-2			
CL-59-01-WW1		WS-59-01-018-1			
CL-59-01-WW2		WS-59-01-018-2			
CL-59-01-WW3		WS-59-01-018-3			
CL-59-01-WW4		WS-59-01-018-4			
FD-59-CL-3		WS-59-01-018-5			
CL-59-02-F01		WS-59-01-018-6			
CL-59-02-F02		WS-59-01-018-7			
FD-59-CL-02		WS-59-01-018-8			
CL-59-02-WE1		WS-59-02-002-1			
CL-59-02-WE2		WS-59-02-002-2			
CL-59-02-WN1		WS-59-02-002-3			
CL-59-02-WN2		WS-59-02-003-1			
CL-59-02-WS1		WS-59-02-003-2			
CL-59-02-WS2		WS-59-02-003-3			
CL-59-02-WW1		WS-59-02-003-4			
CL-59-02-WW2		WS-59-02-003-5			
CL-59-03-F01		WS-59-02-004-1			
CL-59-03-F02		WS-59-03-001-1			
CL-59-03-F03		WS-59-03-001-2			
CL-59-03-WE1		WS-59-03-001-3			
CL-59-03-WN1		FD-59-WS-01			
CL-59-03-WN2		WS-59-03-002-1			

Notes:

1. List of samples was derived based on Table 1 of the Final Draft Removal Report (ENSR, 2002). Field duplicates were not presented in Table 1 of the ENSR report but are included here based on the review of the sample chain of custody reports. CL-59-OTHERC-WE1 is presented in Table 1 of the ENSR report but is not included in this table based on the review of notations made in the ENSR report.

2. List of samples comprises all TCRA windrow samples marked as backfilled in Table 1 of the ENSR report. Field duplicates were not presented in Table 1 of the ENSR report but are included here based on the review of the sample chain of custody reports.

3. List of samples was derived based on the evaluation of all soil data collected during the Expanded Site Inspection and Phase I Remedial Investigation. Samples with associated soil considered in-place were included in this table. Sample location is listed with sample ID presented in the parenthesis.

Table 1B
In-Place Samples - SEAD-71
Seneca Army Depot Activity

TCRA Confirmatory Sample [1]		TCRA Backfilled Windrow Sample [2]	Historical Sample [3]		Fill Material [1]
CL-71-A-F01	CL-71-D-WE1	WS-71-A-009-9	SS71-1 (71013)	SS71-6 (71028)	FM-01
CL-71-A-WE1	CL-71-D-WN1	WS-71-B-009-6	SS71-10 (71017)	SS71-8 (71019)	FM-02
CL-71-A-WN1	CL-71-D-WS1	WS-71-B-009-8	SS71-11 (71024)	SS71-9 (71018)	
CL-71-A-WS1	CL-71-D-WW3	WS-71-D-009-2	SS71-12 (71023)	TP71-1 (TP71-1-1)	
CL-71-A-WW1	CL-71-E1-F01	WS-71-D-009-13	SS71-13 (71027)	TP71-1 (TP71-1-2)	
CL-71-B-F01	CL-71-E1-WE1	WS-71-E1-009-3	SS71-14 (71025)	TP71-1 (TP71-1-3)	
CL-71-B-WE2	CL-71-E1-WN1	WS-71-E3-009-10	SS71-15 (71032)	TP71-1 (TP71-1-4)	
CL-71-B-WN1	CL-71-E1-WS1		SS71-16 (71021)	TP71-2 (TP71-2-1)	
CL-71-B-WS1	CL-71-E1-WW1		SS71-17 (71030)	TP71-2 (TP71-2-2)	
CL-71-B-WW1	CL-71-E2-F01		SS71-18 (71022)	TP71-2 (TP71-2-3)	
CL-71-B-WW2	CL-71-E2-WE1		SS71-19 (71020)	TP71-2 (TP71-2-4)	
CL-71-C-F01	CL-71-E2-WN1		SS71-2 (71014)	TP71-3-1 (71002)	
CL-71-C-F02	CL-71-E2-WS1		SS71-20 (71031)	TP71-3-2 (71003)	
CL-71-C-WE1	CL-71-E2-WW1		SS71-3 (71015)	TP71-4-2 (71006)	
CL-71-C-WE2	CL-71-E3-F01		SS71-4 (71016)	TP71-5-1 (71007)	
CL-71-C-WN1	CL-71-E3-WE1		SS71-5 (71029)	TP71-6-1 (71010)	
CL-71-C-WS1	CL-71-E3-WN1				
CL-71-C-WW2	CL-71-E3-WS1				
CL-71-D-F01	CL-71-E3-WW1				

Notes:

1. List of samples was derived based on Table 1 of the Final Draft Removal Report (ENSR, 2002). Field duplicates were not presented in Table 1 of the ENSR report but are included here based on the review of the sample chain of custody reports. The following four confirmatory samples presented in Table 1 of the ENSR report are not included in this table based on the review of notations made in the ENSR report: CL-71-B-WE1, CL-71-C-WW1, CL-71-D-WW1, and CL-71-D-WW2.

2. List of samples comprises all TCRA windrow samples marked as backfilled in Table 1 of the ENSR report. Field duplicates were not presented in Table 1 of the ENSR report but are included here based on the review of the sample chain of custody reports. Sample WS-71-E1-009-3 was designated as stockpile in Table 1 of the ENSR report; however, the 10/31/02 note presented in the report indicated the referenced windrow was backfilled. Based on this note and the fact that no excavated material was observed stockpiled at SEAD-71, soil associated with WS-71-E1-009-3 was assumed backfilled.

3. List of samples was derived based on the evaluation of all soil data collected during the Expanded Site Inspection and Phase I Remedial Investigation. Samples with associated soil considered in-place were included in this table. Sample location is listed with sample ID presented in the parenthesis.

Table 1C
Stockpile Samples - SEAD-59
Seneca Army Depot Activity

No.	TCRA Stockpile Sample
1	WS-59-01-005-4
2	WS-59-01-005-5
3	WS-59-01-006-1
4	WS-59-01-006-12
5	FD-59-WS-03
6	WS-59-01-006-3
7	WS-59-01-006-7
8	WS-59-01-006-9
9	WS-59-01-007-1
10	WS-59-01-007-10
11	WS-59-01-007-11
12	WS-59-01-007-12
13	WS-59-01-007-13
14	WS-59-01-007-14
15	WS-59-01-007-2
16	WS-59-01-007-5
17	WS-59-01-007-6
18	WS-59-01-007-8
19	WS-59-01-008-1
20	WS-59-01-008-2
21	WS-59-01-008-3
22	WS-59-01-011-1
23	WS-59-01-011-2
24	WS-59-01-011-5
25	WS-59-01-011-6
26	WS-59-01-011-7
27	WS-59-01-011-8
28	WS-59-01-011-9
29	WS-59-01-012-2
30	WS-59-01-012-3
31	WS-59-01-013-2
32	WS-59-01-014-5
33	WS-59-01-015-14
34	WS-59-01-015-15
35	WS-59-01-015-16
36	WS-59-01-015-17
37	WS-59-01-015-20
38	WS-59-01-015-3
39	WS-59-01-015-4
40	WS-59-01-015-8
41	WS-59-01-016-1
42	WS-59-01-016-10
43	WS-59-01-016-13
44	WS-59-01-016-14
45	WS-59-01-016-18
46	WS-59-01-016-19
47	WS-59-01-016-2
48	WS-59-01-016-20
49	WS-59-01-016-3
50	WS-59-01-016-4
51	WS-59-01-016-5
52	WS-59-01-016-6
53	WS-59-01-016-9
54	WS-59-04-010-8

Note:
All samples marked as stockpile in Table 1 of the ENSR report are included in the list. Field duplicates were not presented in Table 1 of the ENSR report but are included here based on the review of the sample chain of custody reports.

Table 2A
COPC Identification - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max > RBC?	Is Max > 0.1RBC?	Retained as COPC?	Rationale
VOC								
1,1-Dichloroethene	3	214	0.008	390	NO	NO	NO	Max<Screening
Acetone	52	214	0.55	7000	NO	NO	NO	Max<Screening
Benzene	8	214	0.006	12	NO	NO	NO	Max<Screening
Carbon disulfide	6	214	0.004	780	NO	NO	NO	Max<Screening
Cyclohexane	8	106	0.003				NO	No Region III RBC available, no toxicity information, low detection frequency
Ethyl benzene	4	214	0.11	780	NO	NO	NO	Max<Screening
Meta/Para Xylene	3	77	0.013	1600	NO	NO	NO	Max<Screening
Methyl Acetate	3	106	0.002	7800	NO	NO	NO	Max<Screening
Methyl chloride	1	137	0.003				NO	No Region III RBC available, no toxicity information, low detection frequency
Methyl cyclohexane	10	106	0.005				NO	No Region III RBC available, no toxicity information, low detection frequency
Methyl ethyl ketone	27	214	0.19	4700	NO	NO	NO	Max<Screening
Methyl isobutyl ketone	1	214	0.0019				NO	No Region III RBC available, no toxicity information, low detection frequency
Methylene chloride	38	214	0.0049	85	NO	NO	NO	Max<Screening
Naphthalene			4	160	NO	NO	NO	Max<Screening
Ortho Xylene	3	77	0.0043	1600	NO	NO	NO	Max<Screening
Tetrachloroethene	5	214	0.0064	1.2	NO	NO	NO	Max<Screening
Toluene	17	214	0.016	1600	NO	NO	NO	Max<Screening
Trichloroethene	8	214	0.0045	1.6	NO	NO	NO	Max<Screening
Trichlorofluoromethane	1	106	0.006	2300	NO	NO	NO	Max<Screening
SVOC								
1,1'-Biphenyl	2	106	0.079	3.90E+02	NO	NO	NO	Max<Screening
2-Methylnaphthalene	49	215	10	31	NO	YES	YES	Max >0.1Screening
4-Chloroaniline	2	215	1.2	31	NO	NO	NO	Max<Screening
4-Methylphenol	7	215	0.15	39	NO	NO	NO	Max<Screening
Acenaphthene	58	215	5.1	470	NO	NO	NO	Max<Screening
Acenaphthylene	80	215	1.7				YES	No Region III RBC available
Anthracene	93	215	8.2	2300	NO	NO	NO	Max<Screening
Atrazine	1	106	0.12	2.9	NO	NO	NO	Max<Screening
Benzaldehyde	1	106	0.05	780	NO	NO	NO	Max<Screening
Benzo(a)anthracene	112	215	16	0.87	YES	YES	YES	Max>Screening
Benzo(a)pyrene	113	215	14	0.087	YES	YES	YES	Max>Screening
Benzo(b)fluoranthene	116	215	12	0.87	YES	YES	YES	Max>Screening
Benzo(ghi)perylene	102	215	9				YES	No Region III RBC available
Benzo(k)fluoranthene	109	215	13	8.7	YES	YES	YES	Max>Screening
Bis(2-Ethylhexyl)phthalate	51	215	0.26	4.6	NO	NO	NO	Max<Screening
Butylbenzylphthalate	2	215	1	1600	NO	NO	NO	Max<Screening
Carbazole	34	138	1.5	32	NO	NO	NO	Max<Screening
Chrysene	114	215	16	87	NO	YES	YES	Max >0.1Screening
Dibenz(a,h)anthracene	80	215	2.9	0.087	YES	YES	YES	Max>Screening
Dibenzofuran	41	215	2.8	16	NO	YES	YES	Max >0.1Screening
Diethylphthalate	10	215	0.012	6300	NO	NO	NO	Max<Screening
Di-n-butylphthalate	14	214	0.12	780	NO	NO	NO	Max<Screening
Di-n-octylphthalate	2	215	0.011	310	NO	NO	NO	Max<Screening

Table 2A
COPC Identification - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max > RBC?	Is Max > 0.1RBC?	Retained as COPC?	Rationale
Fluoranthene	120	215	44	310	NO	YES	YES	Max >0.1Screening
Fluorene	64	215	5	310	NO	NO	NO	Max<Screening
Indeno(1,2,3-cd)pyrene	104	215	8.7	0.87	YES	YES	YES	Max>Screening
Naphthalene	47	215	1.7	160	NO	NO	NO	Max<Screening
N-Nitrosodiphenylamine	1	138	0.1	1.30E+02	NO	NO	NO	Max<Screening
Phenanthrene	115	215	41				YES	No Region III RBC
Phenol	1	215	0.017	2300	NO	NO	NO	Max<Screening
Pyrene	122	214	35	230	NO	YES	YES	Max >0.1Screening
PCB								
Aroclor-1260	2	214	0.079	0.32	NO	YES	YES	Max >0.1Screening
Pesticides								
4,4'-DDD	56	214	0.74	2.7	NO	YES	YES	Max >0.1Screening
4,4'-DDE	77	214	2.6	1.9	YES	YES	YES	Max>Screening
4,4'-DDT	68	214	3.7	1.9	YES	YES	YES	Max>Screening
Aldrin	1	214	0.0012	3.80E-02	NO	NO	NO	Max<Screening
Alpha-Chlordane	2	214	0.034	1.8	NO	NO	NO	Max<Screening
Alpha-BHC	9	214	0.0099	1.00E-01	NO	NO	NO	Max<Screening
Beta-BHC	6	214	0.0036	3.50E-01	NO	NO	NO	Max<Screening
Delta-BHC	4	214	0.0014				NO	No Region III RBC available, no toxicity information, low detection frequency
Dieldrin	1	214	0.0018	4.00E-02	NO	NO	NO	Max<Screening
Endosulfan I	2	214	0.016	47	NO	NO	NO	Max<Screening
Endosulfan II	1	214	0.0071	47	NO	NO	NO	Max<Screening
Endosulfan sulfate	2	214	0.0062	47	NO	NO	NO	Max<Screening
Endrin	4	214	0.016	2.3	NO	NO	NO	Max<Screening
Endrin aldehyde	5	214	0.0063	2.3	NO	NO	NO	Max<Screening
Endrin ketone	5	214	0.038	2.3	NO	NO	NO	Max<Screening
Gamma-Chlordane	16	214	0.024	1.8	NO	NO	NO	Max<Screening
Heptachlor epoxide	5	214	0.0057	7.00E-02	NO	NO	NO	Max<Screening
Metals								
Aluminum	214	214	18300	7800	YES	YES	YES	Max>Screening
Antimony	114	214	424	3.1	YES	YES	YES	Max>Screening
Arsenic	214	214	32.2	0.43	YES	YES	YES	Max>Screening
Barium	214	214	304	550	NO	YES	YES	Max >0.1Screening
Beryllium	210	214	2.6	16	NO	YES	YES	Max >0.1Screening
Cadmium	168	214	3.2	7.8	NO	YES	YES	Max >0.1Screening
Calcium	214	214	214000	1333600	NO	YES	NO	Assumes 166.7 mg/kg-day DRI, Max<Screening
Chromium	214	214	39.3	23	YES	YES	YES	Max>Screening
Cobalt	214	214	47.8	160	NO	YES	YES	Max >0.1Screening
Copper	214	214	305	310	NO	YES	YES	Max >0.1Screening
Iron	214	214	64000	2300	YES	YES	YES	Max>Screening
Lead	214	214	164	400	NO	YES	NO	<400 mg/kg EPA residential screening
Magnesium	214	214	34400	69360	NO	YES	NO	Assumes 8.67 mg/kg-day as DRI, Max<screening
Manganese	214	214	1290	160	YES	YES	YES	Max>Screening
Mercury	191	214	0.95	2.3	NO	YES	YES	Max >0.1Screening
Nickel	214	214	88.3	160	NO	YES	YES	Max >0.1Screening
Potassium	214	214	2520	848000	NO	NO	NO	assumes 106 mg/kg-day as DRI, Max<Screening
Selenium	21	214	1.5	39	NO	NO	NO	Max<Screening

Table 2A
COPC Identification - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max > RBC?	Is Max > 0.1RBC?	Retained as COPC?	Rationale
Silver	94	214	2.9	39	NO	NO	NO	Max<Screening
Sodium	209	214	4060	5360	NO	YES	NO	assumes 0.67mg/kg/d as DRI, Max<screening
Thallium	53	214	1.8	0.55	YES	YES	YES	Max>Screening
Vanadium	214	214	28.5	7.8	YES	YES	YES	Max>Screening
Zinc	214	214	341	2300	NO	YES	YES	Max >0.1Screening
Nitrate/Nitrite Nitrogen	20	20	8.34	780	NO	NO	NO	Max<Screening
Total Petroleum Hydrocarbons	9	20	5.09E+03				NO	Individual compounds were evaluated

Notes:

1. EPA Region III Risk-Based Concentrations normalized to cancer risk of 1 in 10^6 and non-cancer hazard quotient of 0.1.
2. For nutrients such as calcium, sodium, potassium, and sodium, the recommended dietary reference intake (Wright, 2001) values were used as the screening values, DRI = Dietary Reference Intake

COPCs identified for the mini risk assessment

Table 2B
COPC Identification - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max>RBC?	Is Max>0.1 RBC?	Retained as COPC?	Rationale
VOC								
1,1,1-Trichloroethane	7	77	0.023	2.20E+03	NO	NO	NO	Max<Screening
Acetone	9	77	0.074	7000	NO	NO	NO	Max<Screening
Benzene	2	77	0.002	12	NO	NO	NO	Max<Screening
Carbon disulfide	3	77	0.005	780	NO	NO	NO	Max<Screening
Cyclohexane	2	24	0.004				NO	No Region III RBC available, no toxicity information, low detection frequency
Ethyl benzene	2	77	0.004	780	NO	NO	NO	Max<Screening
Methyl cyclohexane	3	24	0.006				NO	No Region III RBC available, no toxicity information, low detection frequency
Methylene chloride	12	77	0.011	85	NO	NO	NO	Max<Screening
Styrene	1	56	0.001	1600	NO	NO	NO	Max<Screening
Tetrachloroethene	4	77	0.033	1.2	NO	NO	NO	Max<Screening
Toluene	11	77	0.016	1600	NO	NO	NO	Max<Screening
Total BTEX	4	4	0.0116				NO	Individual compounds were evaluated
Total Xylenes	6	56	0.096	1600	NO	NO	NO	Max<Screening
Trichlorofluoromethane	1	24	0.001	2300	NO	NO	NO	Max<Screening
2,4-Dinitrotoluene	1	78	0.88	16	NO	NO	NO	Max<Screening
SVOC								
2-Methylnaphthalene	17	78	31	31	NO	YES	YES	Max>0.1Screening
4-Nitroaniline	1	56	0.075	32	NO	NO	NO	Max<Screening
Acenaphthene	35	78	42	470	NO	NO	NO	Max<Screening
Acenaphthylene	20	78	1.8				YES	No Region III RBC available
Anthracene	47	78	100	2300	NO	NO	NO	Max<Screening
Benzo(a)anthracene	61	78	150	0.87	YES	YES	YES	Max>Screening
Benzo(a)pyrene	61	78	120	0.087	YES	YES	YES	Max>Screening
Benzo(b)fluoranthene	62	78	88	0.87	YES	YES	YES	Max>Screening
Benzo(ghi)perylene	55	78	62	0	YES	YES	YES	Max>Screening
Benzo(k)fluoranthene	50	78	130	8.7	YES	YES	YES	Max>Screening
Bis(2-Ethylhexyl)phthalate	9	78	0.14	4.6	NO	NO	NO	Max<Screening
Carbazole	33	56	77	32	YES	YES	YES	Max>Screening
Chrysene	64	78	150	87	YES	YES	YES	Max>Screening
Dibenz(a,h)anthracene	45	78	25	0.087	YES	YES	YES	Max>Screening
Dibenzofuran	29	78	38	16	YES	YES	YES	Max>Screening
Di-n-butylphthalate	4	78	0.14	780	NO	NO	NO	Max<Screening
Fluoranthene	66	78	440	310	YES	YES	YES	Max>Screening
Fluorene	32	78	62	310	NO	YES	YES	Max>0.1Screening
Indeno(1,2,3-cd)pyrene	55	78	63	0.87	YES	YES	YES	Max>Screening
Naphthalene	18	78	46	160	NO	YES	YES	Max>0.1Screening
Phenanthrene	61	78	290				YES	No Region III RBC available
Phenol	1	78	0.0045	2300	NO	NO	NO	Max<Screening
Pyrene	64	78	280	230	YES	YES	YES	Max>Screening
PCBs								
Aroclor-1260	3	78	0.2	0.32	NO	YES	YES	Max>0.1Screening
Pesticides								
4,4'-DDD	18	78	0.24	2.7	NO	NO	NO	Max<Screening
4,4'-DDE	31	78	0.81	1.9	NO	YES	YES	Max>0.1Screening
4,4'-DDT	38	78	1.3	1.9	NO	YES	YES	Max>0.1Screening
Alpha-BHC	7	78	0.018	0.1	NO	YES	YES	Max>0.1Screening
Alpha-Chlordane	2	78	0.074	1.8	NO	NO	NO	Max<Screening

Table 2B
COPC Identification - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max>RBC?	Is Max>0.1 RBC?	Retained as COPC?	Rationale
Beta-BHC	8	78	0.035	0.35	NO	NO	NO	Max<Screening
Delta-BHC	1	78	0.0018				NO	No Region III RBC available, no toxicity information, low detection frequency
Dieldrin	3	78	0.0035	0.04	NO	NO	NO	Max<Screening
Endosulfan I	11	78	0.2	47	NO	NO	NO	Max<Screening
Endosulfan II	5	78	0.052	47	NO	NO	NO	Max<Screening
Endosulfan sulfate	11	78	0.11	47	NO	NO	NO	Max<Screening
Endrin	12	78	0.12	2.3	NO	NO	NO	Max<Screening
Endrin aldehyde	18	78	0.12	2.3	NO	NO	NO	Max<Screening
Endrin ketone	16	78	0.18	2.3	NO	NO	NO	Max<Screening
Gamma-BHC/Lindane	1	78	0.004				NO	No Region III RBC available, no toxicity information, low detection frequency
Gamma-Chlordane	5	78	0.048	1.8	NO	NO	NO	Max<Screening
Heptachlor	1	78	0.0012	1.40E-01	NO	NO	NO	Max<Screening
Heptachlor epoxide	13	78	0.18	0.07	YES	YES	YES	Max>Screening
Methoxychlor	12	78	0.52	39	NO	NO	NO	Max<Screening
Inorganics								
Aluminum	78	78	18000	7800	YES	YES	YES	Max>Screening
Antimony	37	78	19.3	3.1	YES	YES	YES	Max>Screening
Arsenic	78	78	14.6	0.43	YES	YES	YES	Max>Screening
Barium	78	78	179	550	NO	YES	YES	Max>0.1Screening
Beryllium	77	78	0.88	16	NO	NO	NO	Max<Screening
Cadmium	51	78	12.1	7.8	YES	YES	YES	Max>Screening
Calcium	78	78	295000	1333600	NO	YES	NO	Assumes 166.7 mg/kg-day DRI, Max<Screening
Chromium	78	78	60.3	23	YES	YES	YES	Max>Screening
Cobalt	78	78	14.6	160	NO	NO	NO	Max<Screening
Copper	78	78	134	310	NO	YES	YES	Max>0.1Screening
Iron	78	78	65100	2300	YES	YES	YES	Max>Screening
Lead	78	78	3470	400	YES	YES	YES	Max>Screening
Magnesium	78	78	59300	69360	NO	YES	YES	Max>0.1Screening
Manganese	78	78	1330	160	YES	YES	YES	Max>Screening
Mercury	60	78	2.7	2.3	YES	YES	YES	Max>Screening
Nickel	78	78	110	160	NO	YES	YES	Max>0.1Screening
Potassium	78	78	2940	848000	NO	NO	NO	assumes 106 mg/kg-day as DRI, Max<Screening
Selenium	15	78	1.8	39	NO	NO	NO	Max<Screening
Silver	28	78	2.2	39	NO	NO	NO	Max<Screening
Sodium	74	78	1040	5360	NO	YES	NO	assumes 0.67mg/kg/d as DRI, Max<screening
Thallium	18	78	2.3	0.55	YES	YES	YES	Max>Screening
Vanadium	78	78	29.2	7.8	YES	YES	YES	Max>Screening
Zinc	77	78	3660	2300	YES	YES	YES	Max>Screening
Total Petroleum Hydrocarbons	19	24	9060				NO	Individual compounds were evaluated

Notes:
1. EPA Region III Risk-Based Concentrations normalized to cancer risk of 1 in 106 and non-cancer hazard quotient of 0.1.
2. For nutrients such as calcium, sodium, potassium, and sodium, the recommended dietary reference intake (Wright, 2001) values were used as the screening values, DRI = Dietary Reference Intake

COPCs identified for the mini risk assessment

Table 2C
COPC Identification - SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max > RBC?	Is Max > 0.1RBC?	Retained as COPC?	Rationale
VOC								
1,1,2-Trichloro-1,2,2-Trifluoroethane	1	54	0.0015	230000	NO	NO	NO	Max<Screening
1,1-Dichloroethene	1	54	0.001	390	NO	NO	NO	Max<Screening
Acetone	13	54	0.069	7000	NO	NO	NO	Max<Screening
Meta/Para Xylene	2	49	0.0023	1600	NO	NO	NO	Max<Screening
Methyl ethyl ketone	5	54	0.007	4700	NO	NO	NO	No Region III RBC available, no toxicity information, low detection frequency
Methylene chloride	1	54	0.0042	85	NO	NO	NO	Max<Screening
Ortho Xylene	5	49	0.0019	1600	NO	NO	NO	Max<Screening
Tetrachloroethene	3	54	0.0067	1.2	NO	NO	NO	Max<Screening
Total Xylenes	1	5	0.003	1600	NO	NO	NO	Max<Screening
Trichloroethene	5	54	0.0047	1.6	NO	NO	NO	No Region III RBC available, no toxicity information, low detection frequency
SVOC								
1,1'-Biphenyl	1	5	0.059	3.90E+02	NO	NO	NO	Max<Screening
2,4,6-Tribromophenol	15	15	0.099				YES	No Region III RBC available
2-Fluorobiphenyl	15	15	0.087				YES	No Region III RBC available
2-Methylnaphthalene	27	54	1.2	31	NO	NO	NO	Max<Screening
Acenaphthene	47	54	2.4	470	NO	NO	NO	Max<Screening
Acenaphthylene	53	54	3.5				YES	No Region III RBC available
Anthracene	54	54	6.6	2300	NO	NO	NO	Max<Screening
Benzo(a)anthracene	54	54	14	0.87	YES	YES	YES	Max>Screening
Benzo(a)pyrene	54	54	16	0.087	YES	YES	YES	Max>Screening
Benzo(b)fluoranthene	54	54	11	0.87	YES	YES	YES	Max>Screening
Benzo(ghi)perylene	54	54	8				YES	No Region III RBC available
Benzo(k)fluoranthene	54	54	13	8.7	YES	YES	YES	Max>Screening
Bis(2-Ethylhexyl)phthalate	3	54	0.13	4.6	NO	NO	NO	Max<Screening
Carbazole	4	5	1.1	32	NO	NO	NO	Max<Screening
Chrysene	54	54	13	87	NO	YES	YES	Max>0.1Screening
Dibenz(a,h)anthracene	53	54	2.9	0.087	YES	YES	YES	Max>Screening
Dibenzofuran	33	54	1.3	16	NO	NO	NO	Max<Screening
Fluoranthene	54	54	29	310	NO	NO	NO	Max < Screening
Fluorene	48	54	3.1	310	NO	NO	NO	Max < Screening
Indeno(1,2,3-cd)pyrene	54	54	8	0.87	YES	YES	YES	Max > Screening
Naphthalene	33	54	1.2	160	NO	NO	NO	Max<Screening
Pentachlorophenol	1	54	0.66	5.3	NO	YES	YES	Max>0.1Screening
Phenanthrene	54	54	17		YES	YES	YES	Max>Screening
Pyrene	54	54	22	230	NO	NO	NO	Max < Screening
Pesticides								
4,4'-DDD	33	54	0.45	2.7	NO	YES	YES	Max >0.1Screening
4,4'-DDE	33	54	0.23	1.9	NO	YES	YES	Max>0.1Screening
4,4'-DDT	37	54	0.52	1.9	NO	YES	YES	Max>0.1Screening
Alpha-BHC	1	54	0.0044	1.00E-01	NO	NO	NO	Max < Screening
Alpha-Chlordane	6	54	0.027	1.8	NO	NO	NO	Max<Screening
Beta-BHC	1	54	0.013	3.50E-01	NO	NO	NO	Max < Screening
Endrin ketone	1	54	0.015	2.30E+00	NO	NO	NO	Max<Screening
Gamma-Chlordane	5	54	0.021	1.80E+00	NO	NO	NO	No Region III RBC available, no toxicity information, low detection frequency

Table 2C
COPC Identification - SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	Number of Detects	Sample Number	Maximum Detected Concentration (mg/kg)	EPA Region III RBC [1] (mg/kg)	Is Max > RBC?	Is Max > 0.1RBC?	Retained as COPC?	Rationale
Metals								
Aluminum	54	54	13400	7800	YES	YES	YES	Max>Screening
Antimony	11	54	43.9	3.1	YES	YES	YES	Max>Screening
Arsenic	54	54	7.3	0.43	YES	YES	YES	Max>Screening
Barium	54	54	135	550	NO	YES	YES	Max >0.1Screening
Beryllium	54	54	0.69	16	NO	NO	NO	Max < Screening
Cadmium	53	54	1.2	7.8	NO	YES	YES	Max >0.1Screening
Calcium	54	54	100000	1333600	NO	NO	NO	Assumes 166.7 mg/kg-day DRI, Max<Screening
Chromium	54	54	35	23	YES	YES	YES	Max > Screening
Cobalt	54	54	13.9	160	NO	NO	NO	Max < Screening
Copper	54	54	51.8	310	NO	YES	YES	Max >0.1Screening
Iron	54	54	26500	2300	YES	YES	YES	Max>Screening
Lead	54	54	1440	400	YES	YES	YES	Max > Screening
Magnesium	54	54	26600	69360	NO	YES	NO	Assumes 8.67 mg/kg-day as DRI, Max<screening
Manganese	54	54	1220	160	YES	YES	YES	Max>Screening
Mercury	54	54	0.52	2.3	NO	YES	YES	Max >0.1Screening
Nickel	54	54	56.6	160	NO	YES	YES	Max >0.1Screening
Potassium	54	54	1580	848000	NO	NO	NO	assumes 106 mg/kg-day as DRI, Max<Screening
Selenium	2	54	0.72	39	NO	NO	NO	Max<Screening
Silver	9	54	4.7	39	NO	YES	YES	Max > 0.1Screening
Sodium	54	54	525	5360	NO	NO	NO	assumes 0.67mg/kg/d as DRI, Max<screening
Thallium	27	54	0.99	0.55	YES	YES	YES	Max>Screening
Vanadium	54	54	35.4	7.8	YES	YES	YES	Max>Screening
Zinc	54	54	185	2300	NO	NO	NO	Max < Screening

Notes:

1. EPA Region III Risk-Based Concentrations normalized to cancer risk of 1 in 10^6 and non-cancer hazard quotient of 0.1.
2. For nutrients such as calcium, sodium, potassium, and sodium, the recommended dietary reference intake (Wright, 2001) values were used as the screening values, DRI = Dietary Reference Intake

COPCs identified for the mini risk assessment

Table 3A
Exposure Point Concentrations for COPCs - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	EPC (mg/kg)
SVOC	
2-Methylnaphthalene	10
Acenaphthylene	1.7
Benzo(a)anthracene	16
Benzo(a)pyrene	14
Benzo(b)fluoranthene	12
Benzo(ghi)perylene	9
Benzo(k)fluoranthene	13
Chrysene	16
Dibenz(a,h)anthracene	2.9
Dibenzofuran	2.8
Fluoranthene	44
Indeno(1,2,3-cd)pyrene	8.7
Phenanthrene	41
Pyrene	35
PCB	
Aroclor-1260	0.079
Pesticides	
4,4'-DDD	0.74
4,4'-DDE	2.6
4,4'-DDT	3.7
Metals	
Aluminum	18300
Antimony	424
Arsenic	32.2
Barium	304
Beryllium	2.6
Cadmium	3.2
Chromium	39.3
Cobalt	47.8
Copper	305
Iron	64000
Manganese	1290
Mercury	0.95
Nickel	88.3
Thallium	1.8
Vanadium	28.5
Zinc	341

Note: The maximum detected concentration was used as the EPC.

Table 3B
Exposure Point Concentrations for COPCs - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	EPC (mg/kg)
SVOC	
2-Methylnaphthalene	31
Acenaphthylene	1.8
Benzo(a)anthracene	150
Benzo(a)pyrene	120
Benzo(b)fluoranthene	88
Benzo(ghi)perylene	62
Benzo(k)fluoranthene	130
Carbazole	77
Chrysene	150
Dibenz(a,h)anthracene	25
Dibenzofuran	38
Fluoranthene	440
Fluorene	62
Indeno(1,2,3-cd)pyrene	65
Naphthalene	46
Phenanthrene	290
Pyrene	280
PCB	
Aroclor-1260	0.2
Pesticides	
4,4'-DDE	0.81
4,4'-DDT	1.3
Alpha-BHC	0.018
Heptachlor epoxide	0.18
Inorganics	
Aluminum	18000
Antimony	19.3
Arsenic	14.6
Barium	179
Cadmium	12.1
Chromium	60.3
Copper	134
Iron	65100
Lead	3470
Magnesium	59300
Manganese	1330
Mercury	2.7
Nickel	110
Thallium	2.3
Vanadium	29.2
Zinc	3660

Note: The maximum detected concentration was used as the EPC.

Table 3C
Exposure Point Concentrations for COPCs - SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

	EPC (mg/kg)
SVOC	
2,4,6-Tribromophenol	0.099
2-Fluorobiphenyl	0.087
Acenaphthylene	3.5
Benzo(a)anthracene	14
Benzo(a)pyrene	16
Benzo(b)fluoranthene	11
Benzo(ghi)perylene	8
Benzo(k)fluoranthene	13
Chrysene	13
Dibenz(a,h)anthracene	2.9
Indeno(1,2,3-cd)pyrene	8
Pentachlorophenol	0.66
Phenanthrene	17
Pesticides	
4,4'-DDD	0.45
4,4'-DDE	0.23
4,4'-DDT	0.52
Metals	
Aluminum	13400
Antimony	43.9
Arsenic	7.3
Barium	135
Cadmium	1.2
Chromium	35
Copper	51.8
Iron	26500
Lead	1440
Manganese	1220
Mercury	0.52
Nickel	56.6
Silver	4.7
Thallium	0.99
Vanadium	35.4

Note: The maximum detected concentration was used as the EPC.

