65-Ø8

BCT AGENDA
January 21,2003
1300-1600

1. Ash landfill - Institutional Controls- Vegetative Covers

2. SEAD 48 Work Plan- Response to comments status

3. SEAD 4- Response to comments - Army Path forward

4. Airfield Small Arms Range status of review and further action.

5. RCRA Closure Plans

PARSONS

MEMORANDUM

TO:	Steve Absolom, SEDA Tom Enroth, USACE – NY District Kevin Healy, USACE - Huntsville	**DATE:**	January 21, 2003
FROM:	Jackie Travers, Parsons	**COPIES:**	**file**

SUBJECT: SEAD-16/17 Proposed Plan – Cleanup Goals (CUGs) for PAHs and metals and Cost/Volume Estimates

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Introduction

Parsons issued the Draft Final Proposed Plan for SEADs- 16/17 in June 2002. We have received NYSDEC and EPA comments on the document and are completing our responses to re-issue the Final document. However, at this time we believe it would be beneficial to review our proposed CUG approach with the Army prior to submitting responses. This memorandum addresses several comments concerning site cleanup goals (CUGs) for PAHs and metals.

Previous Cleanup Goal Approach

In the Feasibility Study (FS), Alternative 4, Off-Site Disposal, was developed using a CUG for lead of 1250 mg/kg. This alternative was the proposed alternative in the Proposed Plan. Based on comments received from NYSDEC on the Draft Proposed Plan requesting the "level of contaminants to be remediated or left untreated onsite", the Army presented exposure point concentrations (EPCs) (i.e. the 95th upper confidence limit of the mean of the site data set) of additional metals (antimony, copper, mercury, thallium, and zinc), which, if left on site, would be protective of human health. These allowable EPCs were risk-based values derived using the baseline risk assessment assumptions as outlined in Section 2 of the FS. The concentrations presented in the Draft Final Proposed Plan were to be used as site "averages" that would be permissible to leave on site. Some exceedances of the concentrations presented would exist beyond the excavation boundaries. However, the EPC derived from the remaining soil would be below the risk-based CUGs.

NYSDEC Comments on Approach

In a letter dated 11/14/02, NYSDEC requested that CUGs be established for PAHs and metals. Specifically, they requested that remedial clean-up levels for PAHs be determined and confirmed by sampling on a point-by-point basis. In addition, they requested that arsenic and cadmium be added to the list of metals (listed above) considered in the Draft Proposed Plan and that CUGs be established such that "no residual contamination in soils exceeds the cleanup goals, not the 95% upper confidence limit of the arithmetic mean of on-site soil samples."

The CUGs are based on the future day-care center child receptor, since it was the most sensitive receptor under the industrial scenario for both cancer and non-cancer risk.

Parsons proposes to establish risk-based CUGs for carcinogenic PAHs and metals (antimony, arsenic, cadmium, copper, mercury, thallium, and zinc) applying the same methodology used for the development of CUGs at other SEDA sites (i.e., SEAD-59/71). CUGs for carcinogenic PAHs were derived using the TAGM 4046 method for establishing CUGs for carcinogens based on a future day-care center child receptor (the most conservative receptor). CUGs for metals were derived by back calculating concentrations of metals that combined would yield a non-carcinogenic risk less than 1. The methodology for deriving these goals is outlined in Attachment 1. The risk-based CUGs for PAHs and metals are presented in Table 1.

Excavation Areas

Using the proposed CUGs on Table 1, new areas of excavation for SEADs-16/17 were delineated, as shown in Figures 1 and 2. For SEAD-16, the expansion of the excavation area is largely driven by meeting the new proposed CUGs for PAHs, copper, zinc, and mercury. The expansion of the excavation area at SEAD-17 is largely due to meeting the new proposed CUGs for cadmium, zinc, and mercury.

The excavation limits shown in Figures 1 and 2 are established using available data from the RI/FS. There is some uncertainty in the limits of excavation in that samples meeting all the CUGs do not exist on the eastern boundary of SEAD-16 and the northern boundary of SEAD-17. In addition, subsurface samples were generally not collected at locations near the excavation limits. Based on the available subsurface data, it is believed that (with few exceptions) the subsurface is not impacted; and, therefore, the depth of excavation has been assumed to be one foot. Based on available data at SEAD-16, the area around subsurface soils sample SB16-4, SB16-5 and SB16-2 are contaminated and will be excavated to a depth of 3 feet, 3 feet, and 2 feet, respectively. Other uncertainty in the limits of excavation may be driven by the cadmium CUG. The NYSDEC TAGM 4046 value for cadmium (2.3 mg/kg, SEDA site background) is used as the CUG since it is greater than the risk-based derived goal (all other goals are above the TAGM). At SEAD-17, the concentrations of cadmium along the northern boundary referred to above are just above the TAGM. No data exists beyond this limit to show a clear boundary.

The Army has expressed concern over CUGs established for arsenic based on recent experiences with remedial actions on site. While arsenic concentrations exceeded the risk-based derived CUG within the area delineated by concentrations of lead greater than 1250 mg/kg (max detection of 32.2 mg/kg and 16.1 mg/kg in surface soil at SEAD-16 and SEAD-17, respectively), arsenic was not detected above the CUG outside this area. In other words, arsenic concentrations are not driving the areal extent of excavation. However, since a CUG is established, regulators will expect that confirmation sampling from the excavation confirm that goals are met. Parsons has considered the concentrations of arsenic found at SEAD-16 and SEAD-17 with respect to depth. The results are presented in Tables 2A and 2B. From the subsurface samples collected, in general, the metals concentrations decrease with increased depth.

Costs
Parsons evaluated three different cost scenarios:

1) Excavation of soils having lead concentrations greater than 1250 mg/kg (Alternative 4 in the FS);
2) Excavation of soils having lead concentrations greater than 1250 mg/kg and PAH concentrations greater than proposed CUGs; and
3) Excavation of soils having lead concentrations greater than 1250 mg/kg, PAH concentrations greater than proposed CUGs, and metal concentrations greater than proposed CUGs.

The original cost estimate for Alternative 4 presented in both the FS and the draft final Proposed Plan was first revised based on other comments from NYSDEC regarding assumptions for hazardous disposal prior to modifying the cost estimate to meet new CUGs. As NYSDEC requested in their letter dated November 14, 2003, the assumption that all material will be disposed as hazardous has been revised. For the purpose of cost estimating, the volume of material (ditch soil, surface soil, and subsurface soil) designated for off-site disposal was decreased from 100% to 15%. Using the revised cost estimate, new costs were derived to account for the increase in remediation volume based on the proposed CUGs. Table 3 presents the remedial volumes and their associated soil remediation cost component under the various scenarios.

Using the revised remedial volumes and the aforementioned assumptions regarding hazardous disposal, updated cost estimates have been prepared for the preferred remedy: Alternative 4, Off-Site Disposal. The revised total present worth costs (including 30 years of O&M) of Alternative 4 are $3.0 million, $2.1 million, and $2.6 million for Alternative 4 presented in the FS (CUGs of lead 1250), revised Alternative 4 (CUG lead 1250 and PAHs), and revised Alternative 4 (CUG lead 1250 and PAHs and metals), respectively, as presented in **Table 4**.

We look forward to discussing these issues with you.

ATTACHMENT 1

Derivation of PAH CUGs

This approach used to calculate risk-based CUGs is in accordance with the NYSDEC TAGM 4046 approach (outlined in Section 2 of TAGM 4046) and the U.S. EPA risk assessment guidelines (U.S. EPA, 1991). Risk-based cleanup goals were only derived for PAHs whose soil criteria values presented in TAGM 4046 were risk-based (benzo(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, and Dibenz(a,h)anthracene). The assumptions used to calculate the risk-based values were based on receptors for an industrial scenario.

Risk-based CUGs represent chemical concentration thresholds at a defined level of risk. A risk-based CUG is calculated based on exposure to contaminated environmental media such as soil or groundwater, and the value of the CUG depends on the amount of chemical exposure. Activities that involve frequent chemical exposure give rise to lower (more stringent) CUGs; activities that involve infrequent chemical exposure will yield higher (less stringent) CUGs at an equivalent "acceptable" risk threshold. Because a CUG depends on the frequency of exposure, CUGs are developed based on a type of activity expected to occur at a site. As such, the CUGs have been derived as a function of the expected land use and exposure frequency for a site.

The risk-based CUGs are derived essentially by reversing the risk calculations performed in a risk assessment. For example, if the risk equation is written as:

$$\text{Cancer Risk} = \text{Concentration (C)} \times \text{Chemical Toxicity Factor (CSF)} \times \text{Intake Factors (IF)}$$

then the CUG is estimated by choosing a target risk level, and solving the above equation for the concentration that yields this risk.

The CUG concentration for each risk driving chemical of concern was calculated according to the following general approach:

$$\textit{Cleanup Goal (CUG)} = \frac{\textit{Acceptable Risk}}{\textit{Chemical Toxicity Factor} \times \textit{Intake Factor}}$$

In addition to the CUGs corresponding to the target cancer risk endpoints, CUGs for non-cancer endpoints were calculated. The acceptable cancer risk was 10^{-6} and the acceptable non-cancer risk was a hazard index of 1.0. The lowest of the non-cancer and cancer based CUGs were used as the limiting health-based CUGs. The TAGM approach considers only ingestion of chemicals in soils in assessing risk-based concentrations. Specific on-site receptors used to estimate CUGs included the site worker, construction worker, trespasser child, day-care center child, and day-care center adult. The CUGs are based on the future day-care center child receptor, since it was the most sensitive receptor under the industrial scenario for both cancer and non-cancer risk.

The risk based cleanup goals derived for the PAHs were reviewed to ensure compliance with the guideline in TAGM 4046 that specifies that individual SVOC concentrations cannot exceed 50,000 μg/kg, and total SVOC concentrations cannot exceed 500,000 μg/kg.

Derivation of Metal CUGs
The risk-based CUGs are determined for metals in a manner similar to the methodology used for PAHs. In order to account for the fact that each metal COC is only a partial contributor to total risk, the post-remediation[1] hazard index for each COC at SEAD-16 was normalized to reflect the magnitude of risk of one metal in comparison to the total risk from all the metals of concern. The normalized HI was subsequently used as the *acceptable risk* value in the calculation described above to determine the CUGs for metals. It should be noted that, with the exception of arsenic, toxicity data for cancer risk was not available for the metals of concern; therefore, all CUGs for metals were based on non-cancer risk calculations. The CUGs derived for SEAD-16 are applied to SEAD-17 as well. In the case that the NYSDEC TAGM 4046 value was higher than the risk-based derived criteria, the TAGM value was adopted.

[1] Post-remediation assumes that all surface soil samples located within the boundary of the area delineated by concentrations of lead greater than 1250 mg/kg have been removed.

TABLE 1
SEAD-16/17 RISK-BASED CLEANUP GOALS FOR SOIL
Proposed Remedial Action Plan for SEAD-16/17
Seneca Army Depot Activity

Compounds	Units	CUGs Presented in DF Proposed Plan [1]	Proposed CUGs for Final Proposed Plan [2]	TAGM 4046 [7]
PAHs[3]				
Benzo(a)anthracene	ug/mg	NA	1,750	224
Benzo(a)pyrene	ug/mg	NA	175	61
Benzo(k)fluoranthene	ug/mg	NA	17,500	1100
Dibenz(a,h)anthracene	ug/mg	NA	175	14
Metals[4]				
Antimony	mg/kg	18	12	5.9
Arsenic	mg/kg	NA	13	8.2
Cadmium	mg/kg	NA	2.3 [5]	2.3
Copper	mg/kg	359	169	33
Lead	mg/kg	1250 [6]	1250 [6]	24.8
Mercury	mg/kg	2.69	0.8	0.1
Thallium	mg/kg	3.59	2.2	0.7
Zinc	mg/kg	539	323	110

Notes:
1. The Army presented these values as exposure point concentrations (EPCs) (i.e. the 95th upper confidence limit of the mean of the site data set), which, if left on site, would be protective of human health.
2. Soil criteria are human health based cleanup goals derived under the industrial scenario for the day-care child receptor. The CUG value is normalized according to the post-remediation HQ distribution for a day-care child receptor.
3. The total value for SVOCs is 500,000 ug/kg (TAGM 4046).
4. The CUG value is normalized according to post-remediation HQ distribution for a day-care child receptor.
5. The cleanup goal value is based on the NYSDEC TAGM 4046, which is site background collected for SEDA, and was adopted since the risk-based value 0.7 was below background.
6. This value was selected as the clean up goal for lead in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996). Refer to the *Remedial Action Objectives* section in the PRAP for a more detailed discussion.
7. TAGM 4046 values for metals were determined from site background samples collected at SEDA.

TABLE 2A
Distribution of Metals in Soil at SEAD-16
Seneca Army Depot Activity

		Proposed CUGs for Final Proposed Plan (mg/kg) [1]	DEPTHS									
			0-.2		0-.2 (DUP)		1'-2'		2'-4'		6'-12'	
SB16-1	Arsenic	13	5	J					3.3	J	6.3	J
	Cadmium	2.3 [2]	0.36						0.07	U	0.19	
	Copper	169	19	J					23.6	J	66.4	
	Lead	1250 [3]	21.9	j					12.6	J	309	
	Mercury	0.8	0.1	J					0.4	U	0.48	
	Thallium	2.2	1.8						0.94	U	0.85	
	Zinc	323	99.8						54.8		119	
SB16-2*	Arsenic	13	*SS16-3 is nearby				6.9	J				
	Cadmium	2.3 [2]					0.45					
	Copper	169					**206**	**J**				
	Lead	1250 [3]					791	J				
	Mercury	0.8					1.9	J				
	Thallium	2.2					0.91					
	Zinc	323					183					
SB16-3*	Arsenic	13	4	J	3.8	J						
	Cadmium	2.3 [2]	0.06	U	0.06	U						
	Copper	169	35.6	J	33	J						
	Lead	1250 [3]	65.9	J	51.7	J						
	Mercury	0.8	0.05	U	0.04	J						
	Thallium	2.2	0.82	U	0.79	U						
	Zinc	323	84.5		79.8							
SB16-4*	Arsenic	13	3	J					5.2	J		
	Cadmium	2.3 [2]	0.18						0.06			
	Copper	169	39.7	J					16.4	J		
	lead	1250 [3]	193	J					21.4	J		
	Mercury	0.8	0.51	J					0.04	J		
	Thallium	2.2	0.72						0.87	U		
	Zinc	323	90.4						89.2			
SB16-5*	Arsenic	13					6.9	J	5	J		
	Cadmium	2.3 [2]					0.09		0.09			
	Copper	169					**736**	**J**	26.6	J		
	lead	1250 [3]					**35400**	**J**	61.6	J		
	Mercury	0.8					0.54	J	0.03	U		
	Thallium	2.2					**88.2**		0.85	U		
	Zinc	323					165		70.9			

Indicates that the concentration increased.

* Location included in area to be remediated to a depth of 1 ft (except SB16-4 and SB16-5 which are being excavated to 3 ft, and SB16-2 which is being excavated to 2 ft.)

bold Indicates that the concentration exceeds the risk-based CUGs

1. Soil criteria are human health based cleanup goals derived under the industrial scenario for the day-care child receptor. The CUG value is normalized according to the post-remediation HQ distribution for a day-care child receptor.
2. The cleanup goal value is based on the NYSDEC TAGM 4046, which is site background collected for SEDA, and was adopted since the risk-based value 0.7 was below background.
3. This value was selected as the clean up goal for lead in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996). Refer to the Remedial Action Objectives section in the PRAP for a more detailed discussion.

TABLE 2B
Distribution of Metals in Soil at SEAD-17
Seneca Army Depot Activity

		Proposed CUGs for Final Proposed Plan (mg/kg) [1]	DEPTHS							
			0-.2		2'-4'		2'-4' (DUP)		4'-6'	
SB17-1	Arsenic	13	4.6		5.2				3.4	
	Cadmium	2.3 [2]	0.73	U	0.74	U			0.56	
	Copper	169	46.4		26.9				20	
	Lead	1250 [3]	266		11.4	J			7.5	J
	Mercury	0.8	0.05	J	0.06	J			0.03	UJ
	Zinc	323	93.4		80.2				57.1	
SB17-2*	Arsenic	13	5.2		6.9		6.3			
	Cadmium	2.3 [2]	**2.8**		0.74	U	0.6	U		
	Copper	169	85.1		18.5		21.5			
	Lead	1250 [3]	686		13		11.2			
	Mercury	0.8	0.04	U	0.04	J	0.04	J		
	Zinc	323	172		63		76.7			
SB17-3	Arsenic	13	4.1		5.4					
	Cadmium	2.3 [2]	0.43	U	0.74	U				
	Copper	169	25.9		26.9					
	Lead	1250 [3]	24.6	J	21.2	J				
	Mercury	0.8	0.06	J	0.04	J				
	Zinc	323	69.7		69					
SB17-4*	Arsenic	13	4.9		5.7					
	Cadmium	2.3 [2]	0.43		0.38	U				
	Copper	169	24		22.7					
	Lead	1250 [3]	12	J	11.7	J				
	Mercury	0.8	0.04	U	0.03	J				
	Zinc	323	64.2		85.1					

Indicates that the concentration increased.
* Location included in area to be remediated to a depth of 1 ft.
bold Indicates that the concentration exceeds the risk-based CUGs

1. Soil criteria are human health based cleanup goals derived under the industrial scenario for the day-care child receptor. The CUG value is normalized according to the post-remediation HQ distribution for a day-care child receptor.
2. The cleanup goal value is based on the NYSDEC TAGM 4046, which is site background collected for SEDA, and was adopted since the risk-based value 0.7 was below background.
3. This value was selected as the clean up goal for lead in accordance with the publication "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil" (USEPA, December 1996). Refer to the Remedial Action Objectives section in the PRAP for a more detailed discussion.

TABLE 3
REMEDIAL VOLUME AND COST ESTIMATES
SEAD-16/17
Seneca Army Depot Activity

	SEAD-16 Volume (CY)	**SEAD-17 Volume (CY)**	**Total Volume (CY)**	**Soil Remediation Cost**	**Total Alternative Cost [2]**
Original Volume for Alt.4 Presented in the FS and PP	1236	1951	3187	$717,000	$2,998,000
Revised Cost for Alt. 4 Based on 15% haz [1]	1236	1951	3187	$369,000	$2,148,000
Revised Cost for Alt. 4 plus removal of PAHs	1744	1951	3696	NA	NA
Revised Cost for Alt. 4 plus removal of PAHs and metals	1954	3015	4969	$586,000	$2,646,000

Notes:

1. designated for off-site disposal was decreased from 100% to 15%. The remainder was disposed of off-site in a subtitle D landfill. Additional material excavated to comply with revised cleanup goals was considered to be non-hazardous. It is still assumed that all building material would require hazardous disposal.
2. Refer to Table 4 for the calculation of Total Alternative Cost, which includes annual post remediation monitoring costs and present worth O&M costs.

TABLE 4
SUMMARY OF REVISED OVERALL COST FOR ALTERNATIVE 4 (OFF-SITE DISPOSAL)
SEAD-16/17
Seneca Army Depot Activity

	Cost for Alt. 4 Presented in FS (CUG=1250 ppm lead)			Revised Cost for Alt. 4, assuming 15% Haz Disposal (CUG=1250 ppm lead)[1]			Revised Cost for Alt. 4, assuming 15% Haz Disposal (CUG=1250 ppm lead+PAHs+metals)[1]		
	cost to prime [2]	cost to owner [3]	project cost [4]	cost to prime [2]	cost to owner [3]	project cost [4]	cost to prime [2]	cost to owner [3]	project cost [4]
Bldg. Remediation Cost	$48,000	$59,000	$94,000	$48,000	$59,000	$94,000	$48,000	$59,000	$94,000
Ditch Soil Remediation	$90,000	$124,000	$196,000	$48,000	$67,000	$106,000	$48,000	$67,000	$106,000
Soil Remediation	$717,000	$990,000	$1,567,000	$369,000	$510,000	$808,000	$586,000	$810,000	$1,282,000
Sampling & testing	$23,000	$32,000	$51,000	$23,000	$32,000	$51,000	$34,000	$47,000	$75,000
Total for alternative	$1,037,000	$1,426,000	$2,258,000	$649,000	$889,000	$1,408,000	$877,000	$1,204,000	$1,906,000
Annual post remediation monitoring costs	-	-	$40,440	-	-	$40,440	-	-	$40,440
Present Worth O&M and Monitoring Costs (30 yrs)	-	-	$699,288	-	-	$699,288	-	-	$699,288
Total Evaluated Price	-	-	**$2,998,000**	-	-	**$2,148,000**	-	-	**$2,646,000**

1. Per request from NYSDEC, the hazardous disposal assumptions were revised. The volume of material (ditch soil, surface soil, and subsurface soil) designated for off-site disposal was decreased from 100% to 15%. The remainder was disposed of off-site in a subtitle D landfill. Additional material excavated to comply with revised cleanup goals was considered to be non-hazardous. It is still assumed that all building material would require hazardous disposal.
2. Cost to prime are the direct costs.
3. Cost to owner (or cost to contractor) are calculated as a percentage of the running total with 5% for field office support, 15% for home office support, 10% for profit, and 4% for bond.
4. Project cost are calculated as a percentage of the running total with 10% for design contingency, 3% for escalation, 25% for construction contingency, 3.5% for other costs, and 8% for construction management.

AMRO Environmental Laboratories Corporation

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December 10, 2002

Steven Kirejczyk
Weston Solutions, Inc.
5537 Rt. 96A
Post Gate #2
Romulus, New York 14541
TEL: (607) 869-2485
FAX: (607) 869-5492

RE: Seneca Army Depot　　　　Workorder No.: 0210173

Dear Steven Kirejczyk:
AMRO Environmental Laboratories Corp. received 3 samples on 10/18/02 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of 60 days from sample receipt date (90 days for samples from New York). After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of 159 pages. This letter is an integral part of your data report. All results in this project relate only to the sample(s) as received by the laboratory and documented in the Chain-of-Custody. This report shall not be reproduced except in full, without the written approval of the laboratory. If you have any questions regarding this project in the future, please refer to the Workorder Number above.

Sincerely,

Nancy Stewart
Vice President/LabDirector

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT: Weston Solutions, Inc.
Project: Seneca Army Depot
Lab Order: 0210173
Date Received: 10/18/02

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Collection Date
0210173-01A	CH-B131-001-0	10/16/02
0210173-01B	CH-B131-001-0	10/16/02
0210173-01C	CH-B131-001-0	10/16/02
0210173-01D	CH-B131-001-0	10/16/02
0210173-02A	CH-TANK-001-0	10/16/02
0210173-02B	CH-TANK-001-0	10/16/02
0210173-02C	CH-TANK-001-0	10/16/02
0210173-02D	CH-TANK-001-0	10/16/02
0210173-03A	CH-FIRE-001-0	10/16/02
0210173-03B	CH-FIRE-001-0	10/16/02
0210173-03C	CH-FIRE-001-0	10/16/02
0210173-03D	CH-FIRE-001-0	10/16/02

AMRO Environmental Laboratories Corp.

Lab Order: 0210173

Client: Weston Solutions, Inc.

Project: Seneca Army Depot

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date	Batch ID
0210173-01A	CH-B131-001-0	10/16/02	Soil	VOLATILES by GC/MS, Bulk Soil		10/16/02	10/22/02	R16059
0210173-01B				ARSENIC, Soil 3051/7060		10/21/02	10/22/02	7928
				ARSENIC, Soil 3051/7060		10/21/02	10/22/02	7928
				Cyanide, Total in Soil			10/25/02	R16109
				ICP METALS, 3051/6010		10/21/02	10/21/02	7928
				ICP METALS, 3051/6010		10/21/02	10/22/02	7928
				ICP METALS, 3051/6010		10/21/02	10/22/02	7928
				ICP METALS, 3051/6010		10/21/02	10/23/02	7928
				ICP METALS, 3051/6010		10/21/02	10/24/02	7928
				MERCURY, Soil		10/21/02	10/21/02	7927
				ORGANOCHLORINE PESTICIDES		10/24/02	10/24/02	7950
				PCBS IN SOIL/SOLIDS		10/24/02	10/24/02	7949
				Percent Moisture			10/19/02	R16021
				SELENIUM, Soil 3051/7740		10/21/02	10/22/02	7928
				SELENIUM, Soil 3051/7740		10/21/02	10/22/02	7928
				SEMIVOLATILE ORGANICS, Soil/Solids		10/22/02	10/23/02	7944
				THALLIUM, Soil 3051/7841		10/21/02	10/22/02	7928
				THALLIUM, Soil 3051/7841		10/21/02	10/22/02	7928
0210173-02A	CH-TANK-001-0			VOLATILES by GC/MS, Bulk Soil		10/16/02	10/22/02	R16059
0210173-02B				ARSENIC, Soil 3051/7060		10/21/02	10/22/02	7928
				ARSENIC, Soil 3051/7060		10/21/02	10/22/02	7928
				Cyanide, Total in Soil			10/25/02	R16109
				ICP METALS, 3051/6010		10/21/02	10/21/02	7928
				ICP METALS, 3051/6010		10/21/02	10/22/02	7928
				ICP METALS, 3051/6010		10/21/02	10/22/02	7928
				MERCURY, Soil		10/21/02	10/21/02	7927
				ORGANOCHLORINE PESTICIDES		10/24/02	10/24/02	7950
				ORGANOCHLORINE PESTICIDES		10/24/02	10/24/02	7950

AMRO Environmental Laboratories Corp.

04-Dec-02

Lab Order: 0210173
Client: Weston Solutions, Inc.
Project: Seneca Army Depot

DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Name	TCLP Date	Prep Date	Analysis Date	Batch ID
0210173-02B	CH-TANK-001-0	10/16/02	Soil	PCBS IN SOIL/SOLIDS		10/24/02	10/24/02	7949
				Percent Moisture			10/19/02	R16021
				SELENIUM, Soil 3051/7740		10/21/02	10/22/02	7928
				SELENIUM, Soil 3051/7740		10/21/02	10/22/02	7928
				SEMIVOLATILE ORGANICS, Soil/Solids		10/22/02	10/23/02	7944
				THALLIUM, Soil 3051/7841		10/21/02	10/22/02	7928
				THALLIUM, Soil 3051/7841		10/21/02	10/22/02	7928
0210173-03A	CH-FIRE-001-0			VOLATILES by GC/MS, Bulk Soil		10/16/02	10/22/02	R16059
0210173-03B				ARSENIC, Soil 3051/7060		10/21/02	10/22/02	7928
				ARSENIC, Soil 3051/7060		10/21/02	10/22/02	7928
				Cyanide, Total in Soil			10/25/02	R16109
				ICP METALS, 3051/6010		10/21/02	10/22/02	7928
				ICP METALS, 3051/6010		10/21/02	10/21/02	7928
				ICP METALS, 3051/6010		10/21/02	10/22/02	7928
				MERCURY, Soil		10/21/02	10/21/02	7927
				ORGANOCHLORINE PESTICIDES		10/24/02	10/24/02	7950
				PCBS IN SOIL/SOLIDS		10/24/02	10/24/02	7949
				Percent Moisture			10/19/02	R16021
				SELENIUM, Soil 3051/7740		10/21/02	10/22/02	7928
				SELENIUM, Soil 3051/7740		10/21/02	10/22/02	7928
				SEMIVOLATILE ORGANICS, Soil/Solids		10/22/02	10/23/02	7944
				THALLIUM, Soil 3051/7841		10/21/02	10/22/02	7928
				THALLIUM, Soil 3051/7841		10/21/02	10/22/02	7928

Amro Environmental
111 Herrick Street
Merrimack, New Hampshire 03054
Tel. (603) 424-2022 Fax (603) 429-8496

Chain of Custody

Page 1 of 2

Turn Time ____Standard (2 Weeks) Other 7-Day	Amro Lab Project ID
If Faster than 5 days, prior approval by laboratory is required #	0210173
State where samples were collected from: MA RI CT NH NJ NY ME USACE Other_______	

Co. Name Weston Solutions	**Project #**	**Project Name (20 Char. or less)** Seneca Army Depot
Contact Person Steven Kirejczyk	**Address** Weston Solutions, Inc. Post Gate #2 5537 Rt. 96A	
City Romulus **State** NY	**Zip** 14541	**WO # 20140.007.203**
Telephone # (607) 869-2485	**Fax #** (607) 869-5492	**Email Address** Steve.Kirejczyk@westonsolutions.com

Amro Lab Sample #	Date	Collection Time	Comp	Grab	Matrix	Sample Identification #	Number of Containers	Type of Containers	Total VOC**	Total SVOC**	Total Heavy Metals**	Total Pesticides/Herbicides**
	October 16, 2002	1:32		X	Soil	CH-B131-001-0	5	G	X	X	X	X
	October 16, 2002	1:45		X	Soil	CH-TANK-001-0	5	G	X	X	X	X
	October 16, 2002	1:55		X	Soil	CH-FIRE-001-0	5	G	X	X	X	X
	Oct 16, 2002	2:00				TBK-101602-001 (Trip Blank)	✓		X			

Analysis Required

Container Type: P-Poly G-Glass S-Sterile V-VOA

Matrix: S-Soild D-Sludge WW-Waste Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present ___Yes ___No
Seals Intact ___Yes ___No N/A:______
Cooler Temp:________

Internal Use Only
[ ] Pickup
[ ] Technician

Comments ** **See attached Tables for New York State TAGM 4046 Analytes**

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time	Relinquished By:(Signature)	Date/Time
Ste Kurl	10/18/02 0900	Jeff Knight	10/18/02 0900		

Received By: (Signature)	Date/Time	Relinquished By: (Signature)	Date/Time	Received By:(Signature)	Date/Time

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Chain of Custody

Turn Time ____Standard (2 Weeks) Other 7-Day If Faster than 5 days, prior approval by laboratory is required #____	Amro Lab Project ID 0210173
State where samples were collected from: MA RI CT NH NJ NY ME USACE Other______	

Co. Name	Project #	Project Name (20 Char. or less)
Weston Solutions		Seneca Army Depot
Contact Person	**Address**	
Steven Kirejczyk	Weston Solutions, Inc. Post Gate #2 5537 Rt. 96A	
City / **State** / **Zip**		**WO # 20140.007.203**
Romulus / NY / 14541		
Telephone #	**Fax #**	**Email Address**
(607) 869-2485	(607) 869-5492	Steve.Kirejczyk@westonsolutions.com

Analysis Required

Amro Lab Sample #	Date	Collection Time	Comp	Grab	Matrix	Sample Identification #	Number of Containers	Type of Containers	Total PCBs**/Pest	Dioxin		
	October 16, 2002	1:32		X	Soil	CH-B131-001-0	5	G	X			
	October 16, 2002	1:45		X	Soil	CH-TANK-001-0	5	G	X			
	October 16, 2002	1:55		X	Soil	CH-FIRE-001-0	5	G	X			

Container Type: P-Poly G-Glass S-Sterile V-VOA

Matrix: S-Soild D-Sludge WW-Waste Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present ___Yes ___No
Internal Use Only
Seals Intact ___Yes ___No N/A:______ [ ] Pickup
Cooler Temp:________ [ ] Technician

Comments ** See attached Tables for New York State TAGM 4046 Analytes

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Date/Time	Relinquished By:(Signature)	Date/Time
Steve Kirejczyk	10/17/02 0900	Jennifer Knight	10/18/02 0900		
Received By: (Signature)	**Date/Time**	**Relinquished By: (Signature)**	**Date/Time**	**Received By:(Signature)**	**Date/Time**

AMRO Environmental Laboratories Corporation

SAMPLE RECEIPT CHECKLIST

111 Herrick Street
Merrimack, NH 03054
(603) 424-2022

Client: Weston Solutions
Project Name: Seneca Army Depot
Ship via: (circle one) Fed Ex, UPS, AMRO Courier, Hand Del., Other Courier, Other:

AMRO ID: 021073
Date Rec.: 10-18-02
Date Due: ~~10-28-02~~ 10-25-02

Items to be Checked Upon Receipt	Yes	No	NA	Comments
1. Army Samples received in individual plastic bags?	✓			
2. Custody Seals present?	✓			
3. Custody Seals Intact?	✓			
4. Air Bill included in folder if received?	✓			
5. Is COC included with samples?	✓			
6. Is COC signed and dated by client?	✓			
7. Laboratory receipt temperature. TEMP = 3°C	✓			
Samples rec. with ice X ice packs___ neither___	✓			
8. Were samples received the same day they were sampled?		✓		
Is client temperature 4°C ± 2°C?	✓			
If no obtain authorization from the client for the analyses.				
Client authorization from: Date: Obtained by:				
9. Is the COC filled out correctly and completely?	✓			7 days =
10. Does the info on the COC match the samples?	✓			
11. Were samples rec. within holding time?	✓			
12. Were all samples properly labeled?	✓			
13. Were all samples properly preserved?	✓			
14. Were proper sample containers used?	✓			For VOC -> bulk
15. Were all samples received intact? (none broken or leaking)	✓			
16. Were VOA vials rec. with no air bubbles?			✓	
17. Were the sample volumes sufficient for requested analysis?	✓			
18. Were all samples received?	✓			
19. VPH and VOA Soils only:				
Sampling Method VPH (circle one): M=Methanol, E=EnCore (air-tight container)				
Sampling Method VOA (circle one): M=Methanol, SB=Sodium Bisulfate, E=EnCore, B=Bulk				
If M or SB:				
Does preservative cover the soil?				
If NO then client must be faxed.				
Does preservation level come close to the fill line on the vial?				
If NO then client must be faxed.				
Were vials provided by AMRO?				
If NO then weights MUST be obtained from client				
Was dry weight aliquot provided?				
If NO then fax client and inform the VOA lab ASAP.				
20. Subcontracted Samples:				
What samples sent: 01C-03C / 01D-03D				
Where sent: STL-NO CANTON; W. SACRA.				
Date: 10-22-02 10-22-02				
Analysis: HERB DIOXIN				
TAT: 7 DAYS 7 DAYS				
21. Information entered into:				
Internal Tracking Log?	✓			
Dry Weight Log?	✓			
Client Log?			✓	
Composite Log?			✓	
Filtration Log?			✓	

Received By: YK Date: 10-18-02 Logged in By: CC Date: 10-21-02
Labeled By: CC Date: 10-21-02 Checked By: [illegible] Date: 10-23-02

7

NA= Not Applicable

qc/qcmemos/forms/samplerec Rev.18 06/00

CASE NARRATIVE
0210173

GENERAL

1. No QC deviations were observed.

GC/MS-VOLATILES
SOIL

1. 2-Butanone was detected in the Method Blank (MB) analyzed on 10/22/02 (Batch ID: R16059) at 214µg/Kg below the laboratory reporting limit of 250µg/Kg.

2. The full list Laboratory Control Sample (LCSF) analyzed on 10/22/02 for Batch ID: R16059 had a recovery for m,p-Xylene at 200% above the QC limit (54-146%).

3. No other QC deviations were observed.

GC/MS-SEMIVOLATILES
SOIL

1. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) for Batch ID: 7944 was performed on sample CH-B131-001-0 (0210173-01B). All %REC's and %RPD's were within the QC limits with the following exceptions:

   1.1 The %REC's for Phenol and N-nitrosodi-n-propylamine were below the QC limits in the MSD limits due to a possible preparation error.

   1.2 All %RPD's were above the QC limits due to a possible preparation error on the MSD.

2. No other QC deviations were observed.

GC/ECD-PESTICIDES
SOIL

1. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) for Batch ID: 7950 was performed on sample CH-FIRE-001-0 (0210173-03B). All %REC's and %RPD's were within the QC limits with the following exception:

    1.1 The %REC for Heptachlor was 125% above the QC limits (29-122%) in the MS.

2. A full list Laboratory Control Sample (LCSF) was analyzed for Batch ID: 7950. All %REC's were within laboratory control limits with the following exceptions:

    2.1 Endrin Ketone and Methoxychlor recovered above the laboratory control limits (50-130%). These compounds were not detected in any associated samples.

3. No other QC deviations were observed.

GC/ECD-PCBS
SOIL

1. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) for Batch ID: 7949 was performed on sample 0210197-09B. All %REC's and %RPD's were within the QC limits with the following exceptions:

    1.1 The %REC for Aroclor-1016 was above the QC limits (35-18%) in the MS and MSD.

2. No other QC deviations were observed.

TRACE METALS
SOIL

1. The Matrix Spike (MS) and Matrix Spike Duplicate (MSD) for ICP and GFAA analytes were performed on sample CH-B131-001-0 (0210173-01B) (Batch ID: 7928). All %R's and %RPD's were within the QC limits with the following exceptions:

   1.1 MS recoveries for Aluminum, Iron, Magnesium and Calcium; MSD recoveries for Iron, Magnesium and Calcium; %RPD for Calcium. These failures were due to high sample concentration relative to the spike concentration.

   1.2 MS recoveries for Arsenic, Selenium and Thallium; MSD recoveries for Selenium and Thallium; %RPD for Selenium. These failures were possibly due to matrix interference.

2. The Method Blank (MB-7928) had Antimony concentration at 1.066mg/Kg and Sodium concentration at 65.77mg/Kg both below the reporting limits 4.0mg/Kg and 250mg/Kg respectively.

3. No other QC deviations were observed.

WET CHEMISTRY
SOIL

1. No QC deviations were observed.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01A	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **KT**
Dichlorodifluoromethane	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Chloromethane	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Vinyl chloride	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Chloroethane	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Bromomethane	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Trichlorofluoromethane	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Acetone	ND	270		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,1-Dichloroethene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Carbon disulfide	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Methylene chloride	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Methyl tert-butyl ether	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
trans-1,2-Dichloroethene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,1-Dichloroethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
2-Butanone	160	270	J	µg/Kg-dry	1	10/22/02 10:07:00 AM
2,2-Dichloropropane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
cis-1,2-Dichloroethene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Chloroform	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Bromochloromethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,1,1-Trichloroethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,1-Dichloropropene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Carbon tetrachloride	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2-Dichloroethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Benzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Trichloroethene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2-Dichloropropane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Bromodichloromethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Dibromomethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
4-Methyl-2-pentanone	ND	270		µg/Kg-dry	1	10/22/02 10:07:00 AM
cis-1,3-Dichloropropene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Toluene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
trans-1,3-Dichloropropene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,1,2-Trichloroethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2-Dibromoethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
2-Hexanone	ND	270		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,3-Dichloropropane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Tetrachloroethene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Dibromochloromethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Chlorobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM

Qualifiers:

- ND - Not Detected at the Reporting Limit
- J - Analyte detected below quantitation limits
- B - Analyte detected in the associated Method Blank
- H - Method prescribed holding time exceeded
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range
- # - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01A	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
1,1,1,2-Tetrachloroethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Ethylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
m,p-Xylene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
o-Xylene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Styrene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Bromoform	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Isopropylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,1,2,2-Tetrachloroethane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2,3-Trichloropropane	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Bromobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
n-Propylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
2-Chlorotoluene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
4-Chlorotoluene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,3,5-Trimethylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
tert-Butylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2,4-Trimethylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
sec-Butylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
4-Isopropyltoluene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,3-Dichlorobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,4-Dichlorobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
n-Butylbenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2-Dichlorobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2-Dibromo-3-chloropropane	ND	140		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2,4-Trichlorobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Hexachlorobutadiene	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
Naphthalene	ND	54		µg/Kg-dry	1	10/22/02 10:07:00 AM
1,2,3-Trichlorobenzene	ND	27		µg/Kg-dry	1	10/22/02 10:07:00 AM
Surr: Dibromofluoromethane	93.1	60-124		%REC	1	10/22/02 10:07:00 AM
Surr: 1,2-Dichloroethane-d4	90.4	55-128		%REC	1	10/22/02 10:07:00 AM
Surr: Toluene-d8	84.7	63-127		%REC	1	10/22/02 10:07:00 AM
Surr: 4-Bromofluorobenzene	78.1	58-125		%REC	1	10/22/02 10:07:00 AM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
\# - See Case Narrative
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02A	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **KT**
Dichlorodifluoromethane	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Chloromethane	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Vinyl chloride	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Chloroethane	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Bromomethane	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Trichlorofluoromethane	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Acetone	ND	250		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,1-Dichloroethene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Carbon disulfide	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Methylene chloride	27	51	J	µg/Kg-dry	1	10/22/02 10:42:00 AM
Methyl tert-butyl ether	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
trans-1,2-Dichloroethene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,1-Dichloroethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
2-Butanone	150	250	J	µg/Kg-dry	1	10/22/02 10:42:00 AM
2,2-Dichloropropane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
cis-1,2-Dichloroethene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Chloroform	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Bromochloromethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,1,1-Trichloroethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,1-Dichloropropene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Carbon tetrachloride	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2-Dichloroethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Benzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Trichloroethene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2-Dichloropropane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Bromodichloromethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Dibromomethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
4-Methyl-2-pentanone	ND	250		µg/Kg-dry	1	10/22/02 10:42:00 AM
cis-1,3-Dichloropropene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Toluene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
trans-1,3-Dichloropropene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,1,2-Trichloroethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2-Dibromoethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
2-Hexanone	ND	250		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,3-Dichloropropane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Tetrachloroethene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Dibromochloromethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Chlorobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02A	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
1,1,1,2-Tetrachloroethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Ethylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
m,p-Xylene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
o-Xylene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Styrene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Bromoform	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Isopropylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,1,2,2-Tetrachloroethane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2,3-Trichloropropane	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Bromobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
n-Propylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
2-Chlorotoluene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
4-Chlorotoluene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,3,5-Trimethylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
tert-Butylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2,4-Trimethylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
sec-Butylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
4-Isopropyltoluene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,3-Dichlorobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,4-Dichlorobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
n-Butylbenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2-Dichlorobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2-Dibromo-3-chloropropane	ND	130		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2,4-Trichlorobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Hexachlorobutadiene	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
Naphthalene	ND	51		µg/Kg-dry	1	10/22/02 10:42:00 AM
1,2,3-Trichlorobenzene	ND	25		µg/Kg-dry	1	10/22/02 10:42:00 AM
Surr: Dibromofluoromethane	89.0	60-124		%REC	1	10/22/02 10:42:00 AM
Surr: 1,2-Dichloroethane-d4	87.3	55-128		%REC	1	10/22/02 10:42:00 AM
Surr: Toluene-d8	81.4	63-127		%REC	1	10/22/02 10:42:00 AM
Surr: 4-Bromofluorobenzene	73.6	58-125		%REC	1	10/22/02 10:42:00 AM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03A	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **KT**
Dichlorodifluoromethane	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Chloromethane	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Vinyl chloride	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Chloroethane	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Bromomethane	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Trichlorofluoromethane	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Acetone	ND	260		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,1-Dichloroethene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Carbon disulfide	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Methylene chloride	27	52	J	µg/Kg-dry	1	10/22/02 11:17:00 AM
Methyl tert-butyl ether	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
trans-1,2-Dichloroethene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,1-Dichloroethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
2-Butanone	140	260	J	µg/Kg-dry	1	10/22/02 11:17:00 AM
2,2-Dichloropropane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
cis-1,2-Dichloroethene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Chloroform	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Bromochloromethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,1,1-Trichloroethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,1-Dichloropropene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Carbon tetrachloride	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2-Dichloroethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Benzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Trichloroethene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2-Dichloropropane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Bromodichloromethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Dibromomethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
4-Methyl-2-pentanone	ND	260		µg/Kg-dry	1	10/22/02 11:17:00 AM
cis-1,3-Dichloropropene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Toluene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
trans-1,3-Dichloropropene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,1,2-Trichloroethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2-Dibromoethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
2-Hexanone	ND	260		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,3-Dichloropropane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Tetrachloroethene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Dibromochloromethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Chlorobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM

Qualifiers:

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E - Value above quantitation range
- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03A	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
1,1,1,2-Tetrachloroethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Ethylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
m,p-Xylene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
o-Xylene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Styrene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Bromoform	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Isopropylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,1,2,2-Tetrachloroethane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2,3-Trichloropropane	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Bromobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
n-Propylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
2-Chlorotoluene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
4-Chlorotoluene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,3,5-Trimethylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
tert-Butylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2,4-Trimethylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
sec-Butylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
4-Isopropyltoluene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,3-Dichlorobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,4-Dichlorobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
n-Butylbenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2-Dichlorobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2-Dibromo-3-chloropropane	ND	130		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2,4-Trichlorobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Hexachlorobutadiene	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
Naphthalene	ND	52		µg/Kg-dry	1	10/22/02 11:17:00 AM
1,2,3-Trichlorobenzene	ND	26		µg/Kg-dry	1	10/22/02 11:17:00 AM
Surr: Dibromofluoromethane	95.6	60-124		%REC	1	10/22/02 11:17:00 AM
Surr: 1,2-Dichloroethane-d4	91.9	55-128		%REC	1	10/22/02 11:17:00 AM
Surr: Toluene-d8	86.5	63-127		%REC	1	10/22/02 11:17:00 AM
Surr: 4-Bromofluorobenzene	76.8	58-125		%REC	1	10/22/02 11:17:00 AM

Qualifiers:

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B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT
Method Blank

Sample ID **mb-10/22/02** Batch ID: **R16059** Test Code: **SW8260B** Units: **µg/Kg** Analysis Date **10/22/02 9:32:00 AM** Prep Date **10/22/02**

Client ID: Run ID: **V-1_021022A** SeqNo: **252089**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
Dichlorodifluoromethane	ND	50	µg/Kg									
Chloromethane	ND	50	µg/Kg									
Vinyl chloride	ND	25	µg/Kg									
Chloroethane	ND	50	µg/Kg									
Bromomethane	ND	50	µg/Kg									
Trichlorofluoromethane	ND	50	µg/Kg									
Acetone	ND	250	µg/Kg									
1,1-Dichloroethene	ND	25	µg/Kg									
Carbon disulfide	ND	50	µg/Kg									
Methylene chloride	ND	50	µg/Kg									
Methyl tert-butyl ether	ND	25	µg/Kg									
trans-1,2-Dichloroethene	ND	25	µg/Kg									
1,1-Dichloroethane	ND	25	µg/Kg									
2-Butanone	214	250	µg/Kg									J
2,2-Dichloropropane	ND	25	µg/Kg									
cis-1,2-Dichloroethene	ND	25	µg/Kg									
Chloroform	ND	25	µg/Kg									
Bromochloromethane	ND	25	µg/Kg									
1,1,1-Trichloroethane	ND	25	µg/Kg									
1,1-Dichloropropene	ND	25	µg/Kg									
Carbon tetrachloride	ND	25	µg/Kg									
1,2-Dichloroethane	ND	25	µg/Kg									
Benzene	ND	25	µg/Kg									
Trichloroethene	ND	25	µg/Kg									
1,2-Dichloropropane	ND	25	µg/Kg									

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT
Method Blank

Bromodichloromethane	ND	25	µg/Kg
Dibromomethane	ND	25	µg/Kg
4-Methyl-2-pentanone	ND	250	µg/Kg
cis-1,3-Dichloropropene	ND	25	µg/Kg
Toluene	ND	25	µg/Kg
trans-1,3-Dichloropropene	ND	25	µg/Kg
1,1,2-Trichloroethane	ND	25	µg/Kg
1,2-Dibromoethane	ND	25	µg/Kg
2-Hexanone	ND	250	µg/Kg
1,3-Dichloropropane	ND	25	µg/Kg
Tetrachloroethene	ND	25	µg/Kg
Dibromochloromethane	ND	25	µg/Kg
Chlorobenzene	ND	25	µg/Kg
1,1,1,2-Tetrachloroethane	ND	25	µg/Kg
Ethylbenzene	ND	25	µg/Kg
m,p-Xylene	ND	25	µg/Kg
o-Xylene	ND	25	µg/Kg
Styrene	ND	25	µg/Kg
Bromoform	ND	50	µg/Kg
Isopropylbenzene	ND	25	µg/Kg
1,1,2,2-Tetrachloroethane	ND	25	µg/Kg
1,2,3-Trichloropropane	ND	25	µg/Kg
Bromobenzene	ND	25	µg/Kg
n-Propylbenzene	ND	25	µg/Kg
2-Chlorotoluene	ND	25	µg/Kg
4-Chlorotoluene	ND	25	µg/Kg
1,3,5-Trimethylbenzene	ND	25	µg/Kg
tert-Butylbenzene	ND	25	µg/Kg
1,2,4-Trimethylbenzene	ND	25	µg/Kg
sec-Butylbenzene	ND	25	µg/Kg
4-Isopropyltoluene	ND	25	µg/Kg

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Method Blank

1,3-Dichlorobenzene	ND	25	µg/Kg						
1,4-Dichlorobenzene	ND	25	µg/Kg						
n-Butylbenzene	ND	25	µg/Kg						
1,2-Dichlorobenzene	ND	25	µg/Kg						
1,2-Dibromo-3-chloropropane	ND	120	µg/Kg						
1,2,4-Trichlorobenzene	ND	25	µg/Kg						
Hexachlorobutadiene	ND	50	µg/Kg						
Naphthalene	ND	50	µg/Kg						
1,2,3-Trichlorobenzene	ND	25	µg/Kg						
Surr: Dibromofluoromethane	2681	25	µg/Kg	2500	0	107	60	124	0
Surr: 1,2-Dichloroethane-d4	2793	25	µg/Kg	2500	0	112	55	128	0
Surr: Toluene-d8	2503	25	µg/Kg	2500	0	100	63	127	0
Surr: 4-Bromofluorobenzene	2268	25	µg/Kg	2500	0	90.7	58	125	0

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID **0210173-03Ams** Batch ID: **R16059** Test Code: **SW8260B** Units: **µg/Kg-dry** Analysis Date **10/22/02 11:52:00 AM** Prep Date **10/16/02**

Client ID: **CH-FIRE-001-0** Run ID: **V-1_021022A** SeqNo: **252093**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
1,1-Dichloroethene	515.6	27	µg/Kg-dry	538.2	0	95.8	55	157	0			
Benzene	493	27	µg/Kg-dry	538.2	0	91.6	79	125	0			
Trichloroethene	462.3	27	µg/Kg-dry	538.2	0	85.9	79	128	0			
Toluene	451.8	27	µg/Kg-dry	538.2	0	84	78	123	0			
Chlorobenzene	472.3	27	µg/Kg-dry	538.2	0	87.8	84	117	0			
Surr: Dibromofluoromethane	2097	27	µg/Kg-dry	2691	0	77.9	60	124	0			
Surr: 1,2-Dichloroethane-d4	2110	27	µg/Kg-dry	2691	0	78.4	55	128	0			
Surr: Toluene-d8	1885	27	µg/Kg-dry	2691	0	70.1	63	127	0			
Surr: 4-Bromofluorobenzene	1766	27	µg/Kg-dry	2691	0	65.6	58	125	0			

Sample ID **0210173-03Amsd** Batch ID: **R16059** Test Code: **SW8260B** Units: **µg/Kg-dry** Analysis Date **10/22/02 12:28:00 PM** Prep Date **10/16/02**

Client ID: **CH-FIRE-001-0** Run ID: **V-1_021022A** SeqNo: **252094**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
1,1-Dichloroethene	478.5	25	µg/Kg-dry	491.5	0	97.4	55	157	515.6	7.48	25	
Benzene	460.5	25	µg/Kg-dry	491.5	0	93.7	79	125	493	6.82	25	
Trichloroethene	444.8	25	µg/Kg-dry	491.5	0	90.5	79	128	462.3	3.87	25	
Toluene	425.4	25	µg/Kg-dry	491.5	0	86.6	78	123	451.8	6.04	25	
Chlorobenzene	448.5	25	µg/Kg-dry	491.5	0	91.3	84	117	472.3	5.18	25	
Surr: Dibromofluoromethane	2001	25	µg/Kg-dry	2457	0	81.4	60	124	0	0	0	
Surr: 1,2-Dichloroethane-d4	1996	25	µg/Kg-dry	2457	0	81.2	55	128	0	0	0	
Surr: Toluene-d8	1813	25	µg/Kg-dry	2457	0	73.8	63	127	0	0	0	
Surr: 4-Bromofluorobenzene	1701	25	µg/Kg-dry	2457	0	69.2	58	125	0	0	0	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Laboratory Control Spike - Full List

Sample ID **lcs-10/22/02** Batch ID: **R16059** Test Code: **SW8260B** Units: **µg/Kg** Analysis Date **10/22/02 7:28:00 AM** Prep Date **10/22/02**

Client ID: Run ID: **V-1_021022A** SeqNo: **252088**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
Dichlorodifluoromethane	389.2	50	µg/Kg	500	0	77.8	10	180	0			
Chloromethane	412.8	50	µg/Kg	500	0	82.6	10	180	0			
Vinyl chloride	435.2	25	µg/Kg	500	0	87	27	169	0			
Chloroethane	664	50	µg/Kg	500	0	133	11	183	0			
Bromomethane	561.8	50	µg/Kg	500	0	112	21	174	0			
Trichlorofluoromethane	587.2	50	µg/Kg	500	0	117	18	159	0			
Acetone	766.8	250	µg/Kg	500	0	153	41	168	0			
1,1-Dichloroethene	613.2	25	µg/Kg	500	0	123	55	142	0			
Carbon disulfide	615.8	50	µg/Kg	500	0	123	30	143	0			
Methylene chloride	568.2	50	µg/Kg	500	0	114	49	139	0			
Methyl tert-butyl ether	521	25	µg/Kg	500	0	104	54	144	0			
trans-1,2-Dichloroethene	518.2	25	µg/Kg	500	0	104	60	127	0			
1,1-Dichloroethane	551.2	25	µg/Kg	500	0	110	65	134	0			
2-Butanone	904	250	µg/Kg	500	214	138	12	177	0			
2,2-Dichloropropane	580	25	µg/Kg	500	0	116	47	144	0			
cis-1,2-Dichloroethene	546.5	25	µg/Kg	500	0	109	69	124	0			
Chloroform	523	25	µg/Kg	500	0	105	70	119	0			
Bromochloromethane	548.8	25	µg/Kg	500	0	110	75	124	0			
1,1,1-Trichloroethane	588.8	25	µg/Kg	500	0	118	56	129	0			
1,1-Dichloropropene	444	25	µg/Kg	500	0	88.8	56	110	0			
Carbon tetrachloride	605.8	25	µg/Kg	500	0	121	52	131	0			
1,2-Dichloroethane	558	25	µg/Kg	500	0	112	57	126	0			
Benzene	506.2	25	µg/Kg	500	0	101	77	120	0			
Trichloroethene	473.2	25	µg/Kg	500	0	94.6	77	120	0			
1,2-Dichloropropane	464.8	25	µg/Kg	500	0	93	73	118	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits; NA - Not applicable where J values or ND results occur

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Laboratory Control Spike - Full List

Bromodichloromethane	503.8	25	µg/Kg	500	0	101	48	119	0	
Dibromomethane	531.2	25	µg/Kg	500	0	106	66	125	0	
4-Methyl-2-pentanone	544.5	250	µg/Kg	500	0	109	47	159	0	
cis-1,3-Dichloropropene	529.2	25	µg/Kg	500	0	106	57	112	0	
Toluene	473.8	25	µg/Kg	500	0	94.8	76	116	0	
trans-1,3-Dichloropropene	498.8	25	µg/Kg	500	0	99.8	58	123	0	
1,1,2-Trichloroethane	489.2	25	µg/Kg	500	0	97.8	70	128	0	
1,2-Dibromoethane	528	25	µg/Kg	500	0	106	72	128	0	
2-Hexanone	606.5	250	µg/Kg	500	0	121	29	156	0	
1,3-Dichloropropane	455	25	µg/Kg	500	0	91	67	123	0	
Tetrachloroethene	514	25	µg/Kg	500	0	103	70	130	0	
Dibromochloromethane	520.5	25	µg/Kg	500	0	104	50	122	0	
Chlorobenzene	481.2	25	µg/Kg	500	0	96.2	80	117	0	
1,1,1,2-Tetrachloroethane	519.8	25	µg/Kg	500	0	104	74	116	0	
Ethylbenzene	454.8	25	µg/Kg	500	0	91	32	163	0	
m,p-Xylene	999	25	µg/Kg	500	0	200	54	146	0	S
o-Xylene	485.8	25	µg/Kg	500	0	97.2	69	130	0	
Styrene	495	25	µg/Kg	500	0	99	67	129	0	
Bromoform	552.2	50	µg/Kg	500	0	110	34	143	0	
Isopropylbenzene	538.8	25	µg/Kg	500	0	108	24	177	0	
1,1,2,2-Tetrachloroethane	460.2	25	µg/Kg	500	0	92	54	151	0	
1,2,3-Trichloropropane	476.2	25	µg/Kg	500	0	95.2	50	152	0	
Bromobenzene	501.8	25	µg/Kg	500	0	100	78	126	0	
n-Propylbenzene	534.8	25	µg/Kg	500	0	107	61	132	0	
2-Chlorotoluene	475.8	25	µg/Kg	500	0	95.2	66	128	0	
4-Chlorotoluene	484.5	25	µg/Kg	500	0	96.9	27	167	0	
1,3,5-Trimethylbenzene	532	25	µg/Kg	500	0	106	66	133	0	
tert-Butylbenzene	504.5	25	µg/Kg	500	0	101	66	132	0	
1,2,4-Trimethylbenzene	494.8	25	µg/Kg	500	0	99	66	132	0	
sec-Butylbenzene	561	25	µg/Kg	500	0	112	61	139	0	
4-Isopropyltoluene	519.5	25	µg/Kg	500	0	104	25	176	0	

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Laboratory Control Spike - Full List

1,3-Dichlorobenzene	489.8	25	µg/Kg	500	0	98	75	130	0
1,4-Dichlorobenzene	491.5	25	µg/Kg	500	0	98.3	74	131	0
n-Butylbenzene	523.2	25	µg/Kg	500	0	105	59	136	0
1,2-Dichlorobenzene	505.5	25	µg/Kg	500	0	101	75	128	0
1,2-Dibromo-3-chloropropane	514.8	120	µg/Kg	500	0	103	20	164	0
1,2,4-Trichlorobenzene	549.5	25	µg/Kg	500	0	110	52	151	0
Hexachlorobutadiene	541	50	µg/Kg	500	0	108	19	186	0
Naphthalene	457	50	µg/Kg	500	0	91.4	45	158	0
1,2,3-Trichlorobenzene	548.2	25	µg/Kg	500	0	110	44	166	0
Surr: Dibromofluoromethane	2806	25	µg/Kg	2500	0	112	60	124	0
Surr: 1,2-Dichloroethane-d4	2788	25	µg/Kg	2500	0	112	55	128	0
Surr: Toluene-d8	2546	25	µg/Kg	2500	0	102	63	127	0
Surr: 4-Bromofluorobenzene	2296	25	µg/Kg	2500	0	91.8	58	125	0

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		**SW8270C**				Analyst: **KD**
Phenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Bis(2-chloroethyl)ether	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2-Chlorophenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
1,3-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
1,4-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Benzyl alcohol	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
2-Methylphenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
1,2-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Bis(2-chloroisopropyl)ether	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Methylphenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
N-Nitrosodi-n-propylamine	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Hexachloroethane	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Nitrobenzene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Isophorone	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,4-Dimethylphenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Benzoic acid	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
2-Nitrophenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Bis(2-chloroethoxy)methane	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,4-Dichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
1,2,4-Trichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Naphthalene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Chloroaniline	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Hexachlorobutadiene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Chloro-3-methylphenol	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
2-Methylnaphthalene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Hexachlorocyclopentadiene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,4,6-Trichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,4,5-Trichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2-Chloronaphthalene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2-Nitroaniline	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
Dimethyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,6-Dinitrotoluene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Acenaphthylene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
3-Nitroaniline	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Nitrophenol	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,4-Dinitrophenol	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
Acenaphthene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
2,4-Dinitrotoluene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dibenzofuran	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Diethyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Chlorophenyl phenyl ether	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Fluorene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Nitroaniline	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
4,6-Dinitro-2-methylphenol	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
N-Nitrosodiphenylamine	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
1,2-Diphenylhydrazine (as Azobenzene)	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
4-Bromophenyl phenyl ether	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Hexachlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Pentachlorophenol	ND	550		µg/Kg-dry	1	10/23/02 5:30:00 PM
Phenanthrene	120	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Anthracene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Carbazole	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Di-n-butyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Fluoranthene	230	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Pyrene	220	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Butyl benzyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Bis(2-ethylhexyl)phthalate	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
3,3´-Dichlorobenzidine	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Benz(a)anthracene	120	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Chrysene	140	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Di-n-octyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Benzo(b)fluoranthene	180	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Benzo(k)fluoranthene	74	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Benzo(a)pyrene	110	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Dibenz(a,h)anthracene	ND	270		µg/Kg-dry	1	10/23/02 5:30:00 PM
Indeno(1,2,3-cd)pyrene	89	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Benzo(g,h,i)perylene	89	270	J	µg/Kg-dry	1	10/23/02 5:30:00 PM
Surr: 2-Fluorophenol	76.0	24-96		%REC	1	10/23/02 5:30:00 PM
Surr: Phenol-d5	74.9	26-100		%REC	1	10/23/02 5:30:00 PM
Surr: Nitrobenzene-d5	75.7	23-101		%REC	1	10/23/02 5:30:00 PM
Surr: 2-Fluorobiphenyl	75.1	26-105		%REC	1	10/23/02 5:30:00 PM
Surr: 2,4,6-Tribromophenol	91.8	26-115		%REC	1	10/23/02 5:30:00 PM
Surr: 4-Terphenyl-d14	77.3	31-113		%REC	1	10/23/02 5:30:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS		**SW8270C**				Analyst: **KD**
Phenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Bis(2-chloroethyl)ether	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2-Chlorophenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
1,3-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
1,4-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Benzyl alcohol	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
2-Methylphenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
1,2-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Bis(2-chloroisopropyl)ether	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Methylphenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
N-Nitrosodi-n-propylamine	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Hexachloroethane	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Nitrobenzene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Isophorone	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,4-Dimethylphenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Benzoic acid	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
2-Nitrophenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Bis(2-chloroethoxy)methane	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,4-Dichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
1,2,4-Trichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Naphthalene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Chloroaniline	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Hexachlorobutadiene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Chloro-3-methylphenol	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
2-Methylnaphthalene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Hexachlorocyclopentadiene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,4,6-Trichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,4,5-Trichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2-Chloronaphthalene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2-Nitroaniline	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
Dimethyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,6-Dinitrotoluene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Acenaphthylene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
3-Nitroaniline	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Nitrophenol	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,4-Dinitrophenol	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
Acenaphthene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
2,4-Dinitrotoluene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dibenzofuran	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Diethyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Chlorophenyl phenyl ether	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Fluorene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Nitroaniline	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
4,6-Dinitro-2-methylphenol	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
N-Nitrosodiphenylamine	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
1,2-Diphenylhydrazine (as Azobenzene)	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
4-Bromophenyl phenyl ether	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Hexachlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Pentachlorophenol	ND	530		µg/Kg-dry	1	10/23/02 6:47:00 PM
Phenanthrene	150	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Anthracene	59	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Carbazole	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Di-n-butyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Fluoranthene	360	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Pyrene	330	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Butyl benzyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Bis(2-ethylhexyl)phthalate	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
3,3´-Dichlorobenzidine	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Benz(a)anthracene	190	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Chrysene	230	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Di-n-octyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Benzo(b)fluoranthene	310	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Benzo(k)fluoranthene	110	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Benzo(a)pyrene	180	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Dibenz(a,h)anthracene	ND	270		µg/Kg-dry	1	10/23/02 6:47:00 PM
Indeno(1,2,3-cd)pyrene	140	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Benzo(g,h,i)perylene	150	270	J	µg/Kg-dry	1	10/23/02 6:47:00 PM
Surr: 2-Fluorophenol	69.5	24-96		%REC	1	10/23/02 6:47:00 PM
Surr: Phenol-d5	72.2	26-100		%REC	1	10/23/02 6:47:00 PM
Surr: Nitrobenzene-d5	71.7	23-101		%REC	1	10/23/02 6:47:00 PM
Surr: 2-Fluorobiphenyl	74.9	26-105		%REC	1	10/23/02 6:47:00 PM
Surr: 2,4,6-Tribromophenol	96.4	26-115		%REC	1	10/23/02 6:47:00 PM
Surr: 4-Terphenyl-d14	79.6	31-113		%REC	1	10/23/02 6:47:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
SEMIVOLATILE ORGANICS	**SW8270C**					Analyst: **KD**
Phenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Bis(2-chloroethyl)ether	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2-Chlorophenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
1,3-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
1,4-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Benzyl alcohol	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
2-Methylphenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
1,2-Dichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Bis(2-chloroisopropyl)ether	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Methylphenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
N-Nitrosodi-n-propylamine	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Hexachloroethane	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Nitrobenzene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Isophorone	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,4-Dimethylphenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Benzoic acid	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
2-Nitrophenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Bis(2-chloroethoxy)methane	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,4-Dichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
1,2,4-Trichlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Naphthalene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Chloroaniline	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Hexachlorobutadiene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Chloro-3-methylphenol	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
2-Methylnaphthalene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Hexachlorocyclopentadiene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,4,6-Trichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,4,5-Trichlorophenol	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2-Chloronaphthalene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2-Nitroaniline	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
Dimethyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,6-Dinitrotoluene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Acenaphthylene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
3-Nitroaniline	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Nitrophenol	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,4-Dinitrophenol	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
Acenaphthene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
2,4-Dinitrotoluene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dibenzofuran	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Diethyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Chlorophenyl phenyl ether	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Fluorene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Nitroaniline	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
4,6-Dinitro-2-methylphenol	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
N-Nitrosodiphenylamine	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
1,2-Diphenylhydrazine (as Azobenzene)	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
4-Bromophenyl phenyl ether	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Hexachlorobenzene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Pentachlorophenol	ND	550		µg/Kg-dry	1	10/23/02 7:13:00 PM
Phenanthrene	70	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Anthracene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Carbazole	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Di-n-butyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Fluoranthene	130	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Pyrene	91	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Butyl benzyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Bis(2-ethylhexyl)phthalate	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
3,3´-Dichlorobenzidine	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Benz(a)anthracene	73	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Chrysene	65	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Di-n-octyl phthalate	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Benzo(b)fluoranthene	100	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Benzo(k)fluoranthene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Benzo(a)pyrene	72	270	J	µg/Kg-dry	1	10/23/02 7:13:00 PM
Dibenz(a,h)anthracene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Indeno(1,2,3-cd)pyrene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Benzo(g,h,i)perylene	ND	270		µg/Kg-dry	1	10/23/02 7:13:00 PM
Surr: 2-Fluorophenol	66.3	24-96		%REC	1	10/23/02 7:13:00 PM
Surr: Phenol-d5	67.6	26-100		%REC	1	10/23/02 7:13:00 PM
Surr: Nitrobenzene-d5	66.8	23-101		%REC	1	10/23/02 7:13:00 PM
Surr: 2-Fluorobiphenyl	66.8	26-105		%REC	1	10/23/02 7:13:00 PM
Surr: 2,4,6-Tribromophenol	80.5	26-115		%REC	1	10/23/02 7:13:00 PM
Surr: 4-Terphenyl-d14	68.5	31-113		%REC	1	10/23/02 7:13:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Method Blank

Sample ID **MB-7944** Batch ID: **7944** Test Code: **SW8270C** Units: **µg/Kg** Analysis Date **10/23/02 4:39:00 PM** Prep Date **10/22/02**

Client ID: Run ID: **SV-4_021023A** SeqNo: **252337**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
Phenol	ND	250	µg/Kg									
Bis(2-chloroethyl)ether	ND	250	µg/Kg									
2-Chlorophenol	ND	250	µg/Kg									
1,3-Dichlorobenzene	ND	250	µg/Kg									
1,4-Dichlorobenzene	ND	250	µg/Kg									
Benzyl alcohol	ND	500	µg/Kg									
2-Methylphenol	ND	250	µg/Kg									
1,2-Dichlorobenzene	ND	250	µg/Kg									
Bis(2-chloroisopropyl)ether	ND	250	µg/Kg									
4-Methylphenol	ND	250	µg/Kg									
N-Nitrosodi-n-propylamine	ND	250	µg/Kg									
Hexachloroethane	ND	250	µg/Kg									
Nitrobenzene	ND	250	µg/Kg									
Isophorone	ND	250	µg/Kg									
2,4-Dimethylphenol	ND	250	µg/Kg									
Benzoic acid	ND	500	µg/Kg									
2-Nitrophenol	ND	250	µg/Kg									
Bis(2-chloroethoxy)methane	ND	250	µg/Kg									
2,4-Dichlorophenol	ND	250	µg/Kg									
1,2,4-Trichlorobenzene	ND	250	µg/Kg									
Naphthalene	ND	250	µg/Kg									
4-Chloroaniline	ND	250	µg/Kg									
Hexachlorobutadiene	ND	250	µg/Kg									
4-Chloro-3-methylphenol	ND	500	µg/Kg									
2-Methylnaphthalene	ND	250	µg/Kg									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits; NA - Not applicable where J values or ND results occur

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Method Blank

Hexachlorocyclopentadiene	ND	250	µg/Kg
2,4,6-Trichlorophenol	ND	250	µg/Kg
2,4,5-Trichlorophenol	ND	250	µg/Kg
2-Chloronaphthalene	ND	250	µg/Kg
2-Nitroaniline	ND	500	µg/Kg
Dimethyl phthalate	ND	250	µg/Kg
2,6-Dinitrotoluene	ND	250	µg/Kg
Acenaphthylene	ND	250	µg/Kg
3-Nitroaniline	ND	500	µg/Kg
4-Nitrophenol	ND	500	µg/Kg
2,4-Dinitrophenol	ND	500	µg/Kg
Acenaphthene	ND	250	µg/Kg
2,4-Dinitrotoluene	ND	250	µg/Kg
Dibenzofuran	ND	250	µg/Kg
Diethyl phthalate	ND	250	µg/Kg
4-Chlorophenyl phenyl ether	ND	250	µg/Kg
Fluorene	ND	250	µg/Kg
4-Nitroaniline	ND	500	µg/Kg
4,6-Dinitro-2-methylphenol	ND	500	µg/Kg
N-Nitrosodiphenylamine	ND	250	µg/Kg
1,2-Diphenylhydrazine (as Azobe	ND	250	µg/Kg
4-Bromophenyl phenyl ether	ND	250	µg/Kg
Hexachlorobenzene	ND	250	µg/Kg
Pentachlorophenol	ND	500	µg/Kg
Phenanthrene	ND	250	µg/Kg
Anthracene	ND	250	µg/Kg
Carbazole	ND	250	µg/Kg
Di-n-butyl phthalate	ND	250	µg/Kg
Fluoranthene	ND	250	µg/Kg
Pyrene	ND	250	µg/Kg
Butyl benzyl phthalate	ND	250	µg/Kg

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Method Blank

Bis(2-ethylhexyl)phthalate	ND	250	µg/Kg						
3,3´-Dichlorobenzidine	ND	250	µg/Kg						
Benz(a)anthracene	ND	250	µg/Kg						
Chrysene	ND	250	µg/Kg						
Di-n-octyl phthalate	ND	250	µg/Kg						
Benzo(b)fluoranthene	ND	250	µg/Kg						
Benzo(k)fluoranthene	ND	250	µg/Kg						
Benzo(a)pyrene	ND	250	µg/Kg						
Dibenz(a,h)anthracene	ND	250	µg/Kg						
Indeno(1,2,3-cd)pyrene	ND	250	µg/Kg						
Benzo(g,h,i)perylene	ND	250	µg/Kg						
Surr: 2-Fluorophenol	2610	50	µg/Kg	3750	0	69.6	24	96	0
Surr: Phenol-d5	2690	50	µg/Kg	3750	0	71.7	26	100	0
Surr: Nitrobenzene-d5	1745	50	µg/Kg	2500	0	69.8	23	101	0
Surr: 2-Fluorobiphenyl	1780	50	µg/Kg	2500	0	71.2	26	105	0
Surr: 2,4,6-Tribromophenol	3033	50	µg/Kg	3750	0	80.9	26	115	0
Surr: 4-Terphenyl-d14	1834	50	µg/Kg	2500	0	73.4	31	113	0

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Sample Matrix Spike

Sample ID **0210173-01BMS** Batch ID: **7944** Test Code: **SW8270C** Units: **µg/Kg-dry** Analysis Date **10/23/02 5:56:00 PM** Prep Date **10/22/02**

Client ID: **CH-B131-001-0** Run ID: **SV-4_021023A** SeqNo: **252341**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
Phenol	2189	270	µg/Kg-dry	4097	0	53.4	27	90	0			
2-Chlorophenol	2241	270	µg/Kg-dry	4097	0	54.7	25	91	0			
1,4-Dichlorobenzene	1367	270	µg/Kg-dry	2731	0	50	19	82	0			
N-Nitrosodi-n-propylamine	1317	270	µg/Kg-dry	2731	0	48.2	25	92	0			
1,2,4-Trichlorobenzene	1317	270	µg/Kg-dry	2731	0	48.2	25	89	0			
4-Chloro-3-methylphenol	2457	550	µg/Kg-dry	4097	0	60	31	98	0			
4-Nitrophenol	2997	550	µg/Kg-dry	4097	0	73.2	25	105	0			
Acenaphthene	1497	270	µg/Kg-dry	2731	0	54.8	26	102	0			
2,4-Dinitrotoluene	1531	270	µg/Kg-dry	2731	0	56.1	24	99	0			
Pentachlorophenol	2826	550	µg/Kg-dry	4097	0	69	21	100	0			
Pyrene	1790	270	µg/Kg-dry	2731	221.2	57.4	22	114	0			
Surr: 2-Fluorophenol	2480	55	µg/Kg-dry	4097	0	60.5	24	96	0			
Surr: Phenol-d5	2445	55	µg/Kg-dry	4097	0	59.7	26	100	0			
Surr: Nitrobenzene-d5	1558	55	µg/Kg-dry	2731	0	57	23	101	0			
Surr: 2-Fluorobiphenyl	1665	55	µg/Kg-dry	2731	0	61	26	105	0			
Surr: 2,4,6-Tribromophenol	2697	55	µg/Kg-dry	4097	0	65.8	26	115	0			
Surr: 4-Terphenyl-d14	1520	55	µg/Kg-dry	2731	0	55.7	31	113	0			

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits; NA - Not applicable where J values or ND results occur

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Sample Matrix Spike Duplicate

Sample ID **0210173-01BMSD** Batch ID: **7944** Test Code: **SW8270C** Units: **µg/Kg-dry** Analysis Date **10/23/02 6:22:00 PM** Prep Date **10/22/02**

Client ID: **CH-B131-001-0** Run ID: **SV-4_021023A** SeqNo: **252342**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
Phenol	1088	270	µg/Kg-dry	4051	0	26.9	27	90	2189	67.2	35	SR
2-Chlorophenol	1129	270	µg/Kg-dry	4051	0	27.9	25	91	2241	66	50	R
1,4-Dichlorobenzene	586.6	270	µg/Kg-dry	2701	0	21.7	19	82	1367	79.9	27	R
N-Nitrosodi-n-propylamine	630.4	270	µg/Kg-dry	2701	0	23.3	25	92	1317	70.5	38	SR
1,2,4-Trichlorobenzene	686.5	270	µg/Kg-dry	2701	0	25.4	25	89	1317	62.9	23	R
4-Chloro-3-methylphenol	1342	540	µg/Kg-dry	4051	0	33.1	31	98	2457	58.7	33	R
4-Nitrophenol	1703	540	µg/Kg-dry	4051	0	42	25	105	2997	55.1	50	R
Acenaphthene	783.8	270	µg/Kg-dry	2701	0	29	26	102	1497	62.6	19	R
2,4-Dinitrotoluene	865.3	270	µg/Kg-dry	2701	0	32	24	99	1531	55.6	47	R
Pentachlorophenol	1495	540	µg/Kg-dry	4051	0	36.9	21	100	2826	61.6	47	R
Pyrene	948	270	µg/Kg-dry	2701	221.2	26.9	22	114	1790	61.5	36	R
Surr: 2-Fluorophenol	1068	54	µg/Kg-dry	4051	0	26.4	24	96	0	0	0	
Surr: Phenol-d5	1183	54	µg/Kg-dry	4051	0	29.2	26	100	0	0	0	
Surr: Nitrobenzene-d5	716.3	54	µg/Kg-dry	2701	0	26.5	23	101	0	0	0	
Surr: 2-Fluorobiphenyl	812.9	54	µg/Kg-dry	2701	0	30.1	26	105	0	0	0	
Surr: 2,4,6-Tribromophenol	1572	54	µg/Kg-dry	4051	0	38.8	26	115	0	0	0	
Surr: 4-Terphenyl-d14	859.9	54	µg/Kg-dry	2701	0	31.8	31	113	0	0	0	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits; NA - Not applicable where J values or ND results occur

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Laboratory Control Spike - Full List

Sample ID **LCSF-7944** Batch ID: **7944** Test Code: **SW8270C** Units: **µg/Kg** Analysis Date **10/23/02 5:05:00 PM** Prep Date **10/22/02**

Client ID: Run ID: **SV-4_021023A** SeqNo: **252339**

Analyte	QC Sample Result	RL	Units	QC Spike Amount	Original Sample Result	%REC	LowLimit	HighLimit	Original Sample or MS Result	%RPD	RPDLimit	Qua
Phenol	1987	250	µg/Kg	3750	0	53	31	90	0			
Bis(2-chloroethyl)ether	1064	250	µg/Kg	2500	0	42.5	35	89	0			
2-Chlorophenol	2031	250	µg/Kg	3750	0	54.2	32	89	0			
1,3-Dichlorobenzene	1204	250	µg/Kg	2500	0	48.1	36	84	0			
1,4-Dichlorobenzene	1244	250	µg/Kg	2500	0	49.8	31	80	0			
Benzyl alcohol	1475	500	µg/Kg	2500	0	59	40	94	0			
2-Methylphenol	1386	250	µg/Kg	2500	0	55.5	17	78	0			
1,2-Dichlorobenzene	1256	250	µg/Kg	2500	0	50.3	37	88	0			
Bis(2-chloroisopropyl)ether	1488	250	µg/Kg	2500	0	59.5	37	118	0			
4-Methylphenol	1318	250	µg/Kg	2500	0	52.7	14	89	0			
N-Nitrosodi-n-propylamine	1197	250	µg/Kg	2500	0	47.9	31	92	0			
Hexachloroethane	1268	250	µg/Kg	2500	0	50.7	34	89	0			
Nitrobenzene	1323	250	µg/Kg	2500	0	52.9	39	91	0			
Isophorone	1296	250	µg/Kg	2500	0	51.8	39	93	0			
2,4-Dimethylphenol	2207	250	µg/Kg	3750	0	58.9	35	89	0			
Benzoic acid	469	500	µg/Kg	2500	0	18.8	10	97	0			J
2-Nitrophenol	1900	250	µg/Kg	3750	0	50.7	39	93	0			
Bis(2-chloroethoxy)methane	1248	250	µg/Kg	2500	0	49.9	39	93	0			
2,4-Dichlorophenol	2170	250	µg/Kg	3750	0	57.9	42	101	0			
1,2,4-Trichlorobenzene	1284	250	µg/Kg	2500	0	51.3	33	88	0			
Naphthalene	1274	250	µg/Kg	2500	0	51	35	97	0			
4-Chloroaniline	1150	250	µg/Kg	2500	0	46	27	93	0			
Hexachlorobutadiene	1306	250	µg/Kg	2500	0	52.2	40	96	0			
4-Chloro-3-methylphenol	2315	500	µg/Kg	3750	0	61.7	35	97	0			
2-Methylnaphthalene	1320	250	µg/Kg	2500	0	52.8	34	99	0			

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Laboratory Control Spike - Full List

Hexachlorocyclopentadiene	1110	250	µg/Kg	2500	0	44.4	14	92	0
2,4,6-Trichlorophenol	2462	250	µg/Kg	3750	0	65.7	43	102	0
2,4,5-Trichlorophenol	1435	250	µg/Kg	2500	0	57.4	18	89	0
2-Chloronaphthalene	1424	250	µg/Kg	2500	0	57	40	98	0
2-Nitroaniline	1548	500	µg/Kg	2500	0	61.9	43	104	0
Dimethyl phthalate	1428	250	µg/Kg	2500	0	57.1	46	104	0
2,6-Dinitrotoluene	1355	250	µg/Kg	2500	0	54.2	42	105	0
Acenaphthylene	1377	250	µg/Kg	2500	0	55.1	43	95	0
3-Nitroaniline	1386	500	µg/Kg	2500	0	55.5	40	101	0
4-Nitrophenol	2408	500	µg/Kg	3750	0	64.2	31	103	0
2,4-Dinitrophenol	1632	500	µg/Kg	3750	0	43.5	10	107	0
Acenaphthene	1430	250	µg/Kg	2500	0	57.2	36	93	0
2,4-Dinitrotoluene	1352	250	µg/Kg	2500	0	54.1	45	105	0
Dibenzofuran	1397	250	µg/Kg	2500	0	55.9	44	100	0
Diethyl phthalate	1426	250	µg/Kg	2500	0	57	47	104	0
4-Chlorophenyl phenyl ether	1444	250	µg/Kg	2500	0	57.7	45	101	0
Fluorene	1432	250	µg/Kg	2500	0	57.3	44	98	0
4-Nitroaniline	1371	500	µg/Kg	2500	0	54.8	40	108	0
4,6-Dinitro-2-methylphenol	2078	500	µg/Kg	3750	0	55.4	16	108	0
N-Nitrosodiphenylamine	1519	250	µg/Kg	2500	0	60.8	47	102	0
1,2-Diphenylhydrazine (as Azobe	1528	250	µg/Kg	2500	0	61.1	42	105	0
4-Bromophenyl phenyl ether	1525	250	µg/Kg	2500	0	61	45	101	0
Hexachlorobenzene	1500	250	µg/Kg	2500	0	60	43	104	0
Pentachlorophenol	2232	500	µg/Kg	3750	0	59.5	28	97	0
Phenanthrene	1531	250	µg/Kg	2500	0	61.2	37	105	0
Anthracene	1538	250	µg/Kg	2500	0	61.5	46	101	0
Carbazole	1605	250	µg/Kg	2500	0	64.2	39	115	0
Di-n-butyl phthalate	1536	250	µg/Kg	2500	0	61.5	48	104	0
Fluoranthene	1556	250	µg/Kg	2500	0	62.2	47	99	0
Pyrene	1498	250	µg/Kg	2500	0	59.9	39	99	0
Butyl benzyl phthalate	1490	250	µg/Kg	2500	0	59.6	45	110	0

Qualifiers: ND - Not Detected at the Reporting Limit
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B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *02-Dec-02*

CLIENT: Weston Solutions, Inc.
Work Order: 0210173
Project: Seneca Army Depot

QC SUMMARY REPORT

Laboratory Control Spike - Full List

Bis(2-ethylhexyl)phthalate	1533	250	µg/Kg	2500	0	61.3	40	115	0
3,3´-Dichlorobenzidine	1428	250	µg/Kg	2500	0	57.1	30	110	0
Benz(a)anthracene	1534	250	µg/Kg	2500	0	61.3	45	100	0
Chrysene	1498	250	µg/Kg	2500	0	59.9	44	102	0
Di-n-octyl phthalate	1582	250	µg/Kg	2500	0	63.3	45	117	0
Benzo(b)fluoranthene	1447	250	µg/Kg	2500	0	57.9	44	99	0
Benzo(k)fluoranthene	1494	250	µg/Kg	2500	0	59.8	39	111	0
Benzo(a)pyrene	1509	250	µg/Kg	2500	0	60.4	46	101	0
Dibenz(a,h)anthracene	1494	250	µg/Kg	2500	0	59.8	45	103	0
Indeno(1,2,3-cd)pyrene	1494	250	µg/Kg	2500	0	59.8	42	101	0
Benzo(g,h,i)perylene	1501	250	µg/Kg	2500	0	60	44	102	0
Surr: 2-Fluorophenol	2186	50	µg/Kg	3750	0	58.3	24	96	0
Surr: Phenol-d5	2279	50	µg/Kg	3750	0	60.8	26	100	0
Surr: Nitrobenzene-d5	1451	50	µg/Kg	2500	0	58	23	101	0
Surr: 2-Fluorobiphenyl	1562	50	µg/Kg	2500	0	62.5	26	105	0
Surr: 2,4,6-Tribromophenol	2598	50	µg/Kg	3750	0	69.3	26	115	0
Surr: 4-Terphenyl-d14	1497	50	µg/Kg	2500	0	59.9	31	113	0

Qualifiers: ND - Not Detected at the Reporting Limit
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B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits
NA - Not applicable where J values or ND results occur
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES		**SW8081A**				Analyst: **RAP**
alpha-BHC	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
beta-BHC	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
delta-BHC	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
gamma-BHC	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
Heptachlor	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
Aldrin	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
Heptachlor epoxide	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
Endosulfan I	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
alpha-Chlordane	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
gamma-Chlordane	ND	8.5		µg/Kg-dry	10	10/24/02 5:37:00 PM
Dieldrin	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
4,4´-DDE	21	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
Endrin	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
Endosulfan II	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
4,4´-DDD	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
Endrin aldehyde	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
Endrin ketone	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
Endosulfan sulfate	ND	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
4,4´-DDT	28	17		µg/Kg-dry	10	10/24/02 5:37:00 PM
Methoxychlor	ND	85		µg/Kg-dry	10	10/24/02 5:37:00 PM
Toxaphene	ND	260		µg/Kg-dry	10	10/24/02 5:37:00 PM
Technical Chlordane	ND	260		µg/Kg-dry	10	10/24/02 5:37:00 PM
Surr: Tetrachloro-m-xylene	103	26-131		%REC	10	10/24/02 5:37:00 PM
Surr: Decachlorobiphenyl	112	19-163		%REC	10	10/24/02 5:37:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES		**SW8081A**				Analyst: **RAP**
alpha-BHC	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
beta-BHC	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
delta-BHC	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
gamma-BHC	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
Heptachlor	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
Aldrin	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
Heptachlor epoxide	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
Endosulfan I	ND	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
alpha-Chlordane	18	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
gamma-Chlordane	68	8.8		µg/Kg-dry	10	10/24/02 6:04:00 PM
Dieldrin	ND	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
4,4´-DDE	3,300	180		µg/Kg-dry	100	10/24/02 8:22:00 PM
Endrin	ND	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
Endosulfan II	ND	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
4,4´-DDD	89	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
Endrin aldehyde	ND	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
Endrin ketone	ND	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
Endosulfan sulfate	ND	18		µg/Kg-dry	10	10/24/02 6:04:00 PM
4,4´-DDT	2,500	180		µg/Kg-dry	100	10/24/02 8:22:00 PM
Methoxychlor	ND	88		µg/Kg-dry	10	10/24/02 6:04:00 PM
Toxaphene	ND	270		µg/Kg-dry	10	10/24/02 6:04:00 PM
Technical Chlordane	ND	270		µg/Kg-dry	10	10/24/02 6:04:00 PM
Surr: Tetrachloro-m-xylene	101	26-131		%REC	10	10/24/02 6:04:00 PM
Surr: Decachlorobiphenyl	127	19-163		%REC	10	10/24/02 6:04:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ORGANOCHLORINE PESTICIDES	**SW8081A**					Analyst: **RAP**
alpha-BHC	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
beta-BHC	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
delta-BHC	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
gamma-BHC	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
Heptachlor	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
Aldrin	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
Heptachlor epoxide	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
Endosulfan I	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
alpha-Chlordane	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
gamma-Chlordane	ND	8.6		µg/Kg-dry	10	10/24/02 6:32:00 PM
Dieldrin	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
4,4´-DDE	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
Endrin	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
Endosulfan II	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
4,4´-DDD	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
Endrin aldehyde	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
Endrin ketone	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
Endosulfan sulfate	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
4,4´-DDT	ND	17		µg/Kg-dry	10	10/24/02 6:32:00 PM
Methoxychlor	ND	86		µg/Kg-dry	10	10/24/02 6:32:00 PM
Toxaphene	ND	270		µg/Kg-dry	10	10/24/02 6:32:00 PM
Technical Chlordane	ND	270		µg/Kg-dry	10	10/24/02 6:32:00 PM
Surr: Tetrachloro-m-xylene	94.6	26-131		%REC	10	10/24/02 6:32:00 PM
Surr: Decachlorobiphenyl	95.9	19-163		%REC	10	10/24/02 6:32:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PCBS BY EPA8082		**SW8082**				Analyst: **RAP**
Aroclor 1016	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Aroclor 1221	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Aroclor 1232	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Aroclor 1242	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Aroclor 1248	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Aroclor 1254	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Aroclor 1260	ND	26		µg/Kg-dry	1	10/24/02 4:54:00 PM
Surr: Tetrachloro-m-xylene	97.1	30-127		%REC	1	10/24/02 4:54:00 PM
Surr: Decachlorobiphenyl	77.7	22-136		%REC	1	10/24/02 4:54:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PCBS BY EPA8082		**SW8082**				Analyst: **RAP**
Aroclor 1016	ND	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Aroclor 1221	ND	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Aroclor 1232	ND	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Aroclor 1242	ND	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Aroclor 1248	ND	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Aroclor 1254	100	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Aroclor 1260	ND	27		µg/Kg-dry	1	10/24/02 5:18:00 PM
Surr: Tetrachloro-m-xylene	78.8	30-127		%REC	1	10/24/02 5:18:00 PM
Surr: Decachlorobiphenyl	81.8	22-136		%REC	1	10/24/02 5:18:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