TABLE 4
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-59/71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	PARAMETER	RME		BASIS	SOURCE
			VALUE	UNITS		
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	Body Weight	70	kg	Default value for adult.	USEPA, 2001a.
		Inhalation Rate	20	m^3/day	Default inhation rate for commercial/industrial worker.	USEPA, 2001a.
		Exposure Frequency	250	days/yr	Default value for indoor worker.	USEPA, 2001a.
	(Air EPC Calculated from Surface Soil Only)	Exposure Duration	25	years	Default value for commercial/industrial worker.	USEPA, 2001a.
		Averaging Time - Nc	9,125	days	25 years.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.
	Ingestion of Soil (Soil EPC Calculated from Surface Soil Only)	Body Weight	70	kg	Default value for adult.	USEPA, 2001a.
		Ingestion Rate	100	mg/day	Default soil ingestion rate for outdoor worker.	USEPA, 2001a.
		Fraction Ingested	1	(unitless)	100% ingestion from site. Conservative assumption.	BPJ.
		Exposure Frequency	250	days/yr	Default value for commercial/industrial worker.	USEPA, 2001a.
		Exposure Duration	25	years	Default value for commercial/industrial worker.	USEPA, 2001a.
		Averaging Time - Nc	9,125	days	25 years.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.
	Dermal Contact of Soil	Body Weight	70	kg	Default value for adult.	USEPA, 2001a.
		Skin Contact Surface Area	3,300	cm^2	The exposed skin surface was limited to face, hands, and forearms.	USEPA, 2001b.
	(Soil EPC Calculated from Surface Soil Only)	Soil to Skin Adherence Factor	0.2	mg/cm^2	Soil to skin adherence factor for RME scenario.	USEPA, 2001b.
		Exposure Frequency	250	days/yr	Default value for indoor worker.	USEPA, 2001a.
		Exposure Duration	25	years	Default value for commercial/industrial worker.	USEPA, 2001a.
		Averaging Time - Nc	9,125	days	25 years.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.

TABLE 4
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-59/71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	PARAMETER	RME		BASIS	SOURCE
			VALUE	UNITS		
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	Body Weight	70	kg	Default value for adult.	USEPA, 2001a.
		Inhalation Rate	20	m^3/day	Default inhalation rate for construction worker.	USEPA, 2001a.
		Exposure Frequency	250	days/yr	Site-specific assumption.	BPJ.
	(Air EPC Calculated from Surface and Subsurface Soils)	Exposure Duration	1	year	Site-specific assumption.	BPJ.
		Averaging Time - Nc	365	days	1 year.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.
	Ingestion of Soil	Body Weight	70	kg	Default value for adult.	USEPA, 2001a.
		Ingestion Rate	330	mg/day	Default value for construction worker.	USEPA, 2001a.
	(Soil EPC Calculated from Surface and Subsurface Soils)	Fraction Ingested	1	(unitless)	100% ingestion from site, conservative assumption.	BPJ.
		Exposure Frequency	250	days/yr	Site-specific assumption.	BPJ.
		Exposure Duration	1	year	Site-specific assumption.	BPJ.
		Averaging Time - Nc	365	days	1 year.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.
	Dermal Contact of Soil	Body Weight	70	kg	Default value for adult.	USEPA, 2001a.
		Skin Contact Surface Area	3,300	cm^2	Face, hands, and forearms. Default value for surface area exposed.	USEPA, 2001a,b.
	(Soil EPC Calculated from Surface and Subsurface Soils)	Soil to Skin Adherence Factor	0.3	mg/cm^2	Default value for adherence factor.	USEPA, 2001a.
		Exposure Frequency	250	days/yr	Site-specific assumption.	BPJ.
		Exposure Duration	1	year	Site-specific assumption.	BPJ.
		Averaging Time - Nc	365	days	1 year.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.

TABLE 4
EXPOSURE FACTOR ASSUMPTIONS FOR SEAD-59/71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	PARAMETER	RME		BASIS	SOURCE
			VALUE	UNITS		
CHILD AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	Body Weight	15	kg	Default value for child (ages 0-6yr).	USEPA, 2001a.
		Inhalation Rate	0.87	m^3/day	Average long term inhalation rate for children (0-6yr) is 7.1 m^3/day, Table 5-25. Assuming exposure time 3 hr/day.	USEPA, 1997.
	(Air EPC Calculated from Surface Soil Only)	Exposure Frequency	250	days/yr	Attends 5 days/wk and 10 days/yr vacation.	BPJ.
		Exposure Duration	6	years	Default exposure duration.	USEPA, 2001a.
		Averaging Time - Nc	2,190	days	6 years.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.
	Ingestion of Soil	Body Weight	15	kg	Default value for child (ages 0-6 yr).	USEPA, 2001a.
		Ingestion Rate	200	mg/day	Default soil ingestion rate for a child.	USEPA, 2001a.
	(Soil EPC Calculated from Surface Soil Only)	Fraction Ingested	1	(unitless)	100% ingestion from site, conservative assumption.	BPJ.
		Exposure Frequency	250	days/yr	Attends 5 days/wk and 10 days/yr vacation.	BPJ.
		Exposure Duration	6	years	Default exposure duration.	USEPA, 2001a.
		Averaging Time - Nc	2,190	days	6 years.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.
	Dermal Contact of Soil	Body Weight	15	kg	Default value for child (ages 0-6 yr).	USEPA, 2001a.
		Skin Contact Surface Area	2,800	cm^2	Head, hands, forearms, lower legs, and feet exposed.	USEPA, 2001a,b.
	(Soil EPC Calculated from Surface Soil Only)	Soil to Skin Adherence Factor	0.2	mg/cm^2	Default soil adherence factor for child receptor under RME scenario.	USEPA, 2001a,b.
		Exposure Frequency	250	days/yr	Attends 5 days/wk and 10 days/yr vacation.	BPJ.
		Exposure Duration	6	years	Default exposure duration.	USEPA, 2001a.
		Averaging Time - Nc	2,190	days	6 years.	
		Averaging Time - Car	25,550	days	70 years, default value for human life span.	USEPA, 2001a.

Notes:
RME = Reasonable Maximum Exposure

Source References:
- BPJ: Best Professional Judgement.
- USEPA, 1997: Exposure Factors Handbook
- USEPA, 2001a: Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites. Peer Review Draft.
- USEPA, 2001b: Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Review Draft - For Public Comment.

TABLE 5
TOXICITY VALUES
RI/FS - SEADs-59 and 71
Seneca Army Depot Activity

Analyte	Oral RfD (mg/kg-day)		Inhalation RfD (mg/kg-day)		Carc. Slope Oral (mg/kg-day)-1		Rank Wt. of Evidence	Carc. Slope Inhalation (mg/kg-day)-1		Dermal RfD (mg/kg-day)		Carc. Slope Dermal (mg/kg-day)-1		Oral Absorption Factor	
Semivolatiles															
2-Fluorobiphenyl	NA		NA		NA		NA	NA		NA	f	NA	g	1	j
2-Methylnaphthalene	4.00E-03	a	NA		NA		NA	NA		0.004	f	NA	g	1	j
2,4,6-tribromophenol	NA		NA		NA		NA	NA		NA	f	NA	g	1	j
Acenaphthylene	NA		NA		NA		D	NA		NA	f	NA	g	1	j
Benzo(a)anthracene	NA		NA		0.73	i	B2	NA		NA	f	0.73	g	1	j
Benzo(a)pyrene	NA		NA		7.3	a	B2	NA		NA	f	7.3	g	1	j
Benzo(b)fluoranthene	NA		NA		0.73	i	B2	NA		NA	f	0.73	g	1	j
Benzo(ghi)perylene	NA		NA		NA		D	NA		NA	f	NA	g	1	j
Benzo(k)fluoranthene	NA		NA		0.073	i	B2	NA		NA	f	0.073	g	1	j
Carbazole	NA		NA		0.02	b	NA	NA		NA	f	0.02	g	1	j
Chrysene	NA		NA		0.0073	i	B2	NA		NA	f	0.0073	g	1	j
Dibenz(a,h)anthracene	NA		NA		7.3	i	B2	NA		NA	f	7.3	g	1	j
Dibenzofuran	2.00E-03	i	NA		NA		D	NA		0.002	f	NA	g	1	j
Fluoranthene	0.04	a	NA		NA		D	NA		0.04	f	NA	g	1	j
Fluorene	0.04	a	NA		NA		D	NA		0.04	f	NA	g	1	j
Indeno(1,2,3-cd)pyrene	NA		NA		0.73	i	B2	NA		NA	f	0.73	g	1	j
Naphthalene	0.02	a	0.0009	a	NA		C	NA		0.02	f	NA	g	1	j
Pentachlorophenol	0.03	a	NA		0.12	a	B2	NA		0.03	f	0.12	g	1	j
Phenanthrene	NA		NA		NA		D	NA		NA	f	NA	g	1	j
Pyrene	0.03	a	NA		NA		D	NA		0.03	f	NA	g	1	j
Pesticides/PCBs															
4,4'-DDD	NA		NA		0.24	a	B2	NA		NA	f	0.24	g	1	j
4,4'-DDE	NA		NA		0.34	a	B2	NA		NA	f	0.34	g	1	j
4,4'-DDT	0.0005	a	NA		0.34	a	B2	0.34	a	0.0005	f	0.34	g	1	j
Aroclor-1260	0.00002	a	NA		2	a	B2	0.4	a	0.00002	f	2	g	1	j
alpha-BHC					6.3	a	B2	6.3	a			6.3	g	1	j
Heptachlor epoxide	1.30E-05	a			9.1	a	B2	9.1	a	0.000013	f	9.1	g	1	j
Metals															
Aluminum	1	c	1E-03	c	NA		NA	NA		1	f	NA	g	1	j
Antimony	0.0004	a	NA		NA		NA	NA		0.00006	f	NA	g	0.15	j
Arsenic	0.0003	a	NA		1.5	a	A	15.1	a	0.0003	f	1.5	g	1	j
Barium	0.07	a	0.00014	a	NA		D	NA		0.0049	f	NA	g	0.07	j
Beryllium	2.00E-03	a	5.7E-06	a	NA		B1	8.4	a	0.000014	f	NA	g	0.007	j
Cadmium	0.0005	a	5.70E-05	i	NA		B1	6.3	a	0.0000125	f	NA	g	0.025	j
Chromium	3.00E-03	a	3E-05	a	NA		A	42	a	0.00009	f	NA	g	0.03	j
Cobalt	0.02	c	5.71E-06	c	NA		NA	9.8	c	0.02	f	NA	g	1	j
Copper	0.04	b	NA		NA		D	NA		0.04	f	NA	g	1	j
Iron	3.00E-01	i	NA		NA		NA	NA		0.3	f	NA	g	1	j
Manganese	0.05	a	1.4E-05	a	NA		D	NA		0.001866667	f	NA	g	0.04	j
Mercury	0.0003	a	8.6E-05	a	NA		C for mercuric chloride	NA		0.000021	f	NA	g	0.07	j
Nickel	0.02	a	NA		NA		NA	NA		0.0008	f	NA	g	0.04	j
Thallium	8.00E-05	b	NA		NA		D	NA		0.00008	f	NA	g	1	j
Vanadium	1.00E-03	c	NA		NA		NA	NA		0.000026	f	NA	g	0.026	j
Zinc	0.3	a	NA		NA		D	NA		0.3	f	NA	g	1	j

a = Values from the Integrated Risk Information System (IRIS) (Online September 2004)
Inhalation RfD and cancer slope factor were calculated from RfC (mg/m^3) and cancer slope factor (per ug/m^3) based on an assumption of 70 kg body weight and 20 m3/day inhalation rate.
b = Values from HEAST 1997
c = EPA provisional peer-reviewed value, from EPA Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV).
f = Calculated from oral RFD value
g = Calculated from oral slope factor
i = EPA-NCEA provisional value, quoted from EPA Region III RBC Table, 2004
j = Based upon EPA Human Health Evaluation Manual Supplemental Guidance: Dermal Risk Assessment Interim Guidance, 2001
NA = Not Available

TABLE 6A
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Air EPC from Surface Soil (mg/m^3) CSsurf x PM10 x CF	Equation for Air EPC from Total Soils (mg/m^3) = CStot x PM10 x CF
Variables: CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg) PM10 = Average Measured PM10 Concentration = 17 ug/m^3 CF = Conversion Factor = 1E-9 kg/ug	Variables: CStot = Chemical Concentration in Total Soils, from EPC data (mg/kg) PM10 = PM10 Concentration Calculated for Construction Worker= 148 ug/m^3 CF = Conversion Factor = 1E-9 kg/ug

Analyte	EPC Data for Surface Soil (mg/kg)	EPC Data for Total Soils (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)	Calculated Air EPC Total Soils (mg/m^3)
SVOCs				
2-Methylnaphthalene	10	10	1.70E-07	1.48E-06
Acenaphthylene	1.7	1.7	2.89E-08	2.52E-07
Benzo(a)anthracene	16	16	2.72E-07	2.37E-06
Benzo(a)pyrene	14	14	2.38E-07	2.07E-06
Benzo(b)fluoranthene	12	12	2.04E-07	1.78E-06
Benzo(ghi)perylene	9	9	1.53E-07	1.33E-06
Benzo(k)fluoranthene	13	13	2.21E-07	1.92E-06
Chrysene	16	16	2.72E-07	2.37E-06
Dibenz(a,h)anthracene	2.9	2.9	4.93E-08	4.29E-07
Dibenzofuran	2.8	2.8	4.76E-08	4.14E-07
Fluoranthene	44	44	7.48E-07	6.51E-06
Indeno(1,2,3-cd)pyrene	8.7	8.7	1.48E-07	1.29E-06
Phenanthrene	41	41	6.97E-07	6.07E-06
Pyrene	35	35	5.95E-07	5.18E-06
PCB				
Aroclor-1260	0.079	0.079	1.34E-09	1.17E-08
Pesticides				
4,4'-DDD	0.74	0.74	1.26E-08	1.10E-07
4,4'-DDE	2.6	2.6	4.42E-08	3.85E-07
4,4'-DDT	3.7	3.7	6.29E-08	5.48E-07
Metals				
Aluminum	18300	18300	3.11E-04	2.71E-03
Antimony	424	424	7.21E-06	6.28E-05
Arsenic	32.2	32.2	5.47E-07	4.77E-06
Barium	304	304	5.17E-06	4.50E-05
Beryllium	2.6	2.6	4.42E-08	3.85E-07
Cadmium	3.2	3.2	5.44E-08	4.74E-07
Chromium	39.3	39.3	6.68E-07	5.82E-06
Cobalt	47.8	47.8	8.13E-07	7.07E-06
Copper	305	305	5.19E-06	4.51E-05
Iron	64000	64000	1.09E-03	9.47E-03
Manganese	1290	1290	2.19E-05	1.91E-04
Mercury	0.95	0.95	1.62E-08	1.41E-07
Nickel	88.3	88.3	1.50E-06	1.31E-05
Thallium	1.8	1.8	3.06E-08	2.66E-07
Vanadium	28.5	28.5	4.85E-07	4.22E-06
Zinc	341	341	5.80E-06	5.05E-05

TABLE 6B
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Air EPC from Surface Soil (mg/m^3) CSsurf x PM10 x CF	Equation for Air EPC from Total Soils (mg/m^3) = CStot x PM10 x CF
Variables: CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg) PM10 = Average Measured PM10 Concentration = 17 ug/m^3 CF = Conversion Factor = 1E-9 kg/ug	Variables: CStot = Chemical Concentration in Total Soils, from EPC data (mg/kg) PM10 = PM10 Concentration Calculated for Construction Worker= 148 ug/m^3 CF = Conversion Factor = 1E-9 kg/ug

Analyte	EPC Data for Surface Soil (mg/kg)	EPC Data for Total Soils (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)	Calculated Air EPC Total Soils (mg/m^3)
SVOCs				
2-Methylnaphthalene	31	31	5.27E-07	4.59E-06
Acenaphthylene	1.8	1.8	3.06E-08	2.66E-07
Benzo(a)anthracene	150	150	2.55E-06	2.22E-05
Benzo(a)pyrene	120	120	2.04E-06	1.78E-05
Benzo(b)fluoranthene	88	88	1.50E-06	1.30E-05
Benzo(ghi)perylene	62	62	1.05E-06	9.18E-06
Benzo(k)fluoranthene	130	130	2.21E-06	1.92E-05
Carbazole	77	77	1.31E-06	1.14E-05
Chrysene	150	150	2.55E-06	2.22E-05
Dibenz(a,h)anthracene	25	25	4.25E-07	3.70E-06
Dibenzofuran	38	38	6.46E-07	5.62E-06
Fluoranthene	440	440	7.48E-06	6.51E-05
Fluorene	62	62	1.05E-06	9.18E-06
Indeno(1,2,3-cd)pyrene	65	65	1.11E-06	9.62E-06
Naphthalene	46	46	7.82E-07	6.81E-06
Phenanthrene	290	290	4.93E-06	4.29E-05
Pyrene	280	280	4.76E-06	4.14E-05
Pesticides/PCBs				
Aroclor-1260	0.2	0.2	3.40E-09	2.96E-08
4,4'-DDE	0.81	0.81	1.38E-08	1.20E-07
4,4'-DDT	1.3	1.3	2.21E-08	1.92E-07
Alpha-BHC	0.018	0.018	3.06E-10	2.66E-09
Heptachlor epoxide	0.18	0.18	3.06E-09	2.66E-08
Metals				
Aluminum	18000	18000	3.06E-04	2.66E-03
Antimony	19.3	19.3	3.28E-07	2.86E-06
Arsenic	14.6	14.6	2.48E-07	2.16E-06
Barium	179	179	3.04E-06	2.65E-05
Cadmium	12.1	12.1	2.06E-07	1.79E-06
Chromium	60.3	60.3	1.03E-06	8.92E-06
Copper	134	134	2.28E-06	1.98E-05
Iron	65100	65100	1.11E-03	9.63E-03
Lead	3470	3470	5.90E-05	5.14E-04
Magnesium	59300	59300	1.01E-03	8.78E-03
Manganese	1330	1330	2.26E-05	1.97E-04
Mercury	2.7	2.7	4.59E-08	4.00E-07
Nickel	110	110	1.87E-06	1.63E-05
Thallium	2.3	2.3	3.91E-08	3.40E-07
Vanadium	29.2	29.2	4.96E-07	4.32E-06
Zinc	3660	3660	6.22E-05	5.42E-04

TABLE 6C
AMBIENT AIR EXPOSURE POINT CONCENTRATIONS - SEAD-59 STOCKPILE
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Air EPC from Surface Soil (mg/m^3) CSsurf x PM10 x CF	Equation for Air EPC from Total Soils (mg/m^3) = CStot x PM10 x CF
Variables: CSsurf = Chemical Concentration in Surface Soil, from EPC data (mg/kg) PM10 = Average Measured PM10 Concentration = 17 ug/m^3 CF = Conversion Factor = 1E-9 kg/ug	Variables: CStot = Chemical Concentration in Total Soils, from EPC data (mg/kg) PM10 = PM10 Concentration Calculated for Construction Worker= 148 ug/m^3 CF = Conversion Factor = 1E-9 kg/ug

Analyte	EPC Data for Surface Soil (mg/kg)	EPC Data for Total Soils (mg/kg)	Calculated Air EPC Surface Soil (mg/m^3)	Calculated Air EPC Total Soils (mg/m^3)
SVOCs				
2,4,6-Tribromophenol	0.099	0.099	1.68E-09	1.47E-08
2-Fluorobiphenyl	0.087	0.087	1.48E-09	1.29E-08
Acenaphthylene	3.5	3.5	5.95E-08	5.18E-07
Benzo(a)anthracene	14	14	2.38E-07	2.07E-06
Benzo(a)pyrene	16	16	2.72E-07	2.37E-06
Benzo(b)fluoranthene	11	11	1.87E-07	1.63E-06
Benzo(ghi)perylene	8	8	1.36E-07	1.18E-06
Benzo(k)fluoranthene	13	13	2.21E-07	1.92E-06
Chrysene	13	13	2.21E-07	1.92E-06
Dibenz(a,h)anthracene	2.9	2.9	4.93E-08	4.29E-07
Indeno(1,2,3-cd)pyrene	8	8	1.36E-07	1.18E-06
Pentachlorophenol	0.66	0.66	1.12E-08	9.77E-08
Phenanthrene	17	17	2.89E-07	2.52E-06
Pesticides				
4,4'-DDD	0.45	0.45	7.65E-09	6.66E-08
4,4'-DDE	0.23	0.23	3.91E-09	3.40E-08
4,4'-DDT	0.52	0.52	8.84E-09	7.70E-08
Metals				
Aluminum	13400	13400	2.28E-04	1.98E-03
Antimony	43.9	43.9	7.46E-07	6.50E-06
Arsenic	7.3	7.3	1.24E-07	1.08E-06
Barium	135	135	2.30E-06	2.00E-05
Cadmium	1.2	1.2	2.04E-08	1.78E-07
Chromium	35	35	5.95E-07	5.18E-06
Copper	51.8	51.8	8.81E-07	7.67E-06
Iron	26500	26500	4.51E-04	3.92E-03
Lead	1440	1440	2.45E-05	2.13E-04
Manganese	1220	1220	2.07E-05	1.81E-04
Mercury	0.52	0.52	8.84E-09	7.70E-08
Nickel	56.6	56.6	9.62E-07	8.38E-06
Silver	4.7	4.7	7.99E-08	6.96E-07
Thallium	0.99	0.99	1.68E-08	1.47E-07
Vanadium	35.4	35.4	6.02E-07	5.24E-06

TABLE 7A
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CA \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CA = Chemical Concentration in Air, Calculated from Air EPC Data
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC* from Surface Soil	Air EPC* from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m3)	(mg/m3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																
2-Methylnaphthalene	NA	NA	1.70E-07	1.48E-06												
Acenaphthylene	NA	NA	2.89E-08	2.52E-07												
Benzo(a)anthracene	NA	NA	2.72E-07	2.37E-06												
Benzo(a)pyrene	NA	NA	2.38E-07	2.07E-06												
Benzo(b)fluoranthene	NA	NA	2.04E-07	1.78E-06												
Benzo(ghi)perylene	NA	NA	1.53E-07	1.33E-06												
Benzo(k)fluoranthene	NA	NA	2.21E-07	1.92E-06												
Chrysene	NA	NA	2.72E-07	2.37E-06												
Dibenz(a,h)anthracene	NA	NA	4.93E-08	4.29E-07												
Dibenzofuran	NA	NA	4.76E-08	4.14E-07												
Fluoranthene	NA	NA	7.48E-07	6.51E-06												
Indeno(1,2,3-cd)pyrene	NA	NA	1.48E-07	1.29E-06												
Phenanthrene	NA	NA	6.97E-07	6.07E-06												
Pyrene	NA	NA	5.95E-07	5.18E-06												
PCB																
Aroclor-1260	NA	4.00E-01	1.34E-09	1.17E-08		9.39E-11		4E-11		3.27E-11		1E-11		4.57E-12		2E-12
Pesticides																
4,4'-DDD	NA	NA	1.26E-08	1.10E-07												
4,4'-DDE	NA	NA	4.42E-08	3.85E-07												
4,4'-DDT	NA	3.40E-01	6.29E-08	5.48E-07		4.40E-09		1E-09		1.53E-09		5E-10		2.14E-10		7E-11
Metals																
Aluminum	1.43E-03	NA	3.11E-04	2.71E-03	6.09E-05		4E-02		5.30E-04		4E-01		1.24E-05		9E-03	
Antimony	NA	NA	7.21E-06	6.28E-05												
Arsenic	NA	1.51E+01	5.47E-07	4.77E-06		3.83E-08		6E-07		1.33E-08		2E-07		1.86E-09		3E-08
Barium	1.43E-04	NA	5.17E-06	4.50E-05	1.01E-06		7E-03		8.80E-06		6E-02		2.05E-07		1E-03	
Beryllium	5.71E-06	8.40E+00	4.42E-08	3.85E-07	8.65E-09	3.09E-09	2E-03	3E-08	7.53E-08	1.08E-09	1E-02	9E-09	1.76E-09	1.51E-10	3E-04	1E-09
Cadmium	5.70E-05	6.30E+00	5.44E-08	4.74E-07	1.06E-08	3.80E-09	2E-04	2E-08	9.27E-08	1.32E-09	2E-03	8E-09	2.16E-09	1.85E-10	4E-05	1E-09
Chromium	2.86E-05	4.20E+01	6.68E-07	5.82E-06	1.31E-07	4.67E-08	5E-03	2E-06	1.14E-06	1.63E-08	4E-02	7E-07	2.65E-08	2.27E-09	9E-04	1E-07
Cobalt	5.71E-06	9.80E+00	8.13E-07	7.07E-06	1.59E-07	5.68E-08	3E-02	6E-07	1.38E-06	1.98E-08	2E-01	2E-07	3.23E-08	2.77E-09	6E-03	3E-08
Copper	NA	NA	5.19E-06	4.51E-05												
Iron	NA	NA	1.09E-03	9.47E-03												
Manganese	1.43E-05	NA	2.19E-05	1.91E-04	4.29E-06		3E-01		3.74E-05		3E+00		8.71E-07		6E-02	
Mercury	8.57E-05	NA	1.62E-08	1.41E-07	3.16E-09		4E-05		2.75E-08		3E-04		6.42E-10		7E-06	
Nickel	NA	NA	1.50E-06	1.31E-05												
Thallium	NA	NA	3.06E-08	2.66E-07												
Vanadium	NA	NA	4.85E-07	4.22E-06												
Zinc	NA	NA	5.80E-06	5.05E-05												
Total Hazard Quotient and Cancer Risk:							4E-01	3E-06			3E+00	1E-06			8E-02	2E-07

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CA =	EPC Surface Only	CA =	EPC Surface and Sub-Surface	CA =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	0.87 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 year	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
* See TABLE 6A for calculation of Air EPCs
NA= Information not available.

TABLE 7B
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CA \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CA = Chemical Concentration in Air, Calculated from Air EPC Data
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC* from Surface Soil	Air EPC* from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m3)	(mg/m3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																
2-Methylnaphthalene	NA	NA	5.27E-07	4.59E-06												
Acenaphthylene	NA	NA	3.06E-08	2.66E-07												
Benzo(a)anthracene	NA	NA	2.55E-06	2.22E-05												
Benzo(a)pyrene	NA	NA	2.04E-06	1.78E-05												
Benzo(b)fluoranthene	NA	NA	1.50E-06	1.30E-05												
Benzo(ghi)perylene	NA	NA	1.05E-06	9.18E-06												
Benzo(k)fluoranthene	NA	NA	2.21E-06	1.92E-05												
Carbazole	NA	NA	1.31E-06	1.14E-05												
Chrysene	NA	NA	2.55E-06	2.22E-05												
Dibenz(a,h)anthracene	NA	NA	4.25E-07	3.70E-06												
Dibenzofuran	NA	NA	6.46E-07	5.62E-06												
Fluoranthene	NA	NA	7.48E-06	6.51E-05												
Fluorene	NA	NA	1.05E-06	9.18E-06												
Indeno(1,2,3-cd)pyrene	NA	NA	1.11E-06	9.62E-06												
Naphthalene	8.57E-04	NA	7.82E-07	6.81E-06	1.53E-07		2E-04		1.33E-06		2E-03		3.11E-08		4E-05	
Phenanthrene	NA	NA	4.93E-06	4.29E-05												
Pyrene	NA	NA	4.76E-06	4.14E-05												
Pesticides/PCBs																
Aroclor-1260	NA	4.00E-01	3.40E-09	2.96E-08		2.38E-10		1E-10		8.28E-11		3E-11		1.16E-11		5E-12
4,4'-DDE	NA	NA	1.38E-08	1.20E-07												
4,4'-DDT	NA	3.40E-01	2.21E-08	1.92E-07		1.54E-09		5E-10		5.38E-10		2E-10		7.53E-11		3E-11
Alpha-BHC	NA	6.30E+00	3.06E-10	2.66E-09		2.14E-11		1E-10		7.45E-12		5E-11		1.04E-12		7E-12
Heptachlor epoxide	NA	9.10E+00	3.06E-09	2.66E-08		2.14E-10		2E-09		7.45E-11		7E-10		1.04E-11		9E-11
Metals																
Aluminum	1.43E-03	NA	3.06E-04	2.66E-03	5.99E-05		4E-02		5.21E-04		4E-01		1.22E-05		9E-03	
Antimony	NA	NA	3.28E-07	2.86E-06												
Arsenic	NA	1.51E+01	2.48E-07	2.16E-06		1.73E-08		3E-07		6.04E-09		9E-08		8.45E-10		1E-08
Barium	1.43E-04	NA	3.04E-06	2.65E-05	5.95E-07		4E-03		5.18E-06		4E-02		1.21E-07		8E-04	
Cadmium	5.70E-05	6.30E+00	2.06E-07	1.79E-06	4.03E-08	1.44E-08	7E-04	9E-08	3.50E-07	5.01E-09	6E-03	3E-08	8.17E-09	7.00E-10	1E-04	4E-09
Chromium	2.86E-05	4.20E+01	1.03E-06	8.92E-06	2.01E-07	7.16E-08	7E-03	3E-06	1.75E-06	2.49E-08	6E-02	1E-06	4.07E-08	3.49E-09	1E-03	1E-07
Copper	NA	NA	2.28E-06	1.98E-05												
Iron	NA	NA	1.11E-03	9.63E-03												
Lead	NA	NA	5.90E-05	5.14E-04												
Magnesium	NA	NA	1.01E-03	8.78E-03												
Manganese	1.43E-05	NA	2.26E-05	1.97E-04	4.42E-06		3E-01		3.85E-05		3E+00		8.98E-07		6E-02	
Mercury	8.57E-05	NA	4.59E-08	4.00E-07	8.98E-09		1E-04		7.82E-08		9E-04		1.82E-09		2E-05	
Nickel	NA	NA	1.87E-06	1.63E-05												
Thallium	NA	NA	3.91E-08	3.40E-07												
Vanadium	NA	NA	4.96E-07	4.32E-06												
Zinc	NA	NA	6.22E-05	5.42E-04												
Total Hazard Quotient and Cancer Risk:							4E-01	3E-06			3E+00	1E-06			7E-02	2E-07

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CA =	EPC Surface Only	CA =	EPC Surface and Sub-Surface	CA =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	0.87 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 year	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
* See TABLE 6B for calculation of Air EPCs
NA= Information not available.

TABLE 7C
CALCULATION OF INTAKE AND RISK FROM INHALATION OF DUST IN AMBIENT AIR
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59 STOCKPILE
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CA \times IR \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CA = Chemical Concentration in Air, Calculated from Air EPC Data
IR = Inhalation Rate
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Inhalation RfD	Carc. Slope Inhalation	Air EPC* from Surface Soil	Air EPC* from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/m3)	(mg/m3)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																
2,4,6-Tribromophenol	NA	NA	1.68E-09	1.47E-08												
2-Fluorobiphenyl	NA	NA	1.48E-09	1.29E-08												
Acenaphthylene	NA	NA	5.95E-08	5.18E-07												
Benzo(a)anthracene	NA	NA	2.38E-07	2.07E-06												
Benzo(a)pyrene	NA	NA	2.72E-07	2.37E-06												
Benzo(b)fluoranthene	NA	NA	1.87E-07	1.63E-06												
Benzo(ghi)perylene	NA	NA	1.36E-07	1.18E-06												
Benzo(k)fluoranthene	NA	NA	2.21E-07	1.92E-06												
Chrysene	NA	NA	2.21E-07	1.92E-06												
Dibenz(a,h)anthracene	NA	NA	4.93E-08	4.29E-07												
Indeno(1,2,3-cd)pyrene	NA	NA	1.36E-07	1.18E-06												
Pentachlorophenol	NA	NA	1.12E-08	9.77E-08												
Phenanthrene	NA	NA	2.89E-07	2.52E-06												
Pesticides																
4,4'-DDD	NA	NA	7.65E-09	6.66E-08												
4,4'-DDE	NA	NA	3.91E-09	3.40E-08												
4,4'-DDT	NA	3.40E-01	8.84E-09	7.70E-08		6.18E-10		2E-10		2.15E-10		7E-11		3.01E-11		1E-11
Metals																
Aluminum	1.43E-03	NA	2.28E-04	1.98E-03	4.46E-05		3E-02		3.88E-04		3E-01		9.05E-06		6E-03	
Antimony	NA	NA	7.46E-07	6.50E-06												
Arsenic	NA	1.51E+01	1.24E-07	1.08E-06		8.67E-09		1E-07		3.02E-09		5E-08		4.23E-10		6E-09
Barium	1.43E-04	NA	2.30E-06	2.00E-05	4.49E-07		3E-03		3.91E-06		3E-02		9.12E-08		6E-04	
Cadmium	5.70E-05	6.30E+00	2.04E-08	1.78E-07	3.99E-09	1.43E-09	7E-05	9E-09	3.48E-08	4.97E-10	6E-04	3E-09	8.10E-10	6.95E-11	1E-05	4E-10
Chromium	2.86E-05	4.20E+01	5.95E-07	5.18E-06	1.16E-07	4.16E-08	4E-03	2E-06	1.01E-06	1.45E-08	4E-02	6E-07	2.36E-08	2.03E-09	8E-04	9E-08
Copper	NA	NA	8.81E-07	7.67E-06												
Iron	NA	NA	4.51E-04	3.92E-03												
Lead	NA	NA	2.45E-05	2.13E-04												
Manganese	1.43E-05	NA	2.07E-05	1.81E-04	4.06E-06		3E-01		3.53E-05		2E+00		8.24E-07		6E-02	
Mercury	8.57E-05	NA	8.84E-09	7.70E-08	1.73E-09		2E-05		1.51E-08		2E-04		3.51E-10		4E-06	
Nickel	NA	NA	9.62E-07	8.38E-06												
Silver	NA	NA	7.99E-08	6.96E-07												
Thallium	NA	NA	1.68E-08	1.47E-07												
Vanadium	NA	NA	6.02E-07	5.24E-06												
Total Hazard Quotient and Cancer Risk:							3E-01	2E-06			3E+00	7E-07			7E-02	9E-08

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CA =	EPC Surface Only	CA =	EPC Surface and Sub-Surface	CA =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
IR =	20 m^3/day	IR =	20 m^3/day	IR =	0.87 m^3/day
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 year	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
* See TABLE 6C for calculation of Air EPCs
NA= Information not available.

TABLE 8A
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CS \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):
CS = Chemical Concentration in Soil, Calculated from Soil EPC Data
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	EPC from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																
2-Methylnaphthalene	4.00E-03	NA	1.00E+01	1.00E+01	9.78E-06		2E-03		3.23E-05		8E-03		9.13E-05		2E-02	
Acenaphthylene	NA	NA	1.70E+00	1.70E+00												
Benzo(a)anthracene	NA	7.30E-01	1.60E+01	1.60E+01		5.59E-06		4E-06		7.38E-07		5E-07		1.25E-05		9E-06
Benzo(a)pyrene	NA	7.30E+00	1.40E+01	1.40E+01		4.89E-06		4E-05		6.46E-07		5E-06		1.10E-05		8E-05
Benzo(b)fluoranthene	NA	7.30E-01	1.20E+01	1.20E+01		4.19E-06		3E-06		5.54E-07		4E-07		9.39E-06		7E-06
Benzo(ghi)perylene	NA	NA	9.00E+00	9.00E+00												
Benzo(k)fluoranthene	NA	7.30E-02	1.30E+01	1.30E+01		4.54E-06		3E-07		6.00E-07		4E-08		1.02E-05		7E-07
Chrysene	NA	7.30E-03	1.60E+01	1.60E+01		5.59E-06		4E-08		7.38E-07		5E-09		1.25E-05		9E-08
Dibenz(a,h)anthracene	NA	7.30E+00	2.90E+00	2.90E+00		1.01E-06		7E-06		1.34E-07		1E-06		2.27E-06		2E-05
Dibenzofuran	2.00E-03	NA	2.80E+00	2.80E+00	2.74E-06		1E-03		9.04E-06		5E-03		2.56E-05		1E-02	
Fluoranthene	4.00E-02	NA	4.40E+01	4.40E+01	4.31E-05		1E-03		1.42E-04		4E-03		4.02E-04		1E-02	
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	8.70E+00	8.70E+00		3.04E-06		2E-06		4.01E-07		3E-07		6.81E-06		5E-06
Phenanthrene	NA	NA	4.10E+01	4.10E+01												
Pyrene	3.00E-02	NA	3.50E+01	3.50E+01	3.42E-05		1E-03		1.13E-04		4E-03		3.20E-04		1E-02	
PCB																
Aroclor-1260	2.00E-05	2.00E+00	7.90E-02	7.90E-02	7.73E-08	2.76E-08	4E-03	6E-08	2.55E-07	3.64E-09	1E-02	7E-09	7.21E-07	6.18E-08	4E-02	1E-07
Pesticides																
4,4'-DDD	NA	2.40E-01	7.40E-01	7.40E-01		2.59E-07		6E-08		3.41E-08		8E-09		5.79E-07		1E-07
4,4'-DDE	NA	3.40E-01	2.60E+00	2.60E+00		9.09E-07		3E-07		1.20E-07		4E-08		2.04E-06		7E-07
4,4'-DDT	5.00E-04	3.40E-01	3.70E+00	3.70E+00	3.62E-06	1.29E-06	7E-03	4E-07	1.19E-05	1.71E-07	2E-02	6E-08	3.38E-05	2.90E-06	7E-02	1E-06
Metals																
Aluminum	1.00E+00	NA	1.83E+04	1.83E+04	1.79E-02		2E-02		5.91E-02		6E-02		1.67E-01		2E-01	
Antimony	4.00E-04	NA	4.24E+02	4.24E+02	4.15E-04		1E+00		1.37E-03		3E+00		3.87E-03		1E+01	
Arsenic	3.00E-04	1.50E+00	3.22E+01	3.22E+01	3.15E-05	1.13E-05	1E-01	2E-05	1.04E-04	1.49E-06	3E-01	2E-06	2.94E-04	2.52E-05	1E+00	4E-05
Barium	7.00E-02	NA	3.04E+02	3.04E+02	2.97E-04		4E-03		9.82E-04		1E-02		2.78E-03		4E-02	
Beryllium	2.00E-03	NA	2.60E+00	2.60E+00	2.54E-06		1E-03		8.40E-06		4E-03		2.37E-05		1E-02	
Cadmium	5.00E-04	NA	3.20E+00	3.20E+00	3.13E-06		6E-03		1.03E-05		2E-02		2.92E-05		6E-02	
Chromium	3.00E-03	NA	3.93E+01	3.93E+01	3.85E-05		1E-02		1.27E-04		4E-02		3.59E-04		1E-01	
Cobalt	2.00E-02	NA	4.78E+01	4.78E+01	4.68E-05		2E-03		1.54E-04		8E-03		4.37E-04		2E-02	
Copper	4.00E-02	NA	3.05E+02	3.05E+02	2.98E-04		7E-03		9.85E-04		2E-02		2.79E-03		7E-02	
Iron	3.00E-01	NA	6.40E+04	6.40E+04	6.26E-02		2E-01		2.07E-01		7E-01		5.84E-01		2E+00	
Manganese	4.67E-02	NA	1.29E+03	1.29E+03	1.26E-03		3E-02		4.17E-03		9E-02		1.18E-02		3E-01	
Mercury	3.00E-04	NA	9.50E-01	9.50E-01	9.30E-07		3E-03		3.07E-06		1E-02		8.68E-06		3E-02	
Nickel	2.00E-02	NA	8.83E+01	8.83E+01	8.64E-05		4E-03		2.85E-04		1E-02		8.06E-04		4E-02	
Thallium	8.00E-05	NA	1.80E+00	1.80E+00	1.76E-06		2E-02		5.81E-06		7E-02		1.64E-05		2E-01	
Vanadium	1.00E-03	NA	2.85E+01	2.85E+01	2.79E-05		3E-02		9.20E-05		9E-02		2.60E-04		3E-01	
Zinc	3.00E-01	NA	3.41E+02	3.41E+02	3.34E-04		1E-03		1.10E-03		4E-03		3.11E-03		1E-02	
Total Hazard Quotient and Cancer Risk:							**2E+00**	**7E-05**			**5E+00**	**9E-06**			**1E+01**	**2E-04**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	CS =	EPC Surface and Subsurface	CS =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
IR =	100 mg/day	IR =	330 mg soil/day	IR =	200 mg soil/day
FI =	1 unitless	FI =	1 unitless	FI =	1 unitless
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 years	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE 8B
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CS \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CS = Chemical Concentration in Soil, Calculated from Soil EPC Data
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	EPC from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																
2-Methylnaphthalene	4.00E-03	NA	3.10E+01	3.10E+01	3.03E-05		8E-03		1.00E-04		3E-02		2.83E-04		7E-02	
Acenaphthylene	NA	NA	1.80E+00	1.80E+00												
Benzo(a)anthracene	NA	7.30E-01	1.50E+02	1.50E+02		5.24E-05		4E-05		6.92E-06		5E-06		1.17E-04		9E-05
Benzo(a)pyrene	NA	7.30E+00	1.20E+02	1.20E+02		4.19E-05		3E-04		5.54E-06		4E-05		9.39E-05		7E-04
Benzo(b)fluoranthene	NA	7.30E-01	8.80E+01	8.80E+01		3.08E-05		2E-05		4.06E-06		3E-06		6.89E-05		5E-05
Benzo(ghi)perylene	NA	NA	6.20E+01	6.20E+01												
Benzo(k)fluoranthene	NA	7.30E-02	1.30E+02	1.30E+02		4.54E-05		3E-06		6.00E-06		4E-07		1.02E-04		7E-06
Carbazole	NA	2.00E-02	7.70E+01	7.70E+01		2.69E-05		5E-07		3.55E-06		7E-08		6.03E-05		1E-06
Chrysene	NA	7.30E-03	1.50E+02	1.50E+02		5.24E-05		4E-07		6.92E-06		5E-08		1.17E-04		9E-07
Dibenz(a,h)anthracene	NA	7.30E+00	2.50E+01	2.50E+01		8.74E-06		6E-05		1.15E-06		8E-06		1.96E-05		1E-04
Dibenzofuran	2.00E-03	NA	3.80E+01	3.80E+01	3.72E-05		2E-02		1.23E-04		6E-02		3.47E-04		2E-01	
Fluoranthene	4.00E-02	NA	4.40E+02	4.40E+02	4.31E-04		1E-02		1.42E-03		4E-02		4.02E-03		1E-01	
Fluorene	4.00E-02	NA	6.20E+01	6.20E+01	6.07E-05		2E-03		2.00E-04		5E-03		5.66E-04		1E-02	
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	6.50E+01	6.50E+01		2.27E-05		2E-05		3.00E-06		2E-06		5.09E-05		4E-05
Naphthalene	2.00E-02	NA	4.60E+01	4.60E+01	4.50E-05		2E-03		1.49E-04		7E-03		4.20E-04		2E-02	
Phenanthrene	NA	NA	2.90E+02	2.90E+02												
Pyrene	3.00E-02	NA	2.80E+02	2.80E+02	2.74E-04		9E-03		9.04E-04		3E-02		2.56E-03		9E-02	
Pesticides/PCBs																
Aroclor-1260	2.00E-05	2.00E+00	2.00E-01	2.00E-01	1.96E-07	6.99E-08	1E-02	1E-07	6.46E-07	9.23E-09	3E-02	2E-08	1.83E-06	1.57E-07	9E-02	3E-07
4,4'-DDE	NA	3.40E-01	8.10E-01	8.10E-01		2.83E-07		1E-07		3.74E-08		1E-08		6.34E-07		2E-07
4,4'-DDT	5.00E-04	3.40E-01	1.30E+00	1.30E+00	1.27E-06	4.54E-07	3E-03	2E-07	4.20E-06	6.00E-08	8E-03	2E-08	1.19E-05	1.02E-06	2E-02	3E-07
Alpha-BHC	NA	6.30E+00	1.80E-02	1.80E-02		6.29E-09		4E-08		8.30E-10		5E-09		1.41E-08		9E-08
Heptachlor epoxide	1.30E-05	9.10E+00	1.80E-01	1.80E-01	1.76E-07	6.29E-08	1E-02	6E-07	5.81E-07	8.30E-09	4E-02	8E-08	1.64E-06	1.41E-07	1E-01	1E-06
Metals																
Aluminum	1.00E+00	NA	1.80E+04	1.80E+04	1.76E-02		2E-02		5.81E-02		6E-02		1.64E-01		2E-01	
Antimony	4.00E-04	NA	1.93E+01	1.93E+01	1.89E-05		5E-02		6.23E-05		2E-01		1.76E-04		4E-01	
Arsenic	3.00E-04	1.50E+00	1.46E+01	1.46E+01	1.43E-05	5.10E-06	5E-02	8E-06	4.71E-05	6.73E-07	2E-01	1E-06	1.33E-04	1.14E-05	4E-01	2E-05
Barium	7.00E-02	NA	1.79E+02	1.79E+02	1.75E-04		3E-03		5.78E-04		8E-03		1.63E-03		2E-02	
Cadmium	5.00E-04	NA	1.21E+01	1.21E+01	1.18E-05		2E-02		3.91E-05		8E-02		1.11E-04		2E-01	
Chromium	3.00E-03	NA	6.03E+01	6.03E+01	5.90E-05		2E-02		1.95E-04		6E-02		5.51E-04		2E-01	
Copper	4.00E-02	NA	1.34E+02	1.34E+02	1.31E-04		3E-03		4.33E-04		1E-02		1.22E-03		3E-02	
Iron	3.00E-01	NA	6.51E+04	6.51E+04	6.37E-02		2E-01		2.10E-01		7E-01		5.95E-01		2E+00	
Lead	NA	NA	3.47E+03	3.47E+03												
Magnesium	NA	NA	5.93E+04	5.93E+04												
Manganese	4.67E-02	NA	1.33E+03	1.33E+03	1.30E-03		3E-02		4.29E-03		9E-02		1.21E-02		3E-01	
Mercury	3.00E-04	NA	2.70E+00	2.70E+00	2.64E-06		9E-03		8.72E-06		3E-02		2.47E-05		8E-02	
Nickel	2.00E-02	NA	1.10E+02	1.10E+02	1.08E-04		5E-03		3.55E-04		2E-02		1.00E-03		5E-02	
Thallium	8.00E-05	NA	2.30E+00	2.30E+00	2.25E-06		3E-02		7.43E-06		9E-02		2.10E-05		3E-01	
Vanadium	1.00E-03	NA	2.92E+01	2.92E+01	2.86E-05		3E-02		9.43E-05		9E-02		2.67E-04		3E-01	
Zinc	3.00E-01	NA	3.66E+03	3.66E+03	3.58E-03		1E-02		1.18E-02		4E-02		3.34E-02		1E-01	
Total Hazard Quotient and Cancer Risk:							**6E-01**	**5E-04**			**2E+00**	**6E-05**			**5E+00**	**1E-03**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	CS =	EPC Surface and Subsurface	CS =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
IR =	100 mg/day	IR =	330 mg soil/day	IR =	200 mg soil/day
FI =	1 unitless	FI =	1 unitless	FI =	1 unitless
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 years	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE 8C
CALCULATION OF INTAKE AND RISK FROM THE INGESTION OF SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59 STOCKPILE
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CS \times IR \times CF \times FI \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):
CS = Chemical Concentration in Soil, Calculated from Soil EPC Data
IR = Ingestion Rate
CF = Conversion Factor
FI = Fraction Ingested
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Oral RfD	Carc. Slope Oral	EPC Surface Soil	EPC from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
					Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk	Intake (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																
2,4,6-Tribromophenol	NA	NA	9.90E-02	9.90E-02												
2-Fluorobiphenyl	NA	NA	8.70E-02	8.70E-02												
Acenaphthylene	NA	NA	3.50E+00	3.50E+00												
Benzo(a)anthracene	NA	7.30E-01	1.40E+01	1.40E+01		4.89E-06		4E-06		6.46E-07		5E-07		1.10E-05		8E-06
Benzo(a)pyrene	NA	7.30E+00	1.60E+01	1.60E+01		5.59E-06		4E-05		7.38E-07		5E-06		1.25E-05		9E-05
Benzo(b)fluoranthene	NA	7.30E-01	1.10E+01	1.10E+01		3.84E-06								8.61E-06		
Benzo(ghi)perylene	NA	NA	8.00E+00	8.00E+00												
Benzo(k)fluoranthene	NA	7.30E-02	1.30E+01	1.30E+01		4.54E-06		3E-07		6.00E-07		4E-08		1.02E-05		7E-07
Chrysene	NA	7.30E-03	1.30E+01	1.30E+01		4.54E-06		3E-08		6.00E-07		4E-09		1.02E-05		7E-08
Dibenz(a,h)anthracene	NA	7.30E+00	2.90E+00	2.90E+00		1.01E-06		7E-06		1.34E-07		1E-06		2.27E-06		2E-05
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	8.00E+00	8.00E+00		2.80E-06		2E-06		3.69E-07		3E-07		6.26E-06		5E-06
Pentachlorophenol	3.00E-02	1.20E-01	6.60E-01	6.60E-01	6.46E-07	2.31E-07	2E-05	3E-08	2.13E-06	3.04E-08	7E-05	4E-09	6.03E-06	5.17E-07	2E-04	6E-08
Phenanthrene	NA	NA	1.70E+01	1.70E+01												
Pesticides																
4,4'-DDD	NA	2.40E-01	4.50E-01	4.50E-01		1.57E-07		4E-08		2.08E-08		5E-09		3.52E-07		8E-08
4,4'-DDE	NA	3.40E-01	2.30E-01	2.30E-01		8.04E-08		3E-08		1.06E-08		4E-09		1.80E-07		6E-08
4,4'-DDT	5.00E-04	3.40E-01	5.20E-01	5.20E-01	5.09E-07	1.82E-07	1E-03	6E-08	1.68E-06	2.40E-08	3E-03	8E-09	4.75E-06	4.07E-07	9E-03	1E-07
Metals																
Aluminum	1.00E+00	NA	1.34E+04	1.34E+04	1.31E-02		1E-02		4.33E-02		4E-02		1.22E-01		1E-01	
Antimony	4.00E-04	NA	4.39E+01	4.39E+01	4.30E-05		1E-01		1.42E-04		4E-01		4.01E-04		1E+00	
Arsenic	3.00E-04	1.50E+00	7.30E+00	7.30E+00	7.14E-06	2.55E-06	2E-02	4E-06	2.36E-05	3.37E-07	8E-02	5E-07	6.67E-05	5.71E-06	2E-01	9E-06
Barium	7.00E-02	NA	1.35E+02	1.35E+02	1.32E-04		2E-03		4.36E-04		6E-03		1.23E-03		2E-02	
Cadmium	5.00E-04	NA	1.20E+00	1.20E+00	1.17E-06		2E-03		3.87E-06		8E-03		1.10E-05		2E-02	
Chromium	3.00E-03	NA	3.50E+01	3.50E+01	3.42E-05		1E-02		1.13E-04		4E-02		3.20E-04		1E-01	
Copper	4.00E-02	NA	5.18E+01	5.18E+01	5.07E-05		1E-03		1.67E-04		4E-03		4.73E-04		1E-02	
Iron	3.00E-01	NA	2.65E+04	2.65E+04	2.59E-02		9E-02		8.56E-02		3E-01		2.42E-01		8E-01	
Lead	NA	NA	1.44E+03	1.44E+03												
Manganese	4.67E-02	NA	1.22E+03	1.22E+03	1.19E-03		3E-02		3.94E-03		8E-02		1.11E-02		2E-01	
Mercury	3.00E-04	NA	5.20E-01	5.20E-01	5.09E-07		2E-03		1.68E-06		6E-03		4.75E-06		2E-02	
Nickel	2.00E-02	NA	5.66E+01	5.66E+01	5.54E-05		3E-03		1.83E-04		9E-03		5.17E-04		3E-02	
Silver	5.00E-03	NA	4.70E+00	4.70E+00	4.60E-06		9E-04		1.52E-05		3E-03		4.29E-05		9E-03	
Thallium	8.00E-05	NA	9.90E-01	9.90E-01	9.69E-07		1E-02		3.20E-06		4E-02		9.04E-06		1E-01	
Vanadium	1.00E-03	NA	3.54E+01	3.54E+01	3.46E-05		3E-02		1.14E-04		1E-01		3.23E-04		3E-01	
Total Hazard Quotient and Cancer Risk:							**3E-01**	**6E-05**			**1E+00**	**8E-06**			**3E+00**	**1E-04**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	CS =	EPC Surface and Subsurface	CS =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
IR =	100 mg/day	IR =	330 mg soil/day	IR =	200 mg soil/day
FI =	1 unitless	FI =	1 unitless	FI =	1 unitless
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 years	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE 9A
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CS = Chemical Concentration in Soil, from Soil EPC Data
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	EPC from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
						Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																	
2-Methylnaphthalene	4.00E-03	NA	1.30E-01	1.00E+01	1.00E+01	8.40E-06		2E-03		1.26E-05		3E-03		3.32E-05		8.31E-03	
Acenaphthylene	NA	NA	1.30E-01	1.70E+00	1.70E+00												
Benzo(a)anthracene	NA	7.30E-01	1.30E-01	1.60E+01	1.60E+01		4.80E-06		4E-06		2.88E-07		2E-07		4.56E-06		3.33E-06
Benzo(a)pyrene	NA	7.30E+00	1.30E-01	1.40E+01	1.40E+01		4.20E-06		3E-05		2.52E-07		2E-06		3.99E-06		2.91E-05
Benzo(b)fluoranthene	NA	7.30E-01	1.30E-01	1.20E+01	1.20E+01		3.60E-06		3E-06		2.16E-07		2E-07		3.42E-06		2.50E-06
Benzo(ghi)perylene	NA	NA	1.30E-01	9.00E+00	9.00E+00												
Benzo(k)fluoranthene	NA	7.30E-02	1.30E-01	1.30E+01	1.30E+01		3.90E-06		3E-07		2.34E-07		2E-08		3.70E-06		2.70E-07
Chrysene	NA	7.30E-03	1.30E-01	1.60E+01	1.60E+01		4.80E-06		4E-08		2.88E-07		2E-09		4.56E-06		3.33E-08
Dibenz(a,h)anthracene	NA	7.30E+00	1.30E-01	2.90E+00	2.90E+00		8.70E-07		6E-06		5.22E-08		4E-07		8.26E-07		6.03E-06
Dibenzofuran	2.00E-03	NA	1.00E-01	2.80E+00	2.80E+00	1.81E-06		9E-04		2.71E-06		1E-03		7.16E-06		3.58E-03	
Fluoranthene	4.00E-02	NA	1.30E-01	4.40E+01	4.40E+01	3.69E-05		9E-04		5.54E-05		1E-03		1.46E-04		3.66E-03	
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	1.30E-01	8.70E+00	8.70E+00		2.61E-06		2E-06		1.57E-07		1E-07		2.48E-06		1.81E-06
Phenanthrene	NA	NA	1.30E-01	4.10E+01	4.10E+01												
Pyrene	3.00E-02	NA	1.30E-01	3.50E+01	3.50E+01	2.94E-05		1E-03		4.41E-05		1E-03		1.16E-04		3.88E-03	
PCB																	
Aroclor-1260	2.00E-05	2.00E+00	1.40E-01	7.90E-02	7.90E-02	7.14E-08	2.55E-08	4E-03	5E-08	1.07E-07	1.53E-09	5E-03	3E-09	2.83E-07	2.42E-08	1E-02	5E-08
Pesticides																	
4,4'-DDD	NA	2.40E-01	3.00E-02	7.40E-01	7.40E-01		5.12E-08		1E-08		3.07E-09		7E-10		4.87E-08		1E-08
4,4'-DDE	NA	3.40E-01	3.00E-02	2.60E+00	2.60E+00		1.80E-07		6E-08		1.08E-08		4E-09		1.71E-07		6E-08
4,4'-DDT	5.00E-04	3.40E-01	3.00E-02	3.70E+00	3.70E+00	7.17E-07	2.56E-07	1E-03	9E-08	1.08E-06	1.54E-08	2E-03	5E-09	2.84E-06	2.43E-07	6E-03	8E-08
Metals																	
Aluminum	1.00E+00	NA	NA	1.83E+04	1.83E+04												
Antimony	6.00E-05	NA	NA	4.24E+02	4.24E+02												
Arsenic	3.00E-04	1.50E+00	3.00E-02	3.22E+01	3.22E+01	6.24E-06	2.23E-06	2E-02	3E-06	9.36E-06	1.34E-07	3E-02	2E-07	2.47E-05	2.12E-06	8E-02	3E-06
Barium	4.90E-03	NA	NA	3.04E+02	3.04E+02												
Beryllium	1.40E-05	NA	NA	2.60E+00	2.60E+00												
Cadmium	1.25E-05	NA	1.00E-03	3.20E+00	3.20E+00	2.07E-08		2E-03		3.10E-08		2E-03		8.18E-08		7E-03	
Chromium	9.00E-05	NA	NA	3.93E+01	3.93E+01												
Cobalt	2.00E-02	NA	NA	4.78E+01	4.78E+01												
Copper	4.00E-02	NA	NA	3.05E+02	3.05E+02												
Iron	3.00E-01	NA	NA	6.40E+04	6.40E+04												
Manganese	1.87E-03	NA	NA	1.29E+03	1.29E+03												
Mercury	2.10E-05	NA	NA	9.50E-01	9.50E-01												
Nickel	8.00E-04	NA	NA	8.83E+01	8.83E+01												
Thallium	8.00E-05	NA	NA	1.80E+00	1.80E+00												
Vanadium	2.60E-05	NA	NA	2.85E+01	2.85E+01												
Zinc	3.00E-01	NA	NA	3.41E+02	3.41E+02												
Total Hazard Quotient and Cancer Risk:								3E-02	5E-05			5E-02	3E-06			1E-01	5E-05

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	CS =	EPC Surface and Subsurface	CS =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	2,800 cm^2
AF =	0.2 mg/cm^2	AF =	0.3 mg/cm^2	AF =	0.2 mg/cm^2
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 years	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE 9B
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CS = Chemical Concentration in Soil, from Soil EPC Data
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	EPC from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
						Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOCs																	
2-Methylnaphthalene	4.00E-03	NA	1.30E-01	3.10E+01	3.10E+01	2.60E-05		7E-03		3.90E-05		1E-02		1.03E-04		2.58E-02	
Acenaphthylene	NA	NA	1.30E-01	1.80E+00	1.80E+00												
Benzo(a)anthracene	NA	7.30E-01	1.30E-01	1.50E+02	1.50E+02		4.50E-05		3E-05		2.70E-06		2E-06		4.27E-05		3.12E-05
Benzo(a)pyrene	NA	7.30E+00	1.30E-01	1.20E+02	1.20E+02		3.60E-05		3E-04		2.16E-06		2E-05		3.42E-05		2.50E-04
Benzo(b)fluoranthene	NA	7.30E-01	1.30E-01	8.80E+01	8.80E+01		2.64E-05		2E-05		1.58E-06		1E-06		2.51E-05		1.83E-05
Benzo(ghi)perylene	NA	NA	1.30E-01	6.20E+01	6.20E+01												
Benzo(k)fluoranthene	NA	7.30E-02	1.30E-01	1.30E+02	1.30E+02		3.90E-05		3E-06		2.34E-06		2E-07		3.70E-05		2.70E-06
Carbazole	NA	2.00E-02	1.30E-01	7.70E+01	7.70E+01		2.31E-05		5E-07		1.39E-06		3E-08		2.19E-05		4.39E-07
Chrysene	NA	7.30E-03	1.30E-01	1.50E+02	1.50E+02		4.50E-05		3E-07		2.70E-06		2E-08		4.27E-05		3.12E-07
Dibenz(a,h)anthracene	NA	7.30E+00	1.30E-01	2.50E+01	2.50E+01		7.50E-06		5E-05		4.50E-07		3E-06		7.12E-06		5.20E-05
Dibenzofuran	2.00E-03	NA	1.00E-01	3.80E+01	3.80E+01	2.45E-05		1E-02		3.68E-05		2E-02		9.72E-05		4.86E-02	
Fluoranthene	4.00E-02	NA	1.30E-01	4.40E+02	4.40E+02	3.69E-04		9E-03		5.54E-04		1E-02		1.46E-03		3.66E-02	
Fluorene	4.00E-02	NA	1.30E-01	6.20E+01	6.20E+01	5.21E-05		1E-03		7.81E-05		2E-03		2.06E-04		5.15E-03	
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	1.30E-01	6.50E+01	6.50E+01		1.95E-05		1E-05		1.17E-06		9E-07		1.85E-05		1.35E-05
Naphthalene	2.00E-02	NA	1.30E-01	4.60E+01	4.60E+01	3.86E-05		2E-03		5.79E-05		3E-03		1.53E-04		7.65E-03	
Phenanthrene	NA	NA	1.30E-01	2.90E+02	2.90E+02												
Pyrene	3.00E-02	NA	1.30E-01	2.80E+02	2.80E+02	2.35E-04		8E-03		3.53E-04		1E-02		9.31E-04		3.10E-02	
Pesticides/PCBs																	
Aroclor-1260	2.00E-05	2.00E+00	1.40E-01	2.00E-01	2.00E-01	1.81E-07	6.46E-08	9E-03	1E-07	2.71E-07	3.87E-09	1E-02	8E-09	7.16E-07	6.14E-08	3.58E-02	1.23E-07
4,4'-DDE	NA	3.40E-01	3.00E-02	8.10E-01	8.10E-01		5.60E-08		2E-08		3.36E-09		1E-09		5.33E-08		1.81E-08
4,4'-DDT	5.00E-04	3.40E-01	3.00E-02	1.30E+00	1.30E+00	2.52E-07	8.99E-08	5E-04	3E-08	3.78E-07	5.40E-09	8E-04	2E-09	9.97E-07	8.55E-08	1.99E-03	2.91E-08
Alpha-BHC	NA	6.30E+00	1.00E-01	1.80E-02	1.80E-02		4.15E-09		3E-08		2.49E-10		2E-09		3.95E-09		2.49E-08
Heptachlor epoxide	1.30E-05	9.10E+00	1.00E-01	1.80E-01	1.80E-01	1.16E-07	4.15E-08	9E-03	4E-07	1.74E-07	2.49E-09	1E-02	2E-08	4.60E-07	3.95E-08	3.54E-02	3.59E-07
Metals																	
Aluminum	1.00E+00	NA	NA	1.80E+04	1.80E+04												
Antimony	6.00E-05	NA	NA	1.93E+01	1.93E+01												
Arsenic	3.00E-04	1.50E+00	3.00E-02	1.46E+01	1.46E+01	2.83E-06	1.01E-06	9E-03	2E-06	4.24E-06	6.06E-08	1E-02	9E-08	1.12E-05	9.60E-07	3.73E-02	1.44E-06
Barium	4.90E-03	NA	NA	1.79E+02	1.79E+02												
Cadmium	1.25E-05	NA	1.00E-03	1.21E+01	1.21E+01	7.81E-08		6E-03		1.17E-07		9E-03		3.09E-07		2.48E-02	
Chromium	9.00E-05	NA	NA	6.03E+01	6.03E+01												
Copper	4.00E-02	NA	NA	1.34E+02	1.34E+02												
Iron	3.00E-01	NA	NA	6.51E+04	6.51E+04												
Lead	NA	NA	NA	3.47E+03	3.47E+03												
Magnesium	NA	NA	NA	5.93E+04	5.93E+04												
Manganese	1.87E-03	NA	NA	1.33E+03	1.33E+03												
Mercury	2.10E-05	NA	NA	2.70E+00	2.70E+00												
Nickel	8.00E-04	NA	NA	1.10E+02	1.10E+02												
Thallium	8.00E-05	NA	NA	2.30E+00	2.30E+00												
Vanadium	2.60E-05	NA	NA	2.92E+01	2.92E+01												
Zinc	3.00E-01	NA	NA	3.66E+03	3.66E+03												
Total Hazard Quotient and Cancer Risk:								**7E-02**	**4E-04**			**1E-01**	**2E-05**			**3E-01**	**4E-04**

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	CS =	EPC Surface and Subsurface	CS =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	2,800 cm^2
AF =	0.2 mg/cm^2	AF =	0.3 mg/cm^2	AF =	0.2 mg/cm^2
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 years	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE 9C
CALCULATION OF ABSORBED DOSE AND RISK FROM DERMAL CONTACT TO SOIL
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59 STOCKPILE
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Equation for Intake (mg/kg-day) = $\frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$

Variables (Assumptions for Each Receptor are Listed at the Bottom):

CS = Chemical Concentration in Soil, from Soil EPC Data
CF = Conversion Factor
SA = Surface Area Contact
AF = Adherence Factor
ABS = Absorption Factor
EF = Exposure Frequency
ED = Exposure Duration
BW = Bodyweight
AT = Averaging Time

Equation for Hazard Quotient = Chronic Daily Intake (Nc)/Reference Dose

Equation for Cancer Risk = Chronic Daily Intake (Car) x Slope Factor

Analyte	Dermal RfD	Carc. Slope Dermal	Absorption Factor*	EPC Surface Soil	EPC from Total Soils	Industrial Worker				Construction Worker				Child at On-Site Day Care Center			
						Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk	Absorbed Dose (mg/kg-day)		Hazard Quotient	Cancer Risk
	(mg/kg-day)	(mg/kg-day)-1	(unitless)	(mg/kg)	(mg/kg)	(Nc)	(Car)			(Nc)	(Car)			(Nc)	(Car)		
SVOC																	
2,4,6-Tribromophenol	NA	NA	1.00E-01	9.90E-02	9.90E-02												
2-Fluorobiphenyl	NA	NA	1.00E-01	8.70E-02	8.70E-02												
Acenaphthylene	NA	NA	1.30E-01	3.50E+00	3.50E+00												
Benzo(a)anthracene	NA	7.30E-01	1.30E-01	1.40E+01	1.40E+01		4.20E-06		3E-06		2.52E-07		2E-07		3.99E-06		2.91E-06
Benzo(a)pyrene	NA	7.30E+00	1.30E-01	1.60E+01	1.60E+01		4.80E-06		4E-05		2.88E-07		2E-06		4.56E-06		3.33E-05
Benzo(b)fluoranthene	NA	7.30E-01	1.30E-01	1.10E+01	1.10E+01		3.30E-06		2E-06		1.98E-07		1E-07		3.13E-06		2.29E-06
Benzo(ghi)perylene	NA	NA	1.30E-01	8.00E+00	8.00E+00												
Benzo(k)fluoranthene	NA	7.30E-02	1.30E-01	1.30E+01	1.30E+01		3.90E-06		3E-07		2.34E-07		2E-08		3.70E-06		2.70E-07
Chrysene	NA	7.30E-03	1.30E-01	1.30E+01	1.30E+01		3.90E-06		3E-08		2.34E-07		2E-09		3.70E-06		2.70E-08
Dibenz(a,h)anthracene	NA	7.30E+00	1.30E-01	2.90E+00	2.90E+00		8.70E-07		6E-06		5.22E-08		4E-07		8.26E-07		6.03E-06
Indeno(1,2,3-cd)pyrene	NA	7.30E-01	1.30E-01	8.00E+00	8.00E+00		2.40E-06		2E-06		1.44E-07		1E-07		2.28E-06		1.66E-06
Pentachlorophenol	3.00E-02	1.20E-01	1.00E-01	6.60E-01	6.60E-01	4.26E-07	1.52E-07	1E-05	2E-08	6.39E-07	9.13E-09	2E-05	1E-09	1.69E-06	1.45E-07	5.63E-05	1.74E-08
Phenanthrene	NA	NA	1.30E-01	1.70E+01	1.70E+01												
Pesticides																	
4,4'-DDD	NA	2.40E-01	3.00E-02	4.50E-01	4.50E-01		3.11E-08		7E-09		1.87E-09		4E-10		2.96E-08		7E-09
4,4'-DDE	NA	3.40E-01	3.00E-02	2.30E-01	2.30E-01		1.59E-08		5E-09		9.55E-10		3E-10		1.51E-08		5E-09
4,4'-DDT	5.00E-04	3.40E-01	3.00E-02	5.20E-01	5.20E-01	1.01E-07	3.60E-08	2E-04	1E-08	1.51E-07	2.16E-09	3E-04	7E-10	3.99E-07	3.42E-08	8E-04	1E-08
Metals																	
Aluminum	1.00E+00	NA	NA	1.34E+04	1.34E+04												
Antimony	6.00E-05	NA	NA	4.39E+01	4.39E+01												
Arsenic	3.00E-04	1.50E+00	3.00E-02	7.30E+00	7.30E+00	1.41E-06	5.05E-07	5E-03	8E-07	2.12E-06	3.03E-08	7E-03	5E-08	5.60E-06	4.80E-07	2E-02	7E-07
Barium	4.90E-03	NA	NA	1.35E+02	1.35E+02												
Cadmium	1.25E-05	NA	1.00E-03	1.20E+00	1.20E+00	7.75E-09		6E-04		1.16E-08		9E-04		3.07E-08		2E-03	
Chromium	9.00E-05	NA	NA	3.50E+01	3.50E+01												
Copper	4.00E-02	NA	NA	5.18E+01	5.18E+01												
Iron	3.00E-01	NA	NA	2.65E+04	2.65E+04												
Lead	NA	NA	NA	1.44E+03	1.44E+03												
Manganese	1.87E-03	NA	NA	1.22E+03	1.22E+03												
Mercury	2.10E-05	NA	NA	5.20E-01	5.20E-01												
Nickel	8.00E-04	NA	NA	5.66E+01	5.66E+01												
Silver	2.00E-04	NA	NA	4.70E+00	4.70E+00												
Thallium	8.00E-05	NA	NA	9.90E-01	9.90E-01												
Vanadium	2.60E-05	NA	NA	3.54E+01	3.54E+01												
Total Hazard Quotient and Cancer Risk:								6E-03	5E-05			8E-03	3E-06			2E-02	5E-05

Assumptions for Industrial Worker		Assumptions for Construction Worker		Assumptions for Child at On-Site Day Care Center	
CF =	1E-06 kg/mg	CF =	1E-06 kg/mg	CF =	1E-06 kg/mg
CS =	EPC Surface Only	CS =	EPC Surface and Subsurface	CS =	EPC Surface Only
BW =	70 kg	BW =	70 kg	BW =	15 kg
SA =	3,300 cm^2	SA =	3,300 cm^2	SA =	2,800 cm^2
AF =	0.2 mg/cm^2	AF =	0.3 mg/cm^2	AF =	0.2 mg/cm^2
EF =	250 days/year	EF =	250 days/year	EF =	250 days/year
ED =	25 years	ED =	1 years	ED =	6 years
AT (Nc) =	9,125 days	AT (Nc) =	365 days	AT (Nc) =	2,190 days
AT (Car) =	25,550 days	AT (Car) =	25,550 days	AT (Car) =	25,550 days

Note: Cells in this table were intentionally left blank due to a lack of toxicity data.
NA= Information not available.