\# - See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *04-Dec-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PCBS BY EPA8082		**SW8082**				Analyst: **RAP**
Aroclor 1016	ND	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Aroclor 1221	ND	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Aroclor 1232	ND	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Aroclor 1242	ND	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Aroclor 1248	ND	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Aroclor 1254	85	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Aroclor 1260	ND	27		µg/Kg-dry	1	10/24/02 5:42:00 PM
Surr: Tetrachloro-m-xylene	76.1	30-127		%REC	1	10/24/02 5:42:00 PM
Surr: Decachlorobiphenyl	81.0	22-136		%REC	1	10/24/02 5:42:00 PM

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

H - Method prescribed holding time exceeded

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *05-Nov-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-B131-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-01B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		**SW6010B**				Analyst: **SJC**
Aluminum	6,600	28		mg/Kg-dry	1	10/22/02 4:13:24 PM
Antimony	ND	5.5		mg/Kg-dry	1	10/22/02 4:13:24 PM
Barium	48	28		mg/Kg-dry	1	10/22/02 4:13:24 PM
Beryllium	0.38	0.69	J	mg/Kg-dry	1	10/22/02 4:13:24 PM
Cadmium	0.16	0.69	J	mg/Kg-dry	1	10/22/02 4:13:24 PM
Calcium	97,000	3,400		mg/Kg-dry	10	10/22/02 4:40:48 PM
Chromium	9.2	1.4		mg/Kg-dry	1	10/22/02 4:13:24 PM
Cobalt	6.6	6.9	J	mg/Kg-dry	1	10/22/02 4:13:24 PM
Copper	16	3.4		mg/Kg-dry	1	10/22/02 4:13:24 PM
Iron	12,000	14		mg/Kg-dry	1	10/22/02 4:13:24 PM
Lead	20	3.4		mg/Kg-dry	1	10/22/02 4:13:24 PM
Magnesium	8,200	340		mg/Kg-dry	1	10/22/02 4:13:24 PM
Manganese	440	2.1		mg/Kg-dry	1	10/22/02 4:13:24 PM
Nickel	15	5.5		mg/Kg-dry	1	10/22/02 4:13:24 PM
Potassium	1,000	340		mg/Kg-dry	1	10/22/02 4:13:24 PM
Silver	ND	1.9		mg/Kg-dry	1	10/22/02 4:13:24 PM
Sodium	230	340	J	mg/Kg-dry	1	10/22/02 4:13:24 PM
Vanadium	13	6.9		mg/Kg-dry	1	10/22/02 4:13:24 PM
Zinc	45	2.8		mg/Kg-dry	1	10/22/02 4:13:24 PM
ARSENIC, SOIL 3051/7060		**SW7060A**				Analyst: **APL**
Arsenic	5.4	0.69		mg/Kg-dry	1	10/22/02 3:56:07 PM
MERCURY, 7471A		**SW7471A**				Analyst: **RK**
Mercury	0.019	0.053	J	mg/Kg-dry	1	10/21/02 2:40:08 PM
PERCENT MOISTURE		**D2216**				Analyst: **JEK**
Percent Moisture	10.0	0		wt%	1	10/19/02
SELENIUM, SOIL 3051/7740		**SW7740**				Analyst: **APL**
Selenium	ND	0.69		mg/Kg-dry	1	10/22/02 6:43:59 PM
THALLIUM, SOIL 3051/7841		**SW7841**				Analyst: **APL**
Thallium	ND	0.69		mg/Kg-dry	1	10/22/02 6:39:58 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
\# - See Case Narrative
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *05-Nov-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-TANK-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-02B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		**SW6010B**				Analyst: **SJC**
Aluminum	3,400	27		mg/Kg-dry	1	10/22/02 4:54:54 PM
Antimony	ND	5.4		mg/Kg-dry	1	10/22/02 4:54:54 PM
Barium	29	27		mg/Kg-dry	1	10/22/02 4:54:54 PM
Beryllium	0.37	0.68	J	mg/Kg-dry	1	10/22/02 4:54:54 PM
Cadmium	1.3	0.68		mg/Kg-dry	1	10/22/02 4:54:54 PM
Calcium	200,000	3,400		mg/Kg-dry	10	10/22/02 5:00:17 PM
Chromium	9.4	1.4		mg/Kg-dry	1	10/22/02 4:54:54 PM
Cobalt	6.1	6.8	J	mg/Kg-dry	1	10/22/02 4:54:54 PM
Copper	19	3.4		mg/Kg-dry	1	10/22/02 4:54:54 PM
Iron	8,500	14		mg/Kg-dry	1	10/22/02 4:54:54 PM
Lead	40	3.4		mg/Kg-dry	1	10/22/02 4:54:54 PM
Magnesium	15,000	340		mg/Kg-dry	1	10/22/02 4:54:54 PM
Manganese	460	2.0		mg/Kg-dry	1	10/22/02 4:54:54 PM
Nickel	14	5.4		mg/Kg-dry	1	10/22/02 4:54:54 PM
Potassium	1,100	340		mg/Kg-dry	1	10/22/02 4:54:54 PM
Silver	ND	1.9		mg/Kg-dry	1	10/22/02 4:54:54 PM
Sodium	200	340	J	mg/Kg-dry	1	10/22/02 4:54:54 PM
Vanadium	13	6.8		mg/Kg-dry	1	10/22/02 4:54:54 PM
Zinc	91	2.7		mg/Kg-dry	1	10/22/02 4:54:54 PM
ARSENIC, SOIL 3051/7060		**SW7060A**				Analyst: **APL**
Arsenic	4.2	0.68		mg/Kg-dry	1	10/22/02 4:21:11 PM
MERCURY, 7471A		**SW7471A**				Analyst: **RK**
Mercury	0.026	0.054	J	mg/Kg-dry	1	10/21/02 2:42:49 PM
PERCENT MOISTURE		**D2216**				Analyst: **JEK**
Percent Moisture	9.7	0		wt%	1	10/19/02
SELENIUM, SOIL 3051/7740		**SW7740**				Analyst: **APL**
Selenium	ND	0.68		mg/Kg-dry	1	10/22/02 7:10:44 PM
THALLIUM, SOIL 3051/7841		**SW7841**				Analyst: **APL**
Thallium	ND	0.68		mg/Kg-dry	1	10/22/02 7:06:14 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative
RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *05-Nov-02*

CLIENT:	Weston Solutions, Inc.	**Client Sample ID:**	CH-FIRE-001-0
Lab Order:	0210173		
Project:	Seneca Army Depot	**Collection Date:**	10/16/02
Lab ID:	0210173-03B	**Matrix:**	SOIL

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ICP METALS TOTAL SW-846 - 3051/6010		**SW6010B**				Analyst: **SJC**
Aluminum	1,900	26		mg/Kg-dry	1	10/22/02 5:05:47 PM
Antimony	ND	5.1		mg/Kg-dry	1	10/22/02 5:05:47 PM
Barium	14	26	J	mg/Kg-dry	1	10/22/02 5:05:47 PM
Beryllium	0.25	0.64	J	mg/Kg-dry	1	10/22/02 5:05:47 PM
Cadmium	ND	0.64		mg/Kg-dry	1	10/22/02 5:05:47 PM
Calcium	220,000	3,200		mg/Kg-dry	10	10/22/02 5:11:02 PM
Chromium	3.2	1.3		mg/Kg-dry	1	10/22/02 5:05:47 PM
Cobalt	7.0	6.4		mg/Kg-dry	1	10/22/02 5:05:47 PM
Copper	14	3.2		mg/Kg-dry	1	10/22/02 5:05:47 PM
Iron	5,800	13		mg/Kg-dry	1	10/22/02 5:05:47 PM
Lead	7.5	3.2		mg/Kg-dry	1	10/22/02 5:05:47 PM
Magnesium	9,300	320		mg/Kg-dry	1	10/22/02 5:05:47 PM
Manganese	330	1.9		mg/Kg-dry	1	10/22/02 5:05:47 PM
Nickel	14	5.1		mg/Kg-dry	1	10/22/02 5:05:47 PM
Potassium	750	320		mg/Kg-dry	1	10/22/02 5:05:47 PM
Silver	ND	1.8		mg/Kg-dry	1	10/22/02 5:05:47 PM
Sodium	210	320	J	mg/Kg-dry	1	10/22/02 5:05:47 PM
Vanadium	7.7	6.4		mg/Kg-dry	1	10/22/02 5:05:47 PM
Zinc	27	2.6		mg/Kg-dry	1	10/22/02 5:05:47 PM
ARSENIC, SOIL 3051/7060		**SW7060A**				Analyst: **APL**
Arsenic	3.9	0.64		mg/Kg-dry	1	10/22/02 4:29:35 PM
MERCURY, 7471A		**SW7471A**				Analyst: **RK**
Mercury	0.018	0.052	J	mg/Kg-dry	1	10/21/02 2:45:25 PM
PERCENT MOISTURE		**D2216**				Analyst: **JEK**
Percent Moisture	9.4	0		wt%	1	10/19/02
SELENIUM, SOIL 3051/7740		**SW7740**				Analyst: **APL**
Selenium	ND	0.64		mg/Kg-dry	1	10/22/02 7:19:47 PM
THALLIUM, SOIL 3051/7841		**SW7841**				Analyst: **APL**
Thallium	ND	0.64		mg/Kg-dry	1	10/22/02 7:15:18 PM

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
H - Method prescribed holding time exceeded
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
- See Case Narrative

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: *05-Nov-02*

CLIENT: Weston Solutions, Inc. **Lab Order:** 0210173
Project: Seneca Army Depot

Lab ID: 0210173-01 **Collection Date:** 10/16/02
Client Sample ID: CH-B131-001-0 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**SW9010B**				Analyst: **GM**
Cyanide	ND	1.1		mg/Kg-dry	1	10/25/02

Lab ID: 0210173-02 **Collection Date:** 10/16/02
Client Sample ID: CH-TANK-001-0 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**SW9010B**				Analyst: **GM**
Cyanide	ND	1.0		mg/Kg-dry	1	10/25/02

Lab ID: 0210173-03 **Collection Date:** 10/16/02
Client Sample ID: CH-FIRE-001-0 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
CYANIDE		**SW9010B**				Analyst: **GM**
Cyanide	ND	1.0		mg/Kg-dry	1	10/25/02

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range

SEVERN TRENT SERVICES

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500

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Fax: 916 371 8420
www.stl-inc.com

November 26, 2002

STL SACRAMENTO PROJECT NUMBER: G2J230244

Nancy Stewart
Amro Environmental Laboratories
111 Herrick Street
Merrimack, NH 03054

Dear Ms. Stewart,

This report contains the analytical results for the samples received under chain of custody by STL Sacramento on October 23, 2002. These samples are associated with your Seneca Army Depot, 0210173 project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4402.

Sincerely,

Robert Hrabak for

Jill Kellmann
Project Manager

TABLE OF CONTENTS

STL SACRAMENTO PROJECT NUMBER G2J230244

CASE NARRATIVE

STL SACRAMENTO PROJECT NUMBER G2J230244

SOLID, 8280A, 2,3,7,8-TCDD/TCDF
Sample(s): 3
All samples were initially extracted on November 7, 2002 (Batch 2311348). However, as this sample had several internal standards that were less than the method recommended goal of 25%, the sample was re-extracted on November 20, 2002 (Batch 2324624). Please note that the re-extraction occurred outside of the method recommended 30 day extraction holding time. Both sets of data are reported for this sample.

The LCS associated with this re-extracted sample (Batch 2324624)) has high recovery for 1,2,3,6,7,8-HxCDF. As this compound is not a target analyte of interest there is no impact upon the data.

There were no other anomalies associated with this project.

STL Sacramento
Quality Control Definitions

QC Parameter	Definition
QC Batch	A set of up to 20 field samples plus associated laboratory QC samples that are similar in composition (matrix) and that are processed within the same time period with the same reagent and standard lots.
Duplicate Control Sample (DCS)	Consist of a pair of LCSs analyzed within the same QC batch to monitor precision and accuracy independent of sample matrix effects. This QC is performed only if required by client or when insufficient sample is available to perform MS/MSD.
Duplicate Sample (DU)	A second aliquot of an environmental sample, taken from the same sample container when possible, that is processed independently with the first sample aliquot. The results are used to assess the effect of the sample matrix on the precision of the analytical process. The precision estimated using this sample is not necessarily representative of the precision for other samples in the batch.
Laboratory Control Sample (LCS)	A volume of reagent water for aqueous samples or a contaminant-free solid matrix (Ottawa sand) for soil and sediment samples which is spiked with known amounts of representative target analytes and required surrogates. An LCS is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects.
Matrix Spike and Matrix Spike Duplicate (MS/MSD)	A field sample fortified with known quantities of target analytes that are also added to the LCS. Matrix spike duplicate is a second matrix spike sample. MSs/MSDs are carried through the entire analytical process and are used to determine sample matrix effect on accuracy of the measurement system. The accuracy and precision estimated using MS/MSD is only representative of the precision of the sample that was spiked.
Method Blank (MB)	A sample composed of all the reagents (in the same quantities) in reagent water carried through the entire analytical process. The method blank is used to monitor the level of contamination introduced during sample preparation steps.
Surrogate Spike	Organic constituents not expected to be detected in environmental media and are added to every sample and QC at a known concentration. Surrogates are used to determine the efficiency of the sample preparation and the analytical process.

Source: STL Sacramento Laboratory Quality Manual

STL Sacramento Certifications:
Alaska (UST-055), Arizona (#AZ00616), Arkansas, California (NELAP # 01119CA) (ELAP #I-2439), Connecticut (#PH-0691), Florida (E87570), Hawaii, Louisiana (AI # 30612), New Jersey (Lab ID 44005), Nevada (#CA 044), New York (LAB ID 11666 serial # 107407), Oregon (LAB ID CA 044), South Carolina (LAB ID 87014, Cert. # 870140), Utah (E-168), Virginia (#00178), Washington (# C087), West Virginia (# 9930C), Wisconsin (Lab 998204680), USNAVY, USACE, USDA Foreign Plant (Permit # 37-82605), USDA Foreign Soil (Permit # S-46613).

Sample Summary
G2J230244

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
FALMP	1	01D CH-B131-001-0	10/16/02 01:32 PM	10/23/02 10:00 AM
FALM2	2	02D CH-TANK-001-0	10/16/02 01:45 PM	10/23/02 10:00 AM
FALM4	3	03D CH-FIRE-001-0	10/16/02 01:55 PM	10/23/02 10:00 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

AMRO Environmental Laboratories Corporation
111 Herrick Street
Merrimack, NH 03054

CHAIN-OF-CUSTODY RECORD

43584

Office: (603) 424-2022
Fax: (603) 429-8496

Project No.:	Project Name: SENECA ARMY DEPOT	Project Manager:	Samplers (Signature): CC	AMRO Project No.: 0210173
	Project State: NY			

Sample ID	Date/Time Sampled	Matrix A= Air S= Soil GW= Ground W. WW= Waste W. DW= Drinking W. O= Oil Other= Specify	Total # of Cont. & Size	Comp	Grab	Analysis Required: DIOXIN 8280	Remarks
01D CH-B131-001-0	10/16/02 1:32	SOIL	1-8oz			✓	
02D CH-TANK-001-0	↓ 1:45	↓	↓			✓	
03D CH-FIRE-001-0	↓ 1:55	↓	↓			✓	
Preservative: Cl-HCl, MeOH, N-HN03, S-H2SO4, Na-NaOH, O- Other						—	
Container Type: P- Plastic, G-Glass, V-Vial, T- Teflon, O-Other						G	

RECEIVED IN GOOD CONDITION UNDER COC
OCT 2 ? 2002
INI CC

Send Results To:	FAX No.:	Seal Intact?	P.O. No:	GW-1* GW-2 GW-3
AMRO ENVIRONMENTAL	603 429 8496	Yes No N/A		MCP Level Needed:
		Results Needed By: 7 DAYS		*= May require additional cost

Relinquished By	Date/ Time	Received By
C Cearley	10/22/02 1700	[signature] 10-23-02 1000

PRIORITY TURNAROUND TIME AUTHORIZATION
Before submitting samples for expedited TAT, you must have requested in advance and received a coded **AUTHORIZATION NUMBER.**
Samples arriving after 12:00 noon will be tracked and billed as received **on the following day.**
AUTHORIZATION No. ______ BY: ______

Please print clearly, legibly and completely. Samples can not be logged in and the turnaround time clock will not start until any ambiguities are resolved.

NOTES: Preservatives, Special reporting limits, Known Contamination, etc;

AMRO policy requires notification in writing to the laboratory in cases where the samples were collected from highly contaminated sites.

White: Lab Copy Yellow: Accompanies Report Pink: Client Copy SHEET 1 OF 1

qc/qcmemos/forms/amrococ/Rev.2 04/01/02

SOLID, 8280A, 2,3,7,8-TCDD/TCDF

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 01D CH-B131-001-0

Trace Level Organic Compounds

Lot-Sample #...:	G2J230244-001	Work Order #...:	FALMP1AC	Matrix.........:	SOLID
Date Sampled...:	10/16/02	Date Received..:	10/23/02		
Prep Date......:	11/07/02	Analysis Date..:	11/16/02		
Prep Batch #...:	2311348				
Dilution Factor:	1				
% Moisture.....:	9.5				

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.021	ng/g	SW846 8280A
2,3,7,8-TCDF	ND	0.025	ng/g	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	95	(25 - 150)
13C-2,3,7,8-TCDF	94	(25 - 150)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	87	(25 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 02D CH-TANK-001-0

Trace Level Organic Compounds

Lot-Sample #...:	G2J230244-002	Work Order #...:	FALM21AC	Matrix.........:	SOLID
Date Sampled...:	10/16/02	Date Received..:	10/23/02		
Prep Date......:	11/07/02	Analysis Date..:	11/16/02		
Prep Batch #...:	2311348				
Dilution Factor:	1				
% Moisture.....:	9.0				

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.027	ng/g	SW846 8280A
2,3,7,8-TCDF	ND	0.022	ng/g	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	89	(25 - 150)
13C-2,3,7,8-TCDF	88	(25 - 150)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	90	(25 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 03D CH-FIRE-001-0

Trace Level Organic Compounds

Lot-Sample #...:	G2J230244-003	Work Order #...:	FALM41AC	Matrix.........:	SOLID
Date Sampled...:	10/16/02	Date Received..:	10/23/02		
Prep Date......:	11/07/02	Analysis Date..:	11/16/02		
Prep Batch #...:	2311348				
Dilution Factor:	1				
% Moisture.....:	11				

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.039	ng/g	SW846 8280A
2,3,7,8-TCDF	ND	0.061	ng/g	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	17 *	(25 - 150)
13C-2,3,7,8-TCDF	19 *	(25 - 150)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	75	(25 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

* Surrogate recovery is outside stated control limits.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 03D CH-FIRE-001-0

Trace Level Organic Compounds

Lot-Sample #...: G2J230244-003 Work Order #...: FALM42AC Matrix.........: SOLID
Date Sampled...: 10/16/02 Date Received..: 10/23/02
Prep Date......: 11/20/02 Analysis Date..: 11/22/02
Prep Batch #...: 2324624
Dilution Factor: 1
% Moisture.....: 11

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.021	ng/g	SW846 8280A
2,3,7,8-TCDF	ND	0.032	ng/g	SW846 8280A

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	84	(25 - 150)
13C-2,3,7,8-TCDF	87	(25 - 150)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	80	(25 - 150)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

SEVERN
TRENT
SERVICES

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720-6961

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Fax: 330 497 0772
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ANALYTICAL REPORT

PROJECT NO. 0210173

SENECA ARMY DEPOT

Lot #: A2J250203

Mary Ann Steen

Amro Environmental Laboratorie
111 Herrick Street
Merrimack, NH 03054

SEVERN TRENT LABORATORIES, INC.

David S. Heakin
Project Manager

November 7, 2002

CASE NARRATIVE
A2J250203

The following report contains the analytical results for three solid samples submitted to STL North Canton by Amro Environmental Laboratories from the Seneca Army Depot Site, project number 0210173. The samples were received October 23, 2002, according to documented sample acceptance procedures.

STL North Canton utilizes only USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the method reference page in accordance with the methods indicated. A summary of QC data for these analyses is included at the rear of the report.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The samples were received at the laboratory at a temperature of 4.0° C.

ORGANOPHOSPHORUS PESTICIDE

Samples 01C CH-B131-001-0, 02C CH-TANK-001-0, and 03C CH-FIRE-001-0 had elevated reporting limits due to matrix interferences.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

STL North Canton conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program, which is described in detail in QA Policy, QA-003. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. STL North Canton requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair.. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. All control analytes indicated by a bold type in the LCS must meet acceptance criteria. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND (non-detected) for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). If the RPD fails for an LCS/LCSD and yet the recoveries are within acceptance criteria, the batch is still acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except under the following circumstances:

- Common organic contaminants may be present at concentrations up to 5 times the reporting limits. Common metals contaminants may be present at concentrations up to 2 times the reporting limit, or the reported blank concentration must be twenty fold less than the concentration reported in the associated environmental samples. (See common laboratory contaminants listed below.)

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride	Phthalate Esters	Copper
Acetone		Iron
2-Butanone		Zinc
		Lead*

- *for analyses run on TJA Trace ICP, ICPMS or GFAA only*

- Organic blanks will be accepted if compounds detected in the blank are present in the associated samples at levels 10 times the blank level. Inorganic blanks will be accepted if elements detected in the blank are present in the associated samples at 20 times the blank level.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS
(Continued)

- Blanks will be accepted if the compounds/elements detected are not present in any of the associated environmental samples.

Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. Due to the potential variability of the matrix of each sample, the MS/MSD results may not have an immediate bearing on any samples except the one spiked; therefore, the associated batch MS/MSD may not reflect the same compounds as the samples contained in the analytical report. When these MS/MSD results fail to meet acceptance criteria, the data is evaluated. If the LCS is within acceptance criteria, the batch is considered acceptable. The acceptance criteria do not apply to samples that are diluted for organics if the native sample amount is 4x the concentration of the spike.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch. However, a Sample Duplicate is less likely to provide usable precision statistics depending on the likelihood of finding concentrations below the standard reporting limit. When the Sample Duplicate result fails to meet acceptance criteria, the data is evaluated.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample is spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

If surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank, and the associated sample(s) are ND, the batch is acceptable. Otherwise, if the LCS, LCSD, or Method Blank surrogate(s) fail to meet recovery criteria, the entire sample batch is reprepped and reanalyzed. If the surrogate recoveries are outside criteria for environmental samples, the samples will be reprepped and reanalyzed unless there is objective evidence of matrix interference or if the sample dilution is greater than the threshold outlined in the associated method SOP.

For the GC/MS BNA methods, the surrogate criterion is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide, PCB, PAH, and Herbicide methods, the surrogate criterion is that one of two surrogate compounds must meet acceptance criteria.

ACCREDITED IN ACCORDANCE WITH nelac

STL North Canton Certifications and Approvals:

Alabama (#41170), California (#2157), Connecticut (#PH-0590), Florida (#E87225), Illinois (#100439), Kansas (#E10336), Kentucky (#90021), Massachusetts (#M-OH048), Maryland (#272), Minnesota (#39-999-348), Missouri (#6090), New Jersey (#74001), New York (#10975), North Dakota (#R-156), Ohio (#6090), OhioVAP (#CL0024), Pennsylvania (#68-340), Rhode Island (#237), South Carolina (#92007001, #92007002, #92007003), Tennessee (#02903), West Virginia (#210), Wisconsin (#999518190),NAVY, ARMY, USDA Soil Permit, ACIL Seal of Excellence – Participating Lab Status Award (#82)

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ANALYTICAL METHODS SUMMARY

A2J250203

PARAMETER	ANALYTICAL METHOD
Chlorinated Herbicides by GC	SW846 8151A
Organophosphorous Compounds by GC	SW846 8141A
Total Residue as Percent Solids	MCAWW 160.3 MOD

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A2J250203

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
FARNG	001	01C CH-B131-001-0	10/16/02	13:32
FARNM	002	02C CH-TANK-001-0	10/16/02	13:45
FARNP	003	03C CH-FIRE-001-0	10/16/02	13:55

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 01C CH-B131-001-0

GC Semivolatiles

Lot-Sample #...:	A2J250203-001	Work Order #...:	FARNG1AD	Matrix.........:	SO
Date Sampled...:	10/16/02 13:32	Date Received..:	10/23/02		
Prep Date......:	10/29/02	Analysis Date..:	11/01/02		
Prep Batch #...:	2302112				
Dilution Factor:	50				
% Moisture.....:	9.5	Method.........:	SW846 8141A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Parathion	ND	1800	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Triphenyl phosphate	127 DIL	(54 - 143)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 01C CH-B131-001-0

GC Semivolatiles

Lot-Sample #...: A2J250203-001 Work Order #...: FARNG1AC Matrix.........: SO
Date Sampled...: 10/16/02 13:32 Date Received..: 10/23/02
Prep Date......: 10/29/02 Analysis Date..: 10/30/02
Prep Batch #...: 2302127
Dilution Factor: 1
% Moisture.....: 9.5 Method.........: SW846 8151A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-D	ND	88	ug/kg
2,4-DB	ND	88	ug/kg
2,4,5-TP (Silvex)	ND	22	ug/kg
2,4,5-T	ND	22	ug/kg
Dalapon	ND	44	ug/kg
Dicamba	ND	44	ug/kg
Dichlorprop	ND	88	ug/kg
Dinoseb	ND	13	ug/kg
MCPA	ND	8800	ug/kg
MCPP	ND	8800	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2,4-Dichlorophenylacetic acid	82	(37 - 110)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 02C CH-TANK-001-0

GC Semivolatiles

Lot-Sample #...:	A2J250203-002	Work Order #...:	FARNM1AD	Matrix.........:	SO
Date Sampled...:	10/16/02 13:45	Date Received..:	10/23/02		
Prep Date......:	10/29/02	Analysis Date..:	11/01/02		
Prep Batch #...:	2302112				
Dilution Factor:	50				
% Moisture.....:	12	Method.........:	SW846 8141A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Parathion	ND	1900	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Triphenyl phosphate	146 DIL,*	(54 - 143)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 02C CH-TANK-001-0

GC Semivolatiles

Lot-Sample #...:	A2J250203-002	Work Order #...:	FARNM1AC	Matrix.........:	SO
Date Sampled...:	10/16/02 13:45	Date Received..:	10/23/02		
Prep Date......:	10/29/02	Analysis Date..:	10/30/02		
Prep Batch #...:	2302127				
Dilution Factor:	1				
% Moisture.....:	12	Method.........:	SW846 8151A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-D	ND	91	ug/kg
2,4-DB	ND	91	ug/kg
2,4,5-TP (Silvex)	ND	23	ug/kg
2,4,5-T	ND	23	ug/kg
Dalapon	ND	45	ug/kg
Dicamba	ND	45	ug/kg
Dichlorprop	ND	91	ug/kg
Dinoseb	ND	14	ug/kg
MCPA	ND	9100	ug/kg
MCPP	ND	9100	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2,4-Dichlorophenylacetic acid	74	(37 - 110)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 03C CH-FIRE-001-0

GC Semivolatiles

Lot-Sample #...:	A2J250203-003	Work Order #...:	FARNP1AD	Matrix.........:	SO
Date Sampled...:	10/16/02 13:55	Date Received..:	10/23/02		
Prep Date......:	10/29/02	Analysis Date..:	11/01/02		
Prep Batch #...:	2302112				
Dilution Factor:	50				
% Moisture.....:	8.4	Method.........:	SW846 8141A		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Parathion	ND	1800	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Triphenyl phosphate	149 DIL,*	(54 - 143)

NOTE(S):

DIL The concentration is estimated or not reported due to dilution or the presence of interfering analytes.

* Surrogate recovery is outside stated control limits.

Results and reporting limits have been adjusted for dry weight.

AMRO ENVIRONMENTAL LABORATORIES

Client Sample ID: 03C CH-FIRE-001-0

GC Semivolatiles

Lot-Sample #...: A2J250203-003 Work Order #...: FARNP1AC Matrix.........: SO
Date Sampled...: 10/16/02 13:55 Date Received..: 10/23/02
Prep Date......: 10/29/02 Analysis Date..: 10/30/02
Prep Batch #...: 2302127
Dilution Factor: 1
% Moisture.....: 8.4 Method.........: SW846 8151A

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,4-D	ND	87	ug/kg
2,4-DB	ND	87	ug/kg
2,4,5-TP (Silvex)	ND	22	ug/kg
2,4,5-T	ND	22	ug/kg
Dalapon	ND	44	ug/kg
Dicamba	ND	44	ug/kg
Dichlorprop	ND	87	ug/kg
Dinoseb	ND	13	ug/kg
MCPA	ND	8700	ug/kg
MCPP	ND	8700	ug/kg

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2,4-Dichlorophenylacetic acid	71	(37 - 110)

NOTE(S):

Results and reporting limits have been adjusted for dry weight.

PROPOSED PLAN - FINAL

The ASH LANDFILL at the SENECA ARMY DEPOT ACTIVITY (SEDA) Romulus New York

July 2002

PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the alternatives considered for remediation at the former Ash Landfill Operable Unit (OU) located within the Seneca Army Depot Activity (SEDA). The plan identifies the preferred remedial option with the rationale for its preference. The Proposed Plan was developed by representatives of the U. S. Army with support from the U.S. Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC). The U.S. Army is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Contingency Plan (NCP). The options summarized here are described in the remedial investigation and feasibility study (RI/FS) report, which should be consulted for a more detailed description of all the options. The RI/FS is contained in the Administrative Record, which is available for public review at the Town of Willard Public Library information repository.

This Proposed Plan is being provided to inform the public of the U.S. Army's preferred remedial alternative. This document is intended to solicit public comments pertaining to all the remedial options evaluated, as well as to specify the Army's preferred remedial option.

The remedy described in this Proposed Plan is the preferred remedy for the site. Changes to the preferred remedy or from the preferred remedy to another remedy may be made if public comments or additional data indicate that such a change would result in a more appropriate remedial action. Public comments are solicited on all of the options considered in the detailed analysis of the RI/FS because EPA, NYSDEC, and the U.S. Army may select a remedy other than the preferred remedy. The final decision regarding the selected remedy will be made after the U.S. Army, the EPA and the NYSDEC have taken into consideration all public comments.

A brief description of the U.S Army's preferred remedy for the Ash Landfill is as follows:

- Excavation and off-site disposal of debris piles, establishment and maintenance of a vegetative soil cover for the Ash Landfill and the Non-Combustion Fill Landfill (NCFL) for source control;
- Installation of three in-situ permeable reactive barrier walls filled with 100% zero valence iron, and maintenance of the proposed walls and the existing one for migration control of the groundwater plume;
- Contingency plan including additional monitoring and air sparging, as necessary;
- Institutional controls such as deed restrictions to prevent future owners from ingesting site groundwater and disturbing the landfill cap;
- Five-year reviews to evaluate whether the response actions remain protective of public health and the environment.

Dates to remember:
MARK YOUR CALENDAR

[enter start and completion dates of public commen period]
Public comment period on RI/FS report, Propose Plan, and remedies considered

[enter public meeting date]
Public meeting at the [enter meeting location an time]

COMMUNITY ROLE IN SELECTION PROCESS

The U.S. Army, the EPA and the NYSDEC rely 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 RI/FS report, the Proposed Plan and supporting documentation have been made available to the public for a public comment period which begins on [enter public comment period start date] and concludes on [enter public comment period end date].

A public meeting will be held during the public comment period at the [meeting location] on [meeting date] at [meeting time] to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred remedial option, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD)--the document which formalizes the selection of the remedy.

All written comments should be addressed to:

Mr. Stephen Absolom
BRAC Environmental Coordinator
Building 123
Seneca Army Depot Activity
Romulus, NY 14541-5001

Copies of the RI/FS report, Proposed Plan, and supporting documentation are available at the following repository:

Seneca Army Depot Activity
Building 116
5786 State Route 96
Romulus, NY 14541-5001
(607) 869-1309
Hours: M-F 8:30 am to 4:30 pm

SITE BACKGROUND

SEDA is a 10,587-acre military facility located in Seneca County, Romulus, New York that has been owned by the United States Government and operated by the Department of the Army since 1941. The facility is located in an uplands area, which forms a divide separating two of the New York Finger Lakes, Cayuga Lake on the east and Seneca Lake on the west. The elevation of the facility is approximately 600 feet above Mean Sea Level (MSL).

The Ash Landfill Operable Unit was initially estimated to encompass an area of approximately 130 acres. This larger area was investigated to ensure that no previously unknown waste disposal areas were overlooked. Following the remedial investigation, the area of the Ash Landfill Operable Unit was refocused to an area of approximately 23 acres. This area includes the Solid Waste Management Units (SWMUs) described below.

The Ash Landfill Operable Unit is located along the western boundary of SEDA. The Operable Unit is bounded on the north by Cemetery Road, on the east by the Seneca Army Depot Railroad line, and on the south by open grassland and brush. Beyond the depot's western boundary, on Smith Farm Road and along Route 96A, are farmland and residences. A map identifying the location of the site on the depot is included as **Figure 1.** A site map of the Ash Landfill Operable Unit, identifying the location of the SWMUs, is provided as **Figure 2.** The Ash Landfill Operable Unit is comprised of five SWMUs including: the Ash Cooling Pond (SEAD-3), the Ash Landfill (SEAD-6), the Non-Combustible Fill Landfill (NCFL) (SEAD-8), the Refuse Burning Pits (SEAD-14) and the Abandoned Solid Waste Incinerator Building (SEAD-15). SEAD-14 is also known as the Debris Piles. The Ash Landfill (SEAD-6) also includes a groundwater plume that emanated from the northern side of the landfill area.

According to the original SWMU Classification Report, SEAD-3 is a circular-bermed area approximately 50 feet in diameter. SEAD-6 is a kidney-shaped landfill approximately 550 feet by 300 feet (4 acres) in area. The groundwater plume associated with the Ash Landfill is approximately 18 acres. SEAD-8 is an area approximately 400 feet by 400 feet (3 acres) in area. SEAD-14 was originally thought to be two pits approximately 40 feet by 80 feet each however further investigation showed it to be three piles of burned trash. SEAD-15 is approximately 25 feet by 40 feet. The area that comprises the remaining 130-acres is a grassy shrub-covered area.

SEDA was proposed for the National Priorities List (NPL) in July 1989. In August 1990, SEDA was finalized for listing, and was listed in Group 14 on the Federal Section of the NPL. The EPA, 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. The Resource Conservation and Recovery Act (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 Base Realignment and Closure (BRAC) process.

Since 1941 the depot has been owned by the United States Government and operated by the Department of the Army. Prior to construction of the depot, the site was used for farming. From 1941 to 1974, uncontaminated trash was burned in a series of burn pits (SEAD-14), near the abandoned incinerator building (Building 2207), (SEAD-15). According to a U.S. Army Environmental Hygiene Agency (USAEHA) Interim Final Report, Groundwater Contamination Survey No. 38-26-0868-88 (July 1987), from 1941 until the late 1950's or early 1960's, the ash from the refuse burning pits was buried in the Ash Landfill (SEAD-6).

The incinerator building was built in 1974. Between 1974 and 1979, materials intended for disposal were transported to the incinerator. The incinerator was a multiple chamber, batch-fed 2,000 pound per hour capacity unit, which burned rubbish and garbage. The incinerator unit contained an automatic ram-type feeder, a refractory-lined furnace with secondary combustion and settling chamber, a reciprocating stoker, a residue conveyor for ash removal, combustion air fans, a wet gas scrubber, an induced draft fan, and a refractory-lined stack (USAEHA, 1975). Nearly all of the approximately 18 tons of refuse generated per week on the depot were incinerated. The source for the refuse was domestic waste from depot activities and family housing. Large items that could not be burned were disposed of at the NCFL (SEAD-8). The NCFL is approximately 2 acres and is located southeast of the incinerator building (immediately south of the SEDA railroad line). The NCFL was used as a disposal site for non-combustible materials, including construction debris, from 1969 until 1977.

Ashes and other residues from the incinerator were temporarily disposed of in an unlined cooling pond (SEAD-3) immediately north of the incinerator building. The cooling pond consisted of an unlined depression approximately 50 feet in diameter and approximately 6 to 8 feet deep. When the pond filled (approximately every 18 months), the fly ash and residues were removed, transported, and buried in the adjacent Ash Landfill, east of the cooling pond. The refuse was dumped in piles and occasionally spread and compacted. No daily or final cover was applied during operation. The active area of the Ash Landfill extended at least 500 feet north of the incinerator building, near a bend in a dirt road, based on an undated aerial photograph of the incinerator during operation. A fire destroyed the incinerator on May 8, 1979, and the landfill was subsequently closed. A vegetative cover, comprised of native soils and grasses, was observed over the Ash Landfill during the RI.

A grease pit disposal area near the eastern boundary of the site was used for disposal of cooking grease. Burn areas, surrounding the Ash Landfill, included areas of blackened soil, charred debris and areas of stressed or dead vegetation.

REMEDIAL INVESTIGATION SUMMARY

Parsons Engineering Science, Inc. (Parsons ES), originally known as the Parsons subsidiary C.T. Main (MAIN), was retained to provide environmental support services in 1990. Parsons ES, conducted the first phase of fieldwork, which was completed in January 1992. The RI report was prepared in two phases. The first document provided was the Preliminary Site Characterization Summary Report (PSCR) submitted on April 27, 1992. The PSCR constituted the first four chapters of the RI and was intended to provide a description of the site conditions, present the Phase 1 data, and identify any data gaps. The PSCR served as the basis for the second phase of data collection. Phase 2 fieldwork was completed by Parsons ES in April 1993. The final RI report was submitted on October 3, 1994.

The nature and extent of the constituents of concern at the Ash Landfill were evaluated through the comprehensive RI program. The primary media investigated at the Ash Landfill were soil, surface water and sediment from Kendaia Creek, on-site wetlands, drainage swales, and groundwater. The primary constituents of concern at the Ash Landfill are Volatile Organic Compounds (VOCs) (primarily chlorinated and aromatic compounds), semi volatile organics (mainly Polynuclear Aromatic Hydrocarbons (PAHs)), and, to a lesser degree, metals. The constituents of concern are believed to have been released to the environment during former activities conducted at the Ash Landfill Operable Unit. The source of the Volatile Organic Compounds was most likely the three alleged solvent dump areas located at the bend in the access road (Bend in the Road) northwest of the Ash Landfill. The source of the VOCs that were allegedly disposed in this area is unknown.

<u>Non-Time Critical Removal Action Summary</u>

A non-time critical removal action, also known as an Interim Removal Measure (IRM), was conducted by the Army between August 1994 and June 1995, under the requirements of the CERCLA, as amended. The removal action consisted of excavation and thermal treatment of VOC-impacted soils using Low Temperature Thermal Desorption (LTTD). The objectives of the removal action were to thermally treat VOCs and PAHs in soils at two source areas near the "Bend in the Road" where sampling identified elevated concentrations of VOCs and PAHs to be present. The non-time critical removal action reduced risk due to future exposure to these soils and prevented continued leaching of VOCs to groundwater associated with this operable unit. Cleanup requirements for soils were adopted from the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) cleanup guidelines. The scope of the removal action is described in the "Action Memorandum, Ash Landfill Removal Action" (Parsons ES, 1993). The non-time critical removal action was conducted by IT Corporation on soils that were the source of a groundwater plume of VOCs. In July 1995, the final report for the Ash Landfill Immediate Response was prepared by IT Corporation. The treatment of soils involved two distinct source areas at the "Bend in the Road" area. Approximately 35,000 tons of soil were excavated from the two source areas and heated to 800-900°F in the LTTD system. After the soil was heated and cooled, soil was tested prior to backfilling into the excavation area. Following backfilling and proper grading for drainage control, a vegetative cover was established to prevent erosion. Sampling and analysis of the excavated and treated soil material indicated that these soils were successfully treated and met the VOC cleanup criteria (NYSDEC TAGM values) for the project. **Tables 1 through 4** list concentrations of constituents of concern in soil prior to and after the IRM as well as their respective NYSDEC TAGM values. These tables show that the concentrations of VOCs in soils after the IRM were lower than the concentrations of VOCs in soil prior to the IRM. Also, concentrations of VOCs in soils after the IRM were below NYSDEC TAGM values. The IRM thermal treatment project provided a positive benefit for the long-term remedial action by eliminating continued leaching of VOCs into groundwater and preventing further exposure to humans and wildlife. In the several years that have passed since the IRM, the positive benefits of the IRM have been observed as the concentrations of VOCs in groundwater in the area have decreased over 100 fold.

Treatment of wastewater and monitoring of air dispersion impacts were also performed as part of the non-time critical removal action. Wastewater in the excavation areas (consisting of infiltrating groundwater, precipitation, runoff, and water generated from other project operations) was collected, pumped, and treated by an on-site water treatment system prior to discharge in a nearby field. The treated water met the requirements of the NYSDEC groundwater criteria for a Class GA groundwater. Class GA groundwater means that the groundwater is suitable for use as a source of potable water.

Tables 1 through 4 provide a summary of soil data collected before and after the IRM. Each table includes the NYSDEC TAGM soil criteria, the count, (i.e. the number of valid samples included in the statistical evaluation), the maximum detected value, the 95th UCL of the mean and the arithmetic mean. Non-detected values were included in the statistical calculation as a detected value at one-half the detection limit.

The 95th UCL of the mean is a probabilistic estimate of the true mean of the site data. The 95th UCL of the mean is a function of the distribution of the data, the standard deviation and the number of samples that were collected. The more samples that are collected, the greater the likelihood that the true mean of the site data is represented by the 95th UCL of the mean. For risk assessment purposes, EPA recommends that the 95th UCL of the mean be used as a reasonable estimate of the exposure point concentration. If the 95th UCL of the mean is reduced by treatment, then presumably the risk would also be reduced.

The arithmetic mean is the sum of each value divided by the number of valid samples.

Table 1 provides an indication of the overall concentrations of chemicals in soil at the Ash Landfill Operable Unit prior to the IRM. This table includes soil data collected during the RI and includes all depths and all locations.

The IRM did not treat all the soil at the site. Only soil within the area known as the "Bend in the Road" was excavated and treated. Soil within this area was identified during the RI as the source of groundwater contamination. The soil data that was used for the statistical calculations in **Table 1** have been separated into **Tables 2** and **3** based on whether they were collected from the area identified as source of groundwater contamination (**Table 3**) or not (**Table 2**). One of the primary goals of the IRM was to eliminate the source of groundwater pollution. **Table 4** provides an indication of the concentrations of volatile and semi volatile constituents after the IRM was performed. **Table 4** does not include any of the RI data. This table was generated from the confirmation data collected following treatment, prior to replacement in the excavation. Comparison of the data from **Table 3** to **Table 4** provides an indication of the effectiveness of the IRM treatment process.

The maximum concentration of trichloroethene in soil at the "Bend in the Road" area, prior to the non-time critical removal action, was 540,000 ug/kg or 540 mg/kg (**Table 3**). The maximum concentration of trichloroethene in soil following thermal treatment was 46 ug/kg or 0.046 mg/kg (**Table 4**). This is a 99.99% reduction in TCE concentrations. Of the 156 valid soil samples collected from the treated soil, excluding duplicates, only this one sample was detected above the Practical Quantitation Limits (PQLs) of the analytical method. These samples represent soil from 150 cubic yard piles that had been thermally treated. The typical PQL for trichloroethene in soil was approximately 10 ug/kg. Following analytical documentation that treatment had been successful, the soil was placed back in the excavation.

Prior to full operation, a prove-out test was performed to document the effectiveness of the proposed thermal treatment technology and evaluate the potential for the treated soil to leach metals. Thermal treatment is not effective in removing metals from soil. A total of 89 post-treatment soil samples were collected and analyzed for the 8 Toxicity Characteristics Leaching Procedure (TCLP) metals following treatment. The 8 metals that are included in the TCLP test are: arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.

The treated soil was tested to evaluate the potential for metals in soil to leach and ensure that the leachable levels did not exceed hazardous waste characteristic levels. The TCLP test is an EPA RCRA test that is used to assess the potential for a waste to leach. It is also used to classify waste as hazardous. The test results are expressed in mg/L, not mg/kg. This is because the test does not measure the total concentration of metals in soil, rather it measures the leachable amount of metals in soil. Of the 8 TCLP metals, lead was used as an indicator for metal impacts, due to the toxicity of lead, the potential for lead to leach and the concentrations of lead in soil that were measured during the RI.

The TCLP metal analytical data indicated that the maximum concentration of leachable lead in the soil samples associated with the IRM thermal treatment project was 814 ug/L. The regulatory limit for the RCRA characteristic of toxicity for lead, using the TCLP test, is 5,000 ug/L, therefore no soil tested was found to be a RCRA characteristic hazardous waste. Numerous TCLP sample results for leachable lead in soil were non-detectable. The concentration of total lead in soil was measured during the RI in the area of the IRM. Total lead in soil measured in the area of the IRM ranged from 4.1 mg/kg to 696 mg/kg. The highest concentration of total lead in soil measured during the RI was 2,890 mg/kg. This sample was obtained from one of the surface debris piles. The TAGM cleanup criteria for lead is 24.8 mg/kg.

Soil

The primary VOCs in soils at the Ash Landfill site were 1,2-dichloroethene (1,2-DCE) (maximum=79 mg/kg), trichloroethene (TCE) (maximum=540 mg/kg), and vinyl chloride (VC) (maximum=1.0 mg/kg). The highest concentrations of these compounds were measured in a two-acre area, located in the northwestern corner of the Ash Landfill, at the "Bend in the Road". The primary aromatic constituents of concern were xylene (maximum=17 mg/kg) and toluene (maximum=5.7 mg/kg). The semi volatiles of principal concern were PAHs. PAHs were measured at concentrations above the NYSDEC TAGM cleanup guidelines. The metals that were detected at elevated concentrations in soils were copper (maximum=836 mg/kg), lead (maximum=2,890 mg/kg), mercury (maximum=1.2 mg/kg) and zinc (maximum=55,700 mg/kg). The highest concentrations of metals were detected in the surface soils of the debris piles. The debris piles are small surface features and do not extend into the subsurface. The extent of the aromatics in the horizontal direction was smaller than that for the chlorinated volatile organics (approximately one-half acre). The vertical impacts extended from the land surface to 4 feet below the surface (above the water table).

A former 1000-gallon underground storage tank (UST) that was used to store heating oil and was located on the east side of the Abandoned Incinerator Building (SEAD-15), was investigated and removed in April 1994 in accordance with the protocols outlined in the NYSDEC STARS memo (August 1992). According to the UST closure report that documented this tank removal, the tank was intact and there was no visual or olfactory evidence of tank leakage in the soil surrounding the UST. This UST removal was not related to the Superfund process.

As part of the Ash Landfill RI, a soil boring program was conducted in the area around SEAD-15 including the adjacent Ash Cooling Pond (SEAD-3) during November 1991. Results from this investigation indicated that concentrations of 29 of the 30 semivolatile compounds were below TAGM criteria. One compound was detected at concentrations exceeding the TAGM criteria. Benzo(a)pyrene was detected at concentrations of 760 J μg/kg and 120 μg/kg in two surface soil samples collected adjacent to the cooling pond. The TAGM value for benzo(a)pyrene is 61 μg/kg. Benzo(a)pyrene was not detected in samples collected below these two surface soil samples indicating that these concentrations were limited to the surface. Benzo(a)pyrene concentrations in surface and subsurface soils were below the TAGM in several other borings in the immediate vicinity of the cooling pond. No pesticides or PCBs were detected in the soil borings, and measured metal concentrations were consistent with background values developed as part of USAEHA Waste Study 37-26-0479-85.

Surface Water and Sediment

No volatile or semi-volatile organic compounds were detected in any of the on-site surface waters or Kendaia Creek. Kendaia Creek has been classified by NYSDEC as a Class C stream. The on-site drainage ditches and wetlands have not been classified by NYSDEC. The on-site wetlands and drainage ditches do not contain surface water throughout the entire year. Metals concentrations were also low in surface water with only iron exceeding NYSDEC surface water quality standards (6 NYCRR Subparts 701-705) in three of the six on-site locations. The concentration of iron in these three samples ranged from 8.75 mg/L to 2.08 mg/L. The NYSDEC Ambient Water Quality Criteria (AWQC) for iron in a Class C surface water body is 0.3 mg/L.

The sediments of the wetland adjacent to the "Bend in the Road" (Wetland W-B) contained elevated concentrations of 1,2-DCE (640 ug/kg). No other on-site sediment samples contained concentrations of volatile or semi-volatile organics. Metals concentrations in several sediment samples exceeded the NYSDEC Sediment Criteria guidelines. For arsenic, the NYSDEC Sediment Criteria of 5 ug/kg was exceeded at 9 of the 16 sample locations. The highest concentration of 12 ug/kg was detected at the on-site wetland SD-WB. For chromium, the NYSDEC Sediment Criteria of 26 ug/kg was exceeded at 2 of the 16 sample locations. The highest concentration of 33 ug/kg was detected at the off-site location SW-600. For copper, the NYSDEC Sediment Criteria of 19 ug/kg was exceeded at 15 of the 16 sample locations. The highest concentration of 59 ug/kg was detected at SW-100. For iron, the NYSDEC Sediment Criteria of 24,000 ug/kg was exceeded at 10 of the 16 sample locations. The highest concentration of 36,800 ug/kg was detected at the off-site location SW-800. For lead, the NYSDEC Sediment Criteria of 27 ug/kg was exceeded at 9 of the 16 sample locations. The highest concentration of 219 ug/kg was detected at the off-site location SW-600. For manganese, the NYSDEC Sediment Criteria of 428 ug/kg was exceeded at 10 of the 16 sample locations. The highest concentration of 1,050 ug/kg was detected at the off-site location SW-800. For mercury, the NYSDEC Sediment Criteria of 0.11 ug/kg was exceeded at 4 of the 16 sample locations. The highest concentration of 0.81 ug/kg was detected at location SD-WE. For nickel, the NYSDEC Sediment Criteria of 22 ug/kg was exceeded at 10 of the 16 sample locations. The highest concentration of 46 ug/kg was detected at SD-WF. For zinc, the NYSDEC Sediment Criteria of 85 ug/kg was exceeded at 15 of the 16 sample locations. The highest concentration of 834 ug/kg was detected at the on-site wetland SD-WB.

Groundwater

The primary impact to the groundwater is a plume containing dissolved concentrations of TCE, 1,2-DCE, and VC that originated in the "Bend in the Road" area near the western edge of the Ash Landfill. Quarterly monitoring in 1996, 1997 and 1998 detected 1,2-DCE between 0.2 ug/L and 2 ug/L at monitoring well MW-56, which is 225 feet past the depot boundary. The most recent sampling of MW-56 in January 2000 did not detect 1,2-DCE above the detection limit of 1 ug/L. The NYSDEC GA groundwater quality standard for 1,2-DCE is 5 ug/L. It is likely that the boundary of the plume extends westward to slightly beyond the depot boundary. Exceedances over the NYSDEC GA groundwater standard, beyond the depot boundary, have not been observed. **Table 5** lists the total chlorinated ethene concentrations for four sampling rounds in the site wells.

The maximum volatile organics concentration was detected in monitoring well MW-44, located within the area considered to be the source area prior to the soil removal action. In November 1993, the concentrations of TCE, 1,2-DCE and VC were 51,000, 130,000, and 23,000 ug/l, respectively, for a total chlorinated ethene concentration of 204,000 ug/l in MW-44. The nearest exposure points for groundwater are the three farmhouse wells, located approximately 1,250 feet from the leading edge of the plume. At least one of the farmhouse wells draws water from the till/weathered shale aquifer and the remaining two wells derive water from the bedrock aquifer. Vertically, the plume is believed to be restricted to the upper till/weathered shale aquifer and is not present in the deeper competent shale aquifer.

Although exceedances of the NYSDEC Class GA groundwater standards were observed in several wells during the RI for the metals chromium, lead, nickel, zinc, antimony, barium beryllium and copper, the data appears to be related to the turbidity of the sample. It was noted that wells with high turbidity have high metals concentrations. Subsequent improvements to the sampling techniques provided less turbid samples with a corresponding decrease in the concentration of metals. For example, lead in MW-44, with a turbidity of 100 NTU was measured during the second round of the RI was 147 ug/L, which was above both the EPA criteria of 15 ug/L and the NYSDEC GA standard of 25 ug/L. During the quarterly sampling conducted following the RI, the concentration of lead in MW-44 was non-detectable at less than 2 ug/L. This same trend was observed for other wells. During these sampling events, the EPA Region II Low Stress (low flow) Purging and Sampling Method was used to reduce the turbidity in the groundwater samples. As a result, the turbidity of the samples was less than 10 NTUs. Furthermore, the locations of the exceedances did not correlate to form a continuous plume, were random, and not related to a source. This supports the contention that the exceedances were related to sample turbidity rather than a release from a point source. As a result of this data, concern over exceedances of metals in groundwater was resolved and attributed to turbidity.

Although the removal action successfully removed volatile and semi volatile organics from soil, positive affects have been observed in the groundwater concentration in the area of the removal action. For example, prior to the removal action, the concentration of total chlorinated ethenes in MW-44 was 204,000 ug/L. In October 1999 and January 2000, the concentrations in MW-44a, the replacement well for MW-44, were 1,104 ug/L and 399 ug/L, 99.5% and 99.8% reductions in concentration. **Figure 3** depicts the groundwater VOC plume before the removal action, and **Figure 4** depicts the groundwater VOC plume based on the results of the most recent (January 2000) groundwater sampling and analysis.

SUMMARY OF SITE RISK

Based on the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future site conditions. The baseline risk assessment estimated the human health and ecological risk that could result from the site if no remedial action were taken. Environmental sampling has shown that SEAD-3 (Ash Cooling Pond) and SEAD-15 (Abandoned Incinerator Building) are not of environmental concern. As such, the baseline risk assessment was focused on the Ash Landfill (SEAD-6), NCFL (SEAD-8), and Debris Piles (SEAD-14).

Human Health Risk Assessment

The reasonable maximum human exposure was evaluated. A four-step process was used for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* identified the contaminants of concern based on several factors such as toxicity, frequency of occurrence, and concentration. *Exposure Assessment* estimated the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. *Toxicity Assessment* determined the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response). *Risk Characterization* summarized and combined the outputs of the exposure and toxicity assessments to provide a quantitative assessment of site-related risks (for example, one-in-a-million excess cancer risk).

The primary constituents of concern at the Ash Landfill are VOCs (primarily chlorinated and aromatic compounds), semi volatile organics (mainly PAHs), and to a lesser degree metals, such as copper, lead, mercury, and zinc. Several compounds including xylenes, toluene and PAH compounds are known to cause cancer in laboratory animals and are suspected to be human carcinogens.

The baseline risk assessment evaluated the health effects that may result from exposure for the following four receptor groups:

1. Current off-site residents;
2. Current on-site deer hunters;
3. Future on-site construction workers, and;
4. Future on-site residents.

The following exposure pathways were considered:

1. Dermal contact to surface water in Kendaia Creek and on-site wetlands while wading (current off-site residents, future on-site residents, current on-site deer hunters);
2. Dermal contact to sediments in Kendaia Creek and on-site wetlands while wading (current off-site residents, future on-site residents, current on-site deer hunters);
3. Ingestion of groundwater from off-depot wells (current off-site residents);
4. Ingestion of groundwater from on-site wells (future on-site residents);
5. Dermal contact with groundwater from off-depot wells while showering or bathing (current off-site residents);
6. Dermal contact with groundwater from on-site wells while showering or bathing (future on-site residents);
7. Inhalation of volatile organics released from groundwater from off-depot wells while showering (current off-site residents);
8. Inhalation of volatile organics released from groundwater from on-site wells while showering (future on-site residents);
9. Inhalation of volatile organics in ambient air emitted from on-site soils and transported downwind to the depot fence line (current off-site residents);
10. Ingestion of on-site surface soils; dermal contact with on-site surface soils (future on-site residents, current on-site deer hunters, future on-site construction workers);
11. Inhalation of volatile organics in ambient air emitted from on-site soils (future on-site residents, current on-site deer hunters, future on-site construction workers).

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

The results of the baseline risk assessment indicate that none of the current receptors are in danger of exceeding the EPA target risk range under the current and expected receptor scenarios. The carcinogenic risk for current off-site receptors is 1.8×10^{-5} and the HI is 0.15. Groundwater sampling performed as part of this investigation, in addition to several years of quarterly groundwater monitoring, has confirmed that the current off-site residents do not exhibit an increased risk of cancer in excess of the target risk range or adverse non-carcinogenic health threats. The current receptors include site workers, occasional hunters and off-site residents. Future receptors include construction workers and on-site residents. There are no on-site residences and there is no intended future use of the site for residential purposes. The on-site residential scenario was considered as a worst case condition. Currently, there are no drinking water wells at the Ash Landfill Operable Unit. Site workers and hunters obtain drinking water from other sources, including water from the depot. The water supply for the depot is supplied by the Varick Water District, which obtains water from Seneca Lake. The off-site residences obtain water from a bedrock well. The well has been tested for several years and chlorinated ethenes have never been detected. The carcinogenic risks for the off-site receptor ingesting groundwater were found to be $6x10^{-6}$ which is within the EPA's target risk range. Additionally, the HI of 0.14 is less than the EPA defined non-carcinogenic HI target risk value of 1.0. The cancer risks for the on-site hunter and the on-site construction worker scenarios were $9.6x10^{-6}$ and $3.4x10^{-7}$ respectively, which are also within the EPA target ranges. The HI for these receptors were 0.0075 and 0.003 respectively, less than the EPA defined non-carcinogenic HI target risk value of 1.0

Currently, there is no evidence of concentrations of VOCs exceeding the New York State GA groundwater quality standards at the leading edge of the plume. The edge of the plume is located at the western boundary of the Ash Landfill Operable Unit. The nearest off-site exposure points for groundwater are the three farmhouse wells, located approximately 1,250 feet from the leading edge of the plume. Groundwater monitoring of these three monitoring wells for approximately eight to ten years has not indicated any VOC contamination in the water supply. The land located off-site and adjacent to the Ash Landfill is currently used as farmland and no residential future land use is currently planned. The till/weathered shale aquifer is unlikely to yield sufficient quantities of water for residential use.

The carcinogenic risks for potential future residents using groundwater for drinking at SEDA is $1.4x10^{-3}$, and the HI is 3.2. Although risks exist for potential future residents using groundwater for drinking at SEDA, the Local Redevelopment Authority (LRA) does not intend to use this land for residential purposes. The future intended use for the site has been determined by the LRA is conservation/recreational area. As part of the BRAC process, the future land use has been determined by the LRA in conjunction with the Army. As of July 1996, the LRA recommended to the Army specific reuse alternatives for several areas at SEDA. Accordingly, it is unreasonable to establish remedial action objectives and remediate to conditions inconsistent with such land use. Any decisions pertaining to implementing a remedial action would be based upon the current and intended future land use. This includes the risk to the receptor groups: the current off-site residents, the current on-site hunters, the future on-site residents, current on-site hunters and the future on-site construction workers. Should the intended future land use become residential, then in accordance with U.S. Army regulations and CERCLA, the U.S. Army would notify all appropriate regulatory bodies and perform any remedial action necessary to meet the risk requirements for this land use scenario.

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:

- *Problem Formulation*--a qualitative evaluation of contaminant release, migration, and fate. Identification of contaminants of concern, receptors, exposure pathways, and known ecological effects of the contaminants; and selection of endpoints for further study.
- *Exposure Assessment*--a quantitative evaluation of contaminant release, migration, and fate; characterization of exposure pathways and receptors; and measurement or estimation of exposure point concentrations.
- *Ecological Effects Assessment*--literature reviews, field studies, and toxicity tests linking contaminant concentrations to effects on ecological receptors.
- *Risk Characterization*--measurement or estimation of current and future adverse effects.

Exposure to terrestrial ecological species was assumed to occur from soil within the top 2 feet of surface soil. The maximum concentration of lead in surface soil was 2,890 mg/kg. However, for the ecological risk assessment, the 95th UCL of the mean for lead in surface soils, calculated as 265 mg/kg, was used as the exposure point concentration. For cadmium, the maximum concentration in surface soil was 43.1 mg/kg. The 95th UCL of the mean for cadmium in surface soils was calculated as 5.5 mg/kg, which was used as the exposure point concentration. The maximum concentration of zinc in surface soil was 55,700 mg/kg. The 95th UCL of the mean for zinc in surface soils, calculated as 1,580 mg/kg, which was used as the exposure point concentration. The maximum concentration of the PAH compound acenaphthene in surface soil was 2.2 mg/kg. The 95th UCL of the mean for acenaphthene in surface soils, calculated as 0.538 mg/kg, which was used as the exposure point concentration.

On-site soils, surface waters and sediment suggest the site conditions may pose a slightly elevated ecological risk due to the presence of heavy metals. However, these criteria are not considered ARARs since none of these criteria are promulgated standards. The NYSDEC and Federal Ambient Water Quality Criteria (AWQC), which are promulgated standards for Kendaia Creek are considered to be ARARs. No exceedances of these AWQCs were observed for downstream samples from Kendaia Creek, classified by NYSDEC as a Class C stream. Metal exceedances were identified for ecological guidelines and reported literature values for on-site soil, sediment and surface water. The actual ecological risk caused by these exceedances is not readily observable. Furthermore, the use of the on-site wetlands and surface waters by aquatic species is unlikely since these wetlands are small and dry during a large portion of the year.

- SC-3: Excavation of Various areas of the Ash Landfill and the Debris Piles/Consolidation to the NCFL/Cap the NCFL
- SC-4: Excavation/Soil Wash/Backfill Coarse Fraction/Landfill and Solidify Fine Fraction
- SC-5: Excavation of Debris Piles at the Ash Landfill/Disposal in an Off-Site, Non-Hazardous Subtitle D landfill/Soil Cap for Ash Landfill and the NCFL

Alternative SC 1: The No-Action Alternative

The Superfund program requires that the "No-Action" option be considered as a baseline for comparison of other options. There are no costs associated with the no-action option. The no-action option means that no remedial activities would be undertaken at the site. No monitoring or security measures would be undertaken. Any attenuation of the threats posed by the site to human health and the environment would be the result of natural processes. Current security measures would be eliminated or modified so that the property may be transferred or leased as appropriate.

Alternative SC-2: Excavation of the Ash Landfill, NCFL, and Debris Piles/Disposal in an Off-Site Subtitle D Landfill

Capital Cost: $17.5 million
O & M Cost: $0
Present Worth Cost: $17.5 million
Construction Time: Construction would take 12 to 18 months depending on the weather.

This option consists of excavating contaminated soils from the Ash Landfill, the NCFL, the debris piles, and consolidating them at the NCFL. The results of the RI indicate that these areas are well-defined localized areas that are less than 10 feet deep in the NCFL and less than 2 feet deep at the Ash Landfill and the debris piles. Based on this finding, the expected depth of excavation at the Ash Landfill and debris piles would be 2 feet, whereas the expected depth of excavation at the NCFL will be 10' or less. The results from the RI further indicate that contaminated soils in all three locations could be removed with standard construction equipment. Following consolidation of contaminated soils at the NCFL, the excavated materials would be transported to an off-site Subtitle D landfill for disposal. Clean backfill materials would then be transported to the site and used to fill the excavated areas. A vegetative cover would be established over the backfilled area. A Subtitle D landfill refers to a solid waste landfill that meets the NYSDEC and USEPA Subtitle D landfill construction specifications.

Excavation would involve removal of approximately 45,500 cubic yards of material. Once excavated, soil and solid waste would be stockpiled and tested for the TCLP. If results indicate that the soil is above the TCLP limits for hazardous waste then the material will be treated and the soil will be disposed of in a Subtitle D landfill.

Alternative SC-2 is protective, implementable and effective for managing the constituents of concern (i.e., metals and PAHs) that remain following the elimination of the VOCs. This alternative is considered to be the best for long-term protectiveness since none of the constituents of concern would remain on-site. However, from the perspective of short-term protectiveness, this alternative would not be ranked high due to the impacts to nearby residents and on-site workers from truck traffic and dust. Ecological receptors would be impacted during the construction phase. Maintenance and monitoring would not be required since all the materials would have been removed. Since this alternative also involves transferring waste from one landfill to another, there will be a decrease in available landfill space. Landfills are used by several municipalities for management of solid waste.

Alternative SC-3: Excavation of the Ash Landfill and Debris Piles/Consolidation at the NCFL/Cap the NCFL

Capital Cost: $1.4 million
O & M Cost: $490,000
Present Worth Cost: $1.89 million
Construction Time: Construction would take 4 to 6 months depending on the weather.

This option consists of excavating contaminated soils from the Ash Landfill area, the "Bend-in-the-Road" area, the debris piles; and consolidating them at the NCFL. The residual materials from the non-time critical removal action would be used as replacement fill material. Due to the NCFL's current use and proximity to the other areas, it is an ideal on-site area to consolidate the non-volatile waste material. Because the soils at the "Bend-in-the-Road" have been remediated, no volatile organic contaminated source soils exist at the site, and the most likely exposure pathway is from dermal contact or ingestion of soils impacted with heavy metal constituents. Isolating these materials in the NCFL would prevent the potential for this type of exposure. The final cap would consist of a 12-inch thick barrier such as clay or a geomembrane, covered with a vegetative layer.

The first step in this option is excavation. An excavation plan would be developed using previous RI data to delineate the extent of removal. A wetland mitigation plan would also be developed. The maximum volume to be excavated is approximately 32,400 cubic yards, which includes all the soils except those in the NCFL. The expected depth of the excavation in soils outside of the NCFL would be approximately 2 feet. Under this alternative, excavation would not be performed on soils in the NCFL, as soil in the NCFL would remain in-place and be capped. The excavation would be accomplished with standard construction equipment, such as a front-end loader or bulldozer. The excavated soil would be immediately transported to the NCFL where it would be consolidated and eventually capped.

There are also areas at the site, such as the debris piles, the refuse burning pits, and the Ash Landfill, that contain elevated concentrations of heavy metals, pesticides, and PAHs. Although leaching and migration into groundwater are not currently occurring, erosion and overland transport could be a potential transport mechanism. Alternative SC-3 would mitigate this concern.

Alternative SC-3 is effective, implementable, and would be relatively cost effective for managing the constituents of concern (metals and PAHs) that remain following the elimination of the VOCs. Because the constituents of concern remain on-site, capping is a necessary technology requiring future maintenance and monitoring to ensure the stability of the landfill, prevent runoff or erosion of the landfill contents, and prevent leaching of the constituents of concern to groundwater.

Because this option would result in contaminants remaining on-site at levels that do not allow for unlimited use and unrestricted exposure, institutional controls and five-year reviews would be required. Under this alternative, the types of institutional controls that would be implemented will include a combination of administrative and physical controls that are implemented to prevent disturbance of the landfill cap at the NCFL. Administrative controls will include deed restrictions that prohibit activities that disturb the NCFL cap. Physical controls that will be implemented include posting of signs and markers to identify these areas. The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment.

Alternative SC-4: Excavation of the Ash Landfill, the NCFL and the Debris Piles/Soil Washing/Backfill Coarse Fraction/Solidify Fine Fraction/Cap

Capital Cost: $31.5 M
O & M Cost: $490,000
Present Worth Cost: $32 M
Construction Time: Construction would take 3 to 6 months.

The SC-4 option involves five unit operations: excavation, soil washing, backfilling of the coarse fraction, solidification of the fine fraction, and capping. The volume to be processed for this option is approximately 68,700 yd^3.

For this option, the sediments and soils would be excavated and processed to segregate the coarse fraction of soil from the fine fraction. Due to the increased surface area, fine particles tend to accumulate constituents of concern greater than other size fractions, but are also more difficult to clean. By segregating the fine particles from the coarse soil particles, the majority of the impacted soil would be removed The coarse fraction would then be backfilled as clean fill, providing the Remedial Action Objectives are met. Fine particles would be treated through solidification.

Acid leaching and biological treatment of the fine particles was also investigated for this option, minimizing the volume of soil that would require off-site disposal. Soil washing is an effective alternative, due to the high percentage of fines at the Ash Landfill (30 to 70%). The success of acid leaching is improbable since the concentrations of the metals are not high enough to warrant this aggressive process. The added cost and safety issues associated with using acid are also negative factors. The efficiency of removing the organic contaminants with acid is also of concern and it is likely that many organic contaminants would remain with the acid extracted soil. For these reasons, acid extraction was not considered further.

Segregated fines can be biologically treated using a slurry reactor. This process is specific for degradation of the organic portion of the washed fine fraction but would have little effect on the heavy metal constituents. Due to the difficulties associated with washing a soil matrix composed primarily of fines, with organic and inorganic contamination, this unit operation was not considered further.

The more attractive option would be to render the segregated fine soil particles non-reactive by solidification. Solidification/stabilization is a process converting components to less toxic, mobile, and/or insoluble forms. The primary goals of solidification are to improve the handling and physical characteristics of the waste, decrease the solubility and mobility of soil metals, and decrease the surface area of the soil matrix. The physical properties of the soil or waste are not necessarily changed by this process (EPA 1990). Solidification of inorganic constituents is achieved with cement or pozzolanic additives. Organic solidification/stabilization is often accomplished with thermo-plastic or organic polymerization additives (EPA, 1989). For soils containing both organic and inorganic contaminants, a combination of these processes can be used.

Solidification/stabilization has been used primarily for the treatment of soils containing inorganic contaminants and has been shown to be effective for heavy metals. If organics are present in large concentrations (such as in oily wastes) the setting process may be adversely affected, and may not bind up in the finished product. Although the soil from the Ash Landfill does contain organic contaminants, the concentrations are not expected to cause solidification problems. Bench-scale treatability tests would be conducted to assess the adequacy of a given additive to a specific soil mixture. Cement-based stabilization is the likely choice for the

Ash Landfill. Portland Cement is a typical solidification technology.

The coarse fraction of the soils that exceed the Toxicity Characteristic Leaching Procedure (TCLP) requirements would also be solidified prior to land filling in the NCFL. Coarse soils that do not exceed TCLP requirements would be backfilled on-site.

Solidification/stabilization can be conducted either in-situ or in a batch mode. For in-situ solidification/stabilization, the mixtures are injected into the soil and then mixed. In batch operations, the material is removed from the ground with standard earthmoving equipment and mixed in units such as standard cement trucks. Batch processes require more area than in-situ processes because space is necessary to store the untreated soil when it is removed from the ground. At the Ash Landfill, a batch operation would be used. The contaminated soil is shallow, and is easily removed. In addition, there is plenty of space available to set up a stockpile area and cement plant. The solidified soil/additive matrix would prevent leaching of these residual materials through both chemical and physical barriers. The chemical barrier is due to the insoluble forms that metals will be created when mixed with the soil/additive matrix. This mass would then be land filled on the site in the location from where the excavation was originally performed and capped to further reduce adverse effects of long term exposure.

This process decreases constituent mobility by binding constituents into a leach-resistant, concrete-like matrix while increasing the waste material volume by approximately 50%. Solidification is expected to be completed at 75 ton/hour (tph) or about 50 cy/hr.

Because this option would result in contaminants remaining on-site at levels that do not allow for unlimited use and unrestricted exposure, institutional controls and five-year reviews would be required. Under this alternative, the types of institutional controls that would be implemented will include a combination of administrative and physical controls that are implemented to prevent disturbance of the landfill cap. Administrative controls will include deed restrictions that prohibit activities that disturb the cap. Physical controls that will be implemented include posting of signs and markers to identify these areas. The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment.

Alternative SC-5: Excavation of Debris Piles/Disposal in an Off-Site, Non-Hazardous Subtitle D Landfill/Vegetative Cover over Ash Landfill and NCFL

Capital Cost: $237,000
30-Year O & M Cost: $490,000 (maintenance of cover)
Present Worth Cost: $727,000
Construction Time: Construction would take 4 to 6 months depending on the weather.

This option consists of excavating soils from the debris piles and transporting the soil to an off-site landfill. The rationale for this option is that the debris piles represent the areas with the highest concentrations of metals and PAHs. The removal of these piles represents an approach that is effective, easily implementable and cost-effective. Off-site disposal at a Subtitle D landfill eliminates any threat that these constituents may pose at the Ash Landfill site. Excavation, hauling, and disposal are proven and readily available remedial technologies. Selective excavation of the debris piles would effectively remove the highest concentrations of metals and PAHs at the site and essentially lower the risk levels associated with on-site soils.

An excavation plan would be developed using previous RI data to delineate the extent of removal. This plan would include a wetland mitigation plan that would provide protection of the existing wetlands. The maximum volume to be excavated is approximately 770 cubic yards, which includes all the soils associated with the debris piles. The soils in the NCFL and the Ash Landfill would remain in-place and be covered with a vegetative soil cover of 12 inches. The excavation would be accomplished with standard construction equipment. The excavated soil would be temporarily stockpiled in a secure area, tested for disposal requirements, and disposed of off-site in a secure, non-hazardous waste, Subtitle D landfill assuming that the soils meet the criteria for disposal. If testing indicates that the soils are not suitable for disposal in a Subtitle D landfill, then other options such as disposal in a Subtitle C landfill would be considered.

Because this option would result in contaminants remaining on-site at levels that do not allow for unlimited use and unrestricted exposure, institutional controls and five-year reviews would be required. Under this alternative, the types of institutional controls that would be implemented will include a combination of administrative and physical controls that are implemented to prevent disturbance of the landfill cap at the NCFL. Administrative controls will include deed restrictions that prohibit activities that disturb the NCFL cap. Physical controls that will be implemented include posting of signs and markers to identify these areas. The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment.

Migration Control Alternatives

The FS report evaluates in detail seven remedial options for addressing the contamination associated with migration control at the Ash Landfill. These options are:

- MC-1: The No-Action Alternative
- MC-2: Natural Attenuation and Degradation of Plume/Institutional Controls/Alternative Water Supply
- MC-3/3a: Air Sparging of Plume/In-Situ Treatment Using Zero Valence Iron
- MC-4: Interceptor Trenches/Tank Storage/Filtration/Liquid-Phase Activated Carbon/Discharge to Surface Water
- MC-5: Interceptor Trenches/Tank Storage/Filtration/Air Stripping/Discharge to Surface Water
- MC-6: Interceptor Trenches/Tank Storage/Filtration/UV Oxidation/Discharge to Surface Water
- MC-7: Interceptor Trenches/Tank Storage/Filtration/Two-Stage Biological Treatment/Discharge to Surface Water

Because all migration control alternatives result in contaminants remaining on-site at levels that do not allow for unlimited use and unrestricted exposure to groundwater for a period of time, institutional controls and five-year reviews would be required for each proposed migration control alternative. Relative to the migration control alternatives, institutional controls will be used to prevent future owners from ingesting site groundwater. The types of institutional controls that would be implemented will include a combination of administrative and physical controls. Examples of administrative controls that will be implemented at this site for groundwater are deed restrictions that prohibit the following:

- installation of any groundwater extraction wells, except for regulator-approved remediation purposes;
- human or ecological exposure to groundwater from the site(s), or use of this groundwater for any industrial, commercial, sanitary, human consumptive, or agricultural purposes; and
- unauthorized interference with monitoring systems or any additional treatment, monitoring, or barrier (i.e., capping) systems that may be subsequently constructed at the site.

Examples of physical controls that will be implemented at this site will include posting signs and warnings that identify and advise use restrictions. Five-year reviews of the migration control alternatives are intended to evaluate whether the response actions remain protective of public health and the environment.

Alternative MC-1: No-Action

The Superfund program requires that the "No-Action" alternative be considered as a baseline for comparison of other options. There are no costs associated with the No-Action option. The No-Action option means that no remedial activities would be undertaken at the site. No monitoring or security measures would be undertaken. Any attenuation of the threats posed by the site to human health and the environment would be the result of natural processes. Current security measures would be eliminated or modified depending upon if the property is transferred or leased. The future land use of the Ash Landfill Operable Unit has been determined by the LRA as conservation/recreational. Access to the Ash Landfill could be limited depending upon the requirement of the LRA. The Army concurs with the future use as conservation/recreational area.

Although current and intended land uses do not indicate unacceptable risks, groundwater quality standards have been exceeded. Detections of low levels of 1,2-DCE in an off-site well suggest that the plume may extend as far as 225 feet beyond the SEDA property. These detections have not been confirmed in recent quarterly monitoring samples. The off-site detections of 1,2-DCE have not been measured above the NYSDEC Class GA groundwater standard. Since these values are promulgated by the State of New York and the federal government, these groundwater quality requirements are considered to be ARARs and, therefore, additional measures may be required.

Alternative MC-2: Natural Attenuation with Institutional Controls and Alternative Water Supply

Capital Cost: $160,000
30-Year O & M Cost: $794,000
Total Present Worth Cost: $954,000
Construction Time: Construction would take 6 to 9 months

This option is different than the No-Action Alternative, MC-1, since MC-2 includes: installation of an alternate water supply to the off-site receptors, institutional controls and a monitoring program. Institutional controls would be included to prevent exposure to on-site groundwater due to ingestion. The groundwater monitoring program, started in 1987, would continue.

With the addition of the zero valence iron reactive barrier wall along the boundary of the Ash Landfill, off-site migration of the groundwater plume has been mitigated. Under this alternative, the remaining on-site groundwater plume would be removed via natural biological degradation and attenuation processes. Although the time for attaining cleanup goals would be extended compared to an active engineered treatment scenario, these processes would reduce the concentration of chlorinated ethenes in groundwater to the required levels. The existing barrier wall would prevent further off-site migration of the chlorinated ethenes if the natural processes cannot reduce the levels to the targeted goals.

Institutional controls for the Ash Landfill site would include a land use restriction to ensure that no drinking water wells would be constructed on-site. An alternate water supply, involving the installation of a water line, would supply drinking water to downgradient receptors. An existing water supply line is located near the former incinerator at the Ash Landfill Operable Unit. This water line is currently not in use but would be extended from SEDA, westerly, down West Smith Farm Road, to the farmhouse. Following base closure, the water supply system will be operated by the Varick Water District. This line would be installed with conventional trenching techniques, extending to below the frost line.

Option MC-2 considers natural processes sufficient to reduce the concentration levels in the plume. As an additional level of protection, institutional controls such as a deed restriction, groundwater monitoring and an alternate water supply would be implemented. NYSDEC groundwater standards for heavy metals and volatiles have been exceeded in on-site wells. Three semi volatile organic compounds exceeded Class GA groundwater standards in one well. This well and the soil and groundwater surrounding it was excavated, treated and replaced. No semi-volatiles were detected in the replacement well following the IRM. Metals in groundwater did not contribute significantly to the risk from groundwater ingestion. This option would monitor groundwater for volatile organics.

To prevent migration and protect off-site receptors, monitoring wells would be monitored along the SEDA boundary. Monitoring activities have included quarterly monitoring of over 30 wells, including private wells at the off-site Farm House and wells between the farmhouse and the SEDA boundary. The wells located between the farmhouse and the SEDA boundary have been used as sentry wells to provide an early detection warning for plume migration. No exceedances of the Class GA standards have been detected in the sentry wells. This program has been recently reduced to semi-annual monitoring program. Monitoring would continue under this option to ensure that natural attenuation was effective in reducing the groundwater concentrations on-site, and the reactive barrier wall was effective in preventing off-site migration. If the groundwater data from the monitoring program indicated a statistically significant rising trend in the concentrations of the targeted volatile organic compounds, then a contingency plan would be initiated. Depending upon the rate of degradation, groundwater modeling has suggested that the on-site concentrations could require nearly 75 to 150 years before Class GA groundwater standards are attained.

The contingency plan would include an evaluation of applicable treatment technologies. At this time, the preferred contingency treatment option for removing VOCs in groundwater is air sparging. The plan would involve installation of a line of air sparging points, placed perpendicular to the plume. The aquifer would be sparged until the concentrations of VOCs are reduced to acceptable levels.

The combination of a long-term monitoring strategy and an alternative water supply makes this an option for protecting human health. This option does not require any additional technologies to meet the remedial action objectives for the Ash Landfill site and, therefore, is easy to implement as it involves only monitoring and an alternative water supply. This is a low-cost option to meet these objectives. The long duration of treatment and the concern about operational issues associated with a dead end public water line makes this option least desirable.

Alternative MC-3: Air Sparging of Plume

Capital Cost: $668,000
30-Year O & M Cost: $1.79M
Present Worth Cost: $2.46M Construction time: Treatability testing would take 2 to 3 months. Construction and startup would take 2 to 3 months.

Option MC-3 uses an in-situ treatment process (air sparging) to achieve reduction in groundwater concentrations. In-situ air sparging is becoming a widely used technology for remediating sites contaminated by VOCs. An air sparging system would provide a cost-effective method for groundwater remediation. The advantages of in-situ air sparging are: (1) a small volume of water must be treated per unit of time, (2) groundwater is not removed from the aquifer, and (3) the process does not draw large volumes of uncontaminated water into the zone of contamination. The treatment uses the concept of air stripping to remove VOCs. Air sparging of groundwater can be conducted using interceptor trenches or air injection wells.
Combining an interceptor trench and air sparging of the plume of VOCs provides an effective in-situ remedial option. The trench allows for the efficient collection of water through which air could be injected, thus assuring sparging of the VOCs.

Air injection wells are often used instead of interceptor trenches. Wells are generally placed a few meters below the groundwater table to induce lateral spreading of air away from the injection well. As air moves through the groundwater zone, VOCs partition into the gas phase and are swept out of the groundwater zone to the vadose zone. At the same time, the oxygen in the sparged air partitions into the groundwater. The oxygen stimulates aerobic microbial degradation of contaminants. If required, sparging systems can be integrated with a vapor recovery system. Vertical wells that have been used for air sparging applications have a

very limited radius of effectiveness. Because of the low permeability of the soils, standard sparging of groundwater through air injection wells would not be as effective a treatment option as the trench. Site geology is considered to be the most important design parameter. The use of vertical wells is limited to coarser grained materials because coarse soils have lower air entry pressure requirements and provide a medium for more even air distribution. This allows better mass transfer efficiencies and more effective VOC removal. Air sparging using vertical wells would not be cost effective. Even if artificial fracturing of the soils was performed on these soils, the true effectiveness and extent of the fracturing, and thus the sparging, would not be assured. For this reason, Alternative MC-3 employs air sparging trenches.

Alternative MC-3 involves installation of two air sparging trenches and two vapor extraction trenches above the sparging trenches to collect the sparged volatiles. The system consists of a sparging trench in the saturated soil and a vapor recovery trench above the sparging trench. A trench for air sparging is constructed in cohesive soils by direct excavation and backfilling with coarse gravel. Greater efficiencies using in-situ trenched air sparging can be achieved by constructing a trench perpendicular to the groundwater flow direction, so that groundwater is forced to flow through the trench. The trenches can be installed to a depth of 30 feet. Two trenches, one located just down gradient of the former source areas and the other located at the toe of the existing plume, would be installed to the top of impermeable bedrock. Horizontal piping would be used in the trench to act as air injection and vapor extraction points. The air promotes volatilization of the organic constituents in the groundwater, and also promotes aerobic biodegradation. The volatilized organics are captured by the vapor recovery wells, in much the same manner as a soil vapor extraction system. The air stream would be passed through vapor-phase carbon or some other vapor treatment technology to meet the requirements of air quality standards. Periodic groundwater monitoring would be used to assess the progress of the treatment. This option has a treatment time of up to 30 years.

Alternative MC-3a: In-situSitu Treatment using Zero Valence Iron

Capital Cost: $2.05 M
15-Year Present Worth O & M Cost: $656,000
Total 15 Year Present Worth Cost: $2.71 M
30 Year Present Worth O & M Cost: $813,000
Total 30 Year Present Worth Cost: $2.86 M
Construction time: Construction and startup would take 4 to 6 months.

Alternative MC-3a involves a modification of MC-3. Alternative MC-3a involves destruction of chlorinated organic compounds, in situ, via a chemical reaction with a reactive zero valence iron wall. Reactive iron filings have been demonstrated to be effective in treating chlorinated solvents. The reaction chemistry involves the simultaneous oxidative corrosion of the reactive iron metal by both water and reductive dechlorination of the chlorinated compounds. Alternative MC-3a has advantages over using air to remove volatile chlorinated organics from groundwater because there is no need to recover and remove organics from the sparged air. Alternative MC-3a involves using zero valence iron, placed in direct contact with dissolved chlorinated organics in the groundwater. Alternative MC-3a will continuously treat groundwater, regardless of the thickness of the aquifer, and will require minimal operation and maintenance costs.

The feasibility study considered two trenches, described in Alternative MC-3. The trenches, arranged perpendicular to groundwater flow, were considered to function in a funnel and gate configuration. This configuration involved installing an impermeable cut-off wall (funnel), along the trench wall, that would be used to divert groundwater flow to an in situ reaction zone (gate). Reactive iron would be placed into the gate. Chlorinated organics would be destroyed as the dissolved organics passed through the reactive zone (gate). Under the original configuration, four gates would be located in each wall. Granular iron mixed with sand would be placed within the gate. The primary factors affecting the capital costs for this system were the plume dimension, the upgradient VOC concentrations and the groundwater velocity. The thickness of the reactive zone is critical to ensure sufficient treatment. The thickness of the reactive zone, and therefore the residence treatment time, can be determined by knowing the groundwater velocity and the degradation rates that are obtained from either modeling or bench-scale testing. Residence times can vary from 5-50 hours for chlorinated solvents such as trichloroethene, vinyl chloride and cis1,2-dichloroethene

Another variation of this configuration is as a continuous reactive barrier wall. In this configuration, the trench is backfilled with a mixture of reactive iron and sand. As groundwater flows through the trench, the zero valence iron chemically destroys chlorinated organics. This configuration produces less hydraulic mounding of groundwater than the funnel and gate configuration because there is no restriction of groundwater flow. At the Ash Landfill Operable Unit, groundwater mounding was identified as a potential problem that could lead to breakout of groundwater at the ground surface.

The feasibility study assumed that Alternative MC-3a would involve two trenches, configured as a funnel and gate. The feasibility study assumed that the time for treatment of the plume was 10 years.

Following the feasibility study, Alternative MC-3a was identified as a promising alternative but was considered innovative and unproven. However, since treatment was in-situ, did not require operation of an aboveground treatment plant, would operate continuously and

very limited radius of effectiveness. Because of the low permeability of the soils, standard sparging of groundwater through air injection wells would not be as effective a treatment option as the trench. Site geology is considered to be the most important design parameter. The use of vertical wells is limited to coarser grained materials because coarse soils have lower air entry pressure requirements and provide a medium for more even air distribution. This allows better mass transfer efficiencies and more effective VOC removal. Air sparging using vertical wells would not be cost effective. Even if artificial fracturing of the soils was performed on these soils, the true effectiveness and extent of the fracturing, and thus the sparging, would not be assured. For this reason, Alternative MC-3 employs air sparging trenches.

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Alternative MC-3a: In-situSitu Treatment using Zero Valence Iron

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15-Year Present Worth O & M Cost: $656,000
Total 15 Year Present Worth Cost: $2.71 M
30 Year Present Worth O & M Cost: $813,000
Total 30 Year Present Worth Cost: $2.86 M
Construction time: Construction and startup would take 4 to 6 months.