TABLE 10A
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - FUTURE INDUSTRIAL USE SCENARIO
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	4E-01	20%	3E-06	3%
	Ingestion of Soil	2E+00	78%	7E-05	58%
	Dermal Contact to Soil	3E-02	2%	5E-05	40%
	Ingestion of Groundwater	NQ		NQ	
	TOTAL RECEPTOR RISK (Nc & Car)	*2E+00*	100%	*1E-04*	100%
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	3E+00	40%	1E-06	8%
	Ingestion of Soil	5E+00	59%	9E-06	70%
	Dermal Contact to Soil	5E-02	1%	3E-06	22%
	TOTAL RECEPTOR RISK (Nc & Car)	*8E+00*	100%	*1E-05*	100%
CHILD AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	8E-02	0.5%	2E-07	0%
	Ingestion of Soil	1E+01	98.6%	2E-04	77%
	Dermal Contact to Soil	1E-01	0.9%	5E-05	23%
	Ingestion of Groundwater	NQ		NQ	
	TOTAL RECEPTOR RISK (Nc & Car)	*1E+01*	100%	*2E-04*	100%

NQ= Not Quantified due to lack of toxicity data.

TABLE 10B
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - FUTURE INDUSTRIAL USE SCENARIO
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-71
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	4E-01	36.5%	3E-06	0%
	Ingestion of Soil	6E-01	56.2%	5E-04	54%
	Dermal Contact to Soil	7E-02	7.3%	4E-04	46%
	Ingestion of Groundwater	NQ		NQ	
	TOTAL RECEPTOR RISK (Nc & Car)	*1E+00*	100%	*9E-04*	100%
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	3E+00	62%	1E-06	1.4%
	Ingestion of Soil	2E+00	36%	6E-05	71.2%
	Dermal Contact to Soil	1E-01	2%	2E-05	27.4%
	TOTAL RECEPTOR RISK (Nc & Car)	*5E+00*	100%	*9E-05*	100%
CHILD AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	7E-02	1.3%	2E-07	0%
	Ingestion of Soil	5E+00	93.5%	1E-03	74%
	Dermal Contact to Soil	3E-01	5.2%	4E-04	26%
	Ingestion of Groundwater	NQ		NQ	
	TOTAL RECEPTOR RISK (Nc & Car)	*6E+00*	100%	*1E-03*	100%

NQ= Not Quantified

TABLE 10C
CALCULATION OF TOTAL NONCARCINOGENIC AND CARCINOGENIC RISKS - FUTURE INDUSTRIAL USE SCENARIO
REASONABLE MAXIMUM EXPOSURE (RME) - SEAD-59 STOCKPILE SAMPLES
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

RECEPTOR	EXPOSURE ROUTE	HAZARD INDEX		CANCER RISK	
		Hazard Index	Percent Contribution	Cancer Risk	Percent Contribution
INDUSTRIAL WORKER	Inhalation of Dust in Ambient Air	3E-01	49%	2E-06	2%
	Ingestion of Soil	3E-01	50%	6E-05	53%
	Dermal Contact to Soil	6E-03	1%	5E-05	45%
	Ingestion of Groundwater	NQ		NQ	
	TOTAL RECEPTOR RISK (Nc & Car)	*7E-01*	100%	*1E-04*	100%
CONSTRUCTION WORKER	Inhalation of Dust in Ambient Air	3E+00	72%	7E-07	6%
	Ingestion of Soil	1E+00	28%	8E-06	68%
	Dermal Contact to Soil	8E-03	0%	3E-06	26%
	TOTAL RECEPTOR RISK (Nc & Car)	*4E+00*	100%	*1E-05*	100%
CHILD AT ON-SITE DAY CARE CENTER	Inhalation of Dust in Ambient Air	7E-02	2.1%	9E-08	0%
	Ingestion of Soil	3E+00	97.2%	1E-04	73%
	Dermal Contact to Soil	2E-02	0.7%	5E-05	27%
	Ingestion of Groundwater	NQ		NQ	
	TOTAL RECEPTOR RISK (Nc & Car)	*3E+00*	100%	*2E-04*	100%

NQ= Not Quantified

Table 11
Summary of Risk-Driving COPC Concentrations - SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Site		SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59
Sample ID		WS-59-01-006-3	WS-59-01-006-9	WS-59-01-007-14	WS-59-01-007-8	WS-59-01-008-2	WS-59-01-008-3	WS-59-01-011-1
Sample Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date		5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004
Carcinogenic PAHs								
Benzo(a)anthracene	UG/KG	5300	5600	13000	6900	8400	7800	8200
Benzo(a)pyrene	UG/KG	6900	7400	14000	8200	11000	9400	9500
Benzo(b)fluoranthene	UG/KG	4600	5400	9800	5800	7300	6700	10000
Benzo(k)fluoranthene	UG/KG	4300	5400	11000	6300	7200	6500	4200
Chrysene	UG/KG	5400	5700	13000	7000	8500	7900	8000
Dibenz(a,h)anthracene	UG/KG	1600 J	1500 J	2500 J	1600 J	2200 J	1900 J	1600 J
Indeno(1,2,3-cd)pyrene	UG/KG	4500 J	4700 J	7000 J	4100 J	5900 J	5200 J	5800
Benz(a)pyrene Equivalent Concentration	**MG/KG**	**10.0**	**10.6**	**19.7**	**11.6**	**15.5**	**13.4**	**13.6**
Other COPCs								
Antimony	MG/KG							
Iron	MG/KG					26500		
Lead	MG/KG							
Vanadium	MG/KG							

Notes:
1. Benzo(a)pyrene equivalence results greater than 10 mg/kg are presented.

2. The maximum concentration is presented for selected risk-driving COPCs other than carcinogenic PAHs. In addition, the maximum concentration is presented for lead. For antimony, the top three highest results are presented.

Table 11
Summary of Risk-Driving COPC Concentrations - SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Site		SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59
Sample ID		WS-59-01-011-2	WS-59-01-011-7	WS-59-01-011-8	WS-59-01-011-9	WS-59-01-012-3	WS-59-01-016-1	WS-59-01-016-14	WS-59-01-016-20
Sample Matrix		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date		5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004
Carcinogenic PAHs									
Benzo(a)anthracene	UG/KG	6900	14000	12000	7700	10000	8200	8400	6800
Benzo(a)pyrene	UG/KG	7400	16000	15000	9900	16000	7600	7300	8500
Benzo(b)fluoranthene	UG/KG	8100	11000	11000	7700	11000	6400	5300	6400
Benzo(k)fluoranthene	UG/KG	3200	13000	11000	7600	13000	6700	5800	6500
Chrysene	UG/KG	6600	13000	12000	7700	11000	9000	7900	7500
Dibenz(a,h)anthracene	UG/KG	1200 J	2800 J	2600 J	1900 J	2900 J	1200 J	1300 J	1800 J
Indeno(1,2,3-cd)pyrene	UG/KG	4500	8000 J	7000 J	5100 J	7800 J	3400 J	3700 J	5000 J
Benz(a)pyrene Equivalent Concentration	**MG/KG**	**10.6**	**22.4**	**20.8**	**14.0**	**22.0**	**10.8**	**10.5**	**12.3**
Other COPCs									
Antimony	MG/KG								
Iron	MG/KG								
Lead	MG/KG								
Vanadium	MG/KG								

Notes:
1. Benzo(a)pyrene equivalence results greater than 10 mg/kg are presented.

2. The maximum concentration is presented for selected risk-driving COPCs other than carcinogenic PAHs. In addition, the maximum concentration is presented for lead. For antimony, the top three highest results are presented.

Table 11
Summary of Risk-Driving COPC Concentrations - SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Site		SEAD-59	SEAD-59	SEAD-59	SEAD-59	SEAD-59
Sample ID		WS-59-01-015-14	WS-59-01-015-16	WS-59-01-011-5	WS-59-01-007-10	WS-59-01-016-10
Sample Matrix		SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date		5/6/2004	5/6/2004	5/6/2004	5/6/2004	5/6/2004
Carcinogenic PAHs						
Benzo(a)anthracene	UG/KG					
Benzo(a)pyrene	UG/KG					
Benzo(b)fluoranthene	UG/KG					
Benzo(k)fluoranthene	UG/KG					
Chrysene	UG/KG					
Dibenz(a,h)anthracene	UG/KG					
Indeno(1,2,3-cd)pyrene	UG/KG					
Benz(a)pyrene Equivalent Concentration	**MG/KG**					
Other COPCs						
Antimony	MG/KG	43.9 J	12	15.6 J		
Iron	MG/KG					
Lead	MG/KG					1440
Vanadium	MG/KG				35.4	

Notes:
1. Benzo(a)pyrene equivalence results greater than 10 mg/kg are presented.

2. The maximum concentration is presented for selected risk-driving COPCs other than carcinogenic PAHs. In addition, the maximum concentration is presented for lead. For antimony, the top three highest results are presented.

Table 12 - Benzo(a)pyrene Toxicity Equivalent Concentrations for SEAD-59/71 and SEAD-59 Stockpile Samples
RI/FS - Mini Risk Assessment
Seneca Army Depot Activity

Site	Total Number of Samples	BTE Maximum (mg/kg)	BTE Average[1] (mg/kg)	Total Number of samples Where BTE > 10 mg/kg		
SEAD-59						
SEAD-59	**215**	**20.9**	**2.2**	**3**		
SEAD-71						
SEAD-71 Outside Fenced Area	62	39.8	2.1	3		
Fenced Area at SEAD-71	15	178.1	47.6	7		
SEAD-71 (Sum)	**77**	**178.1**	**10.9**	**10**		
SEAD-59 Stockpile Samples						
Stockpile Staging Areas	**Total Number of Samples**	**BTE Maximum (mg/kg)**	**BTE Average[1] (mg/kg)**	**Total Number of samples Where BTE > 10 mg/kg**	**Number of Stockpile Lots**	**Estimated Volume[3] (cubic yards)**
Building 128	3	15.5	12.4	2	3	450
North Staging Area	15	19.7	8.4	4	15	2,250
Additional Staging Area	10	22.4	12.4	6	10	1,500
South Staging Area	23	12.3	5.9	3	29	4,350
SEAD-59 Area 4 Staging Area	1	0.3	0.3	0	1	150
Unknown Area[2]	1	7.5	7.5	0	1	150
SEAD-59 Stockpile Samples (Sum)	**53**	**22.4**	**8.0**	**15**	**59**	**8,850**

BTE - Benzo(a)pyrene Toxicity Equivalent Concentration

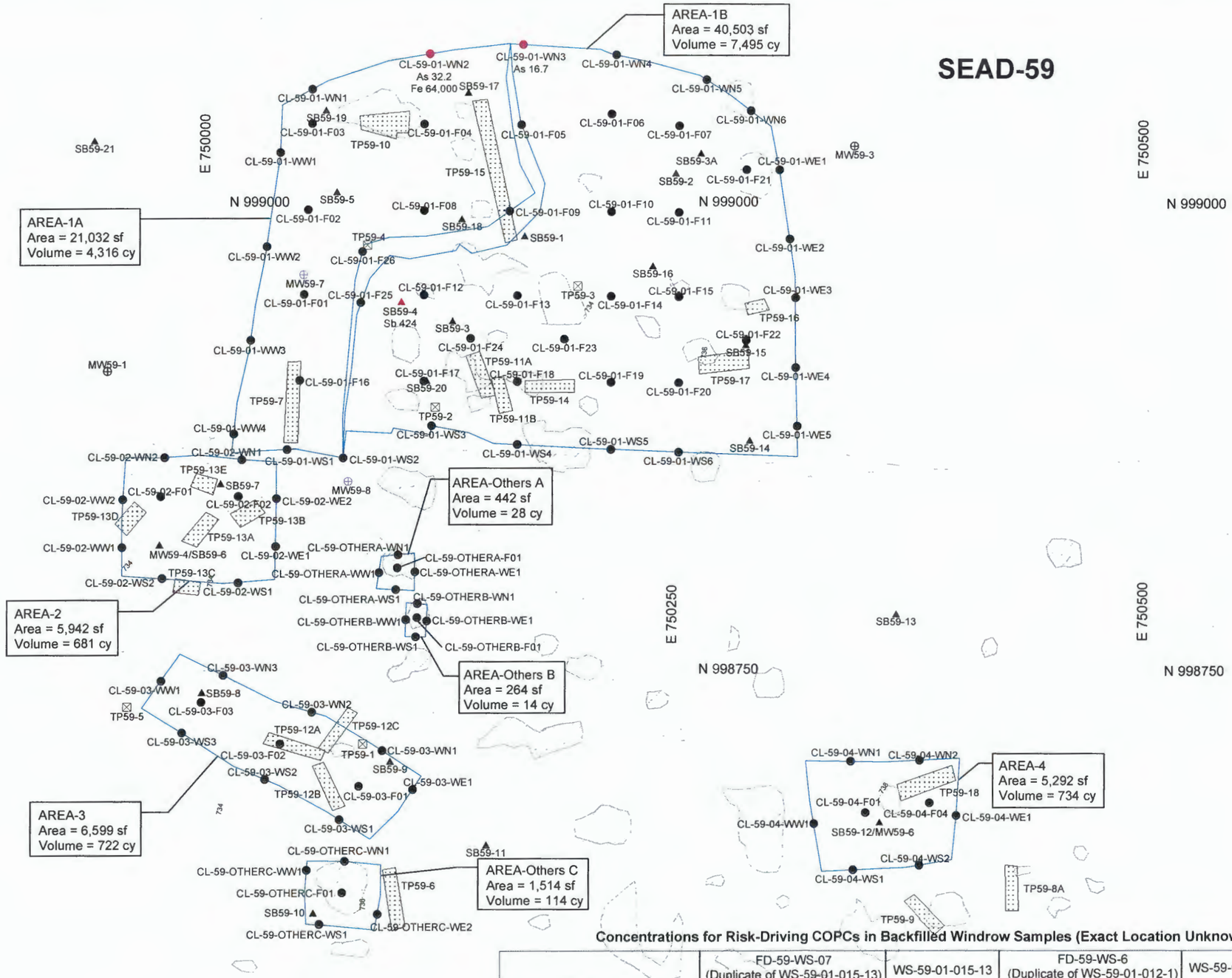
Notes:

1) Field duplicate pair was considered as one discrete sample and the results were averaged to represent the concentration for the location. Results for fill material were not included in the calculation for SEAD-71.

2) The stockpile staging location for stockpile collected from SEAD-59 Area 1, windrow 013, lot 2 is unknown.

3) A lot is approximately 150 cy according to the ENSR 2002 TCRA Completion Report.

SEAD-59



Concentrations for Risk-Driving COPCs in Backfilled Windrow Samples (Exact Location Unknown)

	FD-59-WS-07 (Duplicate of WS-59-01-015-13)	WS-59-01-015-13	FD-59-WS-6 (Duplicate of WS-59-01-012-1)	WS-59-01-013-1
Benzo(a)pyrene (mg/kg)	14	2.1	8.4	7.0
Benzo(a)pyrene Toxicity Equivalent Concentration (mg/kg)	20.9	3.0	11.5	10.2

NOTES: 1. Windrows associated with WS-59-01-012-1 and WS-59-01-013-1 were backfilled to area 1, 3, or 4 according to the ENSR (2002) TCRA Removal Report.
2. No information is available for whereabout of windrow associated with WS-59-01-015-13.

O:\Seneca\Sead5971_2004\71site.mxd

Legend:

- Base Map Feature
- Test Pit
- Test Pit Location
- Monitoring Well Location (installed during ESI)
- Monitoring Well Location (installed during TCRA)
- Soil Boring/Soil Sample Location
- Time-Critical Removal Action Confirmatory Sample Location
- TCRA Excavation Limit
- Contour
- Surface Debris
- ▲ or ● Sample Location
- CL-59-01-WN3 with Risk-Driving COPCs
- As 16.7 Risk-Driving Concentration (mg/kg) for Selected Risk-Driving COPCs

N

NOTE:
1. Historical investigative sample locations and confirmatory sample locations excavated during the 2002 Time-Critical Removal Action are not shown in the figure.

60 30 0 60 Feet

PARSONS

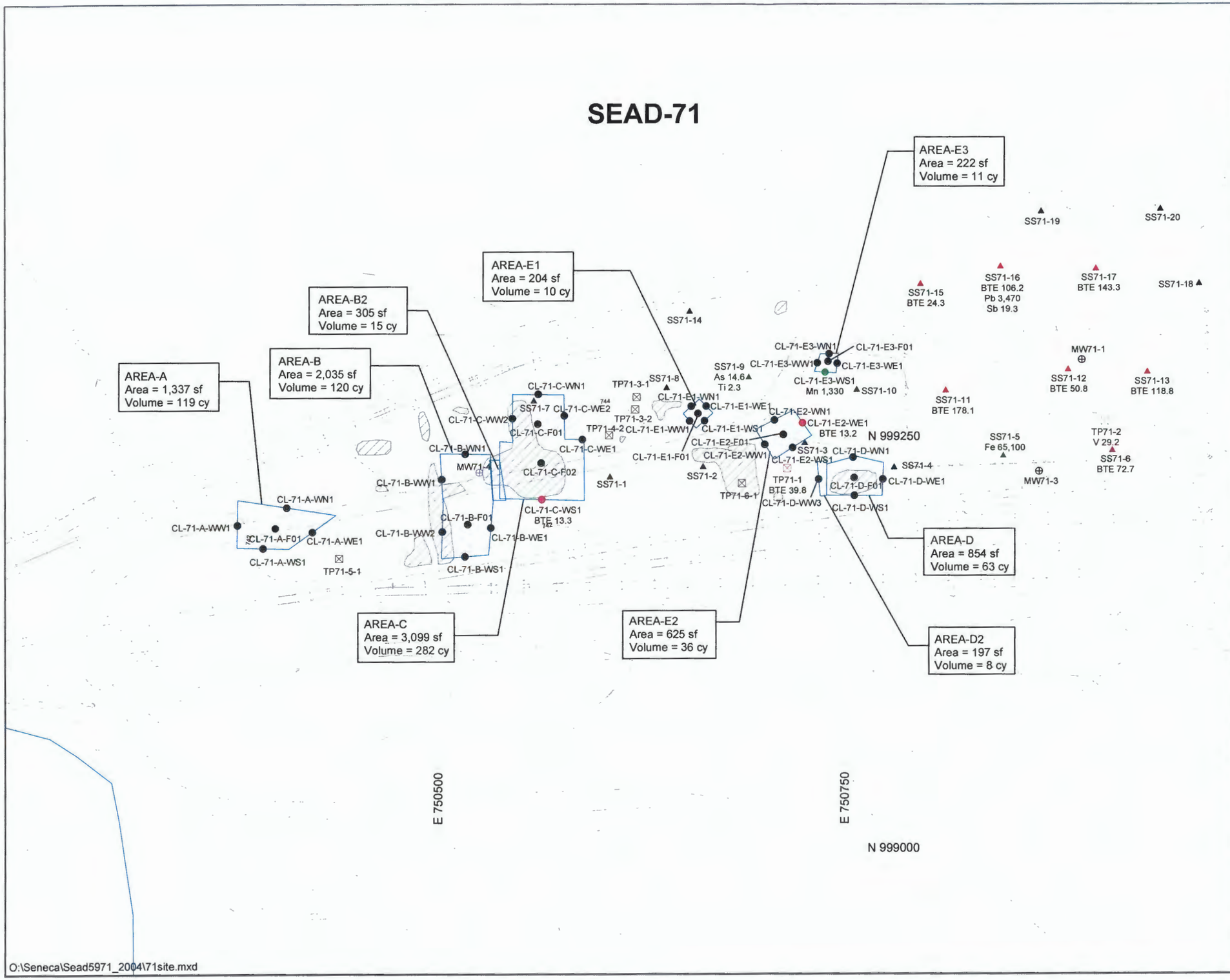
SENECA ARMY DEPOT ACTIVITY
RI/FS Following TCRA at
SEAD-59 and SEAD-71

FIGURE 1

SEAD-59
RISK-DRIVING SAMPLE LOCATIONS

September 2004 | 743519-02300

SEAD-71



O:\Seneca\Sead5971_2004\71site.mxd

Legend:

N

- Base Map Feature
- ⊠ Test Pit Location
- ⊕ Monitoring Well Location (installed during ESI)
- ⊕ Monitoring Well Location (installed during TCRA)
- ▲ Soil Boring/Soil Sample Location
- ● Time-Critical Removal Action Confirmatory Sample Location
- TCRA Excavation Limit
- Contour
- Suspected Location of GPR Anomaly
- ▲ or ⊠ or ● SS71-9 As 146 — Sample Location with Maximum Concentration Detected for Selected Risk-Driving COPCs; Maximum Concentration (mg/kg)
- ▲ or ⊠ or ● SS71-11 BTE 178.1 — Sample Location with Benz(a)pyrene Toxicity Equivalent Concentrations Greater Than 10 mg/kg; Benz(a)pyrene Toxicity Equivalent Concentrations (mg/kg)

NOTE:
1. Historical investigative sample locations and confirmatory sample locations excavated during the 2002 Time-Critical Removal Action are not shown in the figure.

60 30 0 60 Feet

PARSONS

SENECA ARMY DEPOT ACTIVITY
RI/FS Following TCRA at
SEAD-59 and SEAD-71

FIGURE 2

SEAD-71
RISK-DRIVING SAMPLE LOCATIONS

September 2004	743519-02300

BCT Agenda
15 June 2004
1330-1630 Hours
16 June 2004
0900-1400 hours

15 June

1. Status review of all projects.

2. Update of ROD language approval by Dept of Defense and Dept of Justice.

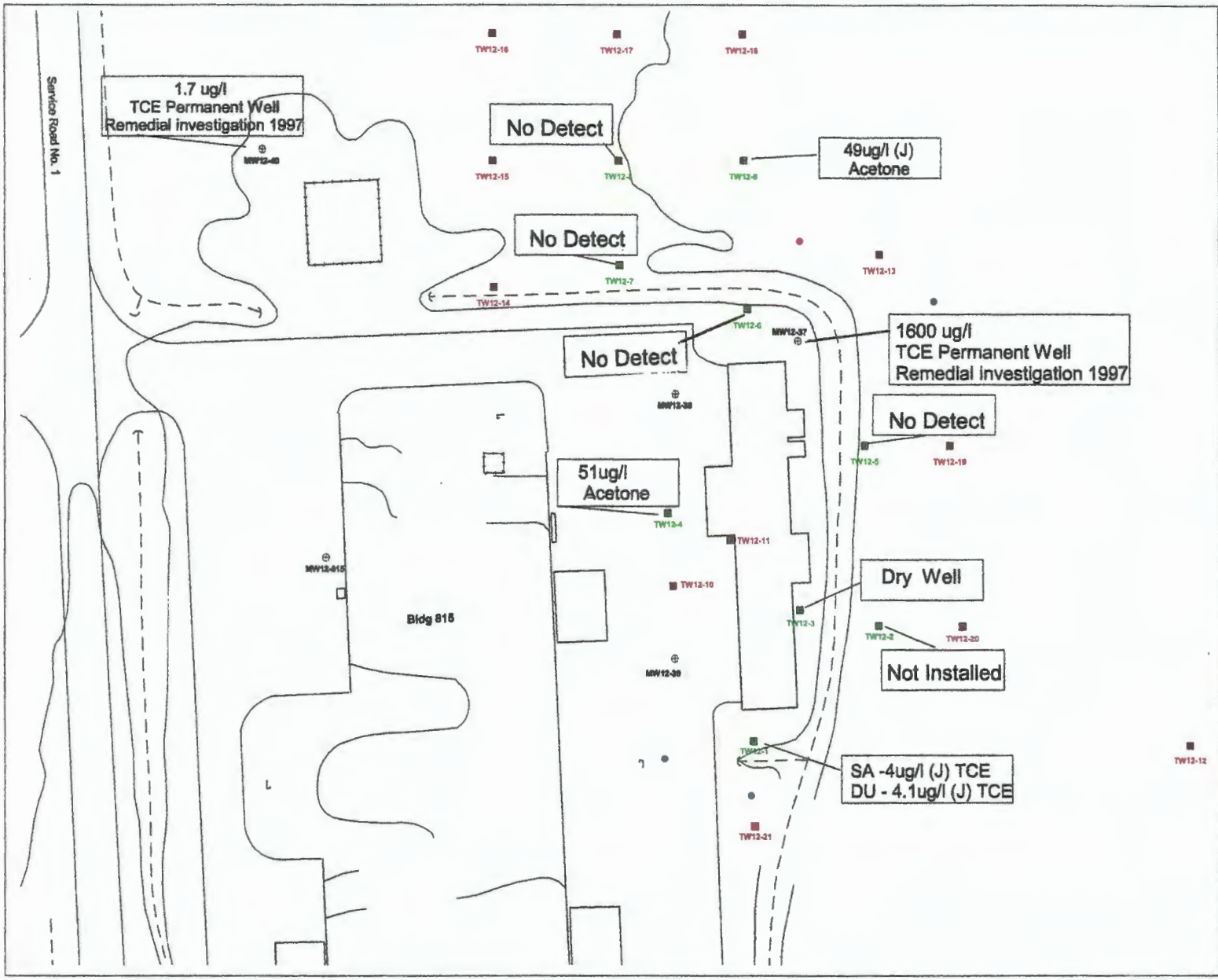
3. SEAD 12 GW results of Phase II sampling at BLDG 813.

4. SEAD 4 discussion of proposed limits of Excavation for the ROD.

5. Open discussion

16 June

Tour of sites
SEAD 23
SEAD 12
SEAD 63
SEAD 13
SEAD 48



LEGEND

SG12-128
⊕ SOIL GAS SAMPLE LOCATION

MW12-37
⊕ MONITORING WELL LOCATION

TW12-37
⊕ TEMPORARY WELL LOCATION

GREEN - 1st phase of borings

RED - 2nd phase of borings
6 of 12 to be installed
based on first round
results

TW12-37
● PROPOSED NEW TEMPORARY WELL LOCATIONS

N

50 0 50 Feet

PARSONS

SENECA ARMY DEPOT ACTIVITY
SUPPLEMENTAL RI
SEAD 12

FIGURE 8
PROPOSED TEMPORARY WELL LOCATIONS

SCALE 1:50 | DATE JUNE 2004

LEGEND

Depth of Excavation (ft)

- 1.0
- 4.0
- 7.0
- 9.0

Note: Excavation will not exceed these depths prior to confirmation sampling but may be shallower in some locations

- $ Soil Sample
- # Soil Boring
- % Sediment Sample
- Monitoring Well

Note: Only surface soil and ditch soil chromium data are posted on this figure

EXCAVATION VOLUME

	Approx vol (CY)
Pond Area	14,347
Former T30 (incl ditch to pond)	3,023
W Ditch	386
Bldg 2084	845
SE Ditch	105
TOTAL	18,706

100 0 100 200 Feet

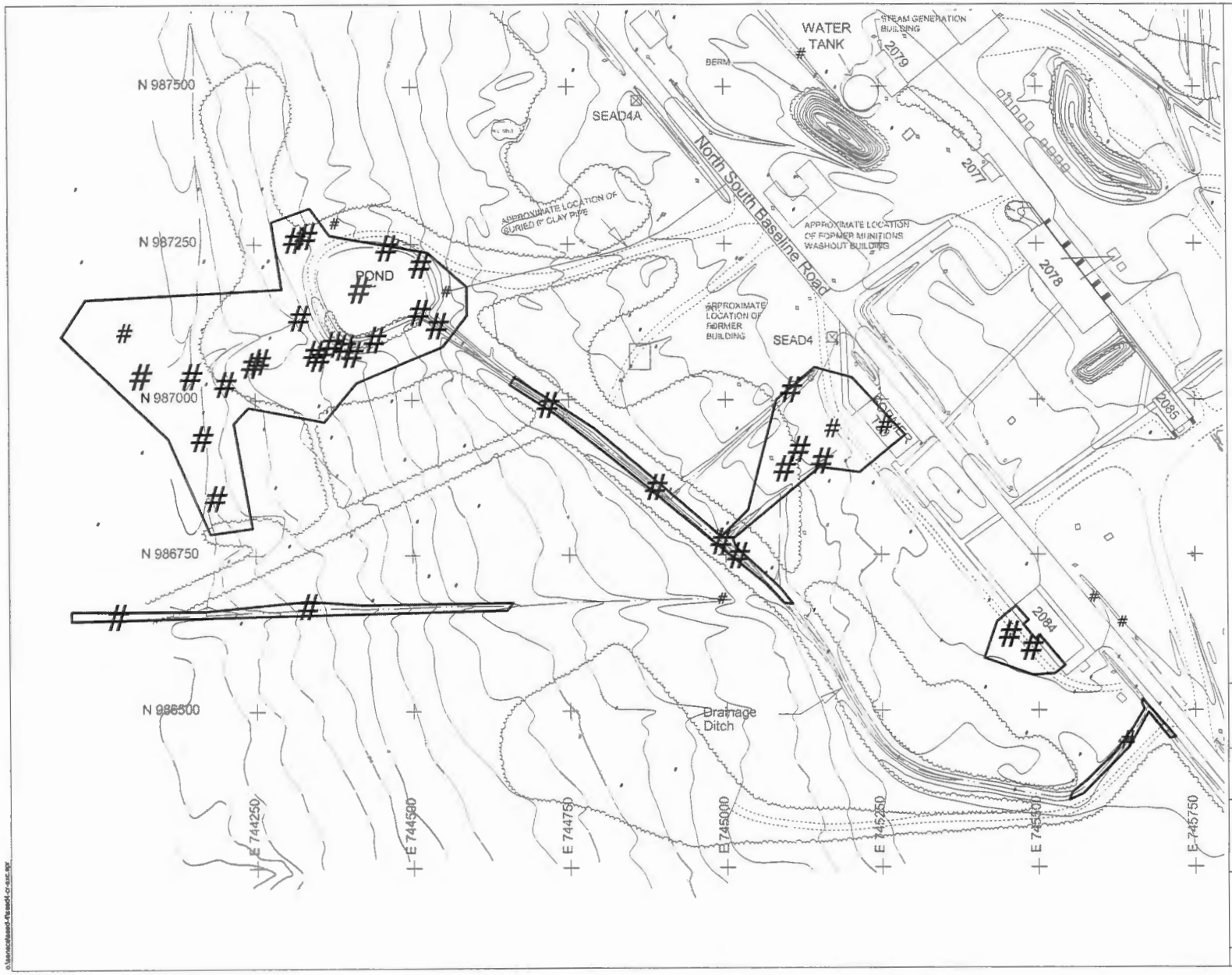
PARSONS

SENECA ARMY DEPOT ACTIVITY

SEAD-4

FIGURE 1
AREAS OF EXCAVATION
OF CONTAMINATED SOIL

1" = 150'	MAY 2004



LEGEND

Proposed Area of Excavation

Surface Soil
Chromium Concentration (ppm)

- . < 40 = 2x avg. site background
- # 40 - 59 = < 2x 95th percentile site background
- # 60 - 89 = < 3x 95th percentile site background
- # > 90 = > 3x 95th percentile site background

N

100 0 100 200 Feet

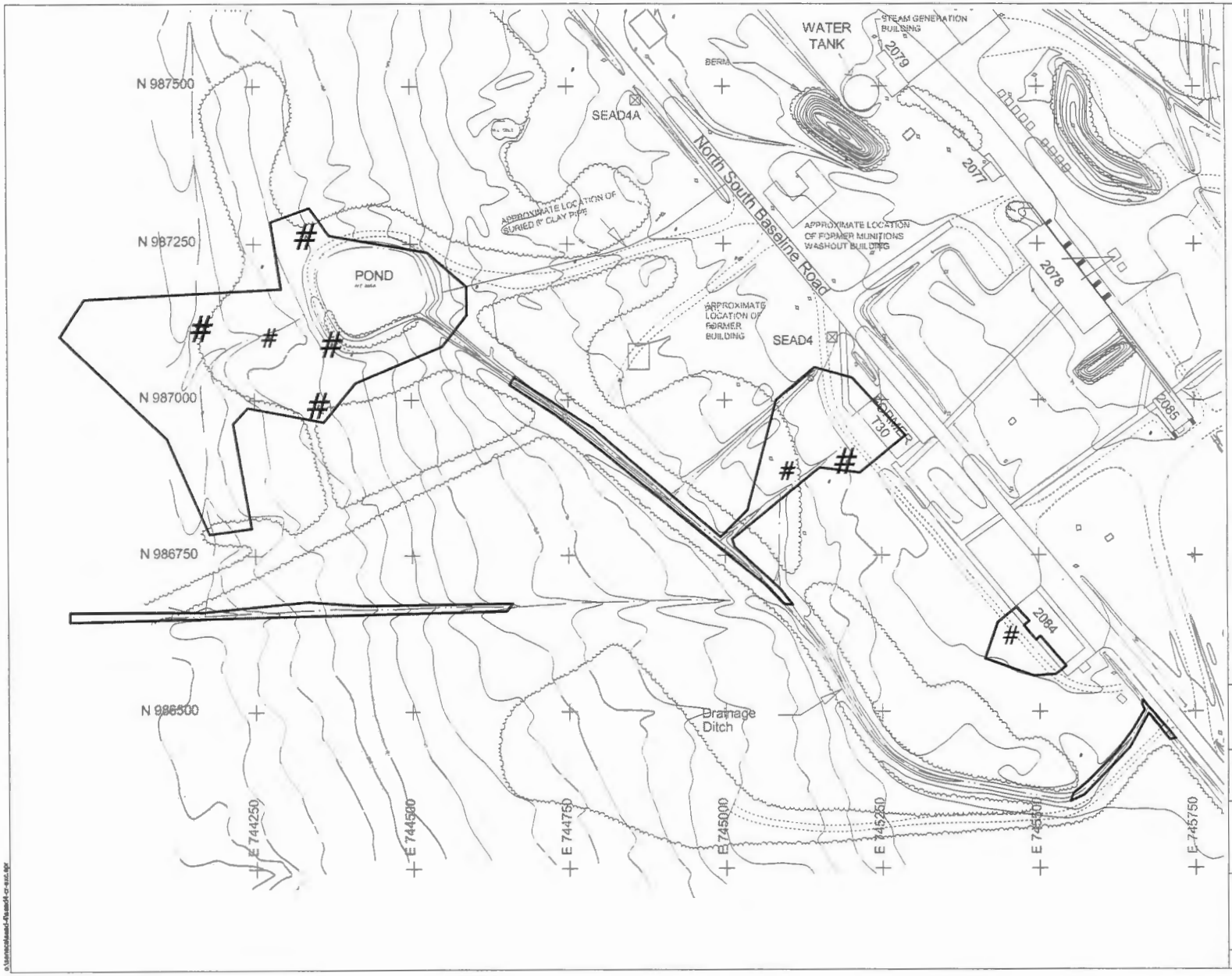
PARSONS

SENECA ARMY DEPOT ACTIVITY

SEAD-4

FIGURE 2
CHROMIUM CONCENTRATIONS IN SURFACE SOIL

1" = 150'	MAY 2004



LEGEND

Proposed Area of Excavation

Subsurface Soil
Chromium Concentration (ppm)

- . < 40 = 2x avg. site background
- # 40 - 59 = < 2x 95th percentile site background
- # 60 - 89 = < 3x 95th percentile site background
- # > 90 = > 3x 95th percentile site background

N

100 0 100 200 Feet

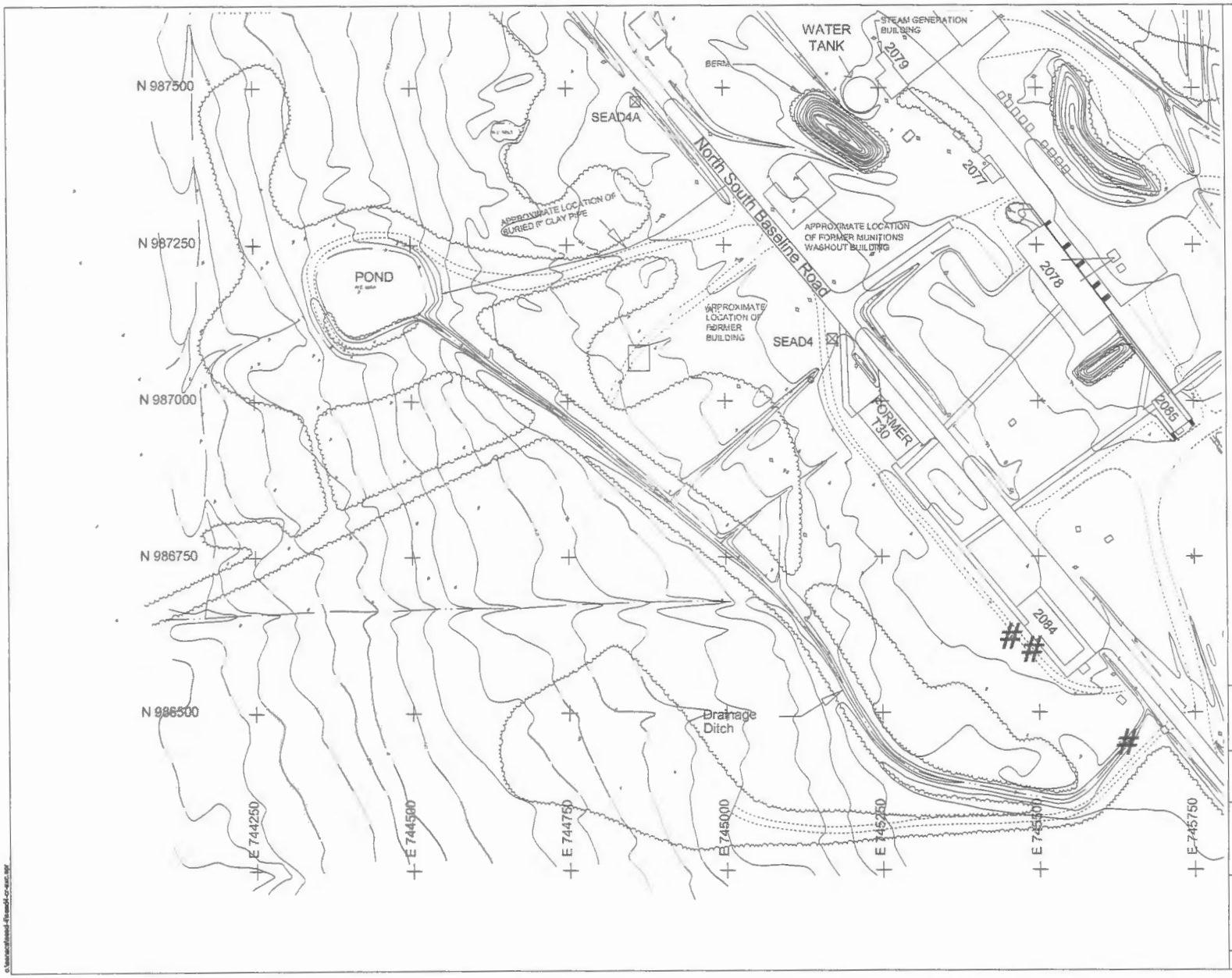
PARSONS

SENECA ARMY DEPOT ACTIVITY

SEAD-4

FIGURE 3
CHROMIUM CONCENTRATIONS IN SUBSURFACE SOIL

1" = 150'	MAY 2004



LEGEND

Surface Soil
Lead Concentration (ppm)

. < 400

> 400

N

100 0 100 200 Feet

PARSONS

SENECA ARMY DEPOT ACTIVITY

SEAD-4

FIGURE 4
LEAD CONCENTRATIONS IN SURFACE SOIL

1" = 150'	MAY 2004

BCT Meeting Summary
Seneca Army Depot Activity
Tuesday, April 19, 2004
Meeting Minutes

Attending:

Steve Absolom, SEDA
Randy Battaglia, NY District
Tom Enroth, NY District
Janet Fallo, NY District
Tom Battaglia, NY District
Kevin Healy, USACE – Huntsville
Joseph White, NYSDEC
Todd Heino, Parsons
Jeff Adams, Parsons
Julio Vazquez, US EPA (phone)
Pat Jones, Seneca County IDA (phone)

The meeting was convened at approximately 1:30 p.m. The opening discussion focused on a review of Records of Decision that are under review by the EPA, NYSDEC, and the Army.

At present there are four RODs in progress; 1) IC sites in the PID; 2) Ash Landfill; 3) SEAD-25/26 and 4) SEAD-50/54. S. Absolom reported that the Army's legal counsel has flagged the inclusion of the State of New York's Environmental Conservation Law (ECL) Title 13, Section 27-1318 (Institutional and Engineering Controls) as an Applicable or Relevant and Appropriate Requirement (ARAR) as a problem to their final acceptance of three of the four RODs (i.e., IC Sites, Ash, and 25/26) as currently written. Under this requirement, if institutional or engineering controls are included as part of the proposed remedy, an easement must be established and maintained for a period of 25 years. Imposition of this requirement violates the US Government's sovereign immunity; the State of New York cannot mandate that an easement be put on Government property. This issue appears to relate primarily to how the ECL is cited in the Appendices of the three RODs as an ARAR, and not how it is presented in the main text of each of the subject RODs (See Sections 1, 5, and 9 or 11). S. Absolom proposed that he thought he thought that the issue could be removed if the Army and the State could develop a mechanism and wording that indicated that the Army agreed with the substantive requirements of the law, but did not explicitly identify the law as an ARAR.

J. White indicated that it is his understanding that the State wants the law left listed as an ARAR. However, he acknowledges that personnel associated with other federal sites (Griffiths, and Hancock) had also expressed similar reservations. He further indicated that the law would apply at transfer of the land from the Federal Government to other parties, thus new owners of transferred property such as the SCIDA would have to make the required annual certifications

that the institutional controls (ICs) were in place, and that nothing at the site has changed to alter their applicability.

P. Jones asked if the law was retroactive, and J. White indicated that is was, for at least a period of 15 years before the enactment of the law. It was further stated that the requirement probably applied to the transferred property at the north end of the Depot (KidsPeace) where a groundwater restriction is in place. Further, while this requirement is not applicable to the ROD that is under review for SEAD-50/54, which covers part of the site where the County plans to build a new jail, it does apply to property outside of SEAD-50/54 which are included in the land that is subject to a ROD under the IC Site work. P. Jones indicated that if this were the case, the County may need to have their legal counsel review the law and the clause prior to accepting the site from the Army. At this point all parties agreed that the biggest issue associated with this law is the continuing, annual inspection, reporting and certification requirement that must be performed by licensed professionals (NY P.E.s). It was further pointed out, that as of this time there is no stipulated or identified civil or criminal penalty for failure to comply with the requirements of the law.

S. Absolom and J. White agreed to discuss possible modifying language for inclusion into the three affected RODs (i.e., IC Sites, SEAD-25/26, Ash). Once mutually acceptable language was developed, he would forward it to Army counsel for review, comment and approval.

The topic of discussion next moved onto a review and status update of projects underway at the Depot. T. Heino indicated that Parsons next planned action for SEAD-16 and 17 was to reissue Final versions of the Proposed Plan and Record of Decision by the end of the month. However, this ROD would also be impacted by the Army's position on the applicability/enforceability of the ECL language. Before this could be done, we would need to receive and incorporate the proposed Army/State language dealing with the ECL.

With reference to SEAD-4, Parsons indicated that the Army is still awaiting NYSDEC comments on, or approval of, its most recent response to prior comments issued by the State on the Feasibility Study. J. White indicated that he was aware that comments were needed, and expressed a desire to review a couple of matters related to the extent of excavation area at some point after this meeting.

Parsons indicated that it was in the process of finalizing responses to the EPA comments. Overall, the Army is proposing to conduct a non-time-critical, interim removal measure during fiscal year 05. The Army says that it anticipates that the funding will be programmed for fiscal year 05, and it needs to move forward with the review and approval of the Action Memoranda for this work. J. White indicates that he has previously asked that documents associated with the proposed IRM at SEAD-11 be made available on a website and announced to the public before

proceeding with the work, and has yet to get an answer. S. Absolom indicates that he has identified a website that is available for this purpose, but is still awaiting information about the cost implications of maintaining the website.

S. Absolom indicated that the Army is still awaiting the EPA's authorization to submit final copies of Records of Decisions for the IC Sites in the PID Area, SEAD-50/54 and the Ash Landfill. J. Vazquez indicated that he has not heard anything back from the Regional upper management other than an indication that there are a few typographical corrections that needed to be made before finalization. However, finalization of these will need to await the Army's and NYSDEC's concurrence on appropriate language regarding the inclusion of ECL 27-1318.

Parsons indicated that it is awaiting NYSDEC review and comments or approval of the Decision Document for SEAD-13. J. White indicated that he still has not looked at this document and it will be reviewed after SEAD-4 and SEAD-11 documents.

The Army indicated that it continues to await the NYSDEC's comments on the DRAFT Closure Report that was submitted for SEAD-1 and SEAD-2 in September 2003. As of this date, no comment had been received from the RCRA group at NYSDEC, but this may be associated with the Army's delay in preparing and submitting closure plans for other RCRA sites at the Depot (SEAD-16/17, Burn Tray, SEAD-72). The Army further indicated that it would follow up with the NYSDEC RCRA group on this matter, and that it was planning to have Parsons begin preparation of necessary plans for the other sites at the Depot. The Army's general approach at the other site would be to indicate that many of the RCRA closure actions would be implemented under the continuing CERCLA activities at SEAD-16/17 and the OB Grounds. Plans would be developed for the closure of the Burn Tray and SEAD-72.

Parsons indicated that it had recently (early March 2004) submitted a copy of the FINAL Findings Report for the Small Arms Range at the Lake Shore Housing Area to both the EPA and the NYSDEC. This document had been issued containing revisions needed to address the EPA's comments on the DRAFT version of this report. It is the Army's position that nothing else is needed to close out this site.

Parsons indicated that it recently (March 2004) submitted a copy of the DRAFT version of the NRC Final Status Survey Report for SEAD-48. The EPA/NYSDEC indicated that both had received the document and that it was presently under review. J. White indicated that the CD copy of the report provided to him did not conform to prior submittals made by Parsons, and he requested that this CD be redone consistent with prior versions of other documents. Parsons agreed to provide a new copy of the CD to the NYSDEC.

Parsons reported that it had received comments from the EPA on the DRAFT Sampling Report for the PID Area sites (SEAD-121C – DRMO Yard and 121I Cosmoline Oil Site). No comments had yet been received from the NYSDEC. The EPA comments have been received and are under review. Parsons will await receipt of comments from the NYSDEC before proceeding with the finalization of responses to these comments.

Parsons reported that the last scheduled quarterly sampling event at the Ash Landfill and Permeable Reactive Barrier wall were recently performed and completed. It expects that the report for this effort will be issued in late June/early July 2004. This sampling was performed in conjunction with other sampling associated with continuing studies at the SEAD-59/71 sites and the SEAD-48 site. Results of each of these actions should be forthcoming.

Parsons reported that the planned continuing investigation work in SEAD-12, in the vicinity of Buildings 813 and 814, is scheduled to begin in mid May 2004. This work involves the further investigation and analysis of an isolated, chlorinated solvent plume that has been identified in the area. Parsons and the Army also indicated that they hoped to initiate work at the Mound Site in the PID Area (SEAD-121J or EBS site 109(7)). The work at SEAD-121J is intended as a limited site inspection to provide data to see if there is any indication of a release. As of this time, the Army has not received any comments from the NYSDEC on its proposed work plan. J. White indicated that he had received comments from the NYSDEC, but had yet to have time to review the work plan.

Parsons reported that it had submitted a copy of the FINAL Characterization Report for the Small Arms Range, Airfield Site. This report presents and summarizes all of the results from the site investigations conducted at this site, but does not include the results of the Treatability Study that was completed at this site, which will be reported separately in the near future. It is the Army's position that the results of the site investigations indicate that this site is suitable for transfer to the SCIDA and that the site can be closed out. Since the SCIDA and the State Police are awaiting transfer of this site, so that it can be reused, S. Absolom is requesting that the EPA and the NYSDEC move this report to the top of their review list to expedite close-out of this site.

S. Absolom indicated that he had not seen a copy of the NYSDEC's concurrence letter for the Record of Decision for SEAD-50/54. J. White indicated that the concurrence letter has not yet been issued, because the NYSDEC is trying to figure out how a ROD for No Further Action at the site with no land use controls will intermesh with the overall IC Site ROD that does have land use controls. The Army indicated that it believed that the governing document for this area would continue to be the IC Site ROD due to the continuing restrictions on the use of groundwater in this area. However, this restriction does not result based on findings from the site, but as a result of conditions found generally within the PID Area.

Discussion next moved to a presentation of the results of the SEAD-67 IRM, which focused on the removal of contaminated soil piles from a site that is located at the northern end of the PID Area. Summary data and a map of sampling locations from confirmational samples were reviewed and discussed. J. White asked many questions about the sampling program performed and how the extent of excavation was determined. T. Battaglia provided commentary on how the work was performed by the selected IRM contractor. As a result of the discussions, the Army agreed to include additional clarification information and commentary within the IRM summary report. This information would be provided once the Army contacted the IRM contractor and obtained requested information.

The last discussion of the meeting focused on a summary of the pending work that is scheduled to commence shortly at the OB Grounds. MKM has been retained to conduct the work at the OB Grounds, and has been authorized to mobilize to the site and commence work dealing with the removal of the oversize material pile that remains at the site. A work plan will be issued prior to the actual initiation of the work with the pile. If the EPA or the NYSDEC had comments or questions on the work plan, responses would be prepared and provided. At present, site preparation is the only activity that is authorized, beyond preparation of the work plan. The Army indicated that MKM will be responsible for sorting, screening, and characterizing the materials contained in the pile. S. Absolom indicated that material that was found to contain greater than 500 ppm of lead would be removed from the site and disposed off-site at licensed facilities. Material found to contain greater than 60 but less than 500 ppm of lead would be left on site but covered with 9 inches of clean fill. Material containing 60 or less ppm of lead would remain on site and did not need covering. All totaled, approximately 20,000 cubic yards of soil and other materials will be managed; this material has already been screen so there is very little fine material entrained within it, most of the remaining material is oversized (greater than 0.5 inches). All material handled will be batched in 200 cubic yard or less piles and characterized before disposition determination. A Completion Report will be prepared and issued at the completion of the work to close out the site under CERCLA.

The Army asked if there had been any agreement reached regarding what material qualified as suitable backfill or covering for the site. J. Vazquez indicated that comparison of backfill analytical data to TAGMs was used to call a soil "clean;" while J. White indicated that the he was amenable to the use of material that met NYS Department of Transportation specifications. The Army asked what analyses needed to be performed to characterize and qualify the soil for use under TAGMs and J. Vazquez indicated that characterization needed to include VOCs, SVOCs, Pesticides and PCBs and Metals. The Army asked the frequency of testing that was required (every load, once from each selected source, etc.) but no specification was provided. The Army requested that all parties reach agreement on the requirements for backfill at the site within the next 7 to 14 days so that the scheduled work could proceed on time. J. Vazquez indicated that he would look into alternative criteria to TAGMs for qualifying soil for use as backfill.

Outstanding Issues:

- Army to Clarify verification sampling procedures and results from SEAD-67.
- Army, EPA, and NYSDEC to reach agreement establishing requirements for selecting/qualifying backfill for use at the OB Grounds.
- Army requests that the EPA and NYSDEC expedite review and approval of the Final Characterization Report for the Small Arms Range, Airfield.

The meeting was adjourned at approximately 4:30 p.m. All parties were reminded of the planned RAB Meeting that would be held at 7:00 p.m. at the Romulus Town Hall in Willard, New York which included presentations on the Small Arms Range, Airfield Site Final Characterization Report, the Draft Sampling Report for the PID Area (SEAD-121C and SEAD-121I), and the Work Plan for the planned investigation at the Mound Area (EBS Site 109(7)).

If so, the SEAD property, an NPL site, would not be subject to the brownfields portions of the New York law. (Is SEAD also listed on the NY Registry mentioned?)

2) Even if the requirement were to include SEAD, we cannot comply as a matter of federal real property law. Army cannot impose an environmental easement on actively-held federal land because we are prohibited from transferring a property interest to another entity (here, the State) while the land is in federal ownership. (If you want backup, I've got it).

3) The NY easement requirement is a procedural, real estate requirement - not a substantive cleanup standard that would normally serve as an ARAR. Meanwhile, Section 27-1318, imposing the easement requirement, has no implementing regulations. Without these, it is hard to see how it rises to the level of an ARAR.

WAY FORWARD:

This said, there are a number of aspects of this NY provision we would actually favor - including imposing (State enforced) requirement onto the transferee to make sure that LUCs are maintained. Since it can be in our interest to impose such a requirement, post transfer, we may want to work with the State on this issue. So, we need to split apart the real property aspects of this requirement from any status as an ARAR.

a) We need to state that the NY environmental easement is not an ARAR because it is a procedural real estate requirement, as opposed to a substantive cleanup standard (and there are no implementing regulations). However we can do the following:

b) Offer to impose the NY easement upon transfer and outline this commitment in our transfer documentation. We can also make note of our intention to impose the easement upon transfer within the ROD -- but this would be part of our outline of the LUCs imposed at this site. The easement would not be an ARAR. This approach keeps the State's requirement in the context where is belongs -- a procedural real property requirement. The reason for doing this is that Army is prohibited from imposing such an environmental easement/covenant on actively-held land.

c) The State requirement indicates that the NY environmental easement shall be executed within 60 days of commencement of the remedial design. I gather from the emails I've seen that transfer of the property is planned very soon. Since we are still executing the ROD, and we are not yet at the RD stage, we could impose the easement as part of our transfer and still meet the State's window period for executing their real estate requirement.

d) We can look at other requirements contained in the NY requirement to see if there are alternative means we can use to meet Sec. 27-1318. For example, a main requirement is an annual certification that LUCs are in place. We can agree, as part of

our remedy, that Army will conduct such annual inspections and certifications and that post-transfer, the transferee will uphold the requirements of Sec. 27-1318.

e) On the outside, we could make another offer. We can impose a "LUC notice" on the actively held property, which would be converted to an environmental easement in favor of the State upon transfer. This notice tells folks about the LUCs imposed but does not create any property right (which we can't do). However, before this option could be offered, we would have to consider NY real property law. Some State's law treats "deed notices" and "deed covenants" as the same - in these States, we cannot provide a notice without creating a property interest. This process is more involved, so we should reserve this option unless we really need it.

FALLBACK: We could agree that the State requirement is an "appropriate and relevant" requirement - not an ARAR. However, since the State seems to be happy with AF's proposals allowing the imposition of the easement upon transfer, we need not get into this option for now.

Kate

-----Original Message-----
From: Citron, Stan Civ AMCCC
To: Barfield, Kate S Ms LITCTR
Cc: Wilson, Creighton H USAEC; Wilcox, William A Jr Mr USALSA; German, John Civ AMCCC; Hinnant, Clarence D MAJ BRACO; 'Stephen Absolom'

Sent: 4/14/2004 5:05 PM
Subject: FW: Legal comments ROD SEAD 25 and 26

Kate -

1. Background - AEC Legal (Creighton Wilson) has raised a concern with using a recent NY State IC law as an ARAR in a SEAD ROD. The primary concern is that the NY State IC law requires an env easement be placed on property that is subject to institutional controls. A copy of the State law is included as an attachment. This rises a similar situation to the current dispute with Colorado.

2. Recommenation - Recommend the following strategy to resolve this matter:

a. Request the state to drop the State IC law as an ARAR and the Army will agree to prepare the RD consistent with the State IC law but no env easement until property transfer. We expect the Army will be responsible for the annual certification (LRA

previously refused to assume this responsibility).

NOTE - Based on previous discussions, the SEAD BEC believes that this proposal will not be acceptable to the State.

2. If the state rejects Option 1, the Army should sign the SEAD ROD with current IC language provided the env easement is put on the property at the time of transfer. In addition, the Army would send a separate letter reserving the right to revisit this issue in the future. RATIONAL - The env easement issue is primarily as active installation issue that should not prevent the transfer of BRAC property. The Army is in a better position to fight this issue at an active installation where we have the best facts to support our position.

3. If Option 1 and 2 are not acceptable, we would want to attempt to negotiate with the LRA and regulators to allow the SEAD property transfers to move forward without the approved ROD. RATIONAL - There is no substantive disagreement regarding the remedy or LUC implementation. This is an authority/legal issue that can be resolved through the FFA dispute resolution process (or other appropriate means) but it should not delay future SEAD property transfers.

Let's talk at your convenience.

Stan

STANLEY R. CITRON
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-----Original Message-----
From: Wilson, Creighton H USAEC
Sent: Tuesday, April 13, 2004 11:37 AM
To: 'stephen.m.absolom@us.army.mil'; Boes, Christopher D USAEC/Versar; German, John Civ AMCCC; Citron, Stan Civ AMCCC
Cc: Wilson, Creighton H USAEC; Tozzi, Kenneth J LTC USAEC

Subject: RE: Legal comments ROD SEAD 25 and 26

Stan,
don't know if you're handling discussions with the state on this or not but my thought is to get them to drop the ARAR and we will voluntarily prepare RD "consistent with" Section 1318, but no easement until transfer of the property and we view the owner as responsible for annual

submission.

v/r
Creighton H. Wilson
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(410)-436-1659

-----Original Message-----
From: Wilson, Creighton H USAEC
Sent: Tuesday, April 13, 2004 11:03 AM
To: Hinnant, Clarence D MAJ BRACO; Wilcox, William A Jr Mr USALSA; Barfield, Kate S Ms LITCTR
Cc: Anderegg, Elaine S Mrs BRACO; Vance, Shirley S Ms BRACO; Baker, Douglas S COL BRACO; Hood, Wesley Mr BRACO; Wilson, Creighton H USAEC; German, John Civ AMCCC; Citron, Stan Civ AMCCC; Boes, Christopher D USAEC/Versar; 'stephen.m.absolom@us.army.mil'; Tozzi, Kenneth J LTC USAEC

Subject: RE: Legal comments ROD SEAD 25 and 26

Doug & all,

This is a very similar issue to the one that the services are encountering in the state of Colorado. The basic issue is whether or not a state can apply a requirement on the

services (or federal property in general) to impose a use restriction covenant/ easement (enforceable

by the state) on our property.

The latest versions of the Seneca RODs (Ash Landfill, PID and 25/26) added similar language to the following:

"The LUC RD for SEAD-25 and SEAD-26 will comply with New York State requirements outlined in Environmental Conservation Law (ECL) Article 27, Section 1318: Institutional and Engineering Controls"

The ARARs list also included the following:

· New York State Environmental Conservation Law (ECL), Title 13, Inactive Hazardous Waste Disposal Sites; Article 27, Section 1318, Institutional and Engineering Controls.

NOTE: Section 1318 references Title 36 of Article 71, which requires the owner of the property to do an environmental easement on the property. So we are really talking about a dual requirement, one for what must go into the remedial design/workplan and one for the easement.

Since this issue is of interest to the Army Secretariat, consistent with the Policy for Staffing and approving RODs, I am forwarding this John German and Stan Citron in coordination with Bill Wilcox and ELD for review of the ROD and this ARAR issue. For BRAC RODs, I only provide comments to AEC, who in turn provide overall comments back to the BRAC FO.

I have attached my latest comments for Seneca 25/26 and the law for reference. I have not given an opinion on the above law b/c at the time

I did not have a copy of it. I remain available to discuss this issue with ELD and NCR FO.

v/r
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information protected under the attorney-client privilege. Portions of this transmission may contain information also protected from disclosure under the Freedom of Information Act, 5 USC §552. Do not release this information without prior authorization from the sender. If this has inadvertently reached the wrong party, please delete this information immediately and notify the sender.

-----Original Message-----
From: Hinnant, Clarence D MAJ BRACO
Sent: Tuesday, April 13, 2004 8:43 AM
To: 'stephen.m.absolom@us.army.mil'; Boes, Christopher D USAEC/Versar; Wilson, Creighton H USAEC; German, John Civ AMCCC; Citron, Stan Civ AMCCC

Cc: Anderegg, Elaine S Mrs BRACO; Jacqueline Travers; Janet Fallo; Jeff Adams; Vance, Shirley S Ms BRACO; Todd Heino; Baker, Douglas S COL BRACO; Hood, Wesley Mr BRACO

Subject: RE: Legal comments ROD SEAD 25 and 26

Creighton, the State has approved the PID area ROD...The EPA is just wordsmithing it now. If you say the NYS law is not applicable or relevant the State will no longer approve the ROD and who knows when this 1000 acres will transfer.

Please work with us on this.

v/r

Doug

-----Original Message-----
From: stephen.m.absolom@us.army.mil [mailto:stephen.m.absolom@us.army.mil]
Sent: Tuesday, April 13, 2004 8:06 AM
To: Boes, Christopher D USAEC/Versar; Wilson, Creighton H USAEC; German, John Civ AMCCC; Citron, Stan Civ AMCCC
Cc: Hinnant, Clarence D MAJ BRACO; Anderegg, Elaine S Mrs BRACO; Jacqueline Travers; Janet Fallo; Jeff Adams; Vance, Shirley S Ms BRACO; Todd Heino

Subject: Legal comments ROD SEAD 25 and 26

Chris, Creighton, and all,

Please provide me a date when the determination of whether the NYS Law regarding ICs is relevant and appropriate as an ARAR for the subject ROD and the legal sufficiency determination can be made. This determination will effect 3 RODs that are in final review before signature. I am sure the NY will invoke the dispute resolution clause of the FFA should we

determine that this law is not an ARAR. The Air Force is also looking into this, so a DOD position may be appropriate.

This decision will also start to hold up my ability to transfer the Planned Industrial Developement Area (PID) and the associated approximate 1000 acres. One of the three RODs under final this is listed as an ARAR and the only action on the sites are the ICs.

An expeditious review will be appreciated as this impacts my ability to complete the process, commit and expense approved funding and transfer property.

SM Absolom
SEDA BEC
<<SEAD25/26>> <<FW: Revisions to SEAD-25/26 ROD>>

Main Identity

From: "Citron, Stan Civ AMCCC" <stan.citron@us.army.mil>
To: <stephen.m.absolom@us.army.mil>
Sent: Monday, April 19, 2004 11:55 AM
Subject: FW: Legal comments ROD SEAD 25 and 26

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-----Original Message-----
From: Citron, Stan Civ AMCCC
Sent: Friday, April 16, 2004 8:55 AM
To: Barfield, Kate S Ms LITCTR
Cc: Wilson, Creighton H USAEC; German, John Civ AMCCC; Hinnant, Clarence D MAJ BRACO; "Stephen Absolom' '; Wilcox, William A Jr Mr USALSA

Subject: RE: Legal comments ROD SEAD 25 and 26

Kate -

Thanks. This sounds like a reasonable pathforward that I will discuss further with the SEAD folks. Could you send me Carolyn White's new telephone number so that I can some addition info on the Air Force's experience with this issue?

Stan

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-----Original Message-----
From: Barfield, Kate S Ms LITCTR
Sent: Thursday, April 15, 2004 9:48 AM
To: Wilcox, William A Jr Mr USALSA; Citron, Stan Civ AMCCC
Cc: Wilson, Creighton H USAEC; German, John Civ AMCCC; Hinnant, Clarence D MAJ BRACO; "Stephen Absolom' '; Willis, Jeffrey S LTC USALSA

Subject: RE: Legal comments ROD SEAD 25 and 26

Bill and Stan:

Here is a synopsis of thoughts on the NY easement issue. I will lay out our best options and then hand this action over to Bill.

I just got an email from Carolyn White - AF is dealing with similar issues with the State of NY. It seems that NY is happy with idea of having AF impose the State easement upon transfer and they are willing to back down on the ARAR issue. I asked to be kept informed if she hears anything different. Given this, I'm going to focus on how we can take a similar tack.

THRESHOLD ISSUES:

1) Let's start at the beginning. It is possible that the NY easement requirement (Sec. 27-1318) may not apply to SEAD. The main section of the law addresses "brownfield sites", which are "any real property, the redevelopment or reuse of which may be complicated by the presence or potential presence of a hazardous waste, petroleum, pollutant, or contaminant." NY. Code Env. § 27-1405(2). However, the definition expressly excludes sites listed on the National Priorities List (NPL), sites listed on the New York Registry of Inactive Hazardous Waste Disposal Sites, or sites subject to certain state or federal enforcement actions or cleanup actions.

APPENDIX D
SUMMARY OF ARARS FOR THE SELECTED REMEDY

APPENDIX D: SUMMARY OF ARARS FOR THE SELECTED REMEDY

D.1 ARAR-BASED REMEDIAL OBJECTIVES

The investigation and cleanup of SEAD-25 and SEAD-26 falls under the jurisdiction of both the State of New York regulations (administered by NYSDEC) and Federal regulations (administered by USEPA Region II). Three categories of potentially applicable state and federal requirements are reviewed separately in the subsequent subsections. The three categories of Applicable or Relevant and Appropriate Requirements (ARARs) are chemical specific, location specific and action specific. A brief regulatory discussion of ARARs is given below.

In 40 CFR §300.5, USEPA defines applicable requirements as those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental, or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. Relevant and appropriate requirements are defined as those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Any standard, requirement, criterion, or limitation under any federal or state environmental or facility siting law may be either applicable or relevant and appropriate to a specific action; they can not be both. The only state laws that may become ARARs are those promulgated such that they are legally enforceable and generally applicable and equivalent to or more stringent than federal laws. A determination of applicability is made for the requirements as a whole, whereas a determination of relevance and appropriateness may be made for only specific portions of a requirement. An action must comply with relevant and appropriate requirements to the same extent as an applicable requirement with regard to substantive conditions, but need not comply with the administrative conditions of the requirement.

As mentioned earlier in this section, three categories of ARARs were analyzed. They are as follows: chemical-specific, location-specific, and action-specific. Chemical-specific ARARs address certain contaminants or a class of contaminants and relate to the level of contamination allowed for a specific pollutant in various environmental media (water, soil, air). Chemical-specific ARARs are identified below, sub-divided into media-specific sections. Location-specific ARARs are based on the specific setting and nature of the site. Action-specific

ARARs relate to specific actions proposed for implementation at a site. Both location-specific and action-specific ARARs are independent of the media. In addition to ARARs, advisories, criteria or guidance may be evaluated as "To Be Considered" (TBC) regulatory items. CERCLA indicates that the TBC category could include advisories, criteria or guidance that were developed by USEPA, other federal agencies or states that may be useful in developing CERCLA remedies. These advisories, criteria or guidance are not promulgated and, therefore, are not legally enforceable standards such as ARARs.

The NCP §300.430 (P)(5)(ii)(B) requires that the selected remedy attains federal and state ARARs, or obtains a waiver of an ARAR.

D.2 CHEMICAL-SPECIFIC ARARs

Chemical-specific ARARs are usually health or risk-based standards limiting the concentration of a chemical found in, or discharged to, the environment. They govern the extent of site remediation by providing actual cleanup levels, or the basis for calculating such levels for specific media. Specific chemical-specific ARARs for SEAD-25 and SEAD-26 are:

- 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-25 and -26 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.

D.3 LOCATION-SPECIFIC ARARS

Location-specific ARARs may serve to limit contaminant concentrations, or even to restrict or to require some forms of remedial action in environmentally or historically sensitive areas at a site, such as natural features (including wetlands, flood-plains, and sensitive ecosystems) and manmade features (including landfills, disposal areas, and places of historic or archaeological significance). These ARARs generally restrict the concentration of hazardous substances or the conduct of activities based solely on the particular characteristics or location of the site.
Potential federal and State location-specific ARARs considered in connection with this response action include the following:

Federal:

- Executive Orders 11593, Floodplain Management (May 24, 1977), and 11990, Protection of Wetlands (May 24, 1977).
- National Historic Preservation Act (16 USC §470) Section 106 and 110(f) and the associated regulations (i.e. 36 CFR part 800) (requires federal agencies to identify all affected properties on or eligible for the National Register of Historic Places and consult with the State Historic Preservation Office and Advisory Council on Historic Presentation)
- RCRA Location Requirements and 100-year Floodplains (40 CFR 264.18(b)).
- Clean Water Act, Section 404, and Rivers and Harbor Act, Section 10 (requirements for Dredge and Fill Activities) and the associated regulations (i.e. 40 CFR part 230).
- Wetlands Construction and Management Procedures (40 CFR part 6, Appendix A).

New York State:

- New York State Freshwater Wetlands Law (New York Environmental Conservation Law (ECL) articles 24 and 71).
- New York State Freshwater Wetlands Permit and Classification Requirements (6 NYCRR 663 and 664).
- New York State Floodplain Management Act, ECL, article 36, and Floodplain Management regulations (6 NYCRR part 500).
- New York State Inactive Hazardous Waste Disposal Sites (6 NYCRR 375).
- Endangered and Threatened Species of Fish and Wildlife, Species of Special Concern Requirements (6 NYCRR part 182).
- New York State Flood Hazard Area Construction Standards.

D.4 ACTION-SPECIFIC ARARS

Action-specific ARARs are usually technology or activity-based requirements or limitations that control actions involving specific substances. Action-specific ARARs generally set performance or design standards, controls, or restrictions on particular types of activities. To develop technically feasible alternatives, applicable performance or design standards must be considered during the development of all response action alternatives.