Alternative MC-3a involves a modification of MC-3. Alternative MC-3a involves destruction of chlorinated organic compounds, in situ, via a chemical reaction with a reactive zero valence iron wall. Reactive iron filings have been demonstrated to be effective in treating chlorinated solvents. The reaction chemistry involves the simultaneous oxidative corrosion of the reactive iron metal by both water and reductive dechlorination of the chlorinated compounds. Alternative MC-3a has advantages over using air to remove volatile chlorinated organics from groundwater because there is no need to recover and remove organics from the sparged air. Alternative MC-3a involves using zero valence iron, placed in direct contact with dissolved chlorinated organics in the groundwater. Alternative MC-3a will continuously treat groundwater, regardless of the thickness of the aquifer, and will require minimal operation and maintenance costs.

The feasibility study considered two trenches, described in Alternative MC-3. The trenches, arranged perpendicular to groundwater flow, were considered to function in a funnel and gate configuration. This configuration involved installing an impermeable cut-off wall (funnel), along the trench wall, that would be used to divert groundwater flow to an in situ reaction zone (gate). Reactive iron would be placed into the gate. Chlorinated organics would be destroyed as the dissolved organics passed through the reactive zone (gate). Under the original configuration, four gates would be located in each wall. Granular iron mixed with sand would be placed within the gate. The primary factors affecting the capital costs for this system were the plume dimension, the upgradient VOC concentrations and the groundwater velocity. The thickness of the reactive zone is critical to ensure sufficient treatment. The thickness of the reactive zone, and therefore the residence treatment time, can be determined by knowing the groundwater velocity and the degradation rates that are obtained from either modeling or bench-scale testing. Residence times can vary from 5-50 hours for chlorinated solvents such as trichloroethene, vinyl chloride and cis1,2-dichloroethene

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The feasibility study assumed that Alternative MC-3a would involve two trenches, configured as a funnel and gate. The feasibility study assumed that the time for treatment of the plume was 10 years.

Following the feasibility study, Alternative MC-3a was identified as a promising alternative but was considered innovative and unproven. However, since treatment was in-situ, did not require operation of an aboveground treatment plant, would operate continuously and

required minimal maintenance, a demonstration study was authorized to determine the effectiveness of this emerging technology and obtain additional constructability and costing data.

The Army selected to pursue a zero valence iron demonstration study for a continuous permeable trench, instead of a funnel and gate configuration due to the concern over groundwater mounding. Using VOC concentrations and groundwater velocities obtained from the RI and degradation rates obtained from vendor modeling, the required residence time that the groundwater must be in contact with the iron was determined. The required thickness of the reactive zone was determined to be 14 inches. A residence time of 1.25 day was estimated to be sufficient for destruction of the chlorinated solvents such as TCE, vinyl chloride, and cis-1,2-dichloroethene.

The demonstration study has been ongoing since December 1998 when a 650-foot long permeable reactive wall was installed near the depot fenceline at the downgradient portion of the dissolved chlorinated organic plume. The trench bottom was placed into the competent bedrock to avoid short-circuiting of groundwater. The trench width was 14 inches and was backfilled with a 50-50 mixture of zero valence iron and imported clean sand. The final depth of the trench was between 7 to 12 feet below ground surface. In addition, a total of eleven monitoring wells were installed upgradient, in the trench and downgradient of the trench and at both ends of the trench to monitor the effectiveness of the technology. Groundwater monitoring of the reactive barrier wall has been ongoing for one year. Although some breakthrough of 1,2-DCE was observed, TCE was consistently degraded by the wall below the detection limit of 1 ug/l confirming the effectiveness of the treatment technology. The design of the three walls for Alternative MC-3a will be developed using a more conservative approach than the design of the existing reactive wall. The conservative approach is based on the complex hydraulics and inconsistent degradation half-lives encountered during the treatability study with zero valent iron continuous reactive wall.

During the demonstration study, groundwater modeling was also performed to further refine the estimated treatment time for the aquifer to reach the Class GA groundwater standards and Federal MCL target concentrations. With only one reactive wall in-place at the boundary of the site, the length of treatment time was estimated to be as long as 60 years. The 60-year compliance time was based upon the slow process of diffusion of chlorinated ethenes from the soil as the limiting factor. The goal for treatment was to obtain compliance in a quicker timeframe, approximately 10 to 15 years. The length of treatment time is dependent upon the number of reactive barrier walls. In order to achieve compliance in 15 years, it was estimated that two additional trenches would be required, located upgradient of the existing boundary wall. (**Figure 6**) A third continuous reactive wall (Compliance Wall on **Figure 6**) may be required to control movement of chlorinated ethenes past the existing boundary trench, that was installed during the demonstration study.

Alternative MC-3a in this PRAP is the same as Alternative 2 developed in the Draft Feasibility Memorandum for Groundwater Remediation Alternatives using Zero Valence Iron Continuous Reactive Wall at the Ash Landfill (Parsons, August 2000). This report presents a conceptual design based on the results and conclusions of the demonstration study for the reactive iron wall and the groundwater and transport modeling of different treatment wall configurations. Alternative 2 in this report included the excavation and filling of three trenches with 100% iron filings. **Figure 6** depicts the location of the existing reactive wall and the additional three proposed reactive walls: One wall would be installed about 300 ft east of the boundary wall (Middle Wall), the second one would be installed close to the former source area of the plume (Source Wall), and the third one would be installed downgradient from the existing wall, on the furthest point of the Army property, past the fenceline (Compliance Wall).

The costs for Alternative 3a in this PRAP were developed in the Feasibility Memorandum for Groundwater Remediation Alternatives using Zero Valence Iron Continuous Reactive Wall at the Ash Landfill (Parsons, August 2000). These costs were updated based on information collected after completion of the FS. The costs in the Feasibility Memorandum were developed assuming compliance in 15 years as indicated by the groundwater modeling study. However, for comparison purposes, the O&M cost was expanded to 30 years, so that the O&M period for all alternatives in this PRAP is 30 years. The 15-year cost developed in the Feasibility Memorandum and the 30-year comparative cost are presented above.

Alternative MC-4: Interceptor Trenches/Tank Storage/Filtration/Liquid-Phase Activated Carbon /Discharge to Surface Water

MC-4 was not considered further in the detailed analysis because activated carbon is not considered to be effective for vinyl chloride treatment.

Alternative MC-5: Interceptor Trenches/Tank Storage/Filtration/Air Stripping/Discharge to Surface Water

Capital Cost: $543,000
30-Year Present Worth O & M Cost: $1.2 million
Total Present Worth Cost: $1.8 million
Construction Time: Treatability testing would take 2 to 3 months. Construction and startup would take 2 to 4 months.

The MC-5 alternative consists of diverting the impacted groundwater from interceptor trenches to an aboveground treatment system employing an air stripping unit. This option is easily implementable and proven to be effective for removing dissolved VOCs in water. Option MC-5 uses what is commonly referred to as a "pump-and-treat" method of decontaminating groundwater.

One interceptor trench would be located as close as possible to the fence which runs along the western boundary of SEDA. This trench would prevent off-site migration of the plume. The other trench would be located in the middle of the plume, and constructed in a "V" shape, with a collection sump in the bottom of the "V." Each trench would be approximately 1,000 feet long by 3 feet wide by 8 feet deep. The trenches would extend from the ground surface to the competent shale bedrock. These trenches are ideal for conditions at this site since the groundwater movement is slow, i.e., less than 20 feet per year, and the aquifer thickness is small, i.e. between 2 to 6 feet depending upon the time of year.

The collection trenches would discharge to a collection sump and be pumped to an aboveground on-site treatment facility. At the treatment facility, the collected water would accumulate in a tank that functions as a flow equalizer. Flow fluctuations are expected over the year due to varying aquifer thickness. This tank would be used as a buffer to allow the subsequent treatment unit operations to operate continuously and uniformly.

Filtration would be provided to remove any collected sediment and precipitated metals. It is common for dissolved metals, especially iron, to precipitate as insoluble oxides as the dissolved oxygen content of the collected groundwater increases due to exposure with ambient air. Clogging and coating of unit processes reduces treatment effectiveness and therefore, sediment or precipitated metal oxides should be controlled via filtration.

For this option, air stripping is used as the treatment process that would reduce the concentration of dissolved chlorinated organics to the remedial action objectives, which are to meet NYSDEC Class GA groundwater quality standards and Federal MCLs. Air stripping is a common groundwater treatment process, which is effective in treating TCE, 1,2-DCE and Vinyl Chloride. Groundwater is passed through a stripping tower, where it is contacted by a countercurrent air stream. Trays or column packing are used to increase the surface area of the air/water contact area to improve the efficiencies of mass transfer operations. The organic constituents are transferred from the water to the air. Depending on the air emissions requirements, the air phase may be treated or directly discharged to the atmosphere. Air emission control technologies include: vapor- phase activated carbon, thermal oxidation or catalytic oxidation. Vapor-phase carbon can be used to treat the off-gas in order to minimize air emissions. Vapor-phase carbon is efficient in capturing TCE and heavier organics but is less efficient at capturing 1,2-DCE, and lighter organics. Carbon is inefficient in capturing vinyl chloride.

Thermal oxidation is another off-gas control technology, which can be used to minimize air emissions. A thermal oxidizer works by combusting the off-gas. Thermal oxidizers are effective in treating all of the chlorinated compounds present in the Ash Landfill groundwater.

Catalytic oxidization is another off-gas treatment technology that could be considered for off-gas control. Catalytic oxidation is similar to thermal oxidation in that the organic compounds are thermally destroyed. An advantage of catalytic oxidizers over thermal oxidizers is that catalytic oxidizers operate at lower temperatures and therefore have lower operating costs. Catalytic oxidizers are effective in treating all the organics present in the site groundwater. Catalytic oxidizers may have higher O&M costs than thermal oxidizers, though the day to day operational costs are lower.

Following treatment, the effluent would be discharged to the nearby drainage ditches that exist along the sides of the patrol roads. Eventually the water drains to Kendaia Creek. In this case, the effluent would need to meet the requirements for NYSDEC Class C surface water which is the classification of Kendaia Creek. This option has a estimated treatment time of 30 years.

Alternative MC-6: Interceptor Trenches/Tank Storage/Filtration/ Hardness Removal/UV Oxidation/Liquid-Phase Carbon/Drainage Ditch Surface Water Discharge

Capital Cost: $556,000
30-Year Present Worth O & M Cost: $1.3 Million
Total Present Worth Cost: $1.9 Million
Construction Time: Treatability testing would take 2 to 3 months. Construction and startup should take 6 to 9 months.

Similar to option MC-5, this option involves collecting groundwater using interceptor trenches and pumping the collected groundwater to an on-site treatment facility. The collected groundwater receives pretreatment including flow equalization from temporary storage and filtration to remove suspended sediment and any precipitated metal oxides.

Following the pretreatment of groundwater, this option uses liquid phase chemical oxidation from hydroxyl radicals, produced from the interactions of ultraviolet (UV) radiation and hydrogen peroxide, H_2O_2. Ozone may be added if treatment effectiveness is lower than required. This treatment process is proven to be effective in achieving greater than 99 percent destruction efficiency. Generally, using metering pumps, the contaminated groundwater is mixed with peroxide, and enters the UV reaction chamber. If required, ozone is added to the reaction chamber, and hydroxyl radicals are formed. The formation of the hydroxyl radicals is catalyzed by the UV light. The hydroxyl radicals react rapidly with the chlorinated organics, generating carbon dioxide, chloride and water. If ozone is added, any ozone not reacted is decomposed in an ozone treatment unit prior to discharge.

The effluent from the UV treatment process is then discharged to the drainage ditches that exist along the edge of patrol roads. This surface water eventually will flow to Kendaia Creek. This surface water discharge would need to meet the NYSDEC Class C stream classification quality standards for Kendaia Creek. This option has an estimated treatment time of 30 years.

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely, overall protection of human health and the environment, compliance with applicable or relevant and appropriate requirements (ARAR)s, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume, short-term effectiveness, implementability, cost, and state and community acceptance. **Table 8** provides a summary of each source control alternative and how each alternative complies with these requirements. **Table 9** provides a similar summary for each migration control alternative and how each alternative complies with these requirements.

A comparative analysis of these alternatives based upon these evaluation criteria is presented below.

Overall Protection of Human Health and the Environment

Alternative SC-1, the no-action alternative for soil, is protective of human health from exposure to soil for on-site residents, hunters and construction workers. The non-carcinogenic risks from exposure to soil, following the IRM are 0.01, 0.0075, 0.064, respectively, which are below the EPA target level of 1. The carcinogenic risks from exposure to soil, following the IRM, have been calculated as $1x10^{-5}$, $9.4x10^{-6}$, $3.7x10^{-6}$, which are within the EPA target level of $1x10^{-4}$ and $1x10^{-6}$.

In addition to risk calculation, NYSDEC also considers exceedances of TAGM guideline values as a factor in determining protectiveness for human health. Instances remain, following the IRM, where soils were found to be in exceedance of the NYSDEC TAGM guideline limits for PAH compounds and metals. Overall, these exceedances do not cause the various site risks to exceed the EPA target levels.

An ecological survey, performed during the RI, reported no observable ecological damage. Concentrations of selected metals in soil samples collected from the Ash Landfill, the debris piles and the NCFL detected levels above guideline values considered to be protective for ecological receptors from long-term exposure. Therefore, ecological receptors were considered to be at an increased risk and not protected.

Alternative MC-1, the no-action alternative, would not be protective of human health if groundwater were ingested. The non-carcinogenic risk due to ingestion of groundwater, calculated during the RI, was 3.2, which is above the EPA target value of 1. The carcinogenic risk from ingestion of groundwater, calculated during the RI is $1.4x10^{-3}$, which is also above the EPA target range of $1x10^{-4}$ and $1x10^{-6}$. The updated risk calculation from ingestion of groundwater has not been performed following the RI or the IRM but the risk would be expected to be less, since the concentrations in groundwater have decreased, in some instances almost 100-fold, as a result of the IRM.

Ingestion of groundwater would occur if residential use was permitted. However, residential use of the Ash Landfill Operable Unit is not the current or planned intended future use. The groundwater plume has migrated to beyond the SEDA boundary. At monitoring well MW-56, which is located 225 feet beyond the SEDA boundary, 1,2-DCE has been detected as high as 2 ug/L. The NYSDEC GA and Federal MCL for 1,2-DCE is 5 ug/L. This compound has not been detected in the last sampling rounds in October 1999 and January 2000.

As a means to control further migration, evaluate an innovative technology and expedite site remediation, the Army conducted an in-situ demonstration study of the zero valence iron technology. Zero valence iron has been shown to be effective in chemically destroying chlorinated ethene compounds through a process known as reductive dechlorination. In December 1998, the Army installed a 650-foot long permeable reactive barrier trench at the boundary of the depot, perpendicular to the flow of the groundwater plume and spanning the entire width of the plume. The trench extended from one foot below the ground surface to the top of the competent bedrock and was backfilled with a 50/50 mixture of clean sand and zero-valence iron. Eleven monitoring wells, three clusters of three wells, were installed immediately upgradient, within and immediately downgradient of the reactive wall with one well being added at each end of the trench. Groundwater monitoring of the trench performance went on for approximately one year. The results of the study indicated that the trench was successful in reducing the concentrations of chlorinated ethenes to non-detectable or low levels. However, there were some field evidences (such as complex hydraulics and inconsistent degradation half-life) that had to be considered in the selection of the final design parameters. This trench is associated with Alternative MC-3a.

Upgradient of the reactive barrier trench, there would be little immediate reduction in risk or in the toxicity, mobility, or volume of the contaminants. The risk assessment indicated that the majority of the site risk is due to ingestion of groundwater for on-site residents. The primary source of the groundwater impacts has been eliminated via thermal treatment during the IRM. Natural attenuation would reduce the contaminant concentrations to federal and state drinking water standards, however, this would take many years. The volume of groundwater contaminated would also not increase appreciably with time, due to the zero valence iron trenches that would prevent continued migration of contaminants. Land use restrictions would prevent on-site ingestion of groundwater. Human exposure could occur due to off-site migration of contaminated groundwater that was present downgradient beyond the trench. Groundwater modeling has indicated that the concentration of groundwater would be below NYSDEC Class GA standards and federal MCLs.

Alternative SC-2 was ranked high for long-term protectiveness, since no waste would remain on-site. However, the short-term protectiveness of this alternative was ranked the lowest, since the increased number of trucks transporting the waste would increase the risks associated with collisions, injury and dust. MC-2, the alternative water supply, affords protection of human health since an alternative potable water supply would ensure clean water to the off-site residents. Since the existing reactive barrier wall will mitigate continued off-site migration, only the groundwater beyond the reactive wall would potentially affect the downgradient receptor. Therefore, some contaminated water will likely continue to migrate into other portions of the aquifer system and increase the volume of contaminated groundwater. In Alternative MC-2, there would be minimal on-site reduction in risk and in the toxicity, mobility, or volume of the contaminants. Natural attenuation to reduce the contaminant concentrations to federal and state drinking water standards would take many years.

Alternative SC-3 was ranked moderately protective for long and short-term protectiveness. Since this alternative involves excavation, consolidation at the NCFL and capping the NCFL, truck traffic will be a concern even though traffic will be reduced compared to SC-2. Truck traffic will be a required as clean backfill and capping material will have to be transported on-site. Dust will also be a short-term concern during construction. Long-term, the risk following consolidation of soils contaminated with metals and PAHs at the NCFL would require that the cap be maintained to prevent exposure to humans and ecological receptors. This alternative is considered to be protective since exposure to metals and PAH compounds would require excavation into the landfill, which is considered unlikely.

MC-3 and MC-3a were ranked high for protectiveness, since treatment would prevent off-site migration and additional trenches would reduce on-site concentrations. Active pumping alternatives are limited in effectiveness since the groundwater fluctuates dramatically during the year, meaning that at certain times of the year the pumping system will likely be dry or minimal. Migration of contaminated groundwater beyond the trenches would be a concern for protectiveness. Modeling has shown that the concentrations will be reduced to levels that are protective by the time the groundwater reached the downgradient supply well. Monitoring will be performed to ensure that exposure is not above state and federal standards for drinking water.

Overall, Alternative SC-4, soil washing, ranks the highest for long- term protection of human health and the environment by actively treating soil on-site, thereby decreasing risks due to off-site transportation. Contamination would be concentrated by washing and treated for eventual disposal off-site. The amount of off-site disposal is the smallest for this alternative and therefore would require the least amount of trucks for transport.

Alternatives MC-5 and MC-6 were ranked equally high as MC-3 and MC-3a for protectiveness because all these alternatives remove VOC contamination from the groundwater. For Migration Control Alternatives, protectiveness is a function of capturing and preventing migration of groundwater to off-site receptors. Each of these alternatives collects groundwater through trenches located at the boundary of the site and at locations within the site; therefore, all are ranked equally high. MC-4 and MC-5 involve active removal but will not be effective during dry periods of the year. Further, these alternatives would be affected by fouling of treatment systems due to iron and hardness. If the fouling were severe then treatment would not be effective and the alternative would not be protective. MC-4 was not considered further in the detailed analysis because carbon is not considered to be effective for vinyl chloride treatment, and sufficient treatment can be expected for volatiles via MC-5 by air stripping. MC-7 was not considered in the detailed analysis of alternatives, since it was screened out due to concern over the reliability of biological treatment with intermittent flow.

Alternative SC-5 was ranked high for protectiveness, but less than SC-4, since contaminated material will remain on-site. Since this alternative would not involve minimal excavation and off-site disposal for only the debris piles. No excavation of the landfill would be required. Clean cover material would be imported to the site.

Compliance with ARARs

Federal and state maximum contaminant levels (MCLs) are chemical-specific ARARs. Federal MCLs were selected as the remedial requirements for groundwater remediation except when more stringent NYSDEC GA standards existed. Compliance with ARARs will be considered for migration control alternatives only since the IRM has treated and eliminated the source of VOCs in groundwater. There are no soil standards. NYSDEC TAGM values are guidelines, not standards. Alternatives MC-1 and MC-2 are not expected to meet due to ingestion of groundwater for on-site residents. The primary source of the groundwater impacts has been eliminated via thermal treatment during the IRM. Natural attenuation would reduce the contaminant concentrations to federal and state drinking water standards, however, this would take many years. The volume of groundwater contaminated would also not increase appreciably with time, due to the zero valence iron trenches that would prevent continued migration of contaminants. Land use restrictions would prevent on-site ingestion of groundwater. Human exposure could occur due to off-site migration of contaminated groundwater that was present downgradient beyond the trench. Groundwater modeling has indicated that the concentration of groundwater would be below NYSDEC Class GA standards and federal MCLs.

Alternative SC-2 was ranked high for long-term protectiveness, since no waste would remain on-site. However, the short-term protectiveness of this alternative was ranked the lowest, since the increased number of trucks transporting the waste would increase the risks associated with collisions, injury and dust. MC-2, the alternative water supply, affords protection of human health since an alternative potable water supply would ensure clean water to the off-site residents. Since the existing reactive barrier wall will mitigate continued off-site migration, only the groundwater beyond the reactive wall would potentially affect the downgradient receptor. Therefore, some contaminated water will likely continue to migrate into other portions of the aquifer system and increase the volume of contaminated groundwater. In Alternative MC-2, there would be minimal on-site reduction in risk and in the toxicity, mobility, or volume of the contaminants. Natural attenuation to reduce the contaminant concentrations to federal and state drinking water standards would take many years.

Alternative SC-3 was ranked moderately protective for long and short-term protectiveness. Since this alternative involves excavation, consolidation at the NCFL and capping the NCFL, truck traffic will be a concern even though traffic will be reduced compared to SC-2. Truck traffic will be a required as clean backfill and capping material will have to be transported on-site. Dust will also be a short-term concern during construction. Long-term, the risk following consolidation of soils contaminated with metals and PAHs at the NCFL would require that the cap be maintained to prevent exposure to humans and ecological receptors. This alternative is considered to be protective since exposure to metals and PAH compounds would require excavation into the landfill, which is considered unlikely.

MC-3 and MC-3a were ranked high for protectiveness, since treatment would prevent off-site migration and additional trenches would reduce on-site concentrations. Active pumping alternatives are limited in effectiveness since the groundwater fluctuates dramatically during the year, meaning that at certain times of the year the pumping system will likely be dry or minimal. Migration of contaminated groundwater beyond the trenches would be a concern for protectiveness. Modeling has shown that the concentrations will be reduced to levels that are protective by the time the groundwater reached the downgradient supply well. Monitoring will be performed to ensure that exposure is not above state and federal standards for drinking water.

Overall, Alternative SC-4, soil washing, ranks the highest for long- term protection of human health and the environment by actively treating soil on-site, thereby decreasing risks due to off-site transportation. Contamination would be concentrated by washing and treated for eventual disposal off-site. The amount of off-site disposal is the smallest for this alternative and therefore would require the least amount of trucks for transport.

Alternatives MC-5 and MC-6 were ranked equally high as MC-3 and MC-3a for protectiveness because all these alternatives remove VOC contamination from the groundwater. For Migration Control Alternatives, protectiveness is a function of capturing and preventing migration of groundwater to off-site receptors. Each of these alternatives collects groundwater through trenches located at the boundary of the site and at locations within the site; therefore, all are ranked equally high. MC-4 and MC-5 involve active removal but will not be effective during dry periods of the year. Further, these alternatives would be affected by fouling of treatment systems due to iron and hardness. If the fouling were severe then treatment would not be effective and the alternative would not be protective. MC-4 was not considered further in the detailed analysis because carbon is not considered to be effective for vinyl chloride treatment, and sufficient treatment can be expected for volatiles via MC-5 by air stripping. MC-7 was not considered in the detailed analysis of alternatives, since it was screened out due to concern over the reliability of biological treatment with intermittent flow.

Alternative SC-5 was ranked high for protectiveness, but less than SC-4, since contaminated material will remain on-site. Since this alternative would not involve minimal excavation and off-site disposal for only the debris piles. No excavation of the landfill would be required. Clean cover material would be imported to the site.

Compliance with ARARs

Federal and state maximum contaminant levels (MCLs) are chemical-specific ARARs. Federal MCLs were selected as the remedial requirements for groundwater remediation except when more stringent NYSDEC GA standards existed. Compliance with ARARs will be considered for migration control alternatives only since the IRM has treated and eliminated the source of VOCs in groundwater. There are no soil standards. NYSDEC TAGM values are guidelines, not standards. Alternatives MC-1 and MC-2 are not expected to meet chemical-specific ARARs in groundwater as neither involves active, continuous remediation methods. Natural degradation and flushing of groundwater may eventually result in achievement of ARARs. The time frame has been estimated as over 100 years. The active extraction system required under Alternatives MC-5 and 6 would provide the best possible containment system for the groundwater contaminant plume. The groundwater extraction scheme in Alternatives MC-5 and 6 would create a capture zone slightly more extensive than MC-3 or MC-3a. It would allow less contamination to migrate off-site and extract a greater volume of contamination since active pumping would be used. Additionally, removal of contaminants to achieve the MCLs in such situations is also difficult due to long-term diffusion of contamination from the glacial till. Hydrologic modeling and aquifer tests performed during the RI indicate that properly placed extraction trenches would create a capture zone but these models overestimate the time to achieve cleanup as all models cannot account for diffusional aquifer matrix effects accurately. The time frame for Alternatives MC-3, MC-5 and MC-6 to achieve compliance with chemical-specific ARARs in the glacial till aquifer are likely to be between 30 to 50 years. Alternative MC-3a is likely to stimulate natural biodegradation, since the chemical reactions in the iron wall release hydrogen, a substance that is used up in microbial dechlorination. This will decrease contaminant levels, which can be expected to significantly reduce the time to achieve ARAR compliance compared to Alternatives MC-3, MC-5 and MC-6.

Alternatives MC-5 and MC-6 include surface water discharge of treated groundwater. Discharge requirements are generally the Federal and State Ambient Water Quality Criteria. The discharge from the groundwater treatment system will be designed to meet the FAWQC and the anti-degradation limits.

Alternatives MC-5 and MC-6 are expected to achieve other ARARs including the Resource Conservation and Recovery Act (RCRA) requirements for treatment facilities, the Department of Transportation (DOT) requirements for off.site transportation of any residual materials, and the New York Solid and Hazardous Waste Regulations and the Occupational Safety and Health Act (OSHA). In addition, the operation of the treatment system in Alternative 4 will comply with federal and state air standards.

Long- Term Effectiveness and Permanence

Alternatives SC-1, MC-1 and MC-2 would not remove or contain contaminants in the groundwater in a continuous or active manner, other than what would be removed by the reactive barrier wall that is currently in-place and operating. Contaminants would continue to migrate and increase the volume of contaminated groundwater. The no-action and alternative water supply alternatives are not considered to be effective over the long term because contaminated groundwater, other than that captured via the reactive barrier wall, remains on-site and some migration off of the property will occur. This condition currently does not affect the drinking water of off-site residents and groundwater modeling has indicated that the concentrations of contaminants will be below drinking water standards by the time the groundwater reaches these wells. These alternatives will require long-term monitoring and sampling.

Alternatives MC-3, MC-5 and MC-6 are all expected to be equal in providing long-term permanence, since each alternative will operate until the desired concentration levels are achieved. The limiting factor in achieving this goal is the rate at which contaminants can be flushed out of the soil matrix. Since the aquifer matrix is glacial till and is high in clay content, diffusion is likely to play an important role in releasing contamination from the aquifer. This means the time for cleanup is long, estimated to be approximately 45 years. MC 3a is expected to take 15 years.

Alternative SC-2 is ranked high for long-term effectiveness and permanence since all materials will be excavated and disposed of in an off-site landfill. Once in the landfill, the contaminated materials are permanently entombed. However, since this alternative does not permanently fix the contaminants and involves such large volume of soil, these wastes may not be as permanently entombed as Alternative SC-4. Therefore, although SC-2 is ranked high for permanence, Alternative SC-4 is ranked the highest for long-term effectiveness and permanence. Under this alternative, contaminants are consolidated, by soil washing, and permanently fixed by stabilization/solidification. Soil washing and stabilization/solidification technology are considered reliable. Following treatment, the stabilized waste will be disposed of in an off-site landfill. The remaining materials left on-site will be free of metals and PAHs. Therefore, this alternative is considered the best from the standpoint of permanence. Although some metals and PAH-impacted soil will remain at the site under Alternatives SC-3 and SC-5, these alternatives are expected to be generally effective in providing long-term permanence. Waste materials would be isolated within either the NCFL or where the materials currently are and covered. Providing the covers remain in-place, the waste materials will not pose a threat due to direct contact and would therefore be permanent. Since leaching is not currently occurring, both alternatives are equally permanent for long-term leaching, since the landfills have been in-place for decades without causing a concern due to leaching. Perhaps, Alternative SC-5 is somewhat more attractive, since all other alternatives, except the no-action alternative, include excavation, which could cause materials, such as metals, to become more leachable, either through interaction with other waste materials or from an increase in the surface area of the waste, following excavation and sorting.

Reduction in Toxicity. Mobility, or Volume

Alternatives MC-1, MC-2 and SC-1 would not provide for any active, continuous mechanisms for the containment, removal, treatment, or disposal of contaminated groundwater, other than what would be accomplished by the reactive barrier wall. Alternatives SC-2, SC-3, SC-5 would not reduce the toxicity, mobility or volume, as there is no treatment performed. For these alternatives, materials are either land filled or covered in-place. SC-2 would include some reduction in mobility following whatever landfill the waste was disposed in. However, there could also be an increase if materials interact with leachate produced as other waste products at the landfill decompose. Presumably, the landfill would have provisions to accumulate and handle any leachate produced; nonetheless, the possibility of migration from a large landfill that collects large amounts of waste materials has a remote possibility that a leak could occur. SC-4 would provide the greatest reduction in toxicity, mobility or volume by providing the most amount of treatment. This alternative involves reduction in volume by soil washing followed by fixation. Chemical fixation, i.e. stabilization/solidification, will decrease the toxicity by making the materials less available for biouptake and reduce the mobility through the chemical bonding that would occur during fixation. Eventually, the stabilized waste would be disposed of in an off-site landfill but the amount would be less than what would have been necessary if soil washing had not been performed. SC-5 involves the least amount of off-site land filling and therefore is the alternative that meets the goal of the NCP to minimize the amount of material that is disposed of in an off-site landfill.

Alternatives MC-3, MC-3a, MC-4 and MC-5 rely on either active pumping or passive treatment of groundwater and are dependent upon yields from the till aquifer. Therefore, these alternatives would all result in reduction in mobility and volume. However, since MC-3a and MC-6 chemically destroy the contaminant, there is a decrease in toxicity.

Short-Term Effectiveness

Providing groundwater at the site is not used for drinking water, all migration control alternatives provide limited effectiveness in the short-term. Installation of interceptor trenches or barrier trenches can be accomplished without large excavations, thereby effectively achieving contaminant reduction in the short term. However, alternatives, such as MC-4 and MC-5 that involve construction of a treatment facility, will require longer times for construction. The system will not be effective in recovering groundwater during the periods of the year when the water table is low. MC-3a is considered to be the best for short-term effectiveness, since it will require the least amount of time to be implemented and be effective and will operate during the entire year.

The source control alternatives that require excavation are also effective in the short-term. However, large excavations such as that required under SC-2, SC-3 and SC-4 will take extended times. Alternative SC-5 can be implemented quickly and will require the shortest time to be effective.

Implementability

Excluding the no-action alternatives, MC-1 and SC-1, which will not require any effort to implement and therefore are the easiest to implement, SC-5 is ranked the highest for implementability of the source control alternatives. This is because the excavation portion of this alternative is minimal and construction of the cover over the Ash Landfill and the NCFL will involve a small amount of material to import. The cover will not be an impermeable RCRA landfill cover but will be a vegetative cover, which is easy to implement. Alternative SC-4, the soil washing alternative, was considered to be the most difficult to implement and was therefore ranked the lowest for implementability. This is because soil washing requires specialized equipment and personnel who have expertise in the technology. Although such equipment and experts are available, they are less available as opposed to local excavation contractors that can easily implement alternatives such as SC-2 and SC-3. While alternatives that involve excavation may be easy to implement from a technical sense, large excavations pose their own complexities. Complexities of the excavation alternatives include: verification and conformational testing, soil stockpile management, excavation pit dewatering, available landfill space, weather factors, dust and noise abatement, logistical truck traffic control and availability of trucks to transport a large amount of materials. Further, due to the requirements of the RCRA Land Disposal Restriction (LDR)s, conformational testing could require that excavated soil be treated to stabilize the soil prior to disposal. This would add an additional aspect of the work that would lead to difficulty in implementation.

Alternatives MC-2, MC-3 and MC-3a would be easiest to implement. Minimal effort would be required to install an alternative water line and perform the monitoring. Several of the wells to be used for monitoring already exist. Alternative MC-3a is also easily implemented, requiring installation of additional reactive barrier walls. The 650-foot long existing reactive wall at the site was installed in one week. This alternative could be implemented immediately and would be effective in reducing off-site migration and the on-site concentrations. The time required to implement Alternative MC-3a is estimated to be 6 months for design and construction. Alternatives MC-5 and MC-6 involve standard construction practices for contaminated groundwater. Alternatives MC-5 and MC-6 also involve standard construction practices and would be technically easily implementable. These alternatives were ranked lower than MC-3a because of the need to construct an aboveground treatment facility.

The extraction trench proposed under Alternatives MC-5 and MC-6 can be designed and installed relatively easily. The effectiveness of the groundwater pumping will be dependent upon the productivity of the glacial till aquifer. Information obtained during the RI indicates that it may not be possible to extract groundwater during all times of the year. In addition, the extracted groundwater is anticipated to be high in iron and alkalinity that will cause long-term performance issues.

Installation of the alternative water pipeline extension and connections is a simple engineering task, but would require coordination with local officials.

Costs

There is no capital cost associated with Alternatives SC-1 and MC-1. The capital cost for Alternative SC-2, excavation and off-site disposal of the Ash Landfill and the NCFL, is estimated to be $17,500,000. There is no annual operation and maintenance cost associated with this alternative since no residual materials would remain on-site. The capital cost for Alternative SC-3, excavation of the Ash Landfill and the Debris Piles and consolidation at the NCFL, is estimated to be $1,370,000. The 30-year present worth operation and maintenance cost is estimated to be $490,000. The total present worth cost is estimated to be $1,860,000. The capital cost for Alternative SC-4, excavation, soil washing, stabilization/solidification, is estimated to be $31,500,000. The 30-year present worth operation and maintenance cost is estimated to be $490,000. The total present worth cost for Alternative SC-4 is estimated to be $32,000,000. The capital cost for Alternative SC-5, excavation and off-site disposal of the Debris Piles/vegetative cover of the Ash Landfill and the NCFL, is estimated to be $237,000. The 30-year operation and maintenance cost is estimated to be $490,000. The total present worth cost for SC-5 is estimated to be $727,000.

The capital cost for Alternative MC-2, the alternative water supply option, is estimated to be $160,000. The 30-year present worth operation and maintenance cost is estimated to be $795,000. The total present worth cost is estimated to be $955,000. The capital cost for Alternative MC-3, air sparging of the plume, is estimated to be $668,000. The 30-year operation and maintenance cost for maintenance of the sparging system and for long-term groundwater monitoring is estimated to be $1,790,000. The interest rate used to calculate the present worth cost was 10% and the compounding period was 30 years. The total present worth cost for Alternative MC-3 is estimated to be $2,500,000. The capital cost for Alternative MC-3a, the zero valence iron reactive walls, is estimated to be $2,050,000. The 30-year operation and maintenance cost of the reactive wall system and for long-term groundwater monitoring is estimated to be $813,000. The total 30-year present worth cost for Alternative MC-3a is estimated to be $2,860,000. No capital or present worth costs have been estimated for MC-4, groundwater extraction and treatment using activated carbon, since this alternative was dropped from further consideration during the alternatives screening portion of the feasibility study. The capital cost for Alternative MC-5, groundwater extraction and treatment using air stripping is estimated to be $543,000. The 30-year operation and maintenance cost for maintenance of the air stripping system and for long-term groundwater monitoring is estimated to be $1,222,000. The interest rate used to calculate the present worth cost was 10% and the compounding period was 30 years. The total present worth cost for Alternative MC-5 is estimated to be $1,800,000. The capital cost for Alternative MC-6, groundwater extraction and treatment using UV/Ozone, is estimated to be $556,000. The 30-year operation and maintenance cost for maintenance of the sparging system and for long-term groundwater monitoring is estimated to be $1,308,000. The interest rate used to calculate the present worth cost was 10% and the compounding period was 30 years. The total present worth cost for Alternative MC-6 is estimated to be $1,900,000. No present worth costs have been calculated for MC-7, the two-stage biological treatment alternative, as this alternative was dropped from further consideration during the alternatives screening portion of the feasibility study.

State Acceptance

State acceptance for the preferred alternative will be assessed in the Record of Decision following review of state comments received on the RI/FS report and the Proposed Plan

Community Acceptance

Community acceptance for the preferred alternative will be assessed in the Record of Decision following review of the public comments received on the RI/FS report and the Proposed Plan.

Summary

A detailed alternative screening entailed an extensive ranking process of the nine evaluation criteria of overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements; long-term effectiveness and permanence; reduction of toxicity, mobility, or volume; short-term effectiveness; implementibility; cost; state acceptance; and community acceptance. Overall protection of human health and the environment and compliance with ARARs were considered threshold criteria because any option that did not meet these criteria was not considered further.

Among the Source Control Alternatives, the No-Action Alternative, SC-1, was retained as a baseline for comparison to other alternatives but does not meet the threshold criteria. The remaining options are summarized in **Table 8**.

Among the Migration Control Alternatives, Options MC-4 and MC-7 were eliminated from consideration because they did not meet threshold criteria requirements. MC-4 and MC-7 were eliminated from further consideration because these alternatives were ranked the lowest of the four pump and treat options. MC-4, the liquid phase carbon was ranked low due to the poor sorptive capacity of activated carbon to vinyl chloride and the expected fouling of the carbon beds due to iron and alkalinity. MC-7, the two-stage biological treatment option was ranked low because biological treatment systems require a continuous flow of water. The aquifer conditions at the site would likely not be able to supply sufficient flow year round. Additionally, the two-stage biological treatment technology is considered innovative and not as reliable as the other options. Operational requirements for a biological system are higher than the other options. The remaining options are summarized in **Table 9**.

PREFERRED ALTERNATIVE

Remedial action alternatives were prepared independently for source control and migration control of constituents of concern at the Ash Landfill. The success of the non-time critical removal action in removing volatile organics from on-site soils (conducted between August 1994 and June 1995) indicates that conditions at the site have improved since the RI/FS reports were prepared. The LRA has determined that the future use of this site is as a conservation/recreational area. The baseline human health risk assessment indicates that under the current and planned future use of the site, the carcinogenic and noncarcinogenic human health risk values are all within the EPA target ranges. If risk-based health criteria are applied to the Ash Landfill, remedial objectives have been met and no further remedial actions are required. This action represents the most cost-effective means for ensuring protection of human health and the environment.

Based on an evaluation of the various options, the U.S. Army recommends Alternative SC-5 for source control and Alternative MC-3a for migration control. Alternative SC-5 accomplishes source control through the excavation and off-site disposal of the debris piles, combined with the establishment and maintenance of a vegetative soil cover for the Ash Landfill and the NCFL. Alternative MC-3a provides migration control for the groundwater contaminant plume through the installation of three in-situ permeable reactive barrier walls that are filled with 100% zero valence iron. Based on the prior removal and NYSDEC-documented closure of the UST at the Abandoned Incinerator Building (SEAD-15), no further action is proposed at this SEAD. During the re-grading of the debris piles, the Ash Cooling Pond (SEAD-3) will be backfilled and re-graded.

Alternative SC-5 was selected as the preferred source control alternative because the vegetative cover will be an effective barrier against exposure and is therefore one of the highest ranked alternatives for protectiveness to human and ecological receptors. The alternative minimizes the negative short-term effects, such as truck traffic and dust problems, that a large excavation would cause. SC-5 will be compliant with all ARARs. This alternative also minimizes the amount of off-site land filling that will be required. SC-5 is the easiest to implement and has the lowest cost.

Alternative, MC-3a, was selected as the preferred management of migration alternative because it will achieve substantial risk reduction by chemically destroying the dissolved chlorinated ethene compounds in groundwater. This alternative is effective in achieving these reductions. The alternative will be protective of human health and the environment by preventing off-site migration of the VOC plume. Monitoring of the plume will ensure that downgradient receptors are protected. The monitoring plan will provide adequate warning should monitoring data indicate that the plume is threatening the drinking water supply.

Since this alternative will result in contaminants remaining at the site that are above levels that allow unlimited use and unrestricted exposure, institutional controls and five-year reviews will be required. For this site, institutional controls are intended to prevent future owners from ingesting site groundwater and/or disturbing the landfill cap. The types of institutional controls that would be implemented will include a combination of administrative and physical controls. Examples of administrative controls that will be implemented at this site are deed restrictions that would prohibit the following:

- installation of any groundwater extraction wells, except for regulator-approved remediation purposes,
- human or ecological exposure to groundwater from the site(s), or use of this groundwater for any industrial, commercial, sanitary, human consumptive, or agricultural purposes, and
- unauthorized interference (to be defined in the Deed) with monitoring systems or any additional treatment, monitoring, or barrier (i.e. capping) systems that may be subsequently constructed at the site. (These systems to be described and locations specified in the Deed to the extent practicable.)

Examples of physical controls that will be implemented at this site will include posting signs and warnings that identify and advise use restrictions at this site.

Implementation and methods of enforcement for specific Institutional Controls will be addressed as part of the Finding of Suitability Transfer (FOST) process. The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment and will consist of document review, ARAR review, interviews, inspection/technology review and reporting,

A contingency plan will be developed as part of this preferred alternative. The contingency plan will include additional monitoring and air sparging, as necessary. Following installation of the reactive walls, groundwater from monitoring well MW-56 (see **Figure 2** for location) will be analyzed and the VOC results will be compared to the Class GA groundwater standards (trigger criteria). If a statistical analysis of the data for this well shows exceedances of Class GA standards, additional remedial action will be required. Temporary wells will be installed in the vicinity of MW-56, and the results will be used to develop an approach for air sparging. A description of the air sparging process is summarized in Alternative MC-3. If concentrations at MW-56 continue to exceed the trigger values following air sparging, an activated carbon system for the farmhouse water supply system will be installed or public water will be delivered to the house. More extensive air sparging will be performed until trigger values are no longer exceeded.

GLOSSARY

Aquifer
An aquifer is an underground rock formation through another composed of such materials as sand, soil, or gravel that can store groundwater and supply it to wells.

Adsorption
Adsorption is the adhesion of molecules of gas, liquid, or dissolved solids to a surface. The term also refers to a method of treating wastes in which activated carbon removes organic matter from wastewater.

Aromatics
Aromatics are organic compounds that contain 6-carbon ring structures, such as creosote, toluene, and phenol, that often are found at dry cleaning and electronic assembly sites.

Air Sparging
In air sparging, air is injected into the ground below a contaminated area, forming bubbles that rise and carry trapped and dissolved contaminants to the surface where they are captured by a soil vapor extraction system. Air sparging may be a good choice of treatment technology at sites contaminated with solvents and other VOCs. *See also Soil Vapor Extraction and Volatile Organic Compound.*

Air Stripping
Air stripping is a treatment system that removes or " strips" VOCs from contaminated groundwater or surface water as air is forced through the water, causing the compounds to evaporate. *See also Volatile Organic Compound.*

Applicable or Relevant and Appropriate Requirement (ARAR)
As defined under CERCLA, ARARs are cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limits set forth under federal or state law that specifically address problems or situations present at a CERCLA site. ARARs are major considerations in setting cleanup goals, selecting a remedy, and determining how to implement that remedy at a CERCLA site. ARARs must be attained at all CERCLA sites unless a waiver is attained. ARARs are not national cleanup standards for the Superfund program. *See also Comprehensive Environmental Response, Compensation, and Liability Act and Superfund.*

Army Corps of Engineer (USACOE)
The engineering organization of the U.S. Army. The districts involved in the Seneca Army Depot Activity project includes: the New York District (CENAN), the New England District (CENED), the Huntsville Center for Engineering Support (CEHNC).

Base Realignment and Closure (BRAC)
A congressionally mandated process that involves closure of military bases. The goal of BRAC is to transition the former bases from military uses to civilian reuse, with the intent of minimizing the negative effects of base closure by spurring economic development and growth. The SEDA was listed as a base to be closed in October, 1995. Base closure is in the process of being performed.