Potential federal and state action specific ARARs considered in connection with this response action include the following:

Federal:

- RCRA Subtitle C Hazardous Waste Treatment Facility Design and Operating Standards for Treatment and Disposal systems, (i.e., landfill, incinerators, tanks, containers, etc.) (40 CFR parts 264 and 265); RCRA section 3004(o), 42 USC 6924(o) (RCRA statutory minimum technology requirements).
- RCRA, Subtitle C, Closure and Post-Closure Standards (40 CFR 264, Subpart G).
- RCRA Groundwater Monitoring and Protection Standards (40 CFR, Subpart F).
- 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).
- Safe Drinking Water Act, Underground Injection Control Requirements (40 CFR parts 144 and 146).

- RCRA Land Disposal Restrictions (40 CFR part 268) (on and off-site disposal of excavated soil).
- CWA--NPDES Permitting Requirements for Discharge of Treatment System Effluent (40 CFR parts 122-125).
- CWA--Effluent Guidelines for Organic Chemicals, Plastics and Synthetic Fibers (discharge limits) (40 CFR part 414).
- CWA--Discharge to POTW—general Pretreatment regulations (40 CFR part 403).
- DOT Rules for Hazardous Materials Transport (49 CFR part 107, and 171.1-171.500).
- OSHA Standards for Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120, and procedures for General Construction Activities (29 CFR parts 1910 and 1926).
- RCRA Air Emission Standards for Process Vents, Equipment Leaks, and Tanks, Surface Impoundments, and Containers (40 CFR subparts AA, BB, and CC.)

New York State:

- New York State Environmental Conservation Law (ECL), Title 13, Inactive Hazardous Waste Disposal Sites; Article 27, Section 1318, Institutional and Engineering Controls.
- New York State Pollution Discharge Elimination System (SPDES) Permit Requirements (Standards for Stormwater Runoff, Surface Water, and Groundwater Discharges (6 NYCRR 750-757).
- New York State RCRA Hazardous Management Standards for Hazardous Waste Treatment Facilities (*i.e.,* landfills, incinerators, tanks, containers, etc.)' and Minimum Technology Requirements (6 NYCRR 370-373).
- New York State Solid Waste Management and Siting Restrictions (6 NYCRR 360-361).
- New York State RCRA Generator and Transporter Requirements for Manifesting Waste for Off-Site Disposal (6 NYCRR 364 and 372).

D.5 TO BE CONSIDERED (TBC) CRITERIA AND GUIDANCE

- 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.

Average Final Results for SEAD 67 Soil
Time Critical Removal Action
SENECA Army Depot

		Area 1			Area 2		
Compound	**Cleanup Goal[1]**	**Floor**	**Perimeter**	**All**	**Floor**	**Perimeter**	**All**
Metals (mg/kg)							
Aluminum	19,200	-	13,200	13,200	12,900	13,400	13,186
Antimony	5.9	-	13.6	13.6	11.0	15.6	13.6
Arsenic	8.24	-	4.90	4.90	5.77	6.40	6.13
Barium	300	-	72	72	113	118	116
Beryllium	1.1	-	0.7	0.7	0.8	1.3	1.1
Cadmium	2.3	-	3.5	3.5	3.1	4.0	3.6
Calcium	120,500	-	3,080	3,080	7,860	6,365	7,006
Chromium	29	-	20	20	21	21	21
Cobalt	30	-	11	11	11	11	11
Copper	29.6	-	19.5	19.5	33.0	40.8	37.5
Iron	35,550	-	24,100	24,100	24,567	26,200	25,500
Lead[3]	400	-	19	19	25	26	26
Magnesium	21,500	-	3,890	3,890	4,623	4,715	4,676
Manganese	1,056	-	438	438	603	461	522
Mercury	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nickel	48.9	-	26	26	30	29	29
Potassium	2,343	-	1,250	1,250	1,920	1,715	1,803
Selenium	2	-	19	19	15	21	19
Silver	0.763	-	0.410	0.410	3.80	3.83	3.81
Sodium	170.3	-	82.8	82.8	90.7	79.6	84.4
Thallium	0.67	-	25.5	25.5	21.0	29.2	25.7
Vanadium	150	-	20	20	20	22	21
Zinc	108.9	-	66.3	66.3	99.7	97.7	98.6
PAHs (µg/kg)							
2-Methylnaphthalene	36,400	-	420	420	312	460	397
Acenaphthene	50,000	-	420	420	158	358	272
Acenaphthylene	41,000	-	27	27	185	354	281
Anthracene	50,000	-	40	40	195	153	171
Benzo(a)anthracene	224	-	160	160	62	127	105
Benzo(a)pyrene	61	10	20	19	34	27	31
Benzo(b)fluoranthene	1,100	-	130	130	279	230	251
Benzo(ghi)perylene	50,000	-	-	-	216	168	189
Benzo(k)fluoranthene	1,100	-	160	160	324	251	282
Chrysene	400	-	190	190	70	151	124
Dibenzo(a,h)anthracene	14	10	14	14	12	13	12
Fluoranthene	50,000	-	340	340	366	217	281
Fluorene	50,000	-	420	420	40	460	280
Indeno(1,2,3-cd)pyrene	3,200	-	97	97	221	175	194
Naphthalene	13,000	-	420	420	314	460	398
Phenanthrene	50,000	-	260	260	293	149	210
Pyrene	50,000	-	400	400	529	272	382

Notes:

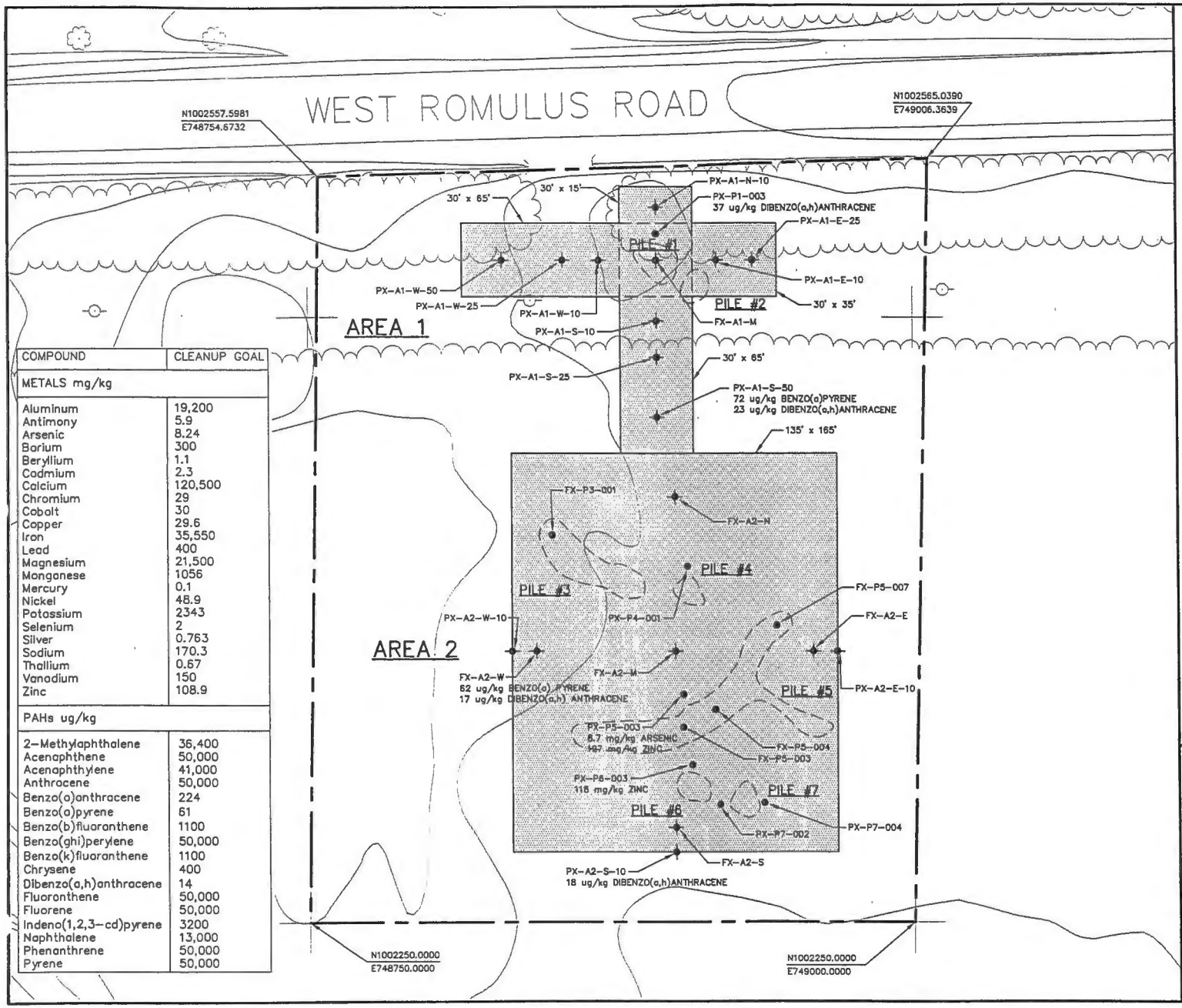
1. The Cleanup goal is based on the New York Technical Administrative Guidance Memorandum (TAGM) No. 4046 Recommended Soil Cleanup Objectives.
Values denoted as Site Background ("SB") in TAGM 4046 were compared with the highlighted values (95th percentile of Seneca Army Depot (SEDA) Site Background)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

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

95th percentile of SEDA Site Background

Result Exceeds Cleanup Criteria

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



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

LEGEND

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

NOTES

1. ALL SOIL PILES WERE REMOVED DURING INITIAL EXCAVATION.
2. ALL EXCAVATION WAS PERFORMED TO A DEPTH OF 1'.
3. ALL SAMPLE LOCATIONS ARE BASED ON FINAL DATA.

GRAPHIC SCALE
40 20 0 20 40
APPROXIMATE SCALE IN FEET

WESTON SOLUTIONS
MANCHESTER NEW HAMPSHIRE

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

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

SAMPLE LOCATION MAP

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

BCT Agenda
20 April 2004
1330-1630 Hours

1. Status review of all projects.

2. Discussion of SEAD 67 Data and Review

3. Discussion of Open Burning Grounds completion effort. Start up of MKM to perform removal of over size material pile.

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Environmental Easemental. Need

DRAFT FINAL
RECORD OF DECISION
FOR

SITES REQUIRING INSTITUTIONAL CONTROLS IN THE PLANNED INDUSTRIAL/OFFICE DEVELOPMENT OR WAREHOUSING AREAS

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
100 Summer St, Suite 800
Boston, Massachusetts

EPA Site ID No.: NY0213820830
NY Site ID No.: 8-50-006
DACA87-95-D-0031, Delivery Order 21
736026

March 2004

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ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirement
AWQS	Ambient Water Quality Criteria
BRA	Baseline Risk Assessment
BRAC	Base Realignment and Closure
CERFA	Community Environmental Response Facilitation Act
CERCLA	Comprehensive Environmental Responsibility, Compensation and Liability Act
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
CRDL	Contract Required Detection Limit
CY	Cubic yards
DoD	Department of Defense
DQO	Data Quality Objective
EBS	Environmental Baseline Survey
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
HEAST	USEPA Health Effects Summary Table
HI	Hazard Index
IAG	Interagency Agreement
IC	Institutional Controls
IRM	Interim Remedial Measure
LRA	Seneca Army Depot Local Redevelopment Authority
LUC	Land Use Controls
LUC/IC	Land Use Controls/Institutional Controls
LUCIP	Land Use Control Implementation Plan
LUCAP	Land Use Control Assurance Plan
MCL	Maximum Contaminant Level
mg	milligrams
mg/L	milligrams per liter
mg/Kg	milligrams per kilogram
mL	milliliters
NA	Not Available
NCP	National Contingency Plan
NPL	National Priorities List

ACRONYMS AND ABBREVIATIONS
(Continued)

NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O&M	Operations and Maintenance
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Planned Industrial Development
ppb	part(s) per billion
ppm	part(s) per million
RAB	Restoration Advisory Board
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
SPDES	State Pollutant Discharge Elimination System
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TBC	To be Considered
TCLP	Toxicity Characteristic Leaching Procedure
UCL	Upper Confidence Limit
µg/L	micrograms per liter
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOCs	Volatile Organic Compounds

1.0 DECLARATION OF THE RECORD OF DECISION

Site Name and Location

Building 360 – Steam Cleaning Waste Tank (SEAD-27), the Garbage Disposal Area (SEAD-64A), and the Pesticide Storage Area Near Building 5 and 6 (SEAD-66).

Seneca Army Depot Activity (SEDA)
CERCLIS ID# NY0213820830
NY State ID# 8-50-006
Romulus, Seneca County, New York

Statement of Basis and Purpose

This decision document presents the U.S. Army's and EPA's selected remedy for Building 360 – Steam Cleaning Waste Tank (SEAD-27), the Garbage Disposal Area (SEAD-64A), and the Pesticide Storage Area Near Building 5 and 6 (SEAD-66), located at the Seneca Army Depot Activity (SEDA) 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 United States Code (USC) §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, National Capital Region Field Office; and the U.S. Environmental Protection Agency (USEPA) Region II have been delegated the authority to approve this Record of Decision (ROD.

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, Building 123, Romulus, NY. 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 NYSDEC and the New York State Department of Health (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 the public health and the environment from actual or threatened releases of hazardous substances into the environment or from actual or threatened releases of pollutants or contaminants from this site that may present an imminent and substantial endangerment to public health or welfare.

Description of the Selected Remedy

The Army recommends establishing institutional controls (ICs) at SEADs 27, 64A, and 66 shown in **Figure 1-1.** The objectives of ICs proposed for SEAD 27, 64A, and 66 ICs include the establishment of the following land use restrictions for the sites:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.
-
- Prevent access to or use of the groundwater until the Class GA Groundwater Standards are met.
- In addition, at SEAD-64A only, which is a historic construction debris landfill, a land use control prohibiting digging within the bounds of the site will be established.
- Complete a review of the selected remedial action every five-years (at minimum), in accordance with Section 121(c) of the CERCLA.

Land Use Controls

The objectives of LUC performance are as follows and will also be incorporated into deeds and/or leases for this property:

- 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 Class GA Groundwater Standards are met.
- At SEAD-64A only, prevent unauthorized excavation at the site.

The LUCs will continue until the concentration of hazardous substances in the soil and the groundwater beneath have been reduced to levels that allow for unlimited exposure and unrestricted use. A LUC Remedial Design for the Sites Requiring Institutional Controls in the Planned Industrial/Office or Warehousing Area ("PID Area"), which will comply with New York State requirements outlined in Environmental Conservation Law (ECL) Article 27, Section 1318: *Institutional and Engineering Controls*, will be prepared.. Consistent with Section 14.4 of the Federal Facilities Agreement (FFA), a schedule for completion of the draft Institutional Control Remedial Design Plan (which will detail implementation and maintenance actions, including periodic inspections and monitoring), will be completed within 21 days of the ROD signature. The Army shall be responsible for implementing, inspecting, reporting on and enforcing the LUCs described in this ROD in accordance with the approved LUC remedial design. Although the Army may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or

through other means, the Army shall retain ultimate responsibility for remedy integrity. Should the Army transfer these procedural responsibilities, the Army shall provide timely written notice to the regulators of the transferee, which shall include the entity's name, address, and general remedial responsibility.

The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment.

These land use restrictions are based on the results of the SEAD-27, SEAD-64A, and SEAD-66 mini risk assessments that are documented in the Completion Report "Decision Document, Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B, Seneca Army Depot Activity, *Final*" (Parsons, 2002), and which are summarized below. The risk assessments suggest that restricting residential activities and access/use of groundwater at SEAD 27, 64A, and 66 will ensure protection of human health and the environment by reducing the hazard indices and cancer risk to within an acceptable range.

The Army recommends that the land use restrictions proposed for SEAD 27, 64A, and 66, exclusive of the proposed no digging restriction proposed for SEAD-64A alone, also be imposed and maintained on all the property within the PID Area, as it is has been defined in the "Reuse Plan and Implementation Strategy for the Seneca Army Depot Activity" (RKG Associates, Inc., 1996). The proposed boundary for the land use restrictions is shown on **Figure 1-2**.

The Army's proposed establishment of an area-wide set of land use restrictions is consistent with the planned reuse of the property by the Seneca County Industrial Development Authority (SCIDA) and will simplify IC implementation by having a single set of land use restrictions for the entire PID Area. Further, the extent of the proposed land use restrictions is consistent with the area that is within the bounds of a Township of Romulus, NY ordinance that requires future developers/owners to provide details of all construction/building/renovation projects that may be performed within this area to the Army and to the town managers for review and approval. Additionally, the Army contends that the proposed boundaries for the area of the proposed ICs are consistent with existing geographic, cultural, demographic, or other historic features and are supported, to the fullest extent possible, by the available analytical data collected at identified sites that are in proximity to the proposed boundary. Generally, the area where the Army proposes to implement the institutional controls is defined by historic and existing security fence lines and roadways that exist at the site. This provides a high degree of visibility, and thus certainty, as to the extent of the proposed boundary without necessitating the installation of new identification markers. Finally, with respect to recommended groundwater use/access restriction, the proposed bounds envelop an area of the former Depot where an ample public water supply is available so that a site-wide groundwater use restriction will have a minimal adverse impact on the future land use.

The Army acknowledges that portions, but not all, of the PID Area for which it is recommending that ICs be implemented as a remedial measure contains sites where hazardous wastes and materials have been used, stored, and treated or disposed. In response to this acknowledgement, the Army, under conditions of regulatory oversight, review, and approval/acceptance, has implemented numerous investigations and studies to identify areas where potential risks from exposure to environmental contaminants continue to exist. Further, as potential sites have been investigated and assessed the Army has, and will continue to, propose and implement necessary remedial actions to eliminate, lessen or control contaminants found. Finally, in accordance with requirements delineated under CERCLA Section 120(h)(3), transfers of certain property by deed will include a covenant by the United States of America through the Secretary of the Army that all remedial action necessary to protect human health and the environment has been taken prior to transfer, a covenant by the United States of America through the Secretary of the Army to undertake any further remedial action found to be necessary after transfer, and a clause granting access to the transferred property in case remedial action or corrective action is found to be necessary after transfer.

The PID Area includes sites ("NA/NFA Sites") that have been closed out under the CERCLA process as No Action/No Further Action sites. The NA/NFA ROD (Parsons, 2003) identified sites at which either no remediation is required or no further remediation is required. The NA sites located in the PID Area include SEADs 9, 10, 20, 22, 33, 36, 37, 42, 47, 49, 55, and 68. The NFA sites located in the PID Area include SEADs 28, 30, 31, and 34. These sites are shown on **Figure 1-2**. The sites listed in the NA/NFA ROD will continue to be subject to PID Area site-wide land use restrictions. However, upon request by a future property owner, the Army, USEPA, and NYSDEC will evaluate requested variance for land use restrictions in a designated area on a site-by-site basis. A copy of the NA/NFA ROD is available at the Information Repository at SEDA.

Data and information used to support the proposed boundary definition have been collected from existing reports that have been prepared for the encompassed and neighboring sites at the Depot. Once Seneca Army Depot was listed on the NPL, the Army, USEPA, and NYSDEC identified a list enumerating 57 solid waste management units (SWMUs) where historic data or information suggested, or evidence existed to support, that hazardous materials or hazardous wastes had been handled and may have possibly been released and migrated into the environment. Each of these sites was identified in the Federal Facilities Agreement (FFA) (USEPA, NYSDEC, Army, 1993) signed by the three parties, and this list subsequently expanded to include 72 sites when the Army completed the "SWMU Classification Report, *Final*" (Parsons, 1994), which was required under the terms of the FFA. Subsequently, when SEDA was approved for closure under BRAC 1995, the Army commissioned an Environmental Baseline Survey (EBS) of the entire Depot, where all property and facilities were evaluated, assessed, and classified in accordance with requirements of the Community Environmental Response Facilitation Act [CERFA 42 USC §9620(h)(4), (5)]. As a result of this work, additional sites within, and near, the area where the ICs are proposed have been investigated

and analytical data are available. These data have been reviewed and the Army believes that they support the proposed boundary for the area where the ICs will be imposed.

A primary criterion used by the Army to define the proposed boundary of the area where the proposed ICs will be applied is the review of data from previous sampling events from SWMUs or EBS sites identified within and near, the bounded area. Specifically, existing analytical data and information from SEADs 2, 9, 17, 25, 26, 49, 50/54, 55, 66, 67, 68, 121B, 121C, 121D, 121E, 121F, 121G, and 121I support the Army's recommendation of the identified boundary. Specific details of the data evaluation criteria used during the definition of the boundary for the area to be subject to the institutional controls are provided in **Appendix C**.

In all cases, the SEADs either define the limit of area requiring land use controls or are sufficiently close to defining the limits given the large buffer area between the outermost sampling points and the nearest boundary. Thus, the Army contends that the proposed boundary for the area where ICs will be implemented is sufficient to ensure that the surrounding areas are suitable for their intended future use. Further, the proposed extent of the area within the bounded area encompasses a number of sites that the Army currently plans to retain pending the completion of ongoing or scheduled investigations and remedial actions. These sites, the "Retained Sites," include: SEAD 1, 2, 5, 16, 17, 25, 26, 39, 40, 50, 54, 59, 67, 71, 121C, 121I, and 121J. Each of these sites is shown on **Figure 1-2**, highlighted in a dark brown color.

The boundary of the area where the Army will implement land use restrictions is shown in **Figure 1-3** and is approximately defined by:

1. Northeast Boundary – The former Depot's perimeter security fence line; this segment is supported by data from SEAD-9.

2. East Central Boundary – The inner fence line that separated the former Depot's Administration Area from the area that is designated as the property of the Elliot Acres Family Housing Area to the east; this segment supported by data from SEADs 121G, 121F, 25, and 68.

3. Southeast Boundary – The former Depot's perimeter security fence line to the southeast; this segment supported by data from SEAD-50/54 and SEADs 49 and 55.

4. South Boundary – Equivalent to the northern boundary of the land that was subject of a federal agency to federal agency transfer where the Loran Transmitter is located to the southeast and the boundary that separated the proposed PID Area from the land transferred to New York for the construction of the Five Points Correctional Facility; this boundary supported by data from SEAD-49, 55 and 26.

5. Southwestern and West Central Boundary – An internal security fence that separates the former warehousing, industrial and administration area from the former Munitions Storage Area to the southwest and along 3rd Street in the west central portion of the site; this boundary supported by data from SEADs 26, 64A, 121I, 121B, 121C and 17.

6. Northwestern Boundary – Along the eastern side of Fayette Road from the west central portion of the site and extending towards the northwest until Fayette Road intersects with West Romulus Road; this portion of the boundary is supported by data from SEADs 2 and 66.

7. Northern Boundary – Along the southern edge of West Romulus Road from the intersection with Fayette Road to the perimeter security fence; this portion of the boundary is supported by data from SEAD-20 and 67.

Additional information substantiating the Army's proposed boundary for the LUCs is provided in **Appendix C**.

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. This letter of concurrence has been placed in **Appendix B**.

Declaration

CERCLA and the NCP requires each Preferred Remedy to be protective of human health and the environment, cost effective, comply with other statutory laws; and use permanent solutions, alternative treatment technologies, and resource recovery options to the maximum extent possible. CERCLA also includes a statute indicating 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 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 and alternative technologies to the maximum extent practicable.

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 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:

_____ _____

JAMES DAVIDSON Date
Director, National Capital Region Field Office

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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
Director, Emergency and Remedial Response Division
U.S. Environmental Protection Agency, Region 2

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2.0 SITE NAME, LOCATION AND DESCRIPTION

SEDA is a 10,634-acre former military facility located in Seneca County near Romulus, New York, which has been owned by the United States Government and operated by the Department of the Army since 1941. A location map for SEDA is 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.

2.1 SEAD-27 – STEAM CLEANING WASTE TANK IN BUILDING 360

Building 360 is located in the eastern-central portion of the Depot (see **Figure 1-1**) and is a building where old equipment was refurbished and reconstructed. Lathes, presses, metal-working machines were degreased with steam, high-pressure water and detergents in the cleaning area. No solvent materials were ever used in the cleaning operation. After steam cleaning, the equipment was moved to other portions of Building 360 for rehabilitation.

SEAD-27, the Steam Cleaning Waste Tank, is located within a high bay area of Building 360 that is located near the north end of the building and is separated from the remainder of the building by cinder block walls. The overall size of the cleaning area is 38 feet-6 inches long by 20 feet-6 inches wide. The Steam Cleaning Waste Tank, also known as the Steam Jenny Accumulation Pit, is a belowground, concrete tank above which track-mounted cars loaded with equipment requiring cleaning can be positioned and steam cleaned. The track-mounted cars are rolled into and out of the cleaning area via permanently installed tracks that extend through roll-up doors and out of the building. Equipment requiring cleaning can also be placed directly above the tank on the floor. An overhead and two cross-sectional views (looking north and west) of the Steam Cleaning Waste Tank are provided as **Figures 2-2**, **2-3**, and **2-4**, respectively.

The floor surrounding and overlying the waste tank slopes towards the tank to channel all condensate and over spray back towards the tracks and collection grates. Under the metal grating is a trench system which slopes from a depth of 2 feet-0 inches at the west end of the overall cleaning area to a depth of 2 feet-10 inches toward the east end. Condensate and wastewater flowed through the trench system and fall into the Steam Cleaning Accumulation Pit, which is located at the east end of the overall cleaning area. The dimensions of the accumulation pit are 10 feet-6 inches wide by 3 feet long by 3 feet-4 inches deep. The maximum capacity of the Steam Cleaning Waste Tank is approximately 5,000 gallons when filled to near the top or 1,100 gallons to the 2-foot freeboard mark. This tank is no longer in use by the Army.

Use of the Steam Cleaning Waste Tank (i.e., Steam Jenny Accumulation Pit) began in 1976. After cleaning operations ceased on January 2, 1990, SEDA periodically monitored the depth of water in the accumulation pit to determine if water levels in the pit are affected by varying groundwater

levels. SEDA reports that there was never any evidence that groundwater was entering the Steam Cleaning Waste Tank. A closure investigation was performed under the RCRA program in July of 1995 and the determination was made that the accumulation pit in Building 360 satisfied the RCRA requirements for clean closure (International Technology Corporation, 1995). Monitoring of the water elevation in the waste tank and the removal of accumulated water (if present) ceased once RCRA closure was completed and certified. The NYSDEC's approval of RCRA Closure for SEAD-27 is documented in a letter dated November 1995 (NYSDEC, Nov. 1995).

2.2 SEAD-64A – GARBAGE DISPOSAL AREA

SEAD-64A is located in the east-central portion of SEDA. The site is bounded to the north by a square storage pad, to the east by the SEDA railroad tracks beyond which is the elevated fire-training pad (SEAD-26), and to the south and west by undeveloped grassland. This SWMU is located on land that is designated for warehouse use. The approximate location of this SWMU is shown on **Figure 1-1**.

SEAD-64A was used during the period from 1974 to 1979 when the on-site solid waste incinerator was not in operation. The types of wastes disposed at the site are suspected to be primarily household items, although according to the SWMU Classification Report (Parsons, 1994), metal drums and other industrial items were reportedly disposed at this site. Test pitting was conducted as part of the ESI, and no evidence of metal drums or industrial waste was found. All materials identified in the test pit log were inert construction debris, such as reinforced concrete slabs, asphalt pieces, and Constantine wire, which are exempt from regulation under New York State Solid Waste Regulations, 6 NYCRR Section 360-7.1 (b)(i). SEDA personnel also reported the operation of small burning pits within this area when it was being landfilled. Debris (asphalt, wooden boards, concrete slabs, and corrugated drain pipe) was visible on the surface, though the site is mostly covered with dense vegetation.

2.3 SEAD-66 – PESTICIDE STORAGE AREA NEAR BUILDINGS 5 AND 6

It has been reported that pesticides were stored in a structure located in the vicinity of Buildings 5 and 6. The Pesticide Storage Area near Buildings 5 and 6 is located in the east-central portion of SEDA (**Figure 1-1**). Building 5 is located approximately 100 feet north of Building 6. Building 5 is an elongated building, approximately 350 feet long and 45 feet wide. It is located on the Bundle Ammunition Pack Road and has three driveway areas between the road and the loading docks. The exact location of the pesticide storage area is unknown. The metal shed, which is suspected to be the former pesticide storage area, is adjacent to Building 5 on the south side. Building 6 is much smaller, approximately 50 feet by 50 feet. A concrete pad, which may have also been used as a former pesticide storage area, is located adjacent to Building 6 on the south side. Both buildings are located approximately 40 to 50 feet from the road. North-south trending railroad tracks are located approximately 20 feet to the west of the two buildings.

Aside from the paved road and driveways, the ground surrounding the buildings is covered with grass. There is little topographic relief in the area, and no surface water bodies are known to exist at the site.

SEAD-66 is located near the divide between the Reeder Creek watershed and the Kendig Creek watershed. Run-off from the site is directed into the Kendig Creek watershed by roadside drainage ditches. Run-off is directed from SEAD-66 into the feeder creek for the Duck Pond, a large surface water body located approximately 1 mile to the north of SEAD-66.

3.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

3.1 LAND USE AND RESPONSE HISTORY

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.

As part of the requirements of RCRA, the Depot identified 72 Solid Waste Management Units (SWMUs). In 1990, the Depot was included in the federal section of the National Priorities List (NPL). As a federal facility listed on the NPL, provisions of CERCLA (42 USC § 9620e) required that the US Army investigate the sites known to exist at the Depot and complete all necessary remedial investigations and actions at the facility. In accordance with this stipulation, the Army, USEPA, and NYSDEC negotiated and finalized a Federal Facility Agreement (FFA) that outlines the administrative process and the procedures that will be followed to comply with CERCLA.

Following the initial identification of sites, the Army ranked each site for investigation based upon that site's projected risk. The goal of the initial categorization of SWMUs was to prioritize the pending investigations and remedial actions so that those sites with the greatest risk would be addressed first. The assigned rankings divided the 72 identified SWMUs into 5 groups (i.e., No Further Action, High Priority, Moderate Priority, Moderately Low Priority, and Low Priority SWMUs). Subsequent to the US Army's proposal of the priority rankings, all parties met to review and discuss the available information for the identified SWMUs, and to finalize priority-ranking assignments. The consensus of all parties was to mount necessary investigations and possible actions at those SWMUs of concern and identify the SWMUs for which no investigations would be required.

In 1995, SEDA was designated for closure under the Department of Defense's (DoD's) Base Realignment and Closure (BRAC) process. 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 (RKG Associates, Inc., 1996). The Seneca County Board of Supervisors subsequently approved this *Reuse Plan* on October 22, 1996. **Figure 1-1** depicts the intended future land uses for SEDA, as proposed by the LRA. With SEDA's inclusion on the BRAC list, the US Army's emphasis expanded from expediting necessary investigations and remedial actions at the High and Moderately High Priority sites. It was changed to include the release and reuse of non-affected portions of the depot to the surrounding community for non-military (i.e., industrial, municipal and residential) purposes. Thus, BRAC sites may be released for non-military use.

As part of the BRAC process, the Army commissioned an Environmental Baseline Survey (EBS) of the Depot. Under the EBS, all of the property identified as subject to transfer or lease at the facility is classified into one of the seven standard environmental conditions of property area types as defined by the Community Environmental Response Facilitation Act (CERFA) guidance and the Department of Defense (DoD) BRAC Cleanup Plan Guidebook. This is achieved by identifying, characterizing, and documenting the obviousness of the presence or likely presence of a release or a threatened release of a hazardous substance or petroleum product associated with the historical and current use of Seneca Army Depot Activity. Areas that are designated as Category 1, 2, 3, or 4 under the CERFA process are suitable for transfer or lease, subject to consideration of the qualifiers. Areas that are designated as Category 5, 6, or 7 are not suitable for transfer, pending further investigation and remediation, as may be needed. The complete details of the EBS are summarized in the document *U.S. Army Base Realignment and Closure 95 Program; Environmental Baseline Survey Report*, Seneca Army Depot Activity, New York (Woodward-Clyde Federal Services, 1997).

At the completion of the EBS, 113 BRAC parcels of land were identified and classified within the 10,634 acre Depot. Of the total area, approximately 8,690 acres were found to be suitable for lease or transfer (as designated by Categories 1 through 4), while the remaining area (approximately 1,945 acres) were designated as Categories 5 through 7 and were not deemed suitable for immediate transfer for reuse.

Data developed under the EBS process were shared with the Seneca Army Depot Local Redevelopment Authority (LRA) and served as part of the basis for their recommendations for the proposed future uses of land within the Depot. As a result of the LRA's efforts, the proposed future uses of various portions of the Depot are shown on **Figure 1-1**. **Table 3-1** summarizes the size of the areas proposed for each of the seven categories identified. Details of the LRA's recommended plan are described in full in the document entitled *Reuse Plan and Implementation Strategy for the Seneca Army Depot* (RKG Associates, Inc., 1996).

SEAD-27 and SEAD-66 are located in the area designated by the LRA as Planned Industrial/Office Development, and SEAD-64A is located in the area designated by the LRA as the Warehouse Area, shown in **Figure 1-1**. A significant factor that contributed to the identification of the border designated by the LRA for these areas was the identification and classification of land within and surrounding these areas as defined under CERFA. Generally, historic land use within each LRA defined zone was similar, while the land use beyond the defined boundary was different. A list of the 33 SWMUs contained within the "PID Area" (i.e., Planned Industrial/Office Development and Warehouse Areas) and their assigned designation under the CERFA process are presented in **Table 3-2**.

It should be noted that at present, some of the historic SWMUs encompassed by the PID Area will be retained by the Army pending the completion of ongoing investigations or remediation at sites within the area. In addition, three new sites, designated as SEAD-121J, SEAD-121C, and SEAD-121I, are

still the subjects of ongoing site investigations based on the classification assigned under the CERFA process. Thus, the following sites located in the PID Area, shown in **Figure 1-2**, will be retained by the Army:

SEAD-5	SEAD-16	SEAD-17	SEAD-25	SEAD-26
SEAD-39	SEAD-40	SEAD-50	SEAD-54	SEAD-59
SEAD-67	SEAD-71	SEAD-121C	SEAD-121I	SEAD-121J

In addition, SEAD-1 and SEAD-2 are currently subject to closure under provisions of RCRA and are excluded from these discussions.

The Army will be completing the CERCLA process for the Retained Areas, and after the ongoing investigations and remedial actions are complete, the sites will continue to be subject to the area-wide restrictions.

There are also SWMUs that are located in the PID Area and are currently discussed in a No Action/No Further Action Record of Decision. The NA/NFA ROD identifies sites at which no remediation or no further remediation is required. The following sites within the PID Area are considered NA or NFA:

SEAD-9	SEAD-10	SEAD-20	SEAD-22	SEAD-28
SEAD-30	SEAD-31	SEAD-33	SEAD-34	SEAD-36
SEAD-37	SEAD-42	SEAD-47	SEAD-49	SEAD-55
SEAD-68				

3.2 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 Federal Facility Agreement (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. SEADs 27, 64A, and 66 were included in Final Decision Document for Various "No Action" Sites Mini Risk Assessments SEAD 9, 27, 28, 32, 33, 34, 43, 44 (A, B), 52, 56, 58, 62, 64 (A, B, C and D), 66, 68, 69, 70, 120B (Parsons, 2002).