Baseline Risk Assessment
A baseline risk assessment is an assessment conducted before cleanup activities begin at a site to identify and evaluate the threat to human health and the environment. After remediation has been completed, the information obtained during a baseline risk assessment can be used to determine whether the cleanup levels were reached.

Bedrock
Bedrock is the rock that underlies the soil; it can be permeable or non-permeable. The underlying bedrock as the Seneca Army Depot Activity is shale. *See also Confining Layer.*

Bioremediation
Bioremediation refers to treatment processes that use microorganisms (usually naturally occurring) such as bacteria, yeast, or fungi to break down hazardous substances into less toxic or nontoxic substances. Bioremediation can be used to clean up contaminated soil and water. In-situ bioremediation treats the contaminated soil or groundwater in the location in which it is found. For ex situ bioremediation processes, contaminated soil must be excavated or groundwater pumped to the surface before they can be treated.

Borehole
A borehole is a hole cut into the ground by means of a drilling rig.

Borehole Geophysics
Borehole geophysics are nuclear or electric technologies used to identify the physical characteristics of geologic formations that are intersected by a borehole.

BTEX
BTEX is the term used for benzene, toluene, ethylbenzene, and xylene-volatile aromatic compounds typically found ill petroleum products, such as gasoline and diesel fuel.

Cadmium
Cadmium is a heavy metal that accumulates in the environment. *See also Heavy Metal.*

Cancer Slope Factor
The slope factor is a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The slope factor is used in risk assessments to estimate an upper-bond lifetime

probability of an individual developing cancer as a result of exposure to a particular level of a potential carcinogen. Slope factors for each chemical are expressed in units of inverse mg chemical per kg body weight per day of exposure.

Capital Cost
The initial cost associated with constructing a treatment remedy. The capital cost does not include the operation and maintenance of the remedy.

Carbon Adsorption
Carbon adsorption is a treatment system that removes contaminants from groundwater or surface water as the water is forced through tanks containing activated carbon.

Chlorinated Ethenes
A group of volatile chlorinated organic compounds that includes tetrachloroethene, trichloroethene, dichloroethene and vinyl chloride. These compounds have been detected at the Ash Landfill Operable Unit.

Cleanup
Cleanup is the term used for actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and or the environment. The term sometimes is used interchangeably with the terms remedial action, removal action, response action, or corrective action.

Clean Water Act (CWA)
CW A is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants to U.S. waters. This law gave EPA the authority to set wastewater discharge standards on an industry-by-industry basis and to set water quality standards for all contaminants in surface waters.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
CERCLA is a federal law passed in 1980 that created a special tax that funds a trust fund, commonly known as Superfund, to be used to investigate and clean up abandoned or uncontrolled hazardous waste sites. CERCLA required for the first time that EPA step beyond its traditional regulatory role and provide response authority to clean up hazardous waste sites. EP A has primary responsibility for managing cleanup and enforcement activities authorized under CERCLA. Under the program, EP A can pay for cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work, or take legal action to force parties responsible for contamination to clean up the site or reimburse the federal government for the cost of the cleanup. *See also Superfund.*

Confining Layer
A "confining layer" is a geological formation characterized by low permeability that inhibits the flow of water. *See also Bedrock and Permeability.*

Contaminant
A contaminant is any physical, chemical, biological, or radiological substance or matter present in any media at concentrations that may result in adverse effects on air, water, or soil.

Data Quality Objective (DQO)
DQOs are qualitative and quantitative statements specified to ensure that data of known and appropriate quality are obtained. The DQO process is a series of planning steps, typically conducted during site assessment and investigation, that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate. The DQO process involves a logical, step-by-step procedure for determining which of the complex issues affecting a site are the most relevant to planning a site investigation before any data are collected.

Dechlorination
Dechlorination, the process used primarily to treat and destroy halogenated aromatic contaminants, is the chemical reaction that removes halogens (usually chlorine) from the primary structure of the contaminating organic chemical. Dechlorination can treat contaminated liquids, soils, sludges, and sediments, as well as halogenated organics and PCBs, pesticides, and some herbicides.

Detection Limit
The lowest concentration of a chemical that can be distinguished reliably from a zero concentration.

Dichloroethene
A group of volatile chlorinated organic compounds that include: 1,1-dichloroethene, cis 1,2-dichloroethene and trans 1,2-dichloroethene

Disposal
Disposal is the final placement or destruction of toxic, radioactive or other wastes; surplus or banned pesticides or other chemicals; polluted soils; and drums containing hazardous materials from removal actions or accidental release. Disposal may be accomplished through the use of approved secure landfills, surface impoundments, land farming, deep well injection, or ocean dumping.

Electromagnetic (EM) Geophysics
EM geophysics refers to technologies used to detect spatial (horizontal and vertical) differences in subsurface electromagnetic characteristics. The data collected provide information about subsurface environments.

Engineered Control
An engineered control, such as barriers placed between a contaminated area and the rest of a site, is a method of managing environmental and health risks. Engineered controls can be used to limit exposure pathways.

Environmental Protection Agency (EPA)
The federal regulatory agency responsible for enforcing the rules and regulations of the United States. Representatives from the EPA Region 2, which includes New York State, are involved in the review and oversight of the environmental work being conducted at the Seneca Army Depot Activity.

Environmental Risk
Environmental risk is the chance that human health or the environment will suffer harm as the result of the presence of environmental hazards.

Environmental Site Assessment (ESA)
An ESA is the process that determines whether contamination is present at a site.

Ethene/Ethane
A non-toxic chemical endpoint in the breakdown of chlorinated ethenes, where all chlorine has been removed.

Expanded Site Investigation (ESI)
An expanded investigation that typically includes media sampling and analyses. An ESI is performed following a Preliminary Site Investigation to obtain more information regarding the concentrations of pollutants at a site.

Exposure Pathway
An exposure pathway is the route of contaminants from the source of contamination to potential contact with a medium (air, soil, surface water, or groundwater) that represents a potential threat to human health or the environment. Determining whether exposure pathways exist is an essential step in conducting a baseline risk assessment. *See also Baseline Risk Assessment.*

Ex Situ
The term ex situ or "moved from its original place, means excavated or removed.

Federal Facilities Agreement (FFA) also known as the Interagency Agreement (IAG)
An agreement signed between EPA, NYSDEC and the Army that describes the process for identifying, investigating and remediating sites at the Seneca Army Depot Activity.

Filtration
Filtration is a treatment process that removes solid matter from water by passing the water through a porous medium, such as sand or a manufactured filter.

GA Groundwater Standard
A water quality standard promulgated by the NYSDEC that establishes a minimum quality of a groundwater supply that could be used as a source of drinking water.

Groundwater
Groundwater is the water flow beneath the earth's surface that fills pores between such materials as sand, soil, or gravel and that often supplies wells and springs. *See also Aquifer .*

Halogenated Organic Compound
A halogenated organic compound *is* a compound containing molecules of chlorine, bromine iodine, and fluorine. Halogenated organic compounds were used in high-voltage electrical transformers because they conducted heat well while being fire resistant and good electrical insulators. Many herbicides, pesticides, and degreasing agents are made from halogenated organic compounds.

Heavy Metal
The term heavy metal refers to a group of toxic metals including arsenic, chromium, copper, lead, mercury, silver, and zinc. Heavy metals often are present at industrial sites at which operations have included battery recycling and metal plating.

Herbicide
A herbicide is a chemical pesticide designed to control or destroy plants, weeds, or grasses.

Hydrocarbon
A hydrocarbon is an organic compound containing only hydrogen and carbon, often occurring in petroleum, natural gas, and coal

Hydrogeology
Hydrogeology is the study of groundwater, including its origin, occurrence, movement, and quality.

Information Repository
An information repository is a location in a public building that is convenient for local residents, such as a public school, city hall, or library, that contains information about a Superfund site, including technical reports and reference documents.

Inorganic Compounds includes Metals
An inorganic compound is a compound that generally does not contain carbon atoms (although carbonate and bicarbonate compounds are notable exceptions). Examples of inorganic compounds include various metals.

Innovative Technology
An innovative technology is a process that has been tested and used as a treatment for hazardous waste or other contaminated materials, but lacks a long history of full-scale use and information about its cost and how well it works sufficient to support prediction of its

performance under a variety of operating conditions. An innovative technology is one that is undergoing pilot-scale treatability studies that usually are conducted in the field or the laboratory and require installation of the technology, and provide performance, cost, and design objectives for the technology. Innovative technologies are being used under many federal and state cleanup programs to treat hazardous wastes that have been improperly released. For example, the innovative technology, reactive barrier wall, is being evaluated to manage off-site migration of contamination. *See also Emerging Technology and Established Technology.*

Ion Exchange
Ion exchange, a common method of softening water, depends on the ability of certain materials to remove and exchange ions from water. These ion exchange materials, generally composed of insoluble organic polymers, are placed in a filtering device. Water softening exchange materials remove calcium and magnesium ions, replacing them with sodium ions.

In-situ
The term in-situ, "in its original place," or" on-site", means unexcavated and unmoved. In-situ soil flushing and natural attenuation are examples of in-situ treatment methods by which contaminated sites are treated without digging up or removing the contaminants.

In-situ Soil Flushing
In-situ soil flushing is an innovative treatment technology that floods contaminated soils beneath the ground surface with a solution that moves the contaminants to an area from which they can be removed. The technology requires the drilling of injection and extraction wells on site and reduces the need for excavation, handling, or transportation of hazardous substances. Contaminants considered for treatment by in-situ soil flushing include heavy metals (such as lead, copper, and zinc), halogenated organic compounds, aromatics, and PCBs. *See also Aromatics, Halogenated Organic Compound, Heavy Metal, and Polychlorinated Biphenyl.*

Institutional Controls
An institutional control is a legal or institutional measure, which subjects a property owner to limit activities at or access to a particular property. They are used to ensure protection of human health and the environment, and to expedite property reuse. Fences, posting or warning signs, and zoning and deed restrictions are examples of institutional controls.

Integrated Risk Information System (IRIS)
IRIS is an electronic database that contains EP A's latest descriptive and quantitative regulatory information about chemical constituents. Files on chemicals maintained in IRIS contain information related to both noncarcinogenic and carcinogenic health effects.

Land Disposal Restrictions (LDR)
LDR is a RCRA program that restricts the land disposal of RCRA hazardous wastes and requires treatment to established treatment standards. LDRs may be an important ARAR for Superfund actions. *See also Applicable or Relevant and Appropriate Requirement and Resource Conservation and Recovery Act.*

Landfill
A sanitary landfill is a land disposal site for non-hazardous solid wastes at which the waste is spread in layers compacted to the smallest practical volume.

Leachate
A leachate is a contaminated liquid that results when water collects contaminants as it trickles through wastes, agricultural pesticides, or fertilizers. Leaching may occur in farming areas and landfills and may be a means of the entry of hazardous substances into soil, surface water, or groundwater.

Lead
Lead is a heavy metal that is hazardous to health if breathed or swallowed. Its use in gasoline, paints, and plumbing compounds has been sharply restricted or eliminated by federal laws and regulations. *See also Heavy Metal.*

Mass Spectrometry
Mass spectrometry is a method of chemical analysis in which the substance to be analyzed is heated and placed in a vacuum. The resulting vapor is exposed to a beam of electrons that causes ionization to occur, either of the molecules or their fragments. The ionized atoms are separated according to their mass and can be identified on that basis.

Medium
A medium is a specific environment-air , water, or soil-which is the subject of regulatory concern and activities.

Mercury
Mercury is a heavy metal that can accumulate in the environment and is highly toxic if breathed or swallowed. Mercury is found in thermometers, measuring devices, pharmaceutical and agricultural chemicals, chemical manufacturing, and electrical equipment. *See also Heavy Metal.*

Methane
Methane is a colorless, nonpoisonous, flammable gas created by anaerobic decomposition of organic compounds.

Maximum Contaminant Level (MCL)
Established under the Safe Drinking Water Act as concentrations of pollutants considered protective for drinking water.

Migration Control (MC)
This term refers to a group of alternatives that were assembled to address control of migration of contamination. Most typically these alternatives involve groundwater.

Migration Pathway
A migration pathway is a potential path or route of contaminants from the source of contamination to contact with human populations or the environment. Migration pathways include air, surface water, groundwater, and land surface. The existence and identification of all potential migration pathways must be considered during assessment and characterization of a waste site.

Monitoring Well
A monitoring well is a well drilled at a specific location on or off a hazardous waste site at which groundwater can be sampled at selected depths and studied to determine the direction of groundwater flow and the types and quantities of contaminants present in the groundwater.

National Contingency Plan (NCP)
The NCP, formally the National Oil and Hazardous Substances Contingency Plan, is the major regulatory framework that guides the Superfund response effort. The NCP is a comprehensive body of regulations that outlines a step-by-step process for implementing Superfund responses and defines the roles and responsibilities of EP A, other federal agencies, states, private parties, and the communities in response to situations in which hazardous substances are released into the environment. *See also Superfund.*

National Priorities List (NPL)
The NPL is EP A's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response under Superfund. Inclusion of a site on the list is based primarily on the score the site receives under the HRS. Money from Superfund can be used for cleanup only at sites that are on the NPL. EP A is required to update the NPL at least once a year. *See also Hazard Ranking System and Superfund.*

Natural Attenuation
Natural attenuation is an approach to cleanup that uses natural processes to contain the spread of contamination from chemical spills and reduce the concentrations and amounts of pollutants in contaminated soil and groundwater. Natural subsurface processes, such as dilution, volatilization, biodegradation, adsorption, and chemical reactions with subsurface materials, are allowed to reduce concentrations of contaminants to acceptable levels. An in-situ treatment method that leaves the contaminants in place while those processes occur, natural attenuation is being used to clean up petroleum contamination from LUSTs across the country.

New York State Department of Environmental Protection (NYSDEC)
The state regulatory agency responsible for enforcing the rules and regulations of New York. Representatives from the headquarters in Albany and Region 8 are involved in the review and oversight of the environmental work being conducted at the Seneca Army Depot Activity.

Nephelometric Turbidity Unit (NTU)
A measurement unit of turbidity in water. Small particles of soil particles, such as clays or silts, become suspended within a water sample and increase the turbidity of the sample. This increase in turbidity has been identified as a source of increased metals concentration in samples. This effect is especially noticeable for groundwater samples collected within the clay-rich glacial till aquifer at the SEDA.

Operable Unit (OU)
A grouping of sites into one larger entity. Sites can be grouped into an Operable Unit due to geographical proximity to each other, similar chemical hazards or for other reasons. The Ash Landfill Operable Unit is comprised of 5 sites that are all located within the 130-acre parcel.

Operation and Maintenance (O&M)
O&M refers to the activities conducted at a site, following remedial actions, to ensure that the cleanup methods are working properly. O&M activities are conducted to maintain the effectiveness of the remedy and to ensure that no new threat to human health or the environment arises. Under the Superfund program, the state or PRP assumes responsibility for O&M, which may include such activities as groundwater and air monitoring, inspection and maintenance of the treatment equipment remaining on site, and maintenance of any security measures or institutional controls.

Organic Chemical or Compound
An organic chemical or compound is a substance produced by animals or plants that contains mainly carbon, hydrogen, and oxygen.

Permeability
Permeability is a characteristic that represents a qualitative description of the relative ease with which rock, soil, or sediment will transmit a fluid (liquid or gas).

Permeable Reactive Barriers
Permeable reactive barriers, also known as passive treatment walls, are installed across the flow path of a contaminated plume, allowing the water portion of the plume to flow through the wall. These barriers allow the passage of water while prohibiting the movement of contaminants by employing such agents as zero- valent iron, chelators, sorbents, and microbes. The contaminants are either degraded or retained in a concentrated form by the barrier material.

Pesticide
A pesticide is a substance or mixture of substances intended to prevent or mitigate infestation by, or destroy or repel, any pest. Pesticides can accumulate in the food chain and or contaminate the environment if misused.

Phenols
A phenol is one of a group of organic compounds that are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations of phenols cause taste and odor problems in water; higher concentrations may be harmful to human health or the environment.

Physical Separation
Physical separation processes use different size sieves and screens to concentrate contaminants into smaller volumes. Most organic and inorganic contaminants tend to bind, either chemically or physically, to the fine fraction of the soil. Fine clay and silt particles are separated from the coarse sand and gravel soil particles to concentrate the contaminants into a smaller volume of soil that could then be further treated or disposed.

Plume
A plume is a visible or measurable emission or discharge of a contaminant from a given point of origin into any medium. The term also is used to refer to measurable and potentially harmful radiation leaking from a damaged reactor.

Polychlorinated Biphenyl (PCB)
PCBs are a group of toxic, persistent chemicals, produced by chlorination of biphenyl, that once were used in high voltage electrical transformers because they conducted heat well while being fire resistant and good electrical insulators. These contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes. Further sale or use of PCBs was banned in 1979.

Polynuclear Aromatic Hydrocarbon (P AH)
A PAH is a chemical compound that contains more than one fused benzene ring. They are commonly found in petroleum fuels, coal products, and tar.

Potentially Responsible Party (PRP)
A PRP is an individual or company (such as owners, operators, transporters, or generators of hazardous waste) that is potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, EP A requires PRPs, through administrative and legal actions, to clean up hazardous waste sites they have contaminated. *See also Comprehensive Environmental Response, Compensation, and Liability Act and Superfund.*

Proposed Remedial Action Plan (PRAP)
The first step in the remedy selection process. The PRAP provides information supporting the decisions of how the preferred alternative was selected. It summarizes the RI/FS process and how the alternatives comply with the requirements of the NCP and CERCLA. The PRAP is provided to the public for comment. The responses to the PRAP comments are provided in the ROD.

Preliminary Assessment and Site Inspection (PA/SI)
A PA/SI is the process of collecting and reviewing available information about a known or suspected hazardous waste site or release. The PA/SI usually includes a visit to the site.

Preliminary Site Characterization Summary Report (PSCR)
A PSCR is a summary report prepared following the first phase of RI sampling. It is intended to provide a description of the results of the sampling, identify any data gaps and provide recommendations for modifications for sampling for the second phase of RI sampling. The PSCR does not include an analysis of risk but does provide a comparison of the Phase 1 data to any standards, criteria or guidelines that may be appropriate.

Present Worth Cost Analysis
The equivalent future worth of money at the present time. By discounting all costs to a common base year, the costs for different remedial action alternative scan be compared on the basis of a single figure for each alternative. This is a calculated value that requires the length of time that the future worth will be needed and the interest rate. For example, the present worth of a long-term operation and maintenance cost of a remedy is provided in terms of the present worth. Typically, a 30-year cost is required and an interest rate of 10%.

Presumptive Remedies
Presumptive remedies are preferred technologies for common categories of CERCLA sites that have been identified through historical patterns of remedy selection and EP A's scientific and engineering evaluation of performance data on technology implementation.

Pump and Treat
Pump and treat is a general term used to describe remediation methods that involve the pumping of groundwater to the surface for treatment. It is one of the most common methods of treating polluted aquifers and groundwater.

Quality Assurance (QA)
QA is a system of management activities that ensure that a process, item, or service is of the type and quality needed by the user. QA deals with setting policy and implementing an administrative system of management controls that cover planning, implementation, and review of data collection activities. QA is an important element

of a quality system that ensures that all research design and performance, environmental monitoring and sampling, and other technical and reporting activities conducted by EPA are of the highest possible quality.

Quality Control (QC)
QC refers to scientific precautions, such as calibrations and duplications, that are necessary if data of known and adequate quality are to be acquired. QC is technical in nature and is implemented at the project level. Like QA, QC is an important element of a quality system that ensures that all research design and performance, environmental monitoring and sampling, and other technical and reporting activities conducted by EPA are of the highest possible quality.

Record of Decision (ROD)
A ROD is a legal, technical, and public document that explains which cleanup alternative will be used at a Superfund NPL site. The ROD is based on information and technical analysis generated during the remedial investigation and feasibility study (RI/FS) and consideration of public comments and community concerns. *See also Preliminary Assessment and Site Investigation and Remedial Investigation and feasability Study.*

Release
A release is any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, leaching, dumping, or disposing into the environment of a hazardous or toxic chemical or extremely hazardous substance, as defined under RCRA. *See also Resource Conservation and Recovery Act.*

Remedial Design and Remedial Action (RD/RA)
The RD/RA is the step in the Superfund cleanup process that follows the RI/FS and selection of a remedy. An RD is the preparation of engineering plans and specifications to properly and effectively implement the remedy. The RA is the actual construction or implementation of the remedy. *See also Remedial Investigation and Feasibility Study.*

Remedial Investigation and Feasibility Study (RI/FS)
The RI/FS is the step in the Superfund cleanup process that is conducted to gather sufficient information to support the selection of a site remedy that will reduce or eliminate the risks associated with contamination at the site. The RI involves site characterization -collection of data and information necessary to characterize the nature and extent of contamination at the site. The RI also determines whether the contamination presents a significant risk to human health or the environment. The FS focuses on the development of specific response alternatives for addressing contamination at a site.

Interim Removal Measure (IRM); Also known as an Interim Removal Action (IRA)
A removal action usually is a short-term effort designed to stabilize or clean up a hazardous waste site that poses an immediate threat to human health or the environment. Removal actions include removing soil contaminated with hazardous substances or security measures, such as a fence at the site. Removal actions also may be conducted to respond to accidental releases of hazardous substances. CERCLA places time and money constraints on the duration of removal actions. *See also Comprehensive Environmental Response, Compensation, and Liability Act.*

Resource Conservation and Recovery Act (RCRA)
RCRA is a federal law enacted in 1976 that established a regulatory system to track hazardous substances from their generation to their disposal. The law requires the use of safe and secure procedures in treating. transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent the creation of new, uncontrolled hazardous waste sites.

Revegate
The process of replacing topsoil, seed and mulch on prepared soil to prevent wind and water erosion.

RfD
The reference dose (RfD) is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime.

Risk Communication
Risk communication, the exchange of information about health or environmental risks among risk assessors, risk managers, the local community, news media and interest groups, is the process of informing members of the local community about environmental risks associated with a site and the steps that are being taken to manage those risks.

Saturated Zone
The saturated zone is the area beneath the surface of the land in which all openings are filled with water.

Sediment Criteria
Technical guidance provided by NYSDEC, the Division of Fish and Wildlife, that describes allowable sediment quality for a variety of chemicals. The values provided in this document have been adopted as screening levels for comparison to site data. Exceedances of these values provides that basis for further evaluation and decision making.

Semi-Volatile Organic Compound (SVOC)
SVOCs, composed primarily of carbon and hydrogen atoms, have boiling points greater than 2000°C. Common SVOCs include PCBs and phenol *See also Phenol and Polychlorinated Biphenyl.*

Seneca Army Depot Activity (SEDA)
A 10,000-acre military facility, constructed in 1941, located in central New York responsible for storage and

management of military commodities, including munitions. The depot is undergoing closure and will cease military operations in 2000. Environmental clean-up activities will continue until all sites have been addressed.

Significant Threat
The term refers to the level of contamination that a state would consider significant enough to warrant an action. The thresholds vary from state to state.

Soil Boring
Soil boring is a process by which a soil sample is extracted from the ground for chemical, biological, and analytical testing to determine the level of contamination present.

Soil Flushing
In soil flushing, large volumes of water, at times supplemented with treatment compounds, are applied to the soil or injected into the groundwater to raise the water table into the zone of contaminated soil. Contaminants are leached into the groundwater, and the extraction fluids are recovered from the underlying aquifer. When possible, the fluids are recycled.

Soil Gas
Soil gas consists of gaseous elements and compounds that occur in the small spaces between particles of the earth and soil. Such gases can move through or leave the soil or rock, depending on changes in pressure.

Soil Vapor Extraction (SVE)
SVE, the most frequently selected innovative treatment at Superfund sites, is a process that physically separates contaminants from soil m a vapor form by exerting a vacuum through the soil formation. SVE removes VOCs and some SVOCs from soil beneath the ground surface.

Soil Washing
Soil washing is an innovative treatment technology that uses liquids (usually water, sometimes combined with chemical additives) and a mechanical process to scrub soils, removes hazardous contaminants, and concentrates the contaminants into a smaller volume. The technology is used to treat a wide range of contaminants, such as metals, gasoline, fuel oils, and pesticides. Soil washing is a relatively low-cost alternative for separating waste and minimizing volume as necessary to facilitate subsequent treatment. It is often used in combination with other treatment technologies. The technology can be brought to the site, thereby eliminating the need to transport hazardous wastes.

Solidification and Stabilization
Solidification and stabilization are the processes of removing wastewater from a waste or changing it chemically to make the waste less permeable and susceptible to transport by water. Solidification and stabilization technologies can immobilize many heavy metals, certain radionuclides, and selected organic compounds, while decreasing the surface area and permeability of many types of sludge, contaminated soils, and solid wastes.

Solid Waste Management Unit (SWMU)
A SWMU is a RCRA term used to describe a contiguous area of land on or in which where solid waste, including hazardous waste, was managed. This includes landfills, tanks, land treatment areas, spills and other areas where waste materials were handled. Identification of all SWMUs at SEDA was performed as part of the RCRA Part B Permit Application process.

Solvent
A solvent is a substance, usually liquid, that is capable of dissolving or dispersing one or more other substances.

Source Control
This term refers to a group of alternatives that were assembled to address control the source of contamination. Most typically these alternatives involve addressing soil or sludge contamination.

Subsurface
Underground; beneath the surface.

Surface Water
Surface water is all water naturally open to the atmosphere, such as rivers, lakes, reservoirs, streams, and seas.

Superfund
Superfund is the trust fund that provides for the cleanup of hazardous substances released into the environment, regardless of fault. The Superfund was established under CERCLA and subsequent amendments to CERCLA. The term Superfund also is used to refer to cleanup programs designed and conducted under CERCLA and its subsequent amendments. *See also Comprehensive Environmental Response, Compensation, and Liability Act.*

Superfund Amendment and Reauthorization Act (SARA)
SARA is the 1986 act amending CERCLA that increased the size of the Superfund trust fund and established a preference for the development and use of permanent remedies, and provided new enforcement and settlement tools. *See also Comprehensive Environmental Response, Compensation, and Liability Act.*

TCL Target Compound List
The Target Compound List is a list of organic compounds that are required to analyzed when performing analytical procedures. The list includes volatile organic compounds, semi-volatile compounds, pesticides and PCBs.

Technical Administrative Guidance Memorandum (TAGM)
TAGMs are technical guidance publications provided by NYSDEC that describes various processes and procedures recommended by NYSDEC for the investigation and remediation of hazardous waste sites. One TAGM, No. 4046, provides guideline values for soil clean-up limits at waste sites. These values have been adopted as screening levels to determine "How clean is clean".

Thermal Desorption also known as Low Temperature Thermal Desorption (LTTD)
Thermal desorption is an innovative treatment technology that heats soils contaminated with hazardous wastes to temperatures from 200 to 1,000°F so that contaminants that have low boiling points will vaporize and separate from the soil. The vaporized contaminants then are collected for further treatment or destruction, typically by an air emissions treatment system. The technology is most effective at treating VOCs, SVOCs and other organic contaminants, such as PCBs, PAHs, and pesticides. It is effective in separating organics from refining wastes, coal tar wastes, waste from wood treatment, and paint wastes. It also can separate solvents, pesticides, PCBs, dioxins, and fuel oils from contaminated soil. *See also Polyaromatic Hydrocarbon, Polychlorinated Biphenyl, semi volatile Organic Compound, and Volatile Organic Compound.*

Threshold Criteria
Criteria against which a remedial alternative is evaluated to determine if it will be further considered as an option for a given site. Screening of remedial alternatives is performed by whether the alternative will pass or fail the threshold criteria. The threshold criteria is overall protective of human health and the environment and is compliant with ARARs.

Toluene
Toluene is a colorless liquid chemical with a sweet, strong odor. It is used as a solvent in aviation gasoline and in making other chemicals, perfumes, medicines, dyes, explosives, and detergents.

Total Petroleum Hydrocarbon (TPH)
TPH refers to a measure of concentration or mass of petroleum hydrocarbon constituents present in a given amount of air, soil, or water

Toxicity
Toxicity is a quantification of the degree of danger posed by a substance to animal or plant life.

Toxicity Characteristic Leaching Procedure (TCLP)
The TCLP is a testing procedure used to identify the toxicity of wastes and is the most commonly used test for degree of mobilization offered by a solidification and stabilization process. Under this procedure, a waste is subjected to a process designed to model the leaching effects that would occur if the waste was disposed of in a RCRA Subtitle D municipal landfill. *See also Solidification and Stabilization.*

Treatability Testing / Demonstration Study
Treatability testing is a process of collecting engineering performance data that will be used for final design purposes. In many instances treatability testing is performed to demonstrate the effectiveness of an innovative technology. A demonstration study has been on-going at the Ash Landfill Operable Unit involving a zero-valence iron treatment wall.

Treatment Wall
A treatment wall is a structure installed underground to treat contaminated groundwater found at hazardous waste sites. Treatment walls, also called passive treatment walls, are put in place by constructing a trench across the flow path of contaminated groundwater and filling the trench with one of a variety of materials carefully selected for the ability to clean up specific types of contaminants. As the contaminated groundwater passes through the treatment wall, the contaminants are trapped by the treatment wall or transformed into harmless substances that flow out of the wall. The major advantage of using treatment walls is that they are passive systems that treat the contaminants in place so the property can be put to productive use while it is being cleaned up. Treatment walls are useful at some sites contaminated with chlorinated solvents and metals. A treatment wall was installed at the Ash Landfill Operable Unit.

Trichloroethylene also known as Trichloroethene (TCE)
TCE is a stable, low-boiling colorless liquid that is used as a solvent, metal degreasing agent, and in other industrial applications. It is a volatile chlorinated organic chemical.

Unsaturated Zone
The unsaturated zone is the area between the land surface and the uppermost aquifer (or saturated zone). The soils in an unsaturated zone may contain air and water.

Vadose Zone
The vadose zone is the area between the surface of the land and the surface of the water table in which the moisture content is less than the saturation point and the pressure is less than atmospheric. The openings (pore spaces) also typically contain air or other gases.

Vapor
Vapor is the gaseous phase of any substance that is liquid or solid at atmospheric temperatures and pressures. Steam is an example of a vapor.

Volatile Organic Compound (VOC)
A VOC is one of a group of carbon-containing compounds that evaporate readily at room temperature. Examples of VOCs include trichloroethane;

trichloroethylene; and BTEX. These contaminants typically are generated from metal degreasing, printed circuit board cleaning, gasoline, and wood preserving processes.

Volatilization
Volatilization is the process of transfer of a chemical from the aqueous or liquid phase to the gas phase. Solubility, molecular weight, and vapor pressure of the liquid and the nature of the gas-liquid affect the rate of volatilization.

Vinyl Chloride
A volatile chlorinated organic chemical, produced as a breakdown product of trichloroethene. This compound is highly volatile, being a gas a room temperature.

Wastewater
Wastewater is spent or used water from an individual home, a community, a farm, or an industry that contains dissolved or suspended matter.

Water Table
A water table is the boundary between the saturated and unsaturated zones beneath the surface of the earth, the level of groundwater, and generally is the level to which water will rise in a well *See also Aquifer and Groundwater*

Table 1

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT
ALL SOIL SAMPLE RESULTS - PRE IRM (1)

COMPOUND	UNITS	NYSDEC TAGM (2)	COUNT	MAXIMUM	95 th UCL of the MEAN (3)	MEAN (4)	STD.DEV
Volatile Organics							
Vinyl Chloride	ug/kg	200	169	14,500	62.5	173	1,134
1,2-Dichloroethene (total)	ug/kg	300	169	79,000	1,712	1,989	8,288
Trichloroethene	ug/kg	700	169	540,000	2,268	9,373	57,446
Semivolatiles							
2-Methylnaphthalene	ug/kg	36,400	164	3,600	441	393	483
Acenaphthylene	ug/kg	41,000	105	510	265	248	108
Dibenzofuran	ug/kg	6,200	164	7,000	398	373	568
Phenanthrene	ug/kg	50,000	164	43,000	658	882	3,693
Benzo(a)anthracene	ug/kg	220 or MDL(5)	164	9,600	520	531	1,143
bis(2-Ethylhexyl)phthalate	ug/kg	50,000	164	230,000	715	2,051	17,995
Benzo(b)fluoranthene	ug/kg	1,100	164	9,500	498	513	1,068
benzo(k)fluoranthene	ug/kg	1,100	164	6,700	469	448	759
Benzo(a)pyrene	ug/kg	61 or MDL(5)	164	9,000	491	486	1,000
Indeno(1,2,3-cd)pyrene	ug/kg	3,200	164	4,800	431	397	543
Dibenz(a,h)anthracene	ug/kg	14 or MDL(5)	164	2,900	411	368	335
Benzo(g,h,i)perylene	ug/kg	50,000	164	5,000	431	392	527
Pesticides/PCBs							
Aroclor-1260	ug/kg	1,000	164	770	157	143	110
Metals							
Cadmium	mg/kg	1.74	163	43.1	3.84	2.47	3.74
Chromium	mg/kg	26.49	163	62	27.7	26.7	7.66
Copper	mg/kg	25	162	836	40.5	43.6	83.1
Lead	mg/kg	30	147	2,890	90	115	387
Zinc	mg/kg	88.89	163	55,700	409	860	4,887

Notes:
1. This table reflects the soil sample results at all depths at the site prior to the Interim Remedial Measure (IRM).
2. NYSDEC TAGM values based on Technical and Administrative Guidance Memorandum HWR-92-4046, January 24, 1994. The TAGMs are soil cleanup guidelines and are for comparison.
3. 95th Upper Confidence Limit of the mean is a probabilistic estimate of the true site mean. Non-detects were assumed to be at one-half of the detection limit for all statistical calculations.
4. Mean is the arithmetic mean, i.e. the sum of the values divided by the number of samples.
5. For semivolatile organic compounds, the Minimum Detection Limit (MDL) is 330 ug/Kg.
6. Metals are total metals in soil.

Table 2

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT
SOIL SAMPLE RESULTS from outside of the IRM AREA ONLY - PRE IRM (1)

COMPOUND	UNITS	NYSDEC TAGM (2)	COUNT	MAXIMUM	95 th UCL of the MEAN (3)	MEAN (4)	STD.DEV
Volatile Organics							
Vinyl Chloride	ug/kg	200	116	92	6.60	6.68	8.09
1,2-Dichloroethene (total)	ug/kg	300	116	1,300	11.1	23.6	125
Trichloroethene	ug/kg	700	116	540	18.4	22.5	63.8
Semivolatiles							
2-Methylnaphthalene	ug/kg	36,400	112	1,600	359	326	217
Acenaphthylene	ug/kg	41,000	72	510	279	258	109
Dibenzofuran	ug/kg	6,200	112	7,000	406	382	657
Phenanthrene	ug/kg	50,000	112	43,000	819	1,113	4,449
Benzo(a)anthracene	ug/kg	220 or MDL(5)	112	9,600	620	620	1,359
bis(2-Ethylhexyl)phthalate	ug/kg	50,000	112	230,000	901	2,811	21,763
Benzo(b)fluoranthene	ug/kg	1,100	112	9,500	576	591	1,269
benzo(k)fluoranthene	ug/kg	1,100	112	6,700	513	499	890
Benzo(a)pyrene	ug/kg	61 or MDL(5)	112	9,000	556	555	1,186
Indeno(1,2,3-cd)pyrene	ug/kg	3,200	112	4,800	463	423	623
Dibenz(a,h)anthracene	ug/kg	14 or MDL(5)	112	2,900	430	376	350
Benzo(g,h,i)perylene	ug/kg	50,000	112	5,000	456	422	600
Pesticides/PCBs							
Aroclor-1260	ug/kg	1,000	164	770	157	143	110
Metals							
Cadmium	mg/kg	1.74	163	43.1	3.84	2.47	3.74
Chromium	mg/kg	26.49	163	62	27.7	26.7	7.7
Copper	mg/kg	25	162	836	40.5	43.6	83.1
Lead	mg/kg	30	147	2,890	90.0	115	387
Zinc	mg/kg	88.89	163	55,700	409	860	4,887

Notes:
1. This table reflects soil sample results at all depths at the site prior to the Interim Remedial Measure (IRM). Table 2 is different from Table 1 in that the VOCs and SVOCs from soil samples within the areas where the IRM was performed were excluded from the calculations.
2. NYSDEC TAGM values based on Technical and Administrative Guidance Memorandum HWR-92-4046, January 24, 1994. The TAGMs are soil cleanup guidelines and are for comparison.
3. 95th Upper Confidence Limit of the mean is a probabilistic estimate of the true site mean. Non-detects were assumed to be at one-half of the detection limit for all statistical calculations.
4. Mean is the arithmetic mean, i.e. the sum of the values divided by the number of samples.
5. For semivolatile organic compounds, the Minimum Detection Limit (MDL) is 330 ug/Kg.
6. Metals are total metal concentrations in soil.

Table 3

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT
SOIL SAMPLE RESULTS within the IRM AREA ONLY - PRE IRM (1)

COMPOUND	UNITS	NYSDEC TAGM(2)	COUNT	MAXIMUM	95th UCL of the MEAN (3)	MEAN (4)	STD.DEV
Volatile Organics							
Vinyl Chloride	ug/kg	200	53	14,500	2,262	536	1,991
1,2-Dichloroethene (total)	ug/kg	300	53	79,000	406,336	6,292	13,942
Trichloroethene	ug/kg	700	53	540,000	1,690,008	29,839	100,199
Semivolatiles							
2-Methylnaphthalene	ug/kg	36,400	52	3,600	669	539	782
Acenaphthylene	ug/kg	41,000	33	365	257	227	104
Dibenzofuran	ug/kg	6,200	52	2,050	423	354	300
Phenanthrene	ug/kg	50,000	52	2,050	472	386	378
Benzo(a)anthracene	ug/kg	220 or MDL(5)	52	2,050	412	341	312
bis(2-Ethylhexyl)phthalate	ug/kg	50,000	52	2,050	489	413	333
Benzo(b)fluoranthene	ug/kg	1,100	52	2,050	417	346	312
benzo(k)fluoranthene	ug/kg	1,100	52	2,050	408	337	314
Benzo(a)pyrene	ug/kg	61 or MDL(5)	52	2,050	410	338	315
Indeno(1,2,3-cd)pyrene	ug/kg	3,200	52	2,050	411	341	307
Dibenz(a,h)anthracene	ug/kg	14 or MDL(5)	52	2,050	418	349	301
Benzo(g,h,i)perylene	ug/kg	50,000	52	2,050	399	328	311
Pesticides/PCBs							
Aroclor-1260	ug/kg	1,000	52	770	216	181	155
Metals							
Cadmium	mg/kg	1.74	52	4.4	2.23	1.87	1.59
Chromium	mg/kg	26.5	52	34.8	25.2	24.2	4.48
Copper	mg/kg	25	52	146	34.2	29.6	20.2
Lead	mg/kg	30	50	696	54.4	46.3	103
Zinc	mg/kg	88.9	52	3,540	244	241	508

Notes:
1. Soil samples results at all depths in the Interim Remedial Measure area only, prior to the IRM, are included..
2. NYSDEC TAGM values based on Technical and Administrative Guidance Memorandum HWR-94-4046, January 24, 1994. The TAGMs are cleanup guidelines and are for comparison.
3. 95th Upper Confidence Limit of the mean is a probabilistic estimate of the true site mean. Non-detects were assumed to be at one-half of the detection limit for all statistical calculations.
4. Mean is the arithmetic mean, i.e. the sum of the values divided by the number of samples.
5. For semivolatile organic compounds the Minimum Detection Limit (MDL) is 330 ug/Kg.

Table 4

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT
SOIL SAMPLE RESULTS within the IRM AREA ONLY - POST IRM (1)

COMPOUND	UNITS	NYSDEC TAGM (2)	COUNT	MAXIMUM	95th UCL of the MEAN (3)	MEAN (4)	STD.DEV
Volatile Organics							
Vinyl Chloride	ug/kg	200	156	28	9.24	8.29	7.17
1,2-Dichloroethene (total)	ug/kg	300	156	47	9.41	8.35	8.04
Trichloroethene	ug/kg	700	156	46	9.62	8.05	8.14
Semivolatiles							
Napthalene	ug/kg	13,000	156	470	239	222	128
Phenanthrene	ug/kg	50,000	156	2,200	145	115	204
Fluoranthene	ug/kg	50,000	156	2,500	187	133	237
Pyrene	ug/kg	50,000	156	1,800	222	127	186
Bis(2-ethylhexyl) phthalate	ug/kg	50,000	156	3,500	511	452	449
Indeno(1,2,3-cd) pyrene	ug/kg	3,200	156	930	1,238	159	169
Benzo(a)anthracene	ug/kg	220 or MDL(5)	156	760	133	74.5	114
Chrysene	ug/kg	400	156	700	217	103	150
Benzo(a)pyrene	ug/kg	61 or MDL(5)	156	860	147	78.2	145
Dibenzo(a,h)anthracene	ug/kg	14 or MDL(5)	156	990	2.37	43.8	114

Notes:
1. Soil results, following thermal treatment during the Interim Remedial Measure, prior to backfilling. Data obtained from International Technology Corp. "Ash Landfill Immediate Response, July 1995". Total metal concentrations in the treated soil were not analyzed.
2. NYSDEC TAGM values based on Technical and Administrative Guidance Memorandum HWR-94-4046, January 24, 1994. The TAGMs are cleanup guidelines and are for comparison.
3. 95th Upper Confidence Limit of the mean is a probabilistic estimate of the true site mean. Non-detects were assumed to be at one-half of the detection limit for all statistical calculations.
4. Mean is the arithmetic mean, i.e. the sum of the values divided by the number of samples.
5. For semivolatile organic compounds the Minimum Detection Limit (MDL) is 330 ug/Kg.

Table 5

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT
TOTAL CHLORINATED ETHENES OF GROUNDWATER SAMPLES FOR FOUR SAMPLING EVENTS

Monitoring Well Designation	Location	Total Chlorinated Ethene Concentrations, ug/l			
		Jun-93	Jun-97	Oct-99	Jan-00
MW-12A or PT-12	Plume	2,461	3,570	2,123	2,088
MW-27	North of Impact Area	ND	ND	ND	ND
MW-28	Plume	88	88	47	46
MW-29	Plume	101	157	152	100
MW-30	South of West Smith Farm Road	1	ND	2	1
MW-31	South of West Smith Farm Road	ND	ND	ND	ND
MW-32	South of West Smith Farm Road	ND	ND	ND	ND
MW-33	South of West Smith Farm Road	ND	ND	ND	ND
MW-35D	Off of SEDA facility	ND	ND	ND	ND
MW-37	North of Impact Area	ND	n/a	ND	ND
MW-38D	North of Impact Area	ND	ND	ND	ND
MW-39	Northeast of Impact Area	ND	n/a	ND	ND
MW-40	East of Impact Area	ND	ND	ND	ND
MW-43	East of Impact Area	6	n/a	ND	ND
MW-44 or MW-44A	IRM area	132,360	930	1,104	399
MW-45	North of Impact Area	0.5	ND	ND	ND
MW-46	Plume	167	126	157	80
MW-47	Off of SEDA facility, Upgradient of Farmer's well	ND	ND	ND	n/a
MW-48	North of Impact Area	ND	ND	ND	ND
MW-49D	Plume	n/a	n/a	23	30
MW-50D	Plume	n/a	ND	ND	ND
MW-51D	Off of SEDA facility, Upgradient of Farmer's well	n/a	ND	ND	ND
MW-52D	Off of SEDA facility, Upgradient of Farmer's well	n/a	ND	ND	ND
MW-53	Plume	n/a	55	22	33
MW-54D	Plume	n/a	n/a	2.7	1
MW-55D	Plume	n/a	n/a	ND	ND
MW-56	Off of SEDA facility, Upgradient of Farmer's well	n/a	1.6	ND	ND
MW-57D	Off of SEDA facility, Upgradient of Farmer's well	0.2	n/a	ND	ND
MW-58D	Off of SEDA facility, Upgradient of Farmer's well	n/a	n/a	ND	ND
MW-59	South of West Smith Farm Road	ND	ND	ND	ND
MW-60	South of West Smith Farm Road	ND	ND	ND	ND
PT-11	South of West Smith Farm Road	ND	ND	ND	ND
PT-16	North of Impact Area	ND	ND	ND	ND
PT-17	Plume	233	233	132	177
PT-18 or PT-18A	Plume	13,953	3,014	10,591	392
PT-19	South of West Smith Farm Road	ND	ND	ND	ND
PT-20	Plume	90	90	75	60
PT-21A	Plume	254	17	28	10
PT-22	Plume	n/a	n/a	193	184
PT-23	North of Impact Area	ND	ND	ND	ND
PT-24	Plume	66	147	121	102
PT-25	South of West Smith Farm Road	ND	ND	ND	ND
MWT-1	2.5 ft Upgradient of Existing Wall	n/a	n/a	n/a	116
MWT-4	2.5 ft Upgradient of Existing Wall	n/a	n/a	n/a	79
MWT-7	2.5 ft Upgradient of Existing Wall	n/a	n/a	n/a	410

Notes.

1 Total Chlorinated Ethene means the sum of the concentration of Trichloroethene, Cis-1,2-Dichloroethene, Vinyl Chloride, and Tetrachloroethene

2 Results of Monitoring Wells more than 500 ft away from impact area are not presented in this table

3 ND means that no chlorinated ethenes were detected above the detection limit in the sample collected

4 n/a means that the well was not sampled

5 The higher concentration of a sample and a duplicate is presented in this table

Table 6

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT

SOLID WASTE MANAGEMENT UNITS WHERE REMEDIAL INVESTIGATION/FEASIBILITY STUDY WILL BE OR HAS BEEN CONDUCTED

SEAD-4	Munitions Washout Facility Leachfield
SEAD-12	Former Nuclear Weapons Storage Area (WSA)
SEAD-16	Building S-311 Abandoned Deactivation Furnace
SEAD-17	Building 367 Existing Deactivation Furnace
SEAD-23	Open Burning Grounds
SEAD-25	Fire Training and Demonstration Pad
SEAD-26	Fire Training Pit and Area
SEAD-45	Open Detonation Facility
SEAD-3	Ash Landfill
SEAD-6	
SEAD-8	
SEAD-14	
SEAD-15	

Table 7

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL OPERABLE UNIT

Applicable or Relevant and Appropriate Requirements (ARAR) for Soil and Groundwater

	Soil NYSDEC TAGM (1) ug/kg	Groundwater NYSDEC Class GA STANDARD ug/L
Volatile Organic Compounds		
1,1,1-Trichloroethane	800	5
Benzene	60	0.7
Chloroform	300	7
Ethyl benzene	5500	5
Methylene Chloride	100	5
Toluene	1500	5
Xylene (total)	1200	5
Vinyl Chloride	200	2
1,2-Dichloroethene (total)	300	N/A
Cis-1,2-Dichloroethene		5
Trichloroethene	700	5
Semivolatile Organic Compounds		
2-Methylnaphthalene	36400	N/A
Acenaphthylene	41000	N/A
Dibenzofuran	6200	N/A
Phenanthrene	50000	N/A
Benzo(a)anthracene	220 or MDL(2)	N/A
bis(2-Ethylhexyl)phthalate	50000	50
Benzo(b)fluoranthene	1100	N/A
benzo(k)fluoranthene	1100	N/A
Benzo(a)pyrene	61 or MDL(2)	10
Indeno(1,2,3-cd)pyrene	3200	N/A
Dibenz(a,h)anthracene	14 or MDL(2)	N/A
Benzo(g,h,i)perylene	50000	N/A
Pesticides/PCBs		
Aroclor-1260	1000	N/A
Metals		
Cadmium	1.74	10
Chromium	26.49	50
Copper	25	200
Lead	30	25
Zinc	88.89	300

1. NYSDEC TAGM values based on Technical and Administrative Guidance Memorandum HWR-92-4046, January 24, 1994. The TAGMs are soil cleanup guidelines and are for comparison.
2. For semivolatile organic compounds, the Minimum Detection Limit (MDL) is 330 ug/Kg.
3. Class GA groundwater means that the groundwater is suitable for use as a source of potable water.
4. N/A means no standard is available.

Seneca Army Depot
Ash Landfill
Proposed Remedial Action Plan

Table 8
Summary of Detailed Evaluation of Source Control Options

Criteria	Alternative SC-1 No Action	Alternative SC-2 Excavate Ash Landfill and NCFL Dispose in Off-site Subtitle D Landfill	Alternative SC-3 Excavation/Consolidation to On-site Landfill/Cap	Alternative SC-4 Excavation/Soil Washing/ Solidify Fines/Cap	Alternative Sc-5 Excavation of Debris Piles/ Off-Site Subtitle D Landfill
OVERALL PROTECTIVENESS OF HUMAN HEALTH AND THE ENVIRONMENT					
Human Health Protection (EPA target range is 1 x 10E-4 to 1 x 10E-6 for carcinogenic risk and an HI < 1.0 for noncarcinogenic risk)	Sum of risks to current off-site resident, future on-site hunter and future on-site construction worker 2.9 E-05 HI = 0.22	Sum of risks to current off-site resident, future on-site hunter and future on-site construction worker 2.87E-005 HI = 0.1911	Sum of risks to current off-site resident, future on-site hunter and future on-site construction worker 2.87E-005 HI = 0.1911	Sum of risks to current off-site resident, future on-site hunter and future on-site construction worker 2.83E-005 HI = 0.1934	Sum of risks to current off-site resident, future on-site hunter and future on-site construction worker 2.87E-005 HI = 0.1911
Exposure Pathways Include: Ingestion of Groundwater Dermal Contact Inhalation of Volatile Organics Ingestion of Soils (Future On-site hunter and construction worker only)	Protective for Humans due to exposure to soils; IRM has eliminated risk due to VOCs in soil.	Protective of human health; dependant on landfill maintenance	Protective of human health; dependant on landfill maintenance	Protective of human health; Soils > NYSDEC Criteria excavated, washed, fines solidified	Protective of human health; dependent on landfill maintenance
Protection of Ecological Receptors	Not protective for ecological; Metals remain in-place.	Protects ecological receptors; Sediments > NYSDEC Criteria removed from Ash Landfill area.	Protects ecological receptors; Sediments > NYSDEC Criteria removed from Ash Landfill area.	Protects ecological receptors; Sediments > NYSDEC Criteria excavated, washed, fines solidified	Protects ecological receptors; Sediments > NYSDEC Criteria removed from Ash Landfill area.
COMPLIANCE WITH ARARs	Will comply with all ARARs	Will comply with all ARARs	Will comply with all ARARs	Will comply with all ARARs	Will comply with all ARARs
LONG-TERM EFFECTIVENESS AND PERMANENCE					
Magnitude of Residual Risk	Sources have not been removed. Potential threat will remain.	No residual risk will exist , all materials will be removed.	No residual risk will exist , providing landfill does not leak.	Treatment residuals consisting of coarse fraction will remain on-site but will be tested to assure that no unacceptable levels contamination. Fines solidified to render unreactive	No residual risk will exist providing maintenance of cover integrity. Also, the Debris Piles will be disposed of off-site.
Permanence	Not a permanent solution.	Once soils are placed in the off-site landfill, the remedial action would be permanent.	Once soils are placed in the on-site landfill, the remedial action would be permanent, provided cap integrity is maintained.	Upon completion this action will be considered permanent.	Once soils are placed in the off-site landfill, the remedial action would be permanent, provided cap integrity is maintained.

Seneca Army Depot
Ash Landfill
Proposed Remedial Action Plan

Table 8
Summary of Detailed Evaluation of Source Control Options

Criteria	Alternative SC-1 No Action	Alternative SC-2 Excavate Ash Landfill and NCFL Dispose in Off-site Subtitle D Landfill	Alternative SC-3 Excavation/Consolidation to On-site Landfill/Cap	Alternative SC-4 Excavation/Soil Washing/ Solidify Fines/Cap	Alternative Sc-5 Excavation of Debris Piles/ Off-Site Subtitle D Landfill
REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT					
Reduction of Toxicity, Mobility, or Volume	Little to none; The Army believes that some attenuation is expected due to natural mechanisms.	Very effective in reducing mobility; no effect on toxicity or volume of contaminated soils.	Very effective in reducing mobility; no effect on toxicity or volume of contaminated soils.	Very effective in reducing volume, toxicity, and mobility. Solidification reduces toxicity and mobility. Soil washing reduces the volume.	Very effective in reducing mobility; no effect on toxicity or volume of contaminated soils.
SHORT-TERM EFFECTIVENESS					
Community Protection	Most protective under current conditions as current risk is within acceptable ranges.	Least protective as large volume of contaminated soils is excavated. Dust and truck traffic is threat, transported on-site for disposal.	Most protective of remedial actions as no transportation of waste materials off-site will occur. Some dust will be produced during filling and construction of landfill.	Least protective as large volume of contaminated soils is required. Hazardous materials (acids) may be transported on-site for extraction.	Moderately protective as transportation of waste materials off-site will occur.
Worker Protection	Not applicable.	Least protective ; Excavation and off-site transportation of waste materials increase potential for worker exposure and risk.	Most protective of remedial actions as no transportation of waste materials off-site will occur. Some dust will be produced during filling and construction of landfill. Protection required from exposure.	Least protective ; Excavation and off-site transportation of waste materials increase potential for worker exposure and risk. Use of hazardous materials will also increase potential for worker exposure.	Moderately protective ; Excavation and off-site transportation of waste materials increase potential for worker exposure and risk.
Environmental Impacts	Not applicable.	Least protective due to disruption from xcavation. Restoration will require year before site is fully restored.	Excavation will increase potential for dispersion of contaminated soil	Least protective due to increased potential for spills during washing.	Excavation will increase potential for dispersion of contaminated soil
Time Until Action is Complete	Not applicable	Remdial action: 12 to 18 months	Remdial action: 4 to 6 months	Mob. & Prove-out: 1 to 2 months Soil Washing: 1 to 3 months Backfilling & Demob.: 1month. Moderate time required to attain goals, due to soil washing process rate.	Remediation action: 4 to 6 months.

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IMPLEMENTABILITY					
Technical Feasibility	Not applicable.	Very feasible; area with VOC has been remediated. Equipment required for excavation is standard.	Very feasible; area with VOC has been remediated. Equipment required for excavation is standard.	Soil washing is feasible but least feasible of the four remedial actions as this technology is considered the most innovative and least proven for Ash landfill conditions.	Very feasible; area with VOC has been remediated. Equipment required for excavation is standard.
Ease of Doing More Action if Needed	Least interference, as nothing would be done to prevent required future action.	Little to no interference, site conditions would be restored to original condition.	Most interference as on-site landfill will hamper any future actions.	Moderate level of interference as some equipment slabs and roadways may interfere with future actions. Solidified fines mass fairly permanent	Least level of interference as Debris Piles will be removed and NCFL and Landfill will be covered.
Ability to Obtain Approvals and Coordinates with Other Agencies	No approval necessary	Landfill space is available locally, permitted landfills will accept waste.	Cap technology considered a temporary solution by the EPA.	Moderately likely to be approved as this alternative will involve the construction of a waste treatment facility.	Landfill space is abundant in the region. Permitting will not be req. providing the waste meets the requirements of the landfill. Standard bill of lading required to transport waste materials to facility. Most likely to be approved.
Availability of Services and Materials	No services or capacities required	Moderately available, requires large amount of trucks and excavators, limited amount of equipment available	Moderately available, requires specialized materials and installation contractors.	Least available, as technology is available from small, specialized group of soil washing contractors.	Very available; Subtitle D landfills located nearby.
COST					
Capital Cost	$0	$17.5 Million	$1.37 Million	$31.50 Million	$240,000
Annual O&M Cost	$0	$0	$52,000	$52,000	$52,000
30 Year Present Worth O&M Cost	$0	$0	$490,000	$490,000	$490,000
30 Year Present Worth Cost	$0	$17.5 Million	$1.89 Million	$32.00 Million	$730,000

Seneca Army Depot
Ash Landfill
Proposed Remedial Action Plan

Table 9
Summary of Detailed Evaluation of Migration Control Options

Criteria	Alternative MC-1 No Action	Alternative MC-2 Alternate Water Source with Natural Attenuation of Plume	Alternative MC-3/MC-3a Air Sparging of Plume/ Funnel and Gate with Zero Valence Iron	Alternative MC-5 Collection/Filtration/Air Stripping/Discharge	Alternative MC-6 Collection/Filtration/ UV Oxidation/Discharge
PROTECTIVENESS OF HUMAN HEALTH AND THE ENVIRONMENT Human Health Protection (EPA target range is 1 x 10E-4 to 1 x 10E-6 for carcinogenic risk and an HI < 1.0 for noncarcinogenic risk)	Sum of risks to current off-site esident, future on-site hunter and uture on-site construction worker 2.9E-005 HI = 0.22	Sum of risks remaining to off-site resident, hunter & construction worker following limination of groundwater exposure 2.9E-05 - 5.6E-06 = 2.34E-05 HI = (0.22 - 0.14 = 0.08)	Sum of risks remaining to off-site resident, hunter & construction worker following elimination of groundwater exposure 2.9E-05 - 5.6E-06 = 2.34E-05 HI = (0.22 - 0.14 = 0.08)	Sum of risks remaining following elimination of groundwater as an exposure pathway 2.9E-05 - 5.6E-06 = 2.34E-05 HI = (0.22 - 0.14 = 0.08)	Sum of risks remaining following elimination of groundwater as an exposure pathway 2.9E-05 - 5.6E-06 = 2.34E-05 HI = (0.22 - 0.14 = 0.08)
Exposure Pathways Include : Ingestion of Groundwater Dermal Contact Inhalation of Volatile Organics Ingestion of Soils (Future On-site hunter and construction worker only)	Not Protective; Ingestion of groundwater at site oundary could result in exposure	Protective; Alternative water supply eliminates exposure to groundwater.	Protective; Groundwater exposure is eliminated.	Protective; Groundwater exposure is eliminated.	Protective; Groundwater exposure is eliminated.
Protection of Ecological Receptors	rotective; Depth to groundwater prevents ecological expsoure; atural mechanisms reduces conc.	Protective; Depth to groundwater prevents ecological expsoure; Natural mechanisms reduces conc.	Protective; No Exposure from groundwater	Protective; Conc. of groundwater is reduced prior to discharge	Protective; Conc. of groundwater is reduced prior to discharge
COMPLIANCE WITH ARARs	Not Compliant with ARARs	Not Compliant with ARARs	Will comply with all ARARs	Will comply with all ARARs	Will comply with all ARARs
LONG-TERM EFFECTIVENESS AND PERMANENCE					
Magnitude of Residual Risk	Source of VOCs have been removed. On-site risk is above target range, if water is ingested. Off-site migration can lead to unacceptable risk.	Source of VOCs have been removed. On-site risk is above target range, if water is ingested. Off-site risk is controlled by providing a water supply.	No residual risk will exist , groundwater will be treated until it meets treatment criteria.	No residual risk will exist , groundwater will be treated until it meets treatment criteria.	No residual risk will exist , groundwater will be treated until it meets treatment criteria.
Permanence	Will be permanent once natural mechanisms reduce conc. to State and Federal criteria.	Will be permanent once natural mechanisms reduce conc. to State and Federal critieria.	Once State and Federal groundwater quality criteria is attained the action is permanent.	Once State and Federal groundwater quality criteria is attained the action is permanent.	Once State and Federal groundwater quality criteria is attained the action is permanent.

Seneca Army Depot
Ash Landfill
Proposed Remedial Action Plan

Table 9
Summary of Detailed Evaluation of Migration Control Options

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REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT					
Reduction of Toxicity, Mobility, or Volume	Biodegradation and attenuation will not be efficient to prevent igration and increase the volume of contaminated groundwater. The breakdown product vinyl chloride is a toxic by-product of 1,2-DCE. Vinyl chloride is more obile that the parent compound.	Biodegradation and attenuation will not be efficient to prevent migration. The breakdown product inyl chloride is a toxic by-product o 1,2,-DCE. Vinyl chloride is more mobile than the parent compound. Documentation of migration will be onitored to prevent volume increase	Effective; Constituents are removed or destroyed	Effective; Constituents are removed, trenches will eliminate mobility.	Effective; Constituents are destroyed, trenches will eliminate mobility.
SHORT-TERM EFFECTIVENESS					
Community Protection	Protective under current conditions as current risk is within acceptable ranges.	Protective under current conditions as current risk is within acceptable ranges.	Protective of community; air emissions from sparging eliminated via carbon, will comply with air quality standards.	Protective of community; air emissions from stripping eliminated via carbon, will comply with air quality standards.	Protective of community; No air emissions produced, will comply with air quality standards.
Worker Protection	Protective under current conditions as current risk is within acceptable ranges.	Protective under current conditions as current risk is within acceptable ranges.	Dust produced during construction will be eliminated via personnel protective equipment.	Dust produced during construction will be eliminated via personnel protective equipment.	Dust produced during construction will be eliminated via personnel protective equipment.
Environmental Impacts	Current, short-term, conditions re protective of the environment.	Current, short-term, conditions are protective of the environment.	Protective; Any soil excavated will not contain hazardous constituents.	Protective; Any soil excavated will not contain hazardous constituents.	Protective; Any soil excavated will not contain hazardous constituents.
Time Until Action is Complete	Not Applicable; No action is performed	Estimated to be 45 years with a degradation rate of 0.0003/day	Estimated to be 30 years for sparging; estimated to be 30 years with funnel and gate system, and 15 years with permeable walls.	Estimated to be 30 years with three trenches	Estimated to be 30 years with three trenches

Seneca Army Depot
Ash Landfill
Proposed Remedial Action Plan

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Summary of Detailed Evaluation of Migration Control Options

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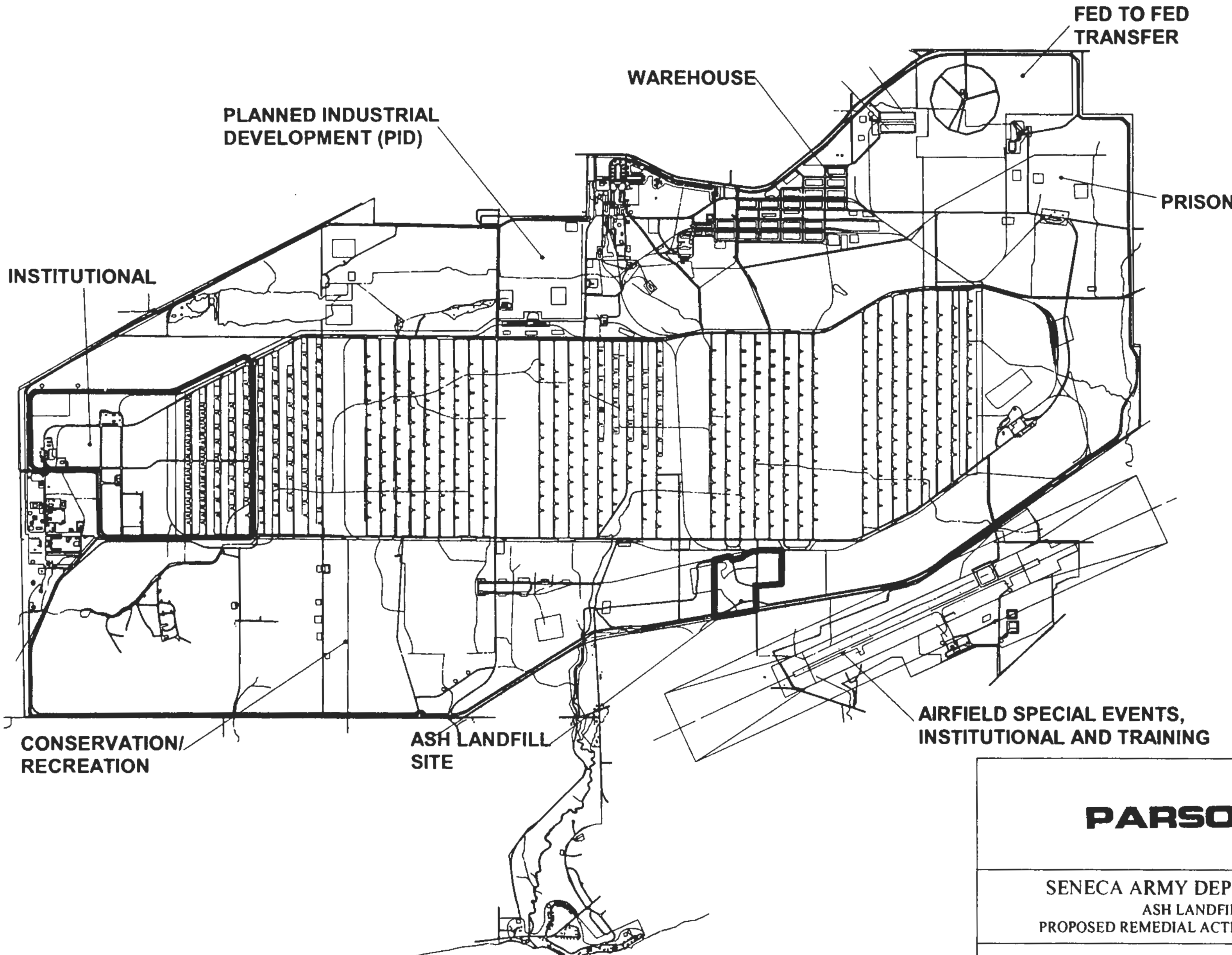
IMPLEMENTABILITY					
Technical Feasibility	Feasible, Nothing is implemented	Feasible, water line can be installed; Natural mechanisms may be degrading pollutants. Degradation may attain acceptable levels Monitoirng will ensure protection.	Feasible; Some uncertainty as zero valence iron is innovative; will require treatability/pilot testing	Feasible; Air stripping is a proven technology for VOC removal in groundwater.	Feasible; UV oxidation is a proven tech. for chlorinated VOCs in groundwater.
Ease of Doing More Action if Needed	Not Applicable; as nothing would be performed in the future	Least interference, as nothing would be done to prevent required future action	This technology will not interfere with any other remedial activities.	Will not interfere with other remedial activities.	Will not interfere with other remedial activities.
Ability to Obtain Approvals and Coordinates with Other Agencies	No Action will be unacceptable to regulatory agencies due to off-site migration	Will require approval for waterline construction from town and the Dept. of Health.	NYSDEC and EPA input required prior to final remedy selection. Regulatory issues will be addressed.	Construction permits are readibly attainable.	Construction permits are readibly attainable.
Availability of Services and Materials	No services required	All services required to install waterline and monitor the plume are readily available.	Material and Services are available. All equipment required is standard	Materials and Services are readily available. All equipment is standard.	Materials and Services are specialized; not as available UV equipment is specialized.
COST					
Capital Cost	$0	$160,000 includes installation of 10 MWs and 4800 l.f. of 6" water main	MC-3 $668,000 MC-3a $2.05 Million	$543,000	$556,000
Annual O&M Cost	$0	$84,000	MC-3 $99,000 MC-3a $86,000	$114,309	$119,546
Operating Life in Years	0	30	30 yr. for MC-3 and 15 yr. for MC-3a	30	30
Operating Life Present Worth O&M Cost	$0	$794,500	MC-3 $1.79 Million MC-3a $656,000 MC-3a $813,000 assuming 30 years	$1.22 Million	1.31 Million
Total Present Worth Cost (Assumes 10% Interest)	$0	30 year Cost $954,500	30 year Cost MC-3 $2.50 Million 15 year Cost MC-3a $2.71 Million 30 year Cost MC-3a $2.86 Million	30 year Cost $1.76 Million	30 year Cost $1.86 Million



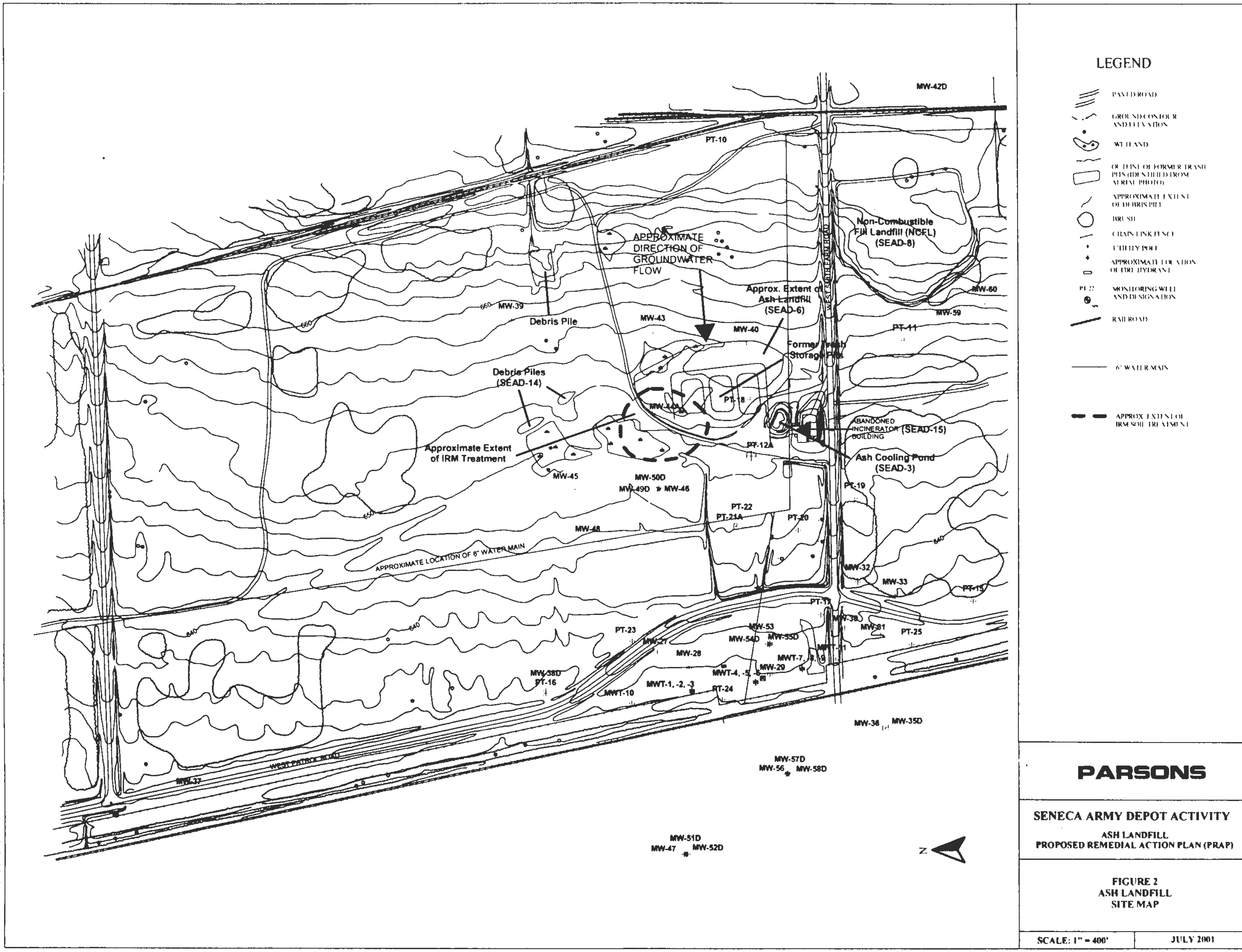
PARSONS

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL
PROPOSED REMEDIAL ACTION PLAN (PRAP)

FIGURE 1
ASH LANDFILL LOCATION
AND PROPOSED LAND REUSE AREAS

NOT TO SCALE	JULY 2001

o: seneca ash_lf prap prap.apr



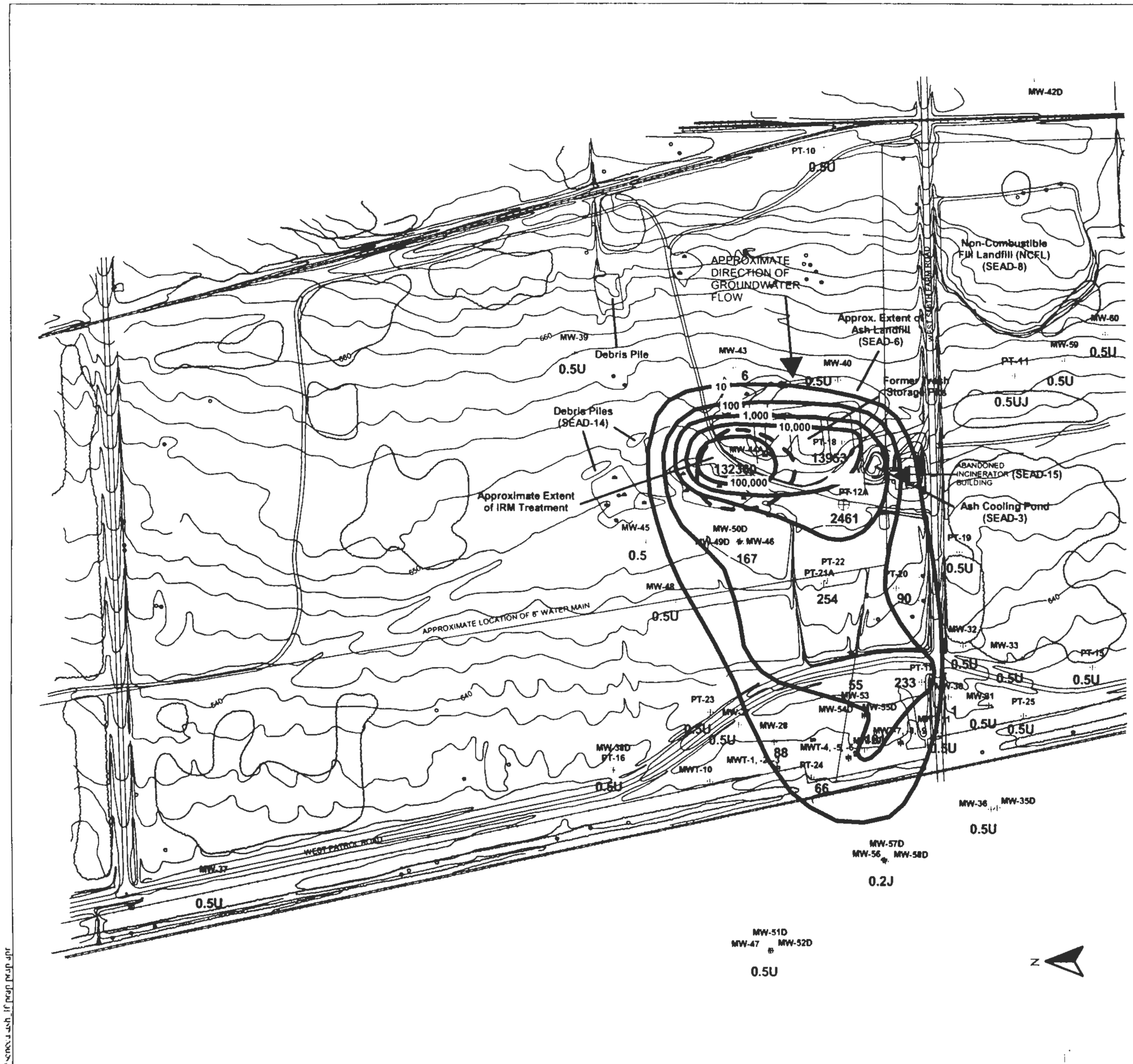
PARSONS

SENECA ARMY DEPOT ACTIVITY

ASH LANDFILL
PROPOSED REMEDIAL ACTION PLAN (PRAP)

FIGURE 2
ASH LANDFILL
SITE MAP

SCALE: 1" = 400'	JULY 2001



LEGEND

▬ ▬	APPROX. EXTENT OF IRM SOIL TREATMENT
▬▬ 1,000	GROUNDWATER ISOCONTOUR (ug/L)
75	TOTAL CHLORINATED ETHENES (ug\L) FROM SAMPLES COLLECTED IN JUNE 1993
0.5U	NO CHLORINATED ETHENES DETECTED (HIGHEST INDIVIDUAL CHLORINATED ETHENE DETECTION LIMIT IS SHOWN)
0.5J	ESTIMATED VALUE
0.5UJ	ESTIMATED DETECTION LIMIT

NOTE:
THE CONCENTRATIONS SHOWN ON THIS FIGURE ARE FOR WELLS SCREENED IN THE TILLED/WEATHERED SHALE AQUIFER.

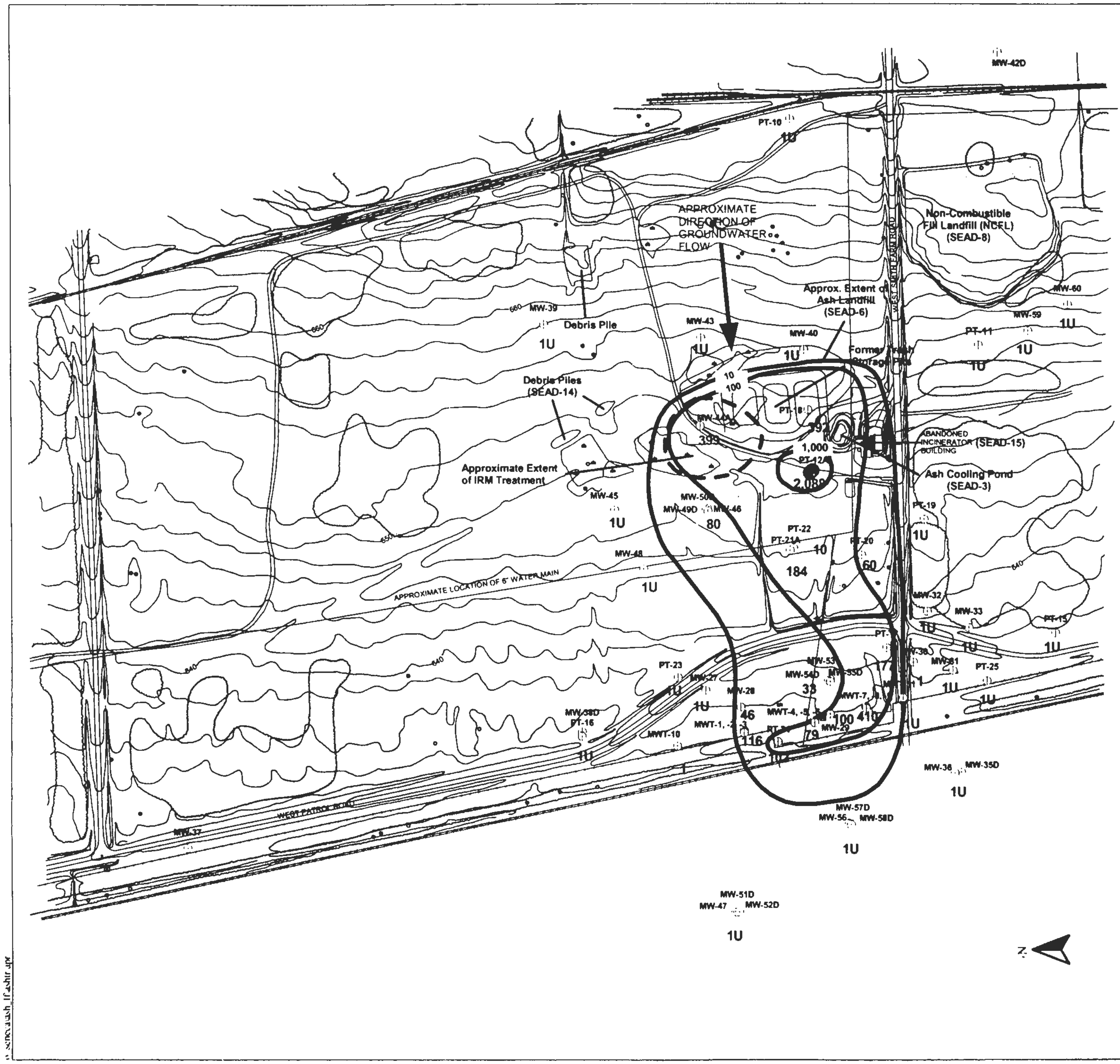
PARSONS

SENECA ARMY DEPOT ACTIVITY

ASH LANDFILL
PROPOSED REMEDIAL ACTION PLAN (PRAP)

FIGURE 3
TOTAL CHLORINATED ETHENES IN GROUNDWATER PRE-IRM PLUME

SCALE: 1" = 400'	JULY 2001



LEGEND

- PAVED ROAD
- GROUND CONTOUR AND ELEVATION (650)
- WETLAND
- OUTLINE OF FORMER TRASH PITS (IDENTIFIED FROM AERIAL PHOTO)
- APPROXIMATE EXTENT OF DEBRIS PILE
- BRUSH
- CHAIN LINK FENCE
- UTILITY POLE
- APPROXIMATE LOCATION OF FIRE HYDRANT
- PT-22 MONITORING WELL AND DESIGNATION
- RAILROAD
- 6" WATER MAIN
- APPROX. EXTENT OF IRM SOIL TREATMENT
- 1,000 GROUNDWATER ISOCONTOUR (ug/L)
- 75 TOTAL CHLORINATED ETHENES (ug/L) FROM SAMPLES COLLECTED IN JANUARY 2000
- 10U NO CHLORINATED ETHENES DETECTED (HIGHEST INDIVIDUAL CHLORINATED ETHENE DETECTION LIMIT IS SHOWN)

NOTE:
THE CONCENTRATIONS SHOWN ON THIS FIGURE ARE FOR WELLS SCREENED IN THE TILLED/WEATHERED SHALE AQUIFER.

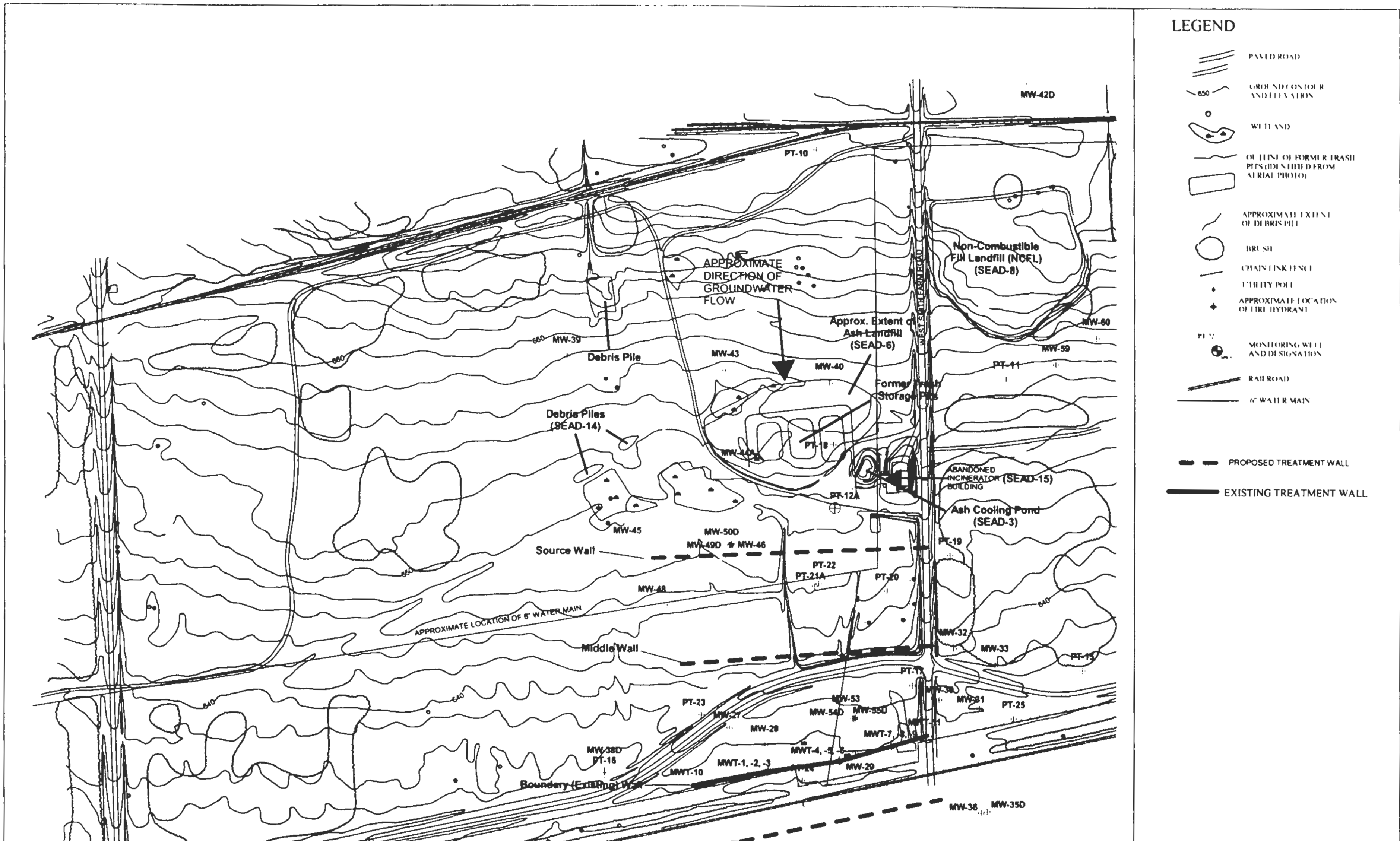
PARSONS

SENECA ARMY DEPOT ACTIVITY

ASH LANDFILL
PROPOSED REMEDIAL ACTION PLAN (PRAP)

FIGURE 4
TOTAL CHLORINATED ETHENES IN GROUNDWATER MOST RECENT CONCENTRATIONS

SCALE: 1" = 400' | JULY 2001



PARSONS

SENECA ARMY DEPOT ACTIVITY

ASH LANDFILL
PROPOSED REMEDIAL ACTION PLAN (PRAP)

FIGURE 5
EXISTING AND PROPOSED REACTIVE BARRIER WALL TRENCHES

SCALE: 1" = 400'	JULY 2001

APPENDIX A
RESPONSE TO COMMENTS

Response to Comments from NYSDEC

RESPONSE to COMMENTS by
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DRAFT PROPOSED REMEDIAL ACTION PLAN
at the ASH LANDFILL
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NY

Response to NYSDEC Comments dated April 25, 1997

Comment #1 **General.** The PRAP should include a site plan of the Ash Landfill site and a second plan showing the groundwater plume and location of three cut-off walls and gates, proposed under the preferred alternative MC-3a.

Response #1 **Agreed;** An updated location map of the Ash Landfill has been included as Figure 1. A site plan of the Ash Landfill site has been included in the PRAP as Figure 2. A groundwater map showing the groundwater plume before and after the IRM has been added as Figures 3 and 4, respectively. The location of the existing and proposed continuous zero valent iron reactive trench has also been added as Figure 5.

Comment #2 **Page 1, Site Background:** This section should include a paragraph detailing all the disposal activities that took place at this site. The disposal activities could be found in Section 1.2.2 of the final feasibility study report.

Response #2 **Agreed;** The following paragraph was added to the end of the "Site Background" section:

"Since 1941 the depot and has been owned by the United States Government and operated by the Department of the Army. Prior to construction of the depot, the site was used for farming. From 1941 to 1974, uncontaminated trash was burned in a series of burn pits, (SEAD-14), near the abandoned incinerator building (Building 2207), (SEAD-15). According to a U.S. Army Environmental Hygiene Agency (USAEHA) Interim Final Report, Groundwater Contamination Survey No. 38-26-0868-88 (July 1987), from 1941 until the late 1950's or early 1960's, the ash from the refuse burning pits was buried in the Ash Landfill (SEAD-6).

The incinerator building was built in 1974. Between 1974 and 1979, materials intended for disposal were transported to the incinerator. The incinerator was a multiple chamber, batch-fed 2,000 pound per hour capacity unit which burned rubbish and garbage. The incinerator unit contained an automatic ram-type feeder, a refractory lined furnace with secondary combustion and settling chamber, a reciprocating stoker, a residue conveyor for ash removal, combustion air fans, a wet gas scrubber, an induced draft fan, and a refractory-lined stack (USAEHA, 1975). Nearly all of the approximately 18 tons of refuse generated per week on the depot were incinerated. The source for the refuse was domestic waste from depot activities and family housing. Large items that could not be burned were disposed of at the NCFL (SEAD-8). The NCFL is approximately 2-acres and is located southeast of the incinerator building (immediately south of the SEDA railroad line). The NCFL was used as a disposal site for non-combustible materials, including construction debris, from 1969 until 1977.