4.0 COMMUNITY PARTICIPATION

The U.S. Army relies on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the Proposed Plan and supporting documentation have been made available to the public for a public comment period, which began on August 31, 2003 and concluded on September 30, 2003. Copies of the Decision Document/Mini-Risk Assessment report, the Proposed Plan, the Record of Decision, and supporting documentation are available at the following repository:

Seneca Army Depot Activity
Building 123, P.O. Box 9
Romulus, NY 14541
(607) 869-1309
Hours are Mon-Thurs. 8:30 am to 2:30 pm

A public meeting was held during the public comment period at the Seneca County Office Building on September 16, 2003 at 7 PM to present the conclusions of the Decision Document/Mini-Risk Assessment, 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 Record of Decision (ROD), **Appendix D**.

In addition, coordination with Native American stakeholders is consistent with the programmatic agreements between the State Historic Preservation Office, recognized Native American Tribes, and the Advisory Council for Historic Preservation.

The primary responsibility assigned to the Local Redevelopment Authority (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, state regulatory agencies, 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.

5.0 SCOPE AND ROLE

As with many sites, the environmental issues at SEDA are complex. This ROD covers the following areas within the Depot:

- SEAD-27 –Steam Cleaning Waste Tank at Building 360;
- SEAD-64A – Garbage Disposal Area; and
- SEAD-66 – the Pesticide Storage Area Near Building 5 and 6.

The Army intends to place institutional controls in the form of land use restrictions on these areas. Specifically, for SEAD-27, SEAD-64A and SEAD-66, the Army intend to impose the following 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 groundwater until the Class GA Groundwater Standards are met.
- In addition, at SEAD-64A only, a land use control prohibiting digging within the bounds of the site will be established.
- .

SEAD-27, SEAD-64A, and SEAD-66 are all located within the east-central portion of the former Depot, in an area that previously was used extensively by the Army for administrative, industrial, and warehousing, and storage purposes associated with the Depot's former mission. As such, these three sites are surrounded by a number of other historic sites where environmental investigations or remedial measures have been implemented. Some of these other investigations and remedial actions have been completed and have resulted in the determination that either No Action or No Further Action is warranted at specific sites within the PID Area. Documentation associated with site investigations and remedial actions for these sites is contained in the Depot's Administrative Record and the final determination for these sites was recorded in the Final Record of Decision, Twenty No Action SWMUs and Eight No Further Action SWMUs (Parsons, 2003).

Several sites within PID Area, in proximity to SEAD- 27, SEAD-64A, and SEAD-66 are subject to ongoing investigations and remediation, and will be retained by the Army pending completion of the CERCLA process. These sites are shown in dark brown on **Figure 1-2** and are listed below.

- SEAD-5 – Sewage Sludge Waste Piles;
- SEAD-16 – Abandoned Deactivation Furnace;

- SEAD-17 – Active Deactivation Furnace;
- SEAD-25 – Fire Training and Demonstration Pad;
- SEAD-26 – Fire Training Pit and Are;
- SEAD-39 – Boiler Blowdown Leach Pit Near Building 121;
- SEAD-40 – Boiler Blowdown Leach Pit Near Building 319;
- SEAD-50 – Tank Farm;
- SEAD-54 – Tank Farm;
- SEAD-59 – Fill Area West of Building 135;
- SEAD-67 - Dump Site East of Sewage Treatment Plant No. 4;
- SEAD-71 – Alleged Paint Disposal Area;
- SEAD-121C – DRMO Yard;
- SEAD-121I – Rumored Cosmoline Oil Disposal Areas; and
- SEAD-121J – Mounds Area, Site 109(7).

Once investigations or remedial actions in these areas are complete, the Army will assess and evaluate the needs for land use restrictions in each of these areas on a site-by-site basis. In the meantime, however, the presence of these sites, in conjunction with the recorded findings for SEAD-27, SEAD-64A, and SEAD-66, provide the basis for the Army's recommendation to impose two of its recommended land use restrictions (i.e., Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds; and Prevent access or use of the groundwater until cleanup levels are met.) on all areas within the bounded PID Area.

The selected remedies are discussed in greater detail in **Section 9.0**.

6.0 SITE CHARACTERISTICS

This section provides an overview of the site impacts and also identifies the actual and potential routes of exposure posed by the conditions at the site for SEAD-27, SEAD-64A, and SEAD-66. A complete description of the site characteristics is included in Section 2.0 of the Final Decision Document – Mini Risk Assessment (Parsons, 2002).

6.1 SEAD-27 – STEAM CLEANING WASTE TANK IN BUILDING 360

Field activities were performed at SEAD-27 as part of the July 1995 Building 360 Closure Investigation (International Technology Corporation, 1995). They are as follows:

- Accumulation pit liquid waste characterization;
- Concrete coring and removal;
- Closure sampling (concrete and soil);
- Drilling and surveying;
- Groundwater monitoring and well installation;
- Closure sampling (monitoring wells and T-sump);
- Pressure washing of metal grating and interior building surfaces; and
- Ongoing periodic post-closure groundwater sampling (monitoring wells and T-sump).

More details of these activities can be found in International Technology Corporation's *Final Report – Volume I, Building 360 Closure, Seneca Army Depot, Romulus, New York.*

The results of the chemical analyses can be found in the Final Decision Document – Mini Risk Assessment (Appendix B, Tables B-1 and B-2) for soil and groundwater, respectively. Although samples of water were collected from the T-sump during the period of February to May 1995 and were presented in the RCRA closure report in 1995, these results were not used in the risk assessment. The conclusion was that contaminants found in the water contained in the T-sump were derived from the DRMO Yard (SEAD-121C), which contained a TCE storage tank. The closure report did not find any evidence of contamination in core samples or soil samples collected at the Steam Cleaning Waste Tank.. Available information indicates that it does not leak, and it is therefore isolated from the surrounding environment.

The RCRA Closure Workplan required testing of all potential contaminants found at the site during the operation of the Steam Jenny Tank. Therefore, soil and groundwater samples were collected and analyzed for volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), cadmium, chromium, and lead. Groundwater samples were also analyzed for semivolatile organic compounds (SVOCs).

Soil

The four soil samples collected from SEAD-27 in 1995 were analyzed for VOCs, PCBs, cadmium, chromium, and lead. Of these compounds, only chromium and lead were detected. None of these detections exceeded recommended soil cleanup goals identified by NYSDEC in Technical and Guidance Memorandum (TAGM) #4046 "*Determination of Soil Cleanup Objectives and Cleanup Levels*" (NYSDEC, 1994).

Steam Cleaning Waste Tank Wastewater

One representative, composite sample of wastewater contained within the Steam Cleaning Waste Tank was collected and analyzed for VOCs, pesticides, herbicides, PCBs, metals, and various classical chemical parameters prior to the beginning of closure of SEAD-27. Resulting analytical data indicated that there were no detectable levels of VOCs, herbicides or PCBs within the sample. Total cresol, lindane, 4,4`-DDE, 10 metals and numerous classical parameters were detected in the wastewater (refer to **Table 6-1** for details), and this data was used as the basis for recommending disposal and treatment of the wastewater at the Depot's wastewater treatment plant.

Concrete Core Samples

Six inch diameter concrete core samples were also collected from three location within the bottom of the Steam Cleaning Waste Tank pit and analyzed for PCBs and toxicity characteristic leaching procedure (TCLP) cadmium, lead, and chromium. Each of these samples was split into three fractions, yielding nine final samples delivered for analysis. The first sample from each core represented concrete from the top portion of the core, the second from the middle portion of the core, and the third from the bottom of the core where it met underlying soil. Resulting data showed that only two detection of chromium were seen in any of the samples, and these concentrations were 22 and 12 µg/L, respectively from the top and middle portions of core CC-3. Both of these values are well below the federal regulatory limit value of 5000 µg/L.

Groundwater

The groundwater samples collected from SEAD-27 in 1995 were analyzed for VOCs, SVOCs, PCBs, cadmium, chromium, and lead. There were three exceedances of NYSDEC's GA groundwater criteria for 1,1-dichloroethane, and one exceedance each for 1,1,2,2-tetrachloroethane and total xylene. All of the observed exceedances occurred in the final round of samples collected (May 1995). 1,1-Dichloroethane was detected in MW-2, the downgradient well, at approximately 7 times the GA standard level, and in the two other wells at levels roughly equivalent to, though higher than, the standard (i.e., 5 µg/L). The concentration of 1,1,2,2-tetrachloroethane measured was slightly greater than NYSDEC's GA standard concentration, while the concentration of total xylene detected

was twice NYSDEC's GA criteria level. The sample collected from the upgradient well contained the noted exceedances for total xylene and 1,1,2,2-tetrachloroethane.

T-Sump Water Sample

Water samples were also collected from the T-sump during each of the groundwater sampling events that were conducted during 1995 as part of the RCRA Closure program at SEAD-27. Lead and 1,1,1-trichloroethane were detected in each of the five samples collected from the T-sump, while, bromodichloromethane, bromoform, and dibromochloromenthane were detected in the sample colleted from the T-sump during the second sampling event. Finally, chromium was detected in the first T-sump sample. All of the concentrations reported for 1,1,1-trichloroethane (i.e., 14, 18, 20, 16 and 18 µg/L, respectively) exceeded its GA groundwater standard (5 µg/L), while three values reported for lead (197 µg/L, 1st event; and 30.5 and 38.5 µg/L, second event and duplicate, respectively) exceeded its GA standard (25 µg/L). In the conclusions of the RCRA Closure Report for the Steam Cleaning Waste Tank, the author states "Data and historical operations of the 1,1,1,-trichloroethane sump and adjacent storage tank suggests the constituents present in the T-sump groundwater are likely not related to past operation of the steam jenny pit area [i.e., Steam Cleaning Waste Tank] but are inherent to the operations of the 1,1,1-trichloroethane storage tank." This conclusion is based on the determination no elevated levels of any of either of these two compounds was found in any of the soil or concrete core samples collected from the Steam Cleaning Waste Tank. Although, lead and chromium were detected in the wastewater removed from the Steam Cleaning Waste Tank at the time of closure, evidence of their migration through the concrete and into the underlying soils were not confirmed. Thus, the T-sump water samples are excluded from this analysis.

6.2 SEAD-64A – GARBAGE DISPOSAL AREA

A field investigation was conducted at SEAD-64A beginning in February 1994, as part of the Expanded Site Inspection for Seven Low Priority AOCs (Parsons, 1996). A geophysical survey was conducted. Twelve soil samples were collected and submitted for VOC, SVOC, pesticide, and metal analyses. Three groundwater samples were collected from SEAD-64A and were submitted for metals, pH, conductivity, temperature, and turbidity analyses.

Several PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene], phenol, and several metals (aluminum, arsenic, chromium, copper, lead, potassium, and zinc) were detected at levels that exceeded TAGMs in one or more soil samples.

During the ESI sampling, aluminum, iron, manganese, and thallium were detected in groundwater at levels that exceeded their respective comparative criteria levels. Results are summarized in **Table 6-2**.

6.3 SEAD-66 – PESTICIDE STORAGE AREA NEAR BUILDINGS 5 AND 6

A Limited Sampling Program was performed at SEAD-66 in December 1993. Surface soil samples collected from SEAD-66 were analyzed for Target Compound List (TCL) pesticides according to the NYSDEC Contract Laboratory Program (CLP) Statement of Work (SOW). Results of the chemical analyses for soil can be found in the Final Decision Document – Mini Risk Assessment (Appendix Q, Table Q-1) (Parsons, 2002).

Of the nine soil samples taken from SEAD-66, two compounds were detected at levels exceeding TAGMs. 4,4'-DDE and 4,4'-DDT were both detected at elevated levels in sample SS66-8 that was taken from a depth of 0-0.2 ft. The soil data are presented in **Table 6-3**.

No groundwater samples were collected.

7.0 SUMMARY OF SITE RISKS

When data was collected in the initial investigation, a mini-risk assessment was conducted for those sites to estimate the risks associated with current and future site conditions. The mini-risk assessment estimated the human health and ecological risk that could result from the site if no remedial action were taken. Maximum site concentrations were used as the exposure point concentrations (EPCs) for each site.

Human Health Risk Assessment

The reasonable maximum human exposure was evaluated. The human health risk assessment methodology is shown in **Figure 7-1**. A four-step process was used for assessing site-related human health risks for a reasonable maximum exposure scenario:

- *Hazard Identification*--identified the COC based on several factors such as toxicity, frequency of occurrence, and concentration;
- *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); and
- *Risk Characterization*--summarized and combined the outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks (for example, one-in-a-million excess cancer risk).

The baseline risk assessment addressed the potential risks to human health by identifying several potential exposure pathways by which the public may be exposed to contaminant releases at the site under current and future land use scenarios. **Figure 7-2** shows the exposure pathways considered for the media of concern for the Planned Industrial/Office Development scenario. For the baseline risk assessment, the reasonable maximum exposure was evaluated.

The receptors used in the risk assessment depended on the intended future use. The potentially exposed populations for the industrial use scenario are as follows:

Planned Industrial Development:

1. Industrial worker,
2. Future on-site construction workers,

3. Future worker at on-site day care center, and
4. Future child at on-site day care center.

Warehouse:

1. Future warehouse worker,
2. Future on-site construction worker, and
3. Future trespasser (adult).

The exposure pathways presented reflect the projected future use of each area. The following exposure pathways were considered:

1. Inhalation of particulate matter in ambient air (all future receptors),
2. Ingestion and dermal contact to on-site surface soils (all future receptors),
3. Ingestion and dermal contact to on-site surface and subsurface soils (future on-site construction worker), and
4. Ingestion of groundwater (daily) (future industrial worker, day care center worker, and day care center child).

Under current USEPA guidelines, the likelihood of carcinogenic and non-carcinogenic effects due to exposure to site-related contaminants 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 contaminant 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. Slope Factors are multiplied by daily intake estimates to generate an upper-bound estimate of excess lifetime cancer risk. 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).

Ecological Risk Assessment

The reasonable maximum environmental 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 Unit and the Ecological Communities it May Affect*—Includes ecological conditions observed at the unit, site habitat characterization, wildlife resources that are present in the area, and ecological resource values to wildlife and to humans;

- *Exposure Assessment*—Discusses COPCs, exposure point concentrations, and it presents exposure assessments. Chemical distribution of COPCs, and their uptake through various pathways are also discussed in this section. And daily intakes of COPCs through environmental media are quantified as well;

- *Toxicity 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 quotient (EQ); and

- *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 was then presented in terms of an EQ, which is derived from the results of the exposure quantification and the toxicity assessment for each COPC. The EQs are based on relevant measurement endpoints and are indicative of the potential for each chemical to pose an ecological risk to receptors. Step 2 of the screening-level exposure estimate and risk calculation in "Ecological risk Assessment Guidance for Superfund (ERAGS): Process for Designing and Conducting ecological Risk Assessments" (USEPA 1997) suggests that EQs less than or equal to 1 present no probable risk. EQs between 1 and 10 present a small potential for environmental effects, EQs between 10 and 100 present a significant potential that effects could result from greater exposure, and EQs greater than 100 indicate the highest potential for expected effects.

7.1 SEAD-27

The total cancer risk from all exposure routes is within the USEPA target range for all three receptors under the industrial scenario. The total non-cancer HI from all exposure routes exceeds one for day care center child (HI=3), but is less than one for the industrial worker (HI=0.7) and the day care center adult worker (HI=0.7). The elevated HI for the day care center child is due solely to ingestion of groundwater, with naphthalene, acetone and chromium being the significant risk contributors.

A risk assessment was also conducted for a residential scenario. The total cancer risk from all exposure routes is within or below the USEPA target range for both receptors (adult resident and child resident). The total non-cancer HI from all exposure routes exceeds one for the adult resident (HI=2) and the child resident (HI=7). The elevated HI for the adult is due solely to ingestion of groundwater and the elevated HI for the child is due to ingestion of groundwater and dermal contact of groundwater. Naphthalene and acetone are the significant risk contributors.

Significant concentrations of acetone were detected in one well in the second and third rounds of the four-month long groundwater sampling program. The fourth round showed that the acetone concentrations had decreased, though they were still present. Naphthalene was detected in the second well, though it was not detected until the fourth quarter of the sampling program. No additional samples have been collected to confirm the presence of naphthalene at the site. Neither of these two compounds has Class GA groundwater criteria, however, their hazard indices indicate that they contribute to risk due to ingestion of groundwater and to dermal contact of groundwater. Based on the current data, should SEAD-27 be used as a residential area, it would be necessary to place a

Land Use Restriction on groundwater use. This would restrict the use of groundwater as a drinking water source, preventing exposure to groundwater. This restriction results in the non-cancer Hazard Indices being less than 1 for both child and adult receptors.

No compounds of concern were detected in SEAD-27 soils. Therefore, no HQs were calculated for this site.

7.2 SEAD-64A

A mini risk assessment was conducted for SEAD-64A based on the 1994 soil and groundwater data, and the results of total cancer risk and total non-cancer hazard index can be found in Table 3.5-10 of the Final Decision Document - Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002). The total cancer risks are below or within the USEPA target ranges for all receptors under a warehouse land use scenario (i.e., warehouse worker, child trespasser, and construction worker). The total non-cancer hazard indices from all exposure routes are less than one for all receptors. The non-cancer hazard indices are overstated as the metal concentrations in groundwater were elevated due to the elevated turbidities in the groundwater samples.

In addition, risks to residential receptors (i.e., residential adult and residential child) have been evaluated based on the 1994 soil and groundwater data. The results of total cancer risk and total non-cancer hazard index can be found in Table V-3 of the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002). The total cancer risks are below or at the USEPA upper target limit for all receptors. The total non-cancer hazard indices from all exposure routes are equal to or greater than one for residential receptors. Groundwater ingestion is the only exposure route that would result in significant risk to residential receptors. The non-cancer hazard indices are overstated as the metal concentrations in groundwater were elevated due to the elevated turbidities in the groundwater samples.

A mini risk assessment was also conducted to evaluate potential risks to deer mice, short-tailed shrews, and American robins posed by the COPCs detected in surface soils at SEAD-64A. The HQs for all COPCs found in shallow soil were found less than one with the exception of benzo(a)pyrene, bis(2-ethylhexyl)phthalate, fluoranthene, and lead. The elevated risks driven by the above compounds were associated with one surface soil sample. The EQs based on the average concentrations of the other four samples were less than one or slightly above one (i.e., less than five). In addition, as a planned warehouse development, this site would most likely not support a balanced habitat. Based on the above discussion, it is concluded that SEAD-64A would not pose significant risk to potential ecological receptors. The mini risk assessment is presented and described in greater detail within the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002).

7.3 SEAD-66

The total cancer risk from all exposure routes is within the USEPA target range for all four receptors under the industrial scenario. Likewise, the total non-cancer HI from all exposure routes is less than one for all four industrial receptors.

A risk assessment was also conducted for a residential scenario. The total cancer risk from all exposure routes is within or below the USEPA target range for both receptors. The total non-cancer HI from all exposure routes exceeds one for the child resident (HI=1+). The elevated HI for this receptor is due solely to ingestion of soil with 4,4'-DDT being the significant risk contributor.

While 4,4'-DDT was detected in most samples (8 out of 9), only the maximum value exceeded the TAGM for 4,4'-DDT. The maximum value used as the Exposure Point Concentration (EPC) for this assessment ranges from 300 to 10,000 times all other measured concentrations. Based on the results of a Grubb's Test (analysis summarized in **Table 7-1**), the value used for the EPC in the risk assessment is an outlier. Furthermore, based on a review of the location from which the sample was collected [see Figure 2-16 of the Final Decision Document – Mini Risk Assessment, Seneca Army Depot Activity (Parsons, 2002)], the sample was collected at a location (SS66-8) that is surrounded by three other sampling locations where measured concentrations are between 200 and 6500 times lower. This suggests that the value is indicative of an isolated "hot spot" of contamination instead of a systematic release.

These results indicate that the actual average exposure to 4,4'-DDT would be much lower. It is unlikely that the child would be exposed to only soils in the corner of the site from which the maximum value was taken. For these reasons, 4,4'-DDT is not considered a COC in soil at this site for this exposure scenario.

An ecological risk assessment was conducted at SEAD-66, which is presented in Section 3.0 of the Decision Document (Parsons, 2002). No significant ecological risk was found.

8.0 REMEDIAL ACTION OBJECTIVES

Remedial action objectives have been developed that consist of media-specific objectives for the protection of human health and the environment. These objectives are based on available information and standards such as ARARs and risk-based levels established in the risk assessment. 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 comply with ARARs to the greatest extent possible. A list of ARARs is provided in **Appendix E**.

The objectives of the Army's recommended land use restrictions are as follows and will also be incorporated into deeds and/or leases for property within the PID Area:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.

- Prevent access or use of the groundwater within the PID Area until Class GA Groundwater Standards are met.

- At SEAD-64A only, prevent unauthorized excavation at the site to reduce and eliminate to the fullest extent possible, the potential exposure of surrounding populations and the environment to covered trash.

9.0 SELECTED REMEDY

Based on the results of the investigations and mini risk assessments completed for the three sites, institutional controls (ICs) are proposed for SEAD-27, SEAD-64A, and SEAD-66. The objectives of ICs proposed for SEAD 27, 64A, and 66 ICs include the establishment of the following land use restrictions for the sites:

- Prohibit the development and use of property for residential housing, elementary and secondary schools, child care facilities and playgrounds.
- Prevent access to or use of the groundwater until the Class GA Groundwater Standards are met.
- In addition, at SEAD-64A only, a land use control prohibiting digging within the bounds of the site will be established.

The LUCs will be continued until the concentration of hazardous substances in the soil and the groundwater beneath have been reduced to levels that allow for unlimited exposure and unrestricted use. A LUC Remedial Design for the Sites Requiring Institutional Controls in the Planned Industrial/Office or Warehousing Area, which will comply with New York State requirements outlined in Environmental Conservation Law (ECL) Article 27, Section 1318: *Institutional and Engineering Controls*, will be prepared as the land use component of the Remedial Design. Consistent with Section 14.4 of the Federal Facilities Agreement (FFA), a schedule for completion of the draft Institutional Control Remedial Design Plan (which will detail implementation and maintenance actions, including periodic inspections and monitoring), will be completed within 21 days of the ROD signature. The Army shall be responsible for implementing, inspecting, reporting on and enforcing the LUCs described in this ROD in accordance with the approved LUC remedial design. Although the Army may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity. Should the Army transfer these procedural responsibilities, the Army shall provide timely written notice to the regulators of the transferee, which shall include the entity's name, address, and general remedial responsibility.

These land use restrictions are based on the results of the SEAD-27, SEAD-64A, and SEAD-66 mini risk assessments that are documented in the Completion Report "Decision Document, Mini Risk Assessment SEAD 9, 27, 28, 32, 33, 34, 43, 44A, 44B, 52, 56, 58, 62, 64A, 64B, 64C, 64D, 66, 68, 69, 70, and 120B, Seneca Army Depot Activity, *Final*" (Parsons, 2002), and which are summarized above. The risk assessments suggest that restricting residential activities and access/use of groundwater at SEAD 27, 64A, and 66 will ensure protection of human health and the environment by reducing the hazard indices and cancer risk to within an acceptable range.

The Army recommends that the land use restrictions proposed for SEAD 27, 64A, and 66, exclusive of the proposed no digging restriction proposed for SEAD-64A alone, also be imposed and

maintained on all the property within the PID Area, as it is has been defined in the "Reuse Plan and Implementation Strategy for the Seneca Army Depot Activity" (RKG Associates, Inc., 1996). The proposed boundary for the land use restrictions is shown on **Figure 1-2**.

The Army's proposed establishment of an area-wide set of land use restrictions is consistent with the planned reuse of the property by the Seneca County Industrial Development Authority (SCIDA) and will simplify IC implementation by having a single set of land use restrictions for the entire PID Area. Further, the extent of the proposed land use restrictions is consistent with the area that is within the bounds of a Township of Romulus, NY ordinance that requires future developers/owners to provide details of all construction/building/renovation projects that may be performed within this area to the Army and to the town managers for review and approval. Additionally, the Army contends that the proposed boundaries for the area of the proposed ICs are consistent with existing geographic, cultural, demographic, or other historic features and are supported, to the fullest extent possible, by the available analytical data collected at identified sites that are in proximity to the proposed boundary. Generally, the area where the Army proposes to implement the institutional controls is defined by historic and existing security fence lines and roadways that exist at the site. This provides a high degree of visibility, and thus certainty, as to the extent of the proposed boundary without necessitating the installation of new identification markers. Finally, with respect to recommended groundwater use/access restriction, the proposed bounds envelop an area of the former Depot where an ample public water supply is available so that a site-wide groundwater use restriction will have a minimal adverse impact on the future land use.

The Army acknowledges that portions, but not all, of the PID Area for which it is recommending that ICs be implemented as a remedial measure contains sites where hazardous wastes and materials have been used, stored, and treated or disposed. In response to this acknowledgement, the Army, under conditions of regulatory oversight, review, and approval/acceptance, has implemented numerous investigations and studies to identify areas where potential risks from exposure to environmental contaminants continue to exist. Further, as potential sites have been investigated and assessed the Army has, and will continue to, propose and implement necessary remedial actions to eliminate, lessen or control contaminants found. Finally, in accordance with requirements delineated under CERCLA section 120(h)(3), transfers of certain property by deed must also include a covenant by the United States of America through the Secretary of the Army that all remedial action necessary to protect human health and the environment has been taken prior to transfer, a covenant by the United States of America through the Secretary of the Army to undertake any further remedial action found to be necessary after transfer, and a clause granting access to the transferred property in case remedial action or corrective action is found to be necessary after transfer.

As has been mentioned earlier, the PID Area includes sites ("NA/NFA Sites") that have been closed out under the CERCLA process as No Action/No Further Action sites. The NA/NFA ROD (Parsons, 2003) identified sites at which either no remediation is required or no further remediation is required.

The NA sites located in the PID Area include SEADs 9, 10, 20, 22, 33, 36, 37, 42, 47, 49, 55, and 68. The NFA sites located in the PID Area include SEADs 28, 30, 31, and 34. These sites are shown on **Figure 1-2**. The sites listed in the NA/NFA ROD will continue to be subject to PID Area site-wide land use restrictions. However, upon request by a future property owner, the Army, USEPA, and NYSDEC will evaluate requested variance for land use restrictions in a designated area on a site-by-site basis. A copy of the NA/NFA ROD is available at the Information Repository at SEDA.

Data and information used to support the proposed boundary definition have been collected from existing reports that have been prepared for the encompassed and neighboring sites at the Depot. Once Seneca Army Depot was listed on the NPL, the Army, USEPA, and NYSDEC identified a list enumerating 57 solid waste management units (SWMUs) where historic data or information suggested, or evidence existed to support, that hazardous materials or hazardous wastes had been handled and may have possibly been released and migrated into the environment. Each of these sites was identified in the Federal Facilities Agreement (FFA) (USEPA, NYSDEC, Army, 1993) signed by the three parties, and this list subsequently expanded to include 72 sites when the Army completed the "SWMU Classification Report, *Final*" (Parsons, 1994), which was required under the terms of the FFA. Subsequently, when SEDA was approved for closure under BRAC 1995, the Army commissioned an Environmental Baseline Survey (EBS) of the entire Depot, where all property and facilities were evaluated, assessed, and classified in accordance with requirements of the Community Environmental Response Facilitation Act [CERFA 42 USC §9620(h)(4), (5)]. As a result of this work, additional sites within, and near, the area where the ICs are proposed have been investigated and analytical data are available. These data have been reviewed and the Army believes that they support the proposed boundary for the area where the ICs will be imposed.

A primary criterion used by the Army to define the proposed boundary of the area where the proposed ICs will be applied is the review of data from previous sampling events from SWMUs or EBS sites identified within and near, the bounded area. Specifically, existing analytical data and information from SEADs 2, 9, 17, 25, 26, 49, 50/54, 55, 66, 67, 68, 121B, 121C, 121D, 121E, 121F, 121G, and 121I support the Army's recommendation of the identified boundary. In all cases, the SEADs either define the limit of area requiring land use controls or are sufficiently close to defining the limits given the large buffer area between the outermost sampling points and the nearest boundary. Thus, the Army contends that the proposed boundary for the area where ICs will be implemented is sufficient to ensure that the surrounding areas are suitable for their intended future use. Further, the proposed extent of the area within the bounded area encompasses a number of sites that the Army currently plans to retain pending the completion of ongoing or scheduled investigations and remedial actions. These sites, the "Retained Sites," include: SEAD 1, 2, 5, 16, 17, 25, 26, 39, 40, 50, 54, 59, 67, 71, 121C, 121I, and 121J. Each of these sites is shown on **Figure 1-2**, highlighted in a dark brown color.

The boundary of the area where the Army is proposing to implement land use restrictions is shown in **Figure 1-3** and is approximately defined by:

1. Northeast Boundary – The former Depot's perimeter security fence line; this segment is supported by data from SEAD-9.

2. East Central Boundary – The inner fence line that separated the former Depot's Administration Area from the area that is designated as the property of the Elliot Acres Family Housing Area to the east; this segment supported by data from SEADs 121G, 121F, 25, and 68.

3. Southeast Boundary – The former Depot's perimeter security fence line to the southeast; this segment supported by data from SEAD-50/54 and SEADs 49 and 55.

4. South Boundary – Equivalent to the northern boundary of the land that was subject of a federal agency to federal agency transfer where the Loran Transmitter is located to the southeast and the boundary that separated the proposed PID Area from the land transferred to New York for the construction of the Five Points Correctional Facility; this boundary supported by data from SEAD-49, 55 and 26.

5. Southwestern and West Central Boundary – An internal security fence that separates the former warehousing, industrial and administration area from the former Munitions Storage Area to the southwest and along 3rd Street in the west central portion of the site; this boundary supported by data from SEADs 26, 64A, 121I, 121B, 121C and 17.

6. Northwestern Boundary – Along the eastern side of Fayette Road from the west central portion of the site and extending towards the northwest until Fayette Road intersects with West Romulus Road; this portion of the boundary is supported by data from SEADs 2 and 66.

7. Northern Boundary – Along the southern edge of West Romulus Road from the intersection with Fayette Road to the perimeter security fence; this portion of the boundary is supported by data from SEAD-20 and 67.

Additional information substantiating the Army's proposed boundary for the LUCs is provided in **Appendix C**.

The Army shall implement, maintain, monitor, report on, and enforce the land use restrictions according to the PID Area Remedial Design (RD) Plan. The PID Area RD Plan includes: a Site Description; the IC Land Use Restrictions, the IC Mechanism to ensure that the land use restrictions are not violated in the future, Reporting/Notification requirements. A copy of the PID Area RD Plan will be available at the Information Repository at SEDA.

10.0 DOCUMENTATION OF SIGNIFICANT CHANGES

(Reserved).

11.0 STATE ROLE

(Reserved).

TABLE 6-1
SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION FOR SITES REQUIRING INSTITUTIONAL CONTROLS
Summary of Steam Cleaning Waste Tank Wastewater Analytical Results

Parameter	Concentration	Units
Volatile Organic Compounds	Not Detected	µg/L
Herbicides	Not Detected	µg/L
PCBs	Not Detected	µg/L
Total Cresol	20	µg/L
Other Semivolatile Organics	Not Detected	µg/L
Lindane	0.1	µg/L
4,4`-DDE	0.25	µg/L
Other pesticides	Not Detected	µg/L
Arsenic	40.3	µg/L
Barium	56.8 J	µg/L
Cadmium	5.4	µg/L
Chromium	43	µg/L
Copper	155	µg/L
Lead	194	µg/L
Nickel	276	µg/L
Selenium	23.4	µg/L
Silver	8 J	µg/L
Zinc	2,590	µg/L
Other Metals	Not Detected	µg/L
Density	0.999	mg/L
Total Dissolved Solids	1500	mg/L
Total Suspended Solids	330	mg/L
Total Organic Carbon	110	mg/L
Total Organic Nitrogen	3.2	mg/L
Phenol	0.01 J	mg/L
Sulfide	1.4	mg/L
pH	8.7	Standard units

Table 7-1
SENECA ARMY DEPOT ACTIVITY
RECORD OF DECISION FOR SITES REQUIRING INSTITUTIONAL CONTROLS
Summary of Grubb's Outlier Test
4,4`-DDT Soil Results from SEAD-66

Original Sample Concentration	1.1 Data Qualifier	1.2 Substituted Value
3.5	J	3.5
4.4	U	2.2
5.5	J	5.5
170		170
9.4	J	9.4
2	J	2
25	J	25
36000		36000
10	J	10
	Mean	4023.177778
	Standard Deviation - SD (n-1)	11991.43
	Grubbs ' Test Value Z = (|mean – value|) / SD	(| 4023 – 36000|) / 11991 = 2.66666
	Critical Z Value	2.21

As the calculated Z value is greater than the critical Z value, there is less than a 5 percent chance (actually less than a 1 % chance) that the observed 36,000 ug/Kg value is anything but an outlier. Given this data analysis, the high concentration reported for 4,4`-DDT at location SS66-8 is an outlier of the data set. Additionally, as this sample location is bounded by three other locations where the measured concentrations are between 200 and 6500 times lower, it is presumed that this value is indicative of an isolated "hot spot."

BCT Agenda
16 November 2004
1330-1630 Hours
17 November 2004
0830-1100 hours

16 November

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Continuation of PBC discussion (as Needed)

SEAD 4 Knee of the Curve revision (Conference in Parsons)

SEAD 12 TCE Plume Discussion (Conference is Parsons)

SEAD 48 Rad Survey site visit (if interest)

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION II
Emergency and Remedial Response Division
290 Broadway, 18th Floor
New York, New York 10007-1866

MEMORANDUM

TO: Julio Vazquez, Remedial Project Manager
ERRD/SPB
FROM: Chuck Nace, Risk Assessor
ERRD/PSB

DATE: November 8, 2004

RE: Response to October 27, 2004 Document Regarding Final Decision Document for the Inhibited Red-Fuming Nitric Acid (IRFNA) Disposal Site (SEAD-13), Seneca Army Depot

Based upon the comments provided by USEPA and the response to comments received from the Seneca Army Depot, it appears that the two parties are in agreement that the risk assessment methodology that was employed for SEAD-13 does not conform with current USEPA guidance for conducting risk assessments in accordance with CERCLA. There is some disagreement on the steps to take to rectify this issue. We have previously asked that the comments we provided be addressed and an updated risk assessment submitted. The Army has declined to take this approach and have not provided any alterative. Instead, they only provided a statement that the mini-risk assessment is more conservative, and therefore that nothing more would be done.

It is unfortunate that the Army has chosen to provide this type of a response rather than to address the concerns or to provide an alternative approach to address these concerns. Although the Army did not provide an alternative, we will make an attempt to reach out to the Army and provide some additional suggestions that will allow the project to move forward, while addressing these concerns.

The comments provided by USEPA can be placed into three categories, methodology, clarification, and transparency. Each category can be addressed within the next phases of the project to address the concerns raised without revising the risk assessment. Details of the approach to use are presented, by category, below.

A. Methodology - This is the most contentious issue associated with the use of the mini-risk assessment instead of using a standard risk assessment approach. There were four issues identified in the comments. All four should be addressed adequately, as described below, in a technical memorandum or in a response to this letter. The technical memorandum or response to this letter can then be referenced in future documents (i.e., proposed plan and record of decision) to show that deviations from the standard risk assessment methodology were satisfactorily addressed.

1. *Background* - As indicated in our earlier comments, the use of background values to eliminate compounds is not an acceptable practice. Due to using background values as part of the screening process, there were at least three inorganic compounds (aluminum, arsenic, and iron) that were not included in the quantitative analysis of risks and hazards. These three compounds had average concentrations that exceeded their respective health-based screening values (i.e., USEPA Region IX Preliminary Remediation Goals). Using the maximum detected concentration may have lead to the inclusion of other compounds, thus the statement that the mini-risk assessment is more conservative is not accurate regarding selection of chemicals of potential concern. **The section of the technical memorandum that addresses methodology should include a qualitative analysis of the underestimation of risk associated with eliminating compounds that exceeded health-based values. It is my understanding that the compounds listed above, although above their respective screening values, would not lead to risks or hazards that are above the acceptable risk range or hazard index. This needs to be clearly stated with technical data to support this claim.**

2. *Health-based screening values* - Health-based screening values were not used in the mini-risk assessment. Chemicals were identified as being of potential concern if they were greater than background or were frequently detected (i.e., >5%). The standard procedure for choosing chemicals of potential concern are to screen the maximum detected concentration against health-based screening values (i.e., USEPA Region IX Preliminary Remediation Goals) and retain those compounds that exceed their respective screening values. Further reduction to the list of chemicals that exceed the screening values can be done through eliminating chemicals that are infrequently detected (i.e., <5%) as long as they are not classified as class A carcinogens. The methodology employed in the mini-risk assessment would tend to overestimate the risks and hazards due to not eliminating chemicals that may have been below screening values. However, there may also have been compounds that are classified as class A carcinogens that were eliminated based upon background considerations or infrequently detected criteria. **A detailed description that indicates qualitatively if the overall risks and hazards are over- or under-estimated based upon the methods employed in the mini-risk assessment should be included in the technical memorandum.**

3. *Exposure point concentrations* - The exposure point concentrations that were used to estimate the potential risk and hazards consisted of the maximum detected concentration. The standard approach is to use the 95% upper confidence limit (UCL), which generally is lower than the maximum detected concentration, when there are ten or more samples per environmental media. Given that the sample size for each media was greater than 10, the use of maximum detected concentrations would tend to overestimate the risks and hazards. **A detailed description that presents a semi-quantitative estimate of the degree of overestimation should be included in the technical memorandum.**

4. *Exposure parameters* - Several of the exposure parameters that were used to estimate the potential risks and hazards are different than the preferred values used in Region 2. Some of the values are higher, which would lead to the mini-risk assessment

underestimating the potential risks and hazards, and some of the values are lower, which would lead to the mini-risk assessment overestimating the potential risks and hazards. There is one value that is recommended to be changed for the park worker, one for the recreational child visitor, and three for the construction worker. As there are only a limited number of parameters that are an issue, it should be very simple to do a quick qualitative assessment that details the degree of over- or underestimation that would occur if the recommended value is used. **A one paragraph description should be included for each receptor population identified above in the technical memorandum.**

5. **A summary paragraph should also be included in the technical memorandum that provides an overall estimate of the cumulative effect of the over- and underestimation of risks and hazards presented in numbers 1 through 4 (e.g., the range of over- or underestimation of the potential risks and hazards is within one order of magnitude, which would indicate that site-related risks and hazards are still below acceptable levels** [*note this is for example purposes and it does not represent an actual evaluation of the risk and hazards for this site.*]).

B. Clarification - There were several items that were asked to be clarified in the risk assessment text. Clarifications were needed to correct inaccurate statements in the text. The responses provided to these items did not address the inaccuracy of the statements. The technical memorandum or response to this letter, as identified above, should include specific responses to the items listed below to ensure that the statements are accurate.

6. *CRAVE* - The comment that was made regarding CRAVE was not directed towards making major revisions to the risk assessment. It was made to correct an inaccurate statement. The risk assessment indicates that "EPA's Carcinogen Risk Assessment Verification Endeavor (CRAVE) has developed slope factors and unit risks (i.e., dose-response values) for estimating excess lifetime cancer risks associated with various levels of lifetime exposure to potential human carcinogens." EPA's CRAVE has not developed slope factors and unit risks for almost a decade. The CRAVE workgroup was incorporated into the Integrated Risk Information System. The toxicity values provided in the risk assessment are from IRIS, which is correct, and **the statement regarding CRAVE should be removed from the mini-risk assessment as it is not an accurate statement.**

7. *Statement on retaining all chemicals* - The statement made on page 3-37, "All chemicals detected that were potentially site-related were retained in this assessment", is not accurate. **This statement should be changed to read "All chemicals that were above background concentrations or were detected in more than 5% of the samples were retained in this assessment."**

C. Transparency - To address the transparency issues raised in our earlier comments would require revising the entire risk assessment. It is agreed that the expenditure of time and effort required to complete this task would not affect the remedial decision for the area, and would only serve to make the risk assessment consistent with the format used at all other sites within our region. However, there is a need to ensure that decisions that are being made are presented in a clear and transparent format so that all of the stakeholders can follow the process. To meet these

needs, **it will be agreed that the RAGS Part D tables will not need to be submitted for the risk assessment, as long as the selection of tables, as well as the format described and presented in OSWER 9200.1-23P "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents" will be followed for presenting the risks and hazards in the Record of Decision.** Presenting the data in the format described in the guidance above will ensure that the appropriate data is provided to complete future reviews (e.g., five-year reviews) at the site. Specifically, see page 6-13 which states "...that the format for the tables presented in this section be used to summarize appropriate risk assessment information in the ROD. The information in these tables was drawn from the standardized tables in RAGS Part D....risk assessment information presented in the ROD should be a relevant subset of the information presented in the RAGS Part D standardized risk tables." Also, please see Section 5.2.1 Baseline Risk Summary in the Record of Decision in OSWER 9285.7-47 "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part D - Standardized Planning, Reporting, and Review of Superfund Risk Assessments".

Lastly, future risk assessments conducted for SEADs within the Seneca Army Depot should not follow the mini-risk assessment methods or format. Risk assessments should be conducted using the current agency guidance and Region 2 guidance. The approach outlined in this memorandum was designed specifically to address the situation with SEAD-13 in an attempt to work cooperatively with the Army to move this project forward and this approach should not be implemented in lieu of performing risk assessments that adhere to current Agency and Regional guidance for other SEADs.

cc: Vince Pitruzzello, PSB
Michael Sivak, TST
John Malleck, FFS

BCT Agenda
16 November 2004
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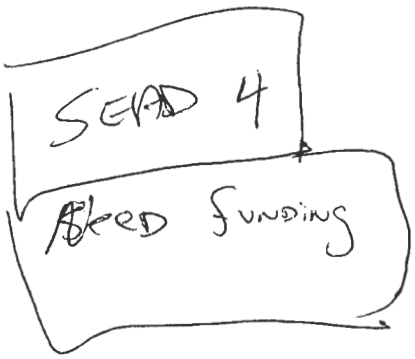
0830-1100 hours



16 November

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SEAD 4 Knee of the Curve revision (Conference in Parsons)

SEAD 12 TCE Plume Discussion (Conference is Parsons)

SEAD 48 Rad Survey site visit (if interest)

SEAD 12 - Visit.

REMEDIATION PLAN AND TRANSFER SCHEDULE
October 25, 2004

PID / WHSE Area

SEAD 59 & SEAD 71- PAINT DISPOSAL AREAS

Acreage: 9 acres
Site History: Site consists of fill areas that debris was placed in.
Risk: Potential Ground water contamination from petroleum contamination found in the soil. No risk remains from soils in fill areas.
Status of Remediation: Removal action of the contaminated soil is complete. Evaluation of GW is underway.

Funds: On Hand
RIP/RC: April 2005
FOST: June 2005
Deed: September 2005

SEAD 001-R (SEAD 16)- ABANDONED DEACTIVATION FURNACE

Acreage: 3 acres.
Site History: This unit was used to destroy small arms ammunition.
Risk. SEAD 16 Abandoned Deactivation Furnace: Facility has residual powder in piping and OE scrap that has potential for explosive residuals. There is heavy metals contamination in the soil.
Status of Remediation: Final Proposed Remedial Action Plan has been agreed to. The Draft Record of Decision is under review.

Funds: November 04
RIP/RC Completion Date: August 2005
FOST: December 2005
Deed: September 2006

SEAD 001-R (SEAD 17) - DEACTIVATION FURNACE

Acreage: 8 acres
Site History: This unit was used to destroy small arms ammunition.
Risk. SEAD 17 Deactivation Furnace: Facility has OE scrap that has potential for explosive residuals. There is heavy metals contamination in the soil.
Status of Remediation: Final Proposed Remedial Action Plan has been agreed to. The Draft Record of Decision is under review.

Funds: November 04
RIP/RC Completion Date: August 2005
FOST: December 2005
Deed: September 2006

SEAD 25 - FIRE DEMONSTRATION AREA

Acreage: 3.5 acres.
Site History: This site was used to demonstrate the installation fire fighting capability.
Risk: Volatiles in the soil contributing to GW contamination. Semi- volatiles in ditch line poses limited long term risk to child.
Status of Remediation: ROD signed, RD/RA underway

Funds: April 2004
RIP/RC Completion Date: April 2005
FOST: May 2005
Deed: September 2005

SEAD 26 - FIRE TRAINING AREA

Acreage: 6.7 acres.
Site History: This site was used to practice fire-fighting capability.
Risk: Semi-volatiles in surface soil and ditch line along railroad pose limited long term risk to child.
Status of Remediation: ROD signed, RD/RA underway

Funds: April 2004
RIP/RC Completion Date: April 2005
FOST: May 2005
Deed: September 2005

SEAD 121 - EBS SITE – INDUSTRIAL

Acreage: 23 Acres
Site History: DRMO yard and cosmoline steam cleaning site.
These sites have had a site investigation performed. PAHs (Semi-volatiles) have been found. Solvents have been found in the ground water around the DRMO yard.
Risk: Soil contamination may pose threat to residential child.
Status of Remediation: RI fieldwork is completed and reports being prepared.

Funds: November 2004
RIP/RC Completion Date: December 2005
FOST: April 2006
Deed: September 2006

SEAD 50 - TANK FARM STORAGE
SEAD 54 - ASBESTOS STORAGE

Acreage: 26 acres
Sites History: These sites are where the Army stored material in above ground steel tanks. Movement of the material resulted in contamination of the soil.
Status of Remediation: These two sites have a removal action underway. The action consists of excavation and disposal by land-filling the soil, which are contaminated with heavy metals.
Status: NFA ROD is being finalized

Funds: Available
RIP/RC date: March 2005
FOST: Dec 2003
Deed: April 2004

SEAD 38 - BUILDING 2078 BOILER BLOW DOWN PIT
SEAD 39 - BUILDING 121 BOILER BLOW DOWN PIT
SEAD 40 - BUILDING 319 BOILER BLOW DOWN PIT

Acreage: 1 acre combined
Site History: These sites consist of contamination resulting in the blow down of the central boilers, which was discharged to the ground. SEAD 38 is also included in the SEAD 4 Area of concern.
Risk: Petroleum products may pose risk.
Status of Remediation: A removal action is underway.

Funds: Available
RIP/RC date: March 2005
FOST: June 2005
Deed: September 2005

SEAD 5 - SLUDGE PILES

Acreage: 2 acres
Site History: This site is a result of the storage of domestic sewage sludge from the sewer treatment plant drying beds. The investigation revealed that the sludge has elevated level of heavy metals in it.
Risk: Heavy metals may pose threat to resident.
Status of Remediation: Removal action is underway.

Funds: Available
RIP/RC date: March 2005
FOST: June 2005
Deed: September 2005

SEAD 67 - DUMPSITE EAST OF STP4

Acreage: 2 acres
Site History: This site is identified as a location where unknown material was dumped. The site investigation revealed that the soil is contaminated with metals and the contaminants were localized.
Risk: Soil contamination has been removed from the site
Status of Remediation: Removal action complete. NFA PRAP being prepared.

Funds: Available
RIP/RC date: April 2005
FOST: May 2005
Deed: September 2005

DECOMMISIONING SURVEYS (PID / Whse Area)

Size: 2 buildings (306 and 5)
Site History: Seneca has a NRC license that requires termination prior to allowing unrestricted access to the inside of the buildings. Field survey work completed. Final evaluation of risk is pending final approval of objectives. Final report and approval is required before transfer.
Risk: Residual depleted uranium material could impact interior surface of structure. (None was found during field investigation)
Status of Remediation: Fieldwork Complete. Final Report has prepared commented on, and resubmitted.

Funds: Available
Site Work Completion Date: N/A
License Termination Date: Dec 2004

CONSERVATION AREA SITES

SEAD 003-R-01 (SEAD 46 &57) - AMMUNTION DESTRUCTION AREAS

Acreage: 113 acres

Site History: These sites are where the Army performed destruction of ammunition by detonation or discharge. The site investigation of these sites revealed contamination of MEC and heavy metals.
Risk: Sites have MEC scrap that has potential for explosive residuals. There is heavy metals contamination in the soil.
Status of Remediation: Field investigation has started.

Funds: November 2009
RIP/RC date: December 2011
FOST: May 2012
Deed: September 2012

SEAD 48 - PITCHBLENDE ORE STORAGE

Acreage: 55 acres
Site History: This site consists of 11 igloos that were used to store pitchblende ore. The igloos were decommissioned in the mid 1980s. Unrestricted access approval is on file from NRC, NYS and EPA. An extensive removal occurred during the decommissioning process however there is a concern for residuals under current standards. Further investigation will determine whether additional work is required.
Risk: Residual left from previous removal may have long term impact for residence.
Status of Remediation: Additional fieldwork is being to address comments on the draft report.

Funds: November 2005
RIP/RC date: December 2006
FOST: March 2007
Deed: September 2007

DECOMMISIONING SURVEYS (Conservation Area)

Size: 105 igloos and 4 buildings
Site History: Seneca has a NRC license that requires termination prior to allowing unrestricted access to the inside of the buildings. Field survey work completed. Final evaluation of risk is pending the final approval of the cleanup objectives. Evaluation of results will be completed and approved before final transfer.
Risk: Residual depleted uranium material could impact interior surface of structure (none was found during the fieldwork).
Status of Remediation: Fieldwork Complete. Final report has been reviewed commented on and resubmitted.

Funds: Available

Site Work Completion Date: N/A
License Termination Date: December 2004

SEAD 63 - MISCELLANEOUS COMPONENTS BURIAL SITE

Acreage: 4 acres
History of Site: This site was use by the Army to bury classified military unique components.
Risk: Military unique items to be removed which have the potential to contain low-level radiological contamination. Some heavy metal contamination may be present.
Status of Remediation: Removal action completed. NFA PRAP being prepared.

Funds: Available
RIP/RC date: April 2005
FOST: May 2005
Deed: September 2005

SEAD 6 - ASH LANDFILL (including SEADs 3,8,14,15)

Acreage: 42 Acres
Site History: Site is former municipal waste disposal area. Heavy metals remain in the soil. TCE (solvent) is found in the ground water.
Risk: Ecological risk exists. Ground water wells will not be permitted.
Status of Remediation: ROD is pending signature

Funds: Available
RIP/RC date: April 2005
FOST: May 2005
Deed: September 2005

SEAD 11 - OLD LANDFILL

Acreage: 6 acres
History of Site: Construction debris and other unknown items were disposed of at this site.
A site investigation conducted revealed contamination and unknown anomalies.
Risk: Heavy metals and solvent in the soil, unknown items in the fill area.
Status of Remediation: An Interim removal action is planned so that a No Further Action Determination can be made.

Funds: January 2005
RIP/RC date: February 2007
FOST: June 2007
Deed: September 2007

SEAD 13 - INHIBITED RED FUMING NITRIC ACID (IRFNA)

Acreage: 11.5 acres
History of Site: This site was used by the Army to neutralize IRFNA, a liquid propellant constituent. The acid was poured into a trench filled with limestone and water and was neutralized. Process resulted in nitrogen compounds being introduced into the ground water. This site is expected to require land use controls only.
Risk: Has excess nitrates above drinking water standards
Status of Remediation: Field work for base line complete. Decision Document has been reviewed and comments are being addressed. IC PRAP/ROD being prepared

Funds: Available
RIP/RC date: April 2005
FOST: May 2005
Deed: September 2005

SEAD 4 - MUNITIONS WASHOUT FACILITY

Size: 4 acres
Site History: This site was used by the Army to wash out shell casing to remove explosives. Heavy metal contamination has been found in the soil.
Risk: None for industrial future use. Contaminants pose ecological concerns
Status of Remediation: The project is in the FS has been prepared, commented on and responses being prepared.

Funds: November 2004
RIP/RC date: April 2006
FOST: May 2006
Deed: September 2006

SEAD 12 - RADIATION SITE

Size: 10.5 acres
History of Site: This site consists of the former Special Weapons Storage Area. Three areas where military unique items were buried and a localized groundwater plume contaminated with TCE was found during the remedial investigation. SEAD 72- Mixed

Waste Storage Bldg. regulated under the Interim Status Hazardous Waste Permit will be closed out and incorporated into the ROD of the SEAD 12. There is potential to accelerate cleanup upon completion of the additional work that required.
Risk: Groundwater has localized TCE (solvent) plume
Status of Remediation: The site is in the RI/FS process. Additional field investigation work is performed.

Funding: November 2008
RIP/RC date: December 2009
FOST: March 2010
Deed: September 2010

SEAD 23 - OPEN BURNING GROUNDS

Acreage: 30 acres
Site History: The Army used this site for burning propellant, explosives and pyrotechnics to destroy unstable items. This site is with in the boundary described by SEAD 115
Risk: See SEAD 115
Status of Remediation: The Record of Decision has been signed. The remedial action for this site will be completed this year.

Funds: Available
RIP/RC date: September 2004
FOST: April 2012
Deed: September 2012

SEAD 002-R-01 (SEAD118) – EAST EOD RANGES

Acreage: 18 acres
Site History: This site represents 2 areas where MEC was found as a result of record search and site investigations. It is proposed to perform removal actions at the three locations and restrict the land use to surface activity.

Mission: site is 2 locations. Site 2 and 3 are adjacent each other and were used by EOD units for training. These sites have MEC scrap that may have residual explosive contamination.
Risk: Sites that have MEC scrap have potential for explosive residuals.
Status of Remediation: Remedial Action is scheduled for funding in FY 05.

Funds: November 2004
RIP/RC date: January 2006
FOST: March 2006
Deed: September 2006

SEAD 007-R-01 (SEAD118) RIFLE GRENADE RANGE
Acreage: 30 acres
Site History: This site represents an area where MEC was found as a result of record search and site investigations. It is proposed to perform removal actions at the three locations and restrict the land use to surface activity.
Mission: site is actually 3 locations. The site was a training range where 40 mm training grenades and 37 mm LAW sub-caliber training rounds were fired. Training rounds have small explosive charge that create the "puff of smoke" to indicate the location of round. This site has MEC scrap that has residual explosive contamination.
Risk: Sites that have MEC scrap have potential for explosive residuals.
Status of Remediation: Remedial Action is scheduled for funding in FY 05.

Funds: November 2004
RIP/RC date: January 2006
FOST: March 2006
Deed: September 2006

SEAD 24 - POWDER BURNING AREA

Acreage: 3.25 acres
Site History: This site was used in the late 40s early 50s to burn black powder and propellants. Investigation shows heavy metal contamination in the soil.
Risk: Soil contamination may pose a chronic risk to residents.
Status of Remediation: A removal action at this site is ongoing.

Funds: Available
RIP/RC date: March 2005
FOST: May 2005

Deed: September 2005

SEAD 006-R-01 (SEAD115) - OPEN BURNING / OPEN DETONATION

Acreage: 400 acres
Site History: This site is where the Army performed destruction of ammunition by detonation or discharge. The site investigation of this site revealed contamination of ordnance residual and heavy metals. This is a RCRA permitted site
Risk: Site has MEC scrap that has potential for explosive residuals. There is heavy metals contamination in the soil.
Status of Remediation: Work to reduce MEC boundary is on going.

Funds: November 2010
RIP/RC date: December 2006
FOST: April 2012
Deed: September 2012

SEAD 64B- GARBAGE DISPOSAL AREA

Acreage: 0.25 acres
Site History: This site is where the Army disposed of approximately 1 truckload of municipal garbage in the early 70's. The material is located under 10 feet of soil cover and requires closure as an inactive solid waste site.

Funds: Available
RIP/RC date: April 2005
FOST: June 2005
DEED: September 2005

SEAD 64D- GARBAGE DISPOSAL AREA

Acreage: 0.25 acres
Site History: This site is where the Army disposed of approximately 1 truckload of municipal garbage in the early 70's. The material is located under 10 feet of soil cover and requires closure as an inactive solid waste site.

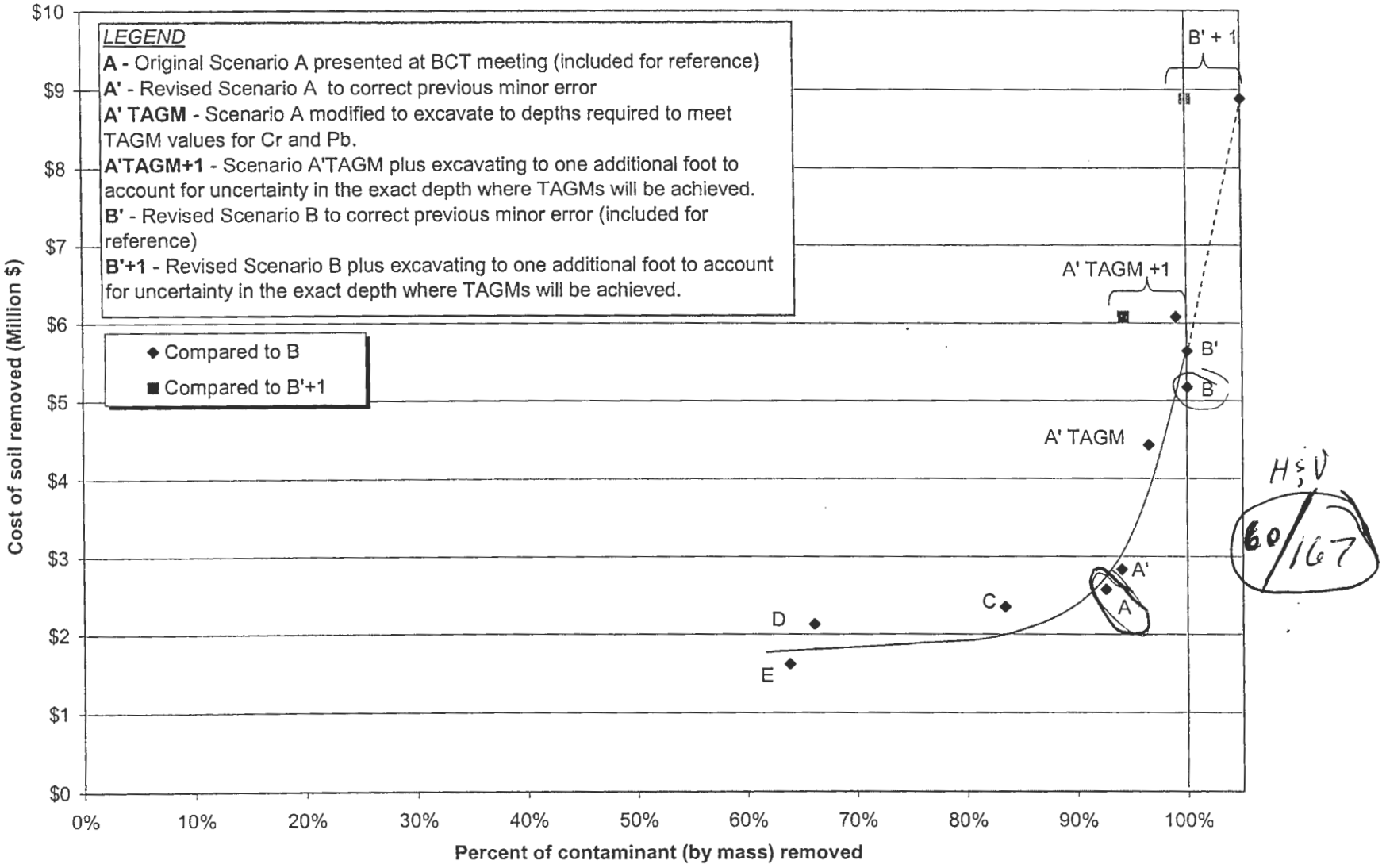
Funds: Available
RIP/RC date: April 2005
FOST: June 2005
DEED: September 2005

SEAD 70- CONSTRUCTION DEBRIS AREA

Acreage: 0.25 acres
Site History: This site is where the Army disposed of construction debris such as fencing posts, concrete etc.
Risk: Site has a single sample that should elevated arsenic in the soil. No other contaminates were at levels of concern.
Status of Remediation: The Army will perform a removal action on this site in Spring 2004 so a No Further Action determination may be made.

Funds: Available
RIP/RC date: December 2006
FOST: August 2007
DEED: September 2007

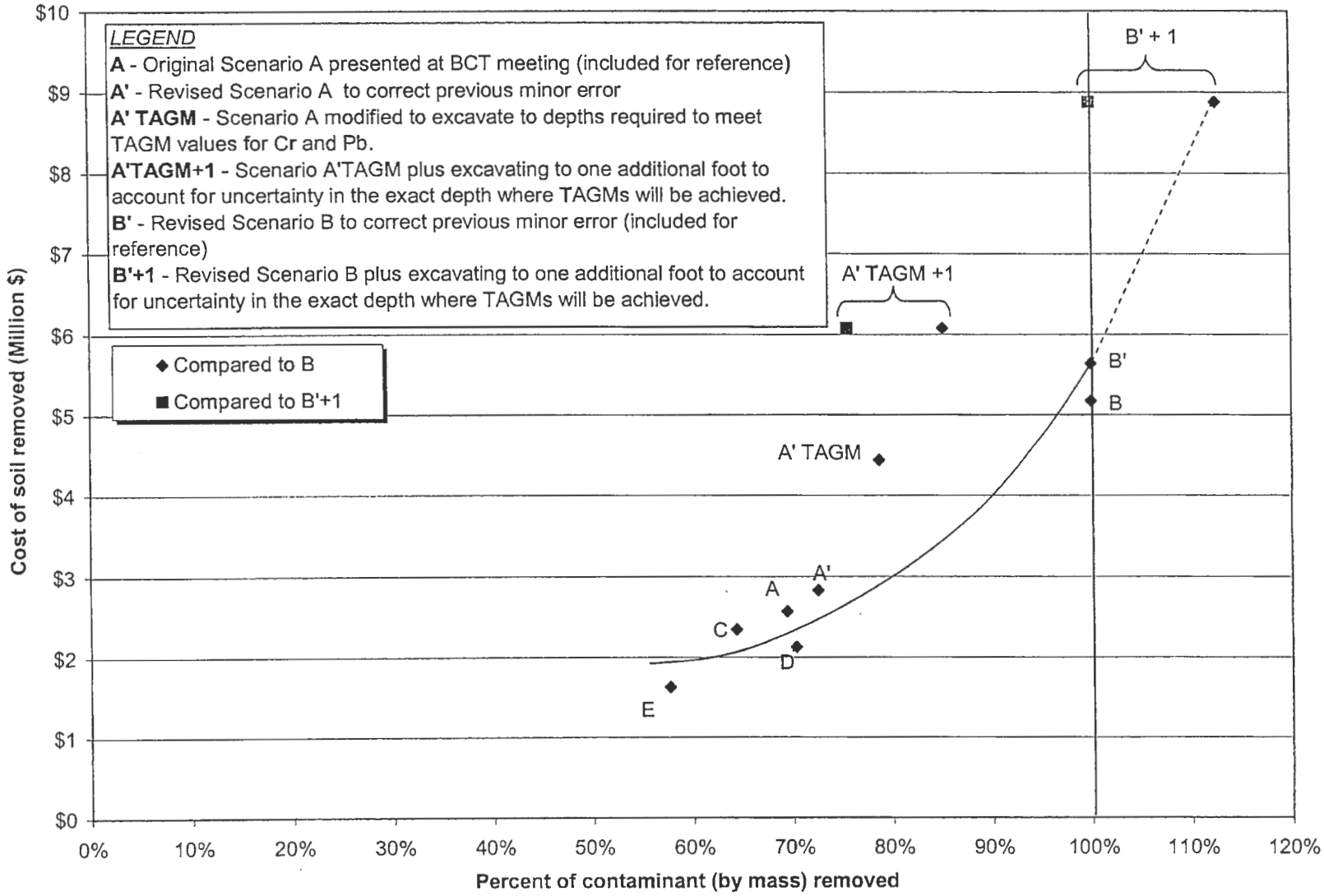
Figure 1
Cost for Chromium Mass Removal to Meet TAGMs at Depth at SEAD-4



H & V
60/167

P:\PIT\Projects\SENECA\SEAD4\FS\revised Exc Area_May2004\average concentrations\rev calcs oct04\Knee of Curve Nov04.xls-Cr %B curve scale

Figure 2
Cost for Lead Mass Removal to Meet TAGMs at Depth at SEAD-4



P:\PIT\Projects\SENECA\SEAD4\FS\revised Exc Area_May2004\sensitivity anal Rev 2 Nov04\Knee of Curve Nov04.xls-Pb %B curve scale

The Army, the EPA, and the NYSDEC continue to work towards the resolution of differences of opinion regarding the cleanup objectives for contaminated soil at SEAD-4, the Leachfield site at the Seneca Army Depot Activity in Romulus, New York. At the center of this difference of opinion is the fact that the NYSDEC cleanup objective for the site has been defined as levels that are consistent with the Technical and Administrative Guidance Memorandum (TAGM) #4046 or background levels, while the Army's recommended cleanup objectives were based on the results of the ecological risk assessment completed as part of the overall RI/FS process.

As part of the efforts to resolve this disagreement, Parsons, at the request of the Army and the NYSDEC, prepared and submitted a sensitivity analysis comparing potential costs of remedial action versus contaminant mass removal for chromium (Cr) and lead (Pb) on September 30, 2004. In summary, the results of this analysis indicated that cleanup goals of 60 mg/Kg and 167 mg/Kg for Cr and Pb, respectively (identified as Scenario A) appeared to represent a cost effective and suitably conservative solution for the two principal contaminants found at the site. The level of 60 mg/Kg for Cr was lower than the ecological cleanup goal for Cr (i.e., 324 mg/Kg) identified within the risk assessment, and the value of 167 mg/Kg for Pb was consistent with the ecological cleanup defined in the risk assessment.

NYSDEC responded to the Army's recommendation by indicating that the Army's recommended cleanup goals were acceptable for defining the horizontal limits of the planned remedial action; however, it was the NYSDEC's position that the vertical limits of excavation should continue to be defined as the TAGM values for Cr and Pb.

In a follow-up memo dated October 15, 2004, Parsons provided a revised sensitivity analysis in which the NYSDEC's request for basing the vertical extent of excavation based on TAGMs was assessed. As part of this follow-up analysis, Parsons indicated that it had identified a calculation error in its prior analysis (correcting for incorrect depth of excavation), which was corrected as part of the follow-up submittal. As a result of this error, values reported for the prior Scenario A and Scenario B had been revised and were now reported as Scenario A' and Scenario B' respectively. Based on the revised calculations, Scenario A' (Cr > 60mg/Kg; Pb > 167 mg/Kg), would excavate 25,000 cy of soil at a cost of $2.8 million, while removing 94% Cr and 72.5 % Pb, by mass. The revised Scenario B' would excavate 53,100 cy of soil at a cost of $5.6 million. Parsons also noted that the revised calculations did not change the Army's overall initial recommendation for cleanup (excavate soil with Cr > 60 mg/Kg and Pb > 167 mg/Kg) at the site.

In addition, within the follow-up analysis, Parsons also evaluated the costs and removal efficiencies of the NYSDEC's proposed vertical excavation to TAGM values. The result of this analysis was presented as Scenario A' TAGM and indicate that cost of excavating Scenario A' to the depth necessary to meet TAGMs is $4.4 million and the percent chromium and lead removed is 96.5% and 78.7%, respectively (based on the comparison to Cr and Pb removal achieved in Scenario A'/Scenario B')

Further extending the proposed Scenario A' vertical excavation to TAGM values (Scenario A' TAGM) results in the removal of approximately 2% more mass of Cr (94% to 96%) and 6.2% of Pb (72.5% to 78.7%) than the original Scenario A' at a cost increase of 57% ($2.8 million to $4.4 million).

Parsons notes that there is an indeterminate amount of uncertainty associate with the anticipated vertical extent of excavation at most of the sites in SEAD-4. The current Scenario A' TAGM and Scenario B' calculations are based on minimal vertical excavations needed. These minimum excavation depths were derived based on Parsons' review of the available soil data and our professional judgment. The uncertainty stems from the fact that in many of the locations evaluated only one sample was collected and analyzed, and the decision of the depth to excavate to is based on that single sample result. Thus, in most cases the excavation depth to achieve TAGM is not firmly bounded, and greater amounts of digging may be needed. To assess the impact of this uncertainty, Parsons also evaluated two additional Scenarios (i.e., A' TAGM+1 and B'+1) to assess the impacts of having to excavate an additional foot of depth at all locations where excavations are presumed required. This analysis yield shows that if excavations required under Scenario B' were extended another foot, an additional 32,500 +/- cy of soil could be removed, with an estimated incremental 5.0 % of Cr and 11.2% of Pb being removed. This would increase to an estimated cost of nearly $8.9 million (i.e., $3.3 above Scenario B' costs). With reference to Scenario A' TAGM+1, an additional 16,500 +/- cy of soil could be removed, with an estimated incremental 2.5% of Cr and 6.4% of the Pb being removed. The additional estimated cost of the excavation of 1 foot at the Scenario A' sites is $3.2 million (above Scenario A' costs). The projected Scenario A' TAGM+1 costs are higher than the previously projected Scenario B' costs (~ $6.1 million to $5.6 million)

A *knee of the curve* presentation is provided in **Figure 1**, which shows all excavation scenarios presented on the same curve. Please note, that all data presented using the black diamond symbol reflects comparisons of the scenario results to the results computed for Scenario B' (corrected for depth). The data presented using grey square symbols reflect a comparison to Scenario B' +1. A similar curve for Pb removal is presented in **Figure 2**.