Ashes and other residues from the incinerator were temporarily disposed of in an unlined cooling pond (SEAD-3) immediately north of the incinerator building. The cooling pond consisted of an unlined depression approximately 50 feet in diameter and approximately 6 to 8 feet deep. When the pond filled (approximately every 18 months), the fly ash and residues were removed, transported, and buried in the adjacent Ash Landfill east of the cooling pond. The refuse was dumped in piles and occasionally spread and compacted.

No daily or final cover was applied during operation. The active area of the Ash Landfill extended at least 500 feet north at the incinerator building, near a bend in a dirt road, based on an undated aerial photograph of the incinerator during operation. A fire destroyed the incinerator on May 8, 1979, and the landfill was subsequently closed. A vegetative cover, comprised of native soils and grasses, was present during the RI.

A grease pit disposal area near the eastern boundary of the site was used for disposal of cooking grease. Burn areas, surrounding the Ash Landfill, included areas of blackened soil, charred debris and areas of stressed or dead vegetation."

Comment #3 **Page 2, first column, first paragraph, last sentence:** Please insert "above" between feet and Mean to read "*....600 feet above Mean Sea Level (MSL).*"

Response #3 **Agreed**. The text has been revised.

Comment #4 **Page 2, Soil:**

i) The first sentence should be corrected to read "The primary VOCs in soils.....";
ii) This section should detail concentration of VOCs and semi-VOCs before and after the removal action;
iii) Please define the term "95th UCL of the mean" (page 3, first column, first paragraph). It may be difficult for a common person to understand this term without explanation. In addition, it appears that this term has been calculated incorrectly. Some of the values shown on Table 1 are lower than mean value (see FS report for mean values).
iv) Please define the term "post prove out soil samples."
v) Please define TCLP (page 3, first column, first paragraph). The last two sentences of this paragraph are ambiguous. It states TCLP metal concentration in mg/kg which appears to be incorrect. Please elaborate metal concentration in soil before and after the removal action.

Response #4 **Agreed;**

i) The first sentence was changed to read "The primary VOCs in soils......"
ii) Table 1, Table 2, Table 3 and Table 4 have been revised to include the concentration of constituents in soil before and after treatment. Table 1 and Table 2 includes all site data, before and after the IRM. Table 3 and Table 4 includes data from only the areas where treatment was performed. Text has also been added to this section that identifies the maximum concentration of TCE prior to and following soil treatment. In many instances the mean values are higher than the 95th UCL of the mean values. This is most likely due to the fact that the distribution of the data was lognormally distributed. The arithmetic mean is simply the sum of each value divided by the number of samples and does not consider the distribution of the data. The data in Table 1 is identical to the values provided in the FS, see Table 2.1. Perhaps the differences were due to comparisons to different depths. Table 2.1 includes soil depths from 0 to 2 feet and all depths for the values provided for all soil at all depths.
iii) A paragraph has been added that explains the term 95th UCL of the mean.
iv) The term "post prove out soil samples" has been removed and replaced with post treated samples. The summary data presented on page two reflects the entire set of soil samples that were collected from the treatment program, including the prove-out testing and the post prove-out testing that was performed during the actual treatment operations.
v) The concentration reported in the text was incorrectly reported as mg/kg. It has been changed to ug/L, (ppb). Additional explanation of what the results of the TCLP testing and the total testing is provided to distinguish the difference between a TCLP test and a total test.

Comment #5 **Page 3, Groundwater:** This section should also discuss the results of groundwater samples taken after the removal action.

Response #5 **Agreed**; Additional discussion regarding the decrease in the groundwater concentrations that were observed following the removal action is provided. Figures 3 and 4 have been added to highlight the reductions in groundwater concentrations that have been observed following the soil thermal treatment Interim Remedial Measure (IRM).

Comment #6 **Page 3 - Human Health Risk Assessment:** The second sentence of the second paragraph of this section states incorrectly that xylene and toluene are PAHs (polynuclear aromatic hydrocarbons). Please delete "PAH" from this sentence.

Response #6 **Agreed.** The sentence was incorrectly worded and mistakenly implied that toluene and xylenes are PAH compounds. This sentence has been modified to state that the compounds toluene, xylene, and some PAHs cause cancer in laboratory animals and are suspected carcinogens. The reference to PAHs were kept in this sentence since PAHs are suspected carcinogens.

Comment #7 **Page 4 - Human Health Risk Assessment:**

i) The first sentence of the second paragraph in the right hand column of this page incorrectly states that LRA is an acronym for the Land Redevelopment Authority. In fact, LRA is an acronym for Local Redevelopment Authority. Please make this correction.

ii) The first bullet on page 5, second column should also include VOCs.

Response # 7 **Agreed**. (i)The LRA has been changed to Local instead of Land.
(ii) VOCs have been added to the bullet.

Comment #8 **Alternative SC-3, Excavation of the Ash Landfill and Debris Piles/Consolidation at the NCFL/CAP the NCFL:**

i) <u>second paragraph, second line</u>: Please correct it to read ... "Bend in-the-road:...;

ii) <u>10th line</u>: Please insert contact between dermal and or. It should read "the most likely exposure pathway is from dermal contact or ingestion....";

iii) It should be stated that the cap will meet requirements of 6NYCRR Part 360.

iv) <u>second column, first paragraph</u>: This paragraph appears to be redundant. The removal action has already been completed and therefore this paragraph does not add any significant value.

Response #8 **Agreed**. i) Road has been changed to road.
Agreed ii) Dermal has been contact has been inserted between dermal and or
Disagreed iii) The proposed cover will be a vegetative cover that will prevent exposure to the landfill contents, such as metals and PAHs, that have been buried in the NCFL and the Ash Landfill. The proposed vegetative cover will be 12-inches thick but will not include all the components of a landfill closure cap such as a gas venting layer, nor a low permeability soil barrier. The vegetative cover will therefore not meet the requirements of 6NYCRR Part 360. A cap required by 6NYCRR Part 360 is not considered necessary, as the landfill materials are not leaching and the risk from exposure due to ingestion or dermal contact can be prevented by a vegetative cover. The source of the groundwater plume, comprised of chlorinated ethenes, was not from the NCFL or the Ash Landfill. The source of the groundwater plume was soil that has been excavated and treated by the IRM. Since the landfill contains ash and non-combustible fill materials (primarily construction debris) landfill gases were either not present or low. Migration of landfill gas is not considered to pose a threat since there are no receptors near the landfill. Since the future land use is conservation/recreational, not residential, a gas collection layer was

deemed unnecessary. The reference to a barrier such as clay or a geomembrane has been removed.

Agreed iv) The paragraph has been removed.

Comment #9 **Alternative SC-5, Excavation of Debris Piles/Disposal in an Off-site, Non-hazardous Subtitle D Landfill:**

i) Table 2 (page 1 of 3) states that sediments greater than NYSDEC criteria will be removed from the Ash Landfill site. Please indicate the concentration and location of sediments exceeding the NYSDEC criteria on page 2 of the PRAP under surface water and sediment section, and the details of sediment removal as part of the remedy in this section;

ii) Please indicate minimum thickness of soil cover;

iii) Last paragraph states that "*If testing indicates that the soils are not suitable for disposal in Subtitle D landfill, then ... onsite landfilling and capping would be considered.*" Based on the available data it does not appear that the soil will fail the TCLP test and therefore would most likely be disposed of in a Subtitle C landfill instead of considering the unacceptable hypothesis of constructing a landfill on site.

Response #9 **Agreed;**

i) There are no plans to remove sediment from the site. As described in the summary of the remedial investigation, the only one wetland, Wetland WB, was impacted. This wetland was removed during the IRM thermal treatment project. Reference to removal of sediment in Table 2 has been removed.

Agreed;

ii) The minimum thickness of the soil cover at the NCFL and the Ash Landfill is 12 inches. This has been added to the text.

Agreed;

iii)The text has been changed. The reference to constructing an on-site landfill has been removed.

Comment #10 **Alternative MC-2, Provide Alternate Water with Natural Attenuation:**

i) The third paragraph incorrectly states that the NYSDEC groundwater standards for heavy metals have not been exceeded in on-site wells. Please correct this error;

ii) The fourth paragraph states that a contingency plan would be initiated, if the groundwater data indicates a statistically significant rising trend in the concentration of heavy metals or semivolatiles.

a) It is our understanding that the alternate water supply to existing threatened farm houses will be provided as part of the remedy. The groundwater monitoring will be conducted to ensure protection to future residents and to monitor the plume. This alternative should clearly state this.

b) The main contaminants of concern at this site are volatile organics (VOCs) in the groundwater monitoring program and the resulting data should be used for implementation of the contingency plan.

c) Please give details of the contingency plan.

Response # 10 **Agreed** i)

The statement that groundwater standards for heavy metals have not been exceeded in on-site wells has been removed.

Agreed ii)

a) Text has been added that states that the groundwater monitoring will be conducted to ensure protection of future residents and to monitor the plume.

b) The text has been modified to indicate that the groundwater monitoring program will monitor volatile organics.

c) Details of the contingency plan have been added. The text has been modified to identify what aspects of the contingency plan will be performed to assure continued protection of off-site receptors. This will include an evaluation of the most appropriate technology, in this instance, air sparging of the plume is the preferred contingency option.

Comment # 11 **Alternative MC-3a, Funnel and Gate/In-situ Treatment:** This alternative does not include any plan for treatment of the contaminated groundwater that has already migrated off site and lies between the existing farmhouse and the Ash Landfill site (Tax Map Parcel #7-1-02). The placement of the passive groundwater collection trenches on the Seneca Army Depot property will not capture this groundwater. This alternative should include periodic groundwater monitoring and a contingency plan to protect the threatened farmhouse and any future off-site resident from the contaminated groundwater which has already migrated off site. Additionally, the groundwater monitoring would be required to evaluate the performance of this remedy.

Response # 11 **Agreed;** This alternative will include a groundwater monitoring program to monitor the effectiveness of the reactive barrier wall. If the water supply to an off-site receptor is threatened, then the contingency plan will include activated carbon adsorption at the receptor location. Carbon adsorption will be used to remove the dissolved chlorinated organics prior to use.

Comment # 12 **Alternative MC-5, Interceptor Trenches/Tank Storage/Filtration/Air Stripping/Discharge to Surface Water, last paragraph:** Please explain why a substantial piping system will be required, when the effluent water will be discharged to the drainage ditch located along the sides of the patrol road.

Response # 12 **Agreed;** The reference to a substantial piping system has been removed. The discharge from the treatment system will be to the nearby drainage ditches, not directly to Kendaia Creek. For cost estimating, the final length of discharge pipe will remain as priced in this alternative.

Comment # 13 **Preferred Alternative, page 11, last paragraph:** It states " *...if migration of the plume continued, a subsequent remedial action would be taken.* " Please provide details of the subsequent remedial action in the details of alternative MC-3a (page 9). Please also see our comments on Alternative MC-3a regarding the contingency plan.

Response # 13 **Agreed;** The subsequent remedial action that will be implemented will involve installation of activated carbon adsorption vessels at the receptor location.

Comment # 14 **Table for Soil Contamination for all depths and Groundwater Contamination:** The PRAP should include two tables showing the details of soil and groundwater contamination and applicable ARARs or TAGMs.

Response # 14 **Agreed;** Table 1 and Table 2 been provided that describes the concentration of soil, before and after the IRM. These two tables include all the soil data collected from the site. Table 2 is different from Table 1 in that the VOCs and Semi-VOCs from soil samples within the areas where the IRM was performed were excluded from the calculations. The concentrations of metals remained the same as the treatment process did not remove metals from soil.

Comment # 15 **Table 3, Page 1 of 3:** In the row regarding Permanence the statement "*once treatment criteria of <5ug/l is attained the action is permanent*" is made for three of the migration control remedial alternatives. Since the clean-up goal for vinyl chloride in groundwater is actually 2 ug/l perhaps it would be better to state "once the remedial action objectives have been attained the action is permanent".

Comment # 15 **Agreed;** The text in the table, which has been renamed **Table 6**, has been modified to indicate that the action is considered permanent once the State and Federal groundwater criteria have been attained.

RESPONSE TO COMMENTS From
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DRAFT PROPOSED REMEDIAL ACTION PLAN
at the ASH LANDFILL
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NY
NYSDEC Comments Dated October 9, 1997 from Marsden Chen

I am confirming our telephone discussion of October 3, 1997 on the Ash Landfill PRAP. We agreed:

Comment #1 a) That adequate groundwater monitoring wells would be constructed downgradient of the funnel and gate groundwater remedy for evaluation of the effectiveness of the remedy.

Response #1 Agreed; The reactive barrier wall demonstration study was installed in December, 1997. Following recommendations of the NYSDEC, Parsons ES installed three (3) well clusters of monitoring wells along the wall. At each cluster, one well was installed 2.5 feet upgradient, one was installed in the trench and one was installed 2.5 feet downgradient of the trench. Each of the clusters were spaced approximately 150 to 200 feet apart. At the suggestion of the NYSDEC, one cluster, the southernmost one, was installed in an area of the plume that was a zone of higher contamination. In addition, one well was installed at each end of the trench. Monitoring data has been collected for 4 quarters and the report is being finalized.

Comment #2 b) Adequate monitoring of the groundwater immediately upgradient of the farmhouse will also be done for detection of potential exposures to the contaminated plume not treated by the remedy. The well(s) for this monitoring will be separate from those in item a) above.

Response #2 Agreed; As part of the final remedy, the Army will perform monitoring of the downgradient farmhouse drinking water wells. The exact number, frequency and location of these wells will not be specified in the PRAP but will be described in the final design documents.

Furthermore, the following modifications are need in your PRAP:

Comment #3 c) A map or schematic is required to locate and identify the Ash Landfill, non-Combustible Landfill, groundwater plume and farmhouse. No such map is to be found in the RI/FS or PRAP.

Response #3 Agreed; An updated site map has been included in the PRAP as Figure 2.

Comment #4 d) A simple statement explaining the location of "Bend of the Road" should be inserted in the RI summary on page 2. The public at large will not be clear on the phrase.

Response #4 Agreed; The location of the "Bend in the Road" has been added.

Comment #5 The PRAP has stated that the excavated soils were cleaned by LTTE, but no mention has been made of the soils remaining in the excavated hole. If data shows those soils to be clean, the PRAP should clearly say so.

Response #5 Agreed; Tables have been added that describe the results of the LTTD IRM. Additional text has been added that provides a summary of the LTTD IRM results.

Comment #7 e) In Alternative SC-5, the term "vegetative soil cover" should be corrected. Please state that the treated soils backfilled into the NCLF (not NCFL) and Ash Landfill is clean soil (from the LTTE) and proper grading and a vegetative cover will be planted to ensure acceptable drainage and erosion control respectively.

Response #7 Agreed; From your comments there is some confusion regarding the work that was performed during the IRM. The soils that were treated during the LTTD IRM were not excavated from the Non-Combustible Fill Landfill (NCFL), therefore, the soils were not backfilled from an area that was not excavated. Soils were excavated from the "Bend in the Road" area which extended partially into the Ash Landfill. This material was screened to remove large debris that would not fit through the LTTD. Once treated and tested, the soil was backfilled into the excavation, graded and a vegetative cover was then established. The cover is established based upon the most recent visit to this site. A sentence has been added to the text that states that following backfilling, a vegetative cover was established to prevent erosion.

Comment #8 f) Your PRAP (page 2) states that the Ash Landfill is approximately 130 acres. Further description of the operable unit, area of concern and the actual size of the Ash Landfill is required, since my recollection is that the actual size of the landfill is the ±3 acres range.

Response #8 Agreed; The entire Ash Landfill Operable unit was expanded during the scoping phase of the work to 130 acres. The RI performed investigative activities over 130 acres that included soil gas survey, geophysical mapping, soil borings, etc. The results of the RI concluded that the areas of concern were the Ash Landfill, the Debris Piles, the NCFL and the groundwater plume. The area of the SWMUs that comprise the Ash Landfill Operable Unit have been added. The area that encompasses these items is much less than 130 acres.

Comment #9 g) On page 3 of the PRAP, soils section, the units, mg/kg, for lead should be checked. Please review your data and confirm either mg/kg or ug/kg for all instances of Pb in the PRAP.

Response #9 Agreed; The units have been corrected.

Comment #10 These comments above are in addition to those sent you on April 25, 1997, and the NYSDEC requests that a final draft copy incorporating these changes should be sent us for review, prior to offering to the public.

Response #10 Agreed; The April 25, 1997 comments have been addressed.

<u>Additional Addendum Comments Dated October 9, 1997</u>

We request that:

Comment #1	a) The PRAP state that other remedial alternatives for the groundwater contaminated plume will be assessed, should the funnel and gate in-situ remedy prove to be ineffective.
Response #1	Agreed; The description of the alternative, MC-3a, includes a contingency alternative of monitoring and providing carbon treatment at the farmhouse.
Comment #2	b) The PRAP state that a remedy will be applied to the untreated groundwater contaminated plume, should the early-warning monitoring well upgradient of the farmhouse indicate unacceptable levels of contamination. Deed restriction may not be an alternative, since we believe the plume have encroached onto private property.
Response #2	Agreed; The plan is to add an additional trench downgradient of the existing trench to address the materials that may have existed on the downgradient side of the existing trench. Monitoring wells will also provide detection of the plume should this additional trench be insufficient. If monitoring detects contamination approaching the farmhouse well then a carbon adsorption system will be place at the farmhouse to provide assurance that the water supply is protected.

Response to Comments
From
New York State Department of Environmental Conservation (NYSDEC)

Draft-Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill and the Draft Feasibility Memorandum for Groundwater Remediation Alternatives using Zero Valence Iron Continuous Reactive Wall at the Ash Landfill Seneca Army Depot Activity, Romulus, NY

Comments Dated April 6, 2001

This is regarding the above referenced Draft-Final Proposed Remedial Action Plan (PRAP) and the Draft Feasibility Memorandum for Groundwater Remediation Alternatives Using Zero Valence Iron Continuous Reactive Wall at the Ash Landfill prepared by Parsons Engineering-Science (Parsons ES) for SEDA through the U.S. Army Corps of Engineers New York District and Huntsville Division.

In addition to the changes made to the document Draft-Final Proposed Remedial Action Plan (PRAP) as requested in the comments below, the results and conclusions of the Treatability Study for the reactive iron wall and the groundwater flow and transport modeling of different treatment wall configurations have been incorporated into remedial option MC-3a. The costs of this option have been updated to reference the costs that have been developed in the Draft Feasibility Memorandum.

Comment No. 1: A Table of Contents should be included.

Response No. 1: Agreed. A Table of Contents has been included.

Comment No. 2: As requested in our comment letter of October 9, 1997, "a map, or schematic is required to locate and identify the Ash Landfill, non-Combustible Landfill, groundwater plume and farmhouse". The farmhouse is not depicted in any of the figures in the current Proposed Plan.

Response No. 2: Agreed. The location of the farmhouse relative to the Ash Landfill and the groundwater plume is shown on new Figure 3. Figures 3 through 5 have been renamed as Figures 4 through 6.

Comment No. 3: Under the Preferred Alternative, the discussion on the contingency plan involving air sparging is limited to one sentence and should be expanded. A reference to the discussion on Alternative MC-3, Air Sparging of Plume, should also be included.

Response No. 3: Agreed. The following paragraph has been added:
"A contingency plan will be developed as part of this preferred alternative. The contingency plan will include additional monitoring and air sparging, as necessary. Following installation of the reactive walls, groundwater from monitoring well MW-56 (see Figure 2 for location) will be analyzed and the VOC results will be compared to the Class GA groundwater standards (trigger criteria). If a statistical analysis of the data for this well shows exceedances of Class GA standards, additional remedial action will be required. Temporary wells will be installed in the vicinity of MW-56, and the results will be used to develop an approach for air sparging. A description of the air sparging process is summarized in Alternative MC-3. If concentrations at MW-56 continue to exceed the trigger values following air sparging, an activated carbon system for the farmhouse water supply system will be installed or public water will be delivered to the house. More extensive air sparging will be performed until trigger values are no longer exceeded."

Comment No. 4: For Alternative SC-3, the Department still believes that the cap would be required to meet 6NYCRR Part 360, despite the Army's response to NYSDEC comments. However, because the preferred alternative does not suggest this technology, the NYSDEC feels resolution may not be essential.

Response No. 4: Agreed. The Army will resolve this issue if required at a later date.

Comment No. 5: In response to NYSDEC comments (specifically comment # 13 of April 25, 1997, comment # 1 and # 2 of October 9, 1997) the Army states that if there is contamination detected in the early warning wells an activated carbon treatment system will be placed at the farmhouse to provide assurance that the water supply is protected, however this is not located anywhere in the body of the Proposed Plan. Please reconcile.

Response No. 5: Agreed. See Response No. 3.

Comment No. 6: As requested in Comment # 14 in the State's comment letter of April 27, 1997, the Proposed Plan should include a table showing the details of groundwater contamination and applicable ARARs.

Response No. 6: Agreed. A new Table 5 shows the concentrations of the total VOCs detected in the groundwater monitoring wells for four sampling rounds: June 1993, June 1997, October 1999 and January 2000. VOCs are summarized since they are the contaminants of concern. This table shows the VOC concentration changes with time. Other contaminants detected in the wells are discussed in the PRAP under *Non-Time Critical Removal Action Summary.* Table 7 has been inserted into the PRAP and provides a list of the applicable ARARs as listed in the *Feasibility Study Report at the Ash Landfill Site* (Parsons, December 1996).

Comment No. 7: On Table 2, there should be a footnote explaining that "Table 2 is different from Table 1 in that the VOCs and Semi-VOCs from soil samples within the areas where the IRM was performed were excluded from the calculations," as stated in Army Response # 14. The title "All Soil Sample Results – Post IRM" is misleading if the table merely reflects pre-IRM sample results with certain data deleted.

Response No. 7: Agreed. The above referenced footnote has been added to Table 2. The title of Table 2 has also been changed to "Soil sample results from outside of the IRM area only – pre IRM".

General Comment: Although the Department does not agree with all of the suggestions and conclusions made, the NYSDEC believes that the Draft Feasibility Memorandum of August 2000 is sufficient for backup documentation for the Proposed Plan. The Department agrees that the treatability study is sufficient to demonstrate that an adequate iron filing permeable reactive barrier (PRB) will degrade the chlorinated solvents present in site groundwater. We encourage the inclusion of additional design methods outlined in the Interstate Technology Regulatory Cooperation document relative to PRBs in addition to reliance on mathematical calculation estimates provided by vendors.

Response: Agreed. The Army will consider additional design methods outlined in ITRC guidance and other cooperative publications during the final design of the permeable reactive walls.

Response to Comments From
New York State Department of Health (NYSDOH)

Draft-Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill
NYS Inactive Hazardous Waste Disposal Site No. 8-50-006
Seneca Army Depot Activity, Romulus, NY

Comments Dated: April 10, 2001
Date of Comments Response: September 24, 2001

This document is in reference to the Draft-Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill, Seneca Army Depot Activity (SEDA), Romulus, New York. Parsons Engineering-Science (Parsons) prepared this document for SEDA through the U.S. Army Corps of Engineers New York District and Huntsville Division.

1. Comment: This PRAP goes to some length to point out that the baseline risk assessment indicated that the USEPA's target risk range is not exceeded under the current or expected future use scenarios but does not plainly state that under a future residential reuse scenario the USEPA's target risk range is exceeded. I agree with the contention in the "Human Health Risk Assessment" section of the PRAP that the planned reuse for this property is conservation/recreation and that future residential reuse is unlikely. Until the selected remedy for treatment of groundwater achieves the remedial action goals the contaminated groundwater, if used as a source of potable water, will continue to pose a threat to human health. This PRAP is unacceptable without provisions for institutional controls to prevent human exposure to contaminated groundwater. If the Ash Landfill property is to be transferred or leased before the groundwater is acceptable for all uses a deed restriction will be necessary.

   Response: Agreed. A formal discussion and development of appropriate Institutional Controls will be included in the final design based, at least in part, on discussions with NYSDEC, NYSDOH, and USEPA.

2. Comment: Finally, I don't think it's appropriate for the Army to speculate on the intentions of the adjacent property owner. Because this is privately owned property outside the Army's control the owner may elect to build a residence there at any time. Groundwater monitoring at the Ash Landfill has demonstrated that the contaminant plume has migrated from the site and has reached the adjacent property. Fortunately, the off-site levels of contamination are well below drinking water standards. I am confident that the preferred groundwater remedy will preclude further off site migration of the contaminant plume and will eventually

eliminate this potential risk. However, until the groundwater remedy is complete it will be necessary to monitor the use of the adjacent property as well as the groundwater quality.

Response: Agreed. Although VOCs have not been detected off-site since June 1997 and off-site exceedance of NYSDEC GA Groundwater Standards has never been observed, future monitoring will be required to detect off-site migration, if any, in the future. A post-closure monitoring plan will be developed during the design phase that will present a protocol for determining if additional action is required in the event of groundwater exceedances on the adjacent property.

Response to Comments From
New York State Department of Environmental Conservation (NYSDEC)

Draft Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill
NYS Inactive Hazardous Waste Disposal Site No. 8-50-006
Seneca Army Depot Activity
Romulus, New York - July 11, 2001

Comments Dated: August 9, 2001
Date of Comment Response: September 24, 2001

This document is in reference to the Draft-Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill, Seneca Army Depot Activity (SEDA), Romulus, New York. Parsons Engineering-Science (Parsons) prepared this document for SEDA through the U.S. Army Corps of Engineers New York District and Huntsville Division.

1. Comment: Please remove "Superfund" from the title. The Army is a responsible party as defined in Section 107 of CERCLA therefore the term "Superfund" is not applicable to this site.

   Response: Agreed. "Superfund" has been removed from the cover page, title page, heading for the table of contents page, and the heading on Page 1.

2. Comment: Page 3, Non-Time Critical Removal Action Summary: TAGM is an acronym for Technical and Administrative Guidance Memorandum, not Manual. Please change accordingly.

   Response: Agreed. "Manual" has been replaced with "Memorandum" when referring to TAGM on Page 3.

3. Comment: Page 4, Non-Time Critical Removal Action Summary: The last sentence of the first full paragraph should be corrected to read "as the concentrations of VOCs in groundwater in the area has decreased over 100 fold."

   Response: Agreed. The words "concentration of" have been replaced with "concentrations of VOCs in" in the last sentence of the 1st paragraph on Page 4.

4. Comment: Page 7, Human Health Risk Assessment: In the right hand column, locally the lake is referred to Seneca Lake not Lake Seneca.

   Response: Agreed. "Lake Seneca" has been changed to "Seneca Lake" on page 7.

5. Comment: Page 21, State Acceptance: Please remove the statement "NYSDEC has preliminarily agreed with the preferred alternative in this PRAP," and replace with the following: "State acceptance for the preferred alternative will be assessed in the Record of Decision following review of state comments received on the RI/FS report and the Proposed Plan."

   Response: Agreed. Text has been replaced, as recommended.

6. Comment: Page 22, Preferred Alternative: Exceedences of Class GA Standards should not be based on what a statistical analysis of data shows but if there is simply an exceedence of a standard. The text should be corrected to state that if there is an exceedence of the trigger criteria, then remedial action may be required. The wells to be installed in the vicinity of MW-56 should not be temporary but permanent to allow resampling of the specific location if need should arise in the future.

   Response: Agreed. A post-closure monitoring plan will be developed during the design phase that will present a protocol for determining if additional remedial action is required should a Class GA Standard be exceeded. We believe that a single, potentially isolated exceedance should not necessarily trigger additional remedial action.
7. Comment: Page 24, Glossary: Text under "Detection Limit" should not be italicized.

   Response: Agreed. Italics format of Text under "Detection Limit" has been changed to the standardized format of the other definitions on Page 24.

8. Comment: Page 25, Glossary: The work "Filtration", above which it is being defined, should be bolded.

   Response: Agreed. The word "Filtration" has been bolded and italicized when it appears as a heading on Page 25.

9. Comment: Page 31, Glossary: The font for "Threshold Criteria" should be changed to like text.

   Response: Agreed. The font for "Threshold Criteria" on Page 31 has been changed to conform to other headings in the Glossary.

10. Comment: Appendix A: Response to comments should not be included in the Proposed Plan document, they should be sent to the regulatory agencies under separate cover. Also, NYSDOH comments on the previous draft were sent on April 17, 2001, however the Army has yet to respond to these comments. Please forward the Army's response to the NYSDOH comments.

    Response: Agreed. Responses will be removed from the appendix and sent to regulatory agencies as suggested. The Army's response to NYSDOH comments (dated April 10, 2001; sent April 17, 2001) will be forwarded to NYSDEC.

11. General Comment: We note the body of this document suffers from a lack of concrete discussion and development of Institutional Controls. This may be due to the fact that the first iteration of the Proposed Plan was issued several years ago when there was not as developed guidance on Institutional Controls as today. Once all agency comments are received by SEDA, we suggest that a teleconference be held with the regulatory agencies to discuss this further.

    Response: Agreed. A formal discussion and development of Institutional Controls will be included in the final design based, at least in part, on discussions with the appropriate regulatory agencies. SEDA welcomes a teleconference to discuss Institutional Controls.

The following comment/responses from the NYSDEC/NYSDOH (October 11, 2002) will be integrated into the Final Proposed Plan following the public comment period.

Please note that the attached Figure 3 will be inserted into the document and all figures will be renumbered.

Response to Comments from the New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH)

Subject: Final Proposal Plan for the Ash Landfill
Seneca Army Depot
Romulus, New York

Comments Dated: October 11, 2002

Date of Comment Response: December 11, 2002

The New York State Departments of Environmental Conservation (NYSDEC) and Health (NYSDOH) have reviewed the above referenced document dated July 2002. Comments are as follow:

Army's Response to Comments:

Comment 1: Contrary to what is stated in the Army's response to NYSDEC's April 6, 2001 comment #2, the location of the farmhouse relative to the groundwater plume is not indicated in any of the figures in this document.

Response 1: Agreed. The figure (Figure 3) was included in the June 2001 Final Proposed Plan; however, it was inadvertently left out of the July 2002 version. The figure has been added. A sentence has been added to the Groundwater section of the Remedial Investigation Summary that states, "The location of the farmhouse is provided on Figure 3".

General Comments:

This document is rather difficult to discuss without section numbering. The Army should include section numbers to help differentiate sections and subsections.

There were several typographical errors noted in this document, similar to those pointed out in our teleconference of July 16, 2002 on the SEADs 25 and 26 Draft Final Proposed Plan. The Army should review and revise these errors. For instance, the phrase "will" is used in several areas where "would" should be used. The term "PRAP" appears many times throughout the document, and in each instance, it should be replaced with "Proposed Plan". Also, the page number of this document is in need of revision.

Response: Agreed. The sections and subsections will be numbered in typical report format. The document will be reviewed for typographical errors and revised as necessary.

Specific Comments:

Comment 1: Page 1, Purpose of Proposed Plan: In the third sentence, please remove the phrase "with support from" and replace it with more appropriate wording such as "in cooperation with". The USEPA and NYSDEC entered into the Federal Facilities Agreement as equal entities therefore the regulatory agencies are not "support" agencies as otherwise indicated.

Response 1: Agreed. The requested change has been made.

Comment 2: Page 3, Remedial Investigation Summary: The first sentence in this paragraph is extraneous and should be stricken from the text.

Response 2: Agreed. The requested change has been made.

Comment 3: Page 9, Summary of Remedial Alternatives: Please revise the statement "following treatment, post prove-out sampling...areas" to "Following treatment, post excavation sampling...areas". "Post prove out" is not reader friendly.

Response 3: Agreed. The requested change has been made.

Comment 4: Page 10, Alternative SC 1: Although it is stated that current security measures would be eliminated or modified to assist in the timely transfer or lease of the property, the Army may want to list what those measures currently are and what the potential change would be.

Response 4: Agreed. The last sentence under Alternative SC-1 will be revised to the following: "Current security measures, such as warning signage and building security locks, will be removed so that the property may be transferred or leased as appropriate."

Comment 5: Page 12, third paragraph: Please define "cy/hr".

Response 5: Agreed. The abbreviation "cy/hr" has been defined as "cubic yards per hour".

Comment 6: Page 13, Alternative MC-2: "With the addition of the zero valence iron reactive barrier...has been mitigated." This is the first place in the document that states that a reactive barrier wall is already in place. The Army should first present this as part of the Remedial Investigation Summary, Groundwater section prior to discussion in the Alternatives section.

Response 6: Agreed. The following paragraphs have been added to the Groundwater section:

"In December 1998, a 650-foot long permeable reactive iron wall was installed approximately 100 feet east of the railroad tracks near the property line. The wall was installed as a demonstration project to show that the reactive iron wall could be effective in reducing the concentrations of chlorinated ethenes through reductive dechlorination. The wall was constructed by placing a mixture of 50 percent zero valent reactive iron granules and 50 percent sand in a trench with a width of 14 inches and a depth ranging from 6 to 12 feet. Eleven monitoring wells were installed upgradient, downgradient and within the wall to monitor its effectiveness. Groundwater sampling has been performed at these wells since the wall installation.

The first four rounds of groundwater sampling in the vicinity of the wall were evaluated to determine if the reactive iron wall technology was effective in destroying TCE in groundwater and would be appropriate for full-scale remediation (Draft Feasibility Memorandum for Groundwater Remediation Alternatives Using Zero Valent Iron Reactive Wall at the Ash Landfill, Parsons, August 2000). The report concluded that the technology was viable, however, future applications would require longer reactive iron residence times in order to meet the targeted groundwater standards.

Column and batch testing was performed in August 2001 using site groundwater and reactive iron to determine if the retention time in the existing wall was sufficient to allow for complete destruction of the TCE. As detailed in the Bench-Scale Treatability Report for the Ash Landfill, Seneca Army Depot Activity, Romulus, NY (Envirometal Technologies, Inc., September 25, 2001), the reactive iron wall will degrade chlorinated ethenes below NYSDEC Class GA standards if sufficient reaction time is allowed. Future walls will be designed to allow sufficient reaction time within the wall.

Three additional rounds of sampling have been conducted on the Ash Landfill wells (Groundwater Monitoring Reports, Ash Landfill, Parson, March 2002, July 2002 and November 2002). The results have been generally consistent with the previous two rounds."

Comment 7: Page 15, Alternative MC-3a: In the second paragraph, the Army references Alternative MC-3, then in the fourth paragraph Alternative MC-3a is referenced. Please correct accordingly.

Response 7: Agreed. The first sentence of the second paragraph has been revised to state the following "The feasibility study considered two trenches".

Comment 8: Page 19, Compliance with ARARs: The Army states in the first paragraph "NYSDEC TAGM values are guidelines, not standards." While that may be true, the text should explain that TAGM values are also considered TBCs.

Response 8: Agreed. A sentence has been added after the referenced sentence that states, "The NYSDEC TAGM values are To Be Considered (TBC) criteria."

Comment 9: Page 21, Implementability: It is assumed that "...verification and conformational testing..." is supposed to read "...verification and confirmational testing..." Please verify.

Response 9: Agreed. The sentence will be revised.

Comment 10: Page 22, Costs: It is stated that no present worth cost was calculated for MC-7, since this alternative was dropped in the feasibility study. Why is MC-7 discussed at all in this section?

Response 10: Agreed. The following paragraph has been added prior to the Evaluation of Alternatives discussion.

> "Alternative MC-7: Interceptor Trenches/Tank Storage/Filtration/Two-Stage Biological Treatment/Discharge to Surface Water
>
> MC-7 was not considered further in the detailed analysis because of the concern over the reliability of biological treatment with intermittent flow."

All other references to Alternative MC-7 have been removed from the Evaluation of Alternatives section.

Comment 11: Page 23, Preferred Alternative, second column, second paragraph: Please revise the last sentence to "The monitoring plan will...drinking water supply wells of site neighbors, i.e., the farmhouse wells."

Response 11: Agreed. The last sentence has been revised as requested.

Comment 12: Glossary: NYSDEC is incorrectly defined as the "New York State Department of Environmental Protection." The last sentence under TAGM should be removed from the text. There were other errors noted in the glossary that are similar to those discussed in our teleconference of July 16 that should be revised accordingly.

Response 12: Agreed. NYSDEC has been correctly referred to as the New York State Department of Environmental Conservation. The last sentence under TAGM will be removed.

Comment 13: Table 1: Footnote 6 should be clarified further.

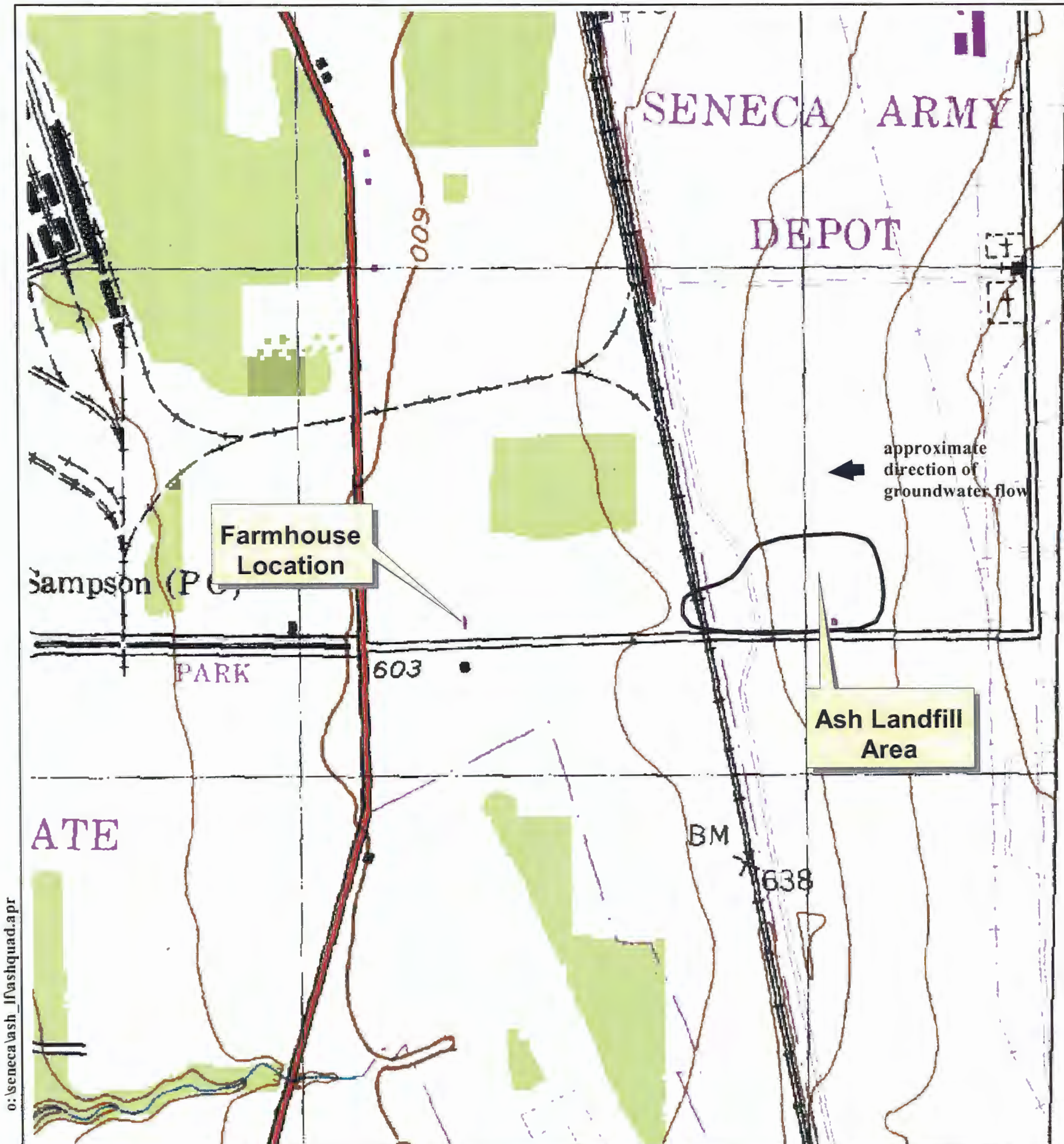
Response 13: The footnote has been removed since it is misleading and unnecessary.

Comment 14: Table 9: Under Alternative MC-3/MC-3a, it states that for ability to attain approvals and coordinate with other agencies, "NYSDEC and EPA input required prior to final remedy selection." As stated in NYSDEC TAGM #4030, "(A)dministrative feasibility refers to compliance with applicable rules, regulations, and statutes and the ability to obtain approvals from other offices and agencies." It is my understanding that administrative feasibility does not include the NYSDEC, USEPA or Army. This table should be revised accordingly.

Response 14: Agreed. The comment has been replaced with "Construction permits are readily available".

Comment 15: Although the Army has addressed the need for off-site groundwater monitoring using the sentinel well adjacent to the landfill, the Army has not rescinded it's assumption that no future residential use of the land adjacent to the landfill is planned. The Army has no control over the future use of that land and should not infer that it knows what the property owner's future intentions are.

Response 15: Agreed. All references to the future use of the land adjacent to the landfill remaining non-residential have been removed.



N

Approximate 10 μg/L total chlorinated ethenes isocontour based on groundwater results of January 2000

KEY PLAN

Study Area

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

SENECA ARMY DEPOT ACTIVITY
ASH LANDFILL
PROPOSED REMEDIAL ACTION PLAN (PRAP)

FIGURE 3

LOCATION OF FARMHOUSE AND
TOTAL CHLORINATED ETHENES PLUME

JOB NUMBER: 736677-01001 | DATE: JULY 2001

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Response to Comments from US EPA

RESPONSE TO COMMENTS FOR
ENVIRONMENTAL PROTECTION AGENCY
DRAFT PROPOSED PLAN FOR THE ASH LANDFILL
AT SENECA ARMY DEPOT ACTIVITY
ROMULUS, NY
COMMENTS DATED OCTOBER 17, 1997

General Comments

General Comment #1 The Draft Proposed Plan for the Ash Landfill Operable Unit recommends Alternative SC-5 as the preferred alternative for source control of contaminated soils and the soil remedial action consists of excavation and off-site disposal of soils from the debris piles and maintenance of a vegetative soil cover for the Ash Landfill and Non Combustible Fill Landfill. Alternative MC-3 a is the preferred alternative for the contaminated groundwater.

According to the Final Reuse Plan and Implementation Strategy for SEDA, the future land use of the Ash Landfill is a conservation/recreation area. The proposed plan should be more specific in detailing the depth of the vegetative soil cover for the two landfills and the post-remediation surface soil concentrations for the chemicals that are driving the potential ecological risk.

Response #1 Agreed; The proposed plan includes a reference to the thickness of the vegetative cover, which will be 12 inches. The post-remediation surface soil concentration for the landfills will be the concentration of these metals in the imported soil that will provide the vegetative cover. The final concentrations of metals in this vegetative soil cover are expected to be similar to the background concentrations of these metals in clean soil. The final concentrations of metals in the vegetative cover cannot be presented in the PRAP, as this data will be collected during the remedial action.

General Comment #2 The Ecological Risk Assessment for the site reveals that cadmium, lead, zinc, and acenaphthene, in surface soils may pose a risk to plant life; their concentrations are above values considered to be phytotoxic. Lead in surface soils also may pose a risk to wildlife; the exposure point concentration exceeds the estimated soil concentration for chronic toxicity to the mallard.

When the soils within this operable unit become vegetated they would provide attractive habitat for wildlife that would use the area for hunting, feeding, and nesting. Animals and birds would be more likely to come into contact with the soils under these conditions. Since the land within this operable unit will be used as feeding, breeding, and home ranges for wildlife, based on the proposed future land use, the United States Environmental Protection Agency (USEPA) believes that a one foot minimum thickness soil cover on the Ash Landfill, the Non Combustible Fill Landfill, and the excavated debris pile areas would be protective in preventing direct contact and incidental soil ingestion by terrestrial wildlife and uptake of contaminants by vegetation. The recommendation for this one foot minimum cover depth is based on the following facts:

- some wildlife species expected to utilize the habitats of the Ash Landfill include eastern cottontail, woodchuck and white-tailed deer. They are expected to come into direct contact with site soils, incidentally ingest It while feeding and grooming, and consume vegetation as a large part of their diet.
- some of these species live in close contact with the soil and burrow into it.
- the bioaccumulation of site-related chemicals up through the food chain would be expected as higher trophic level predators consumed small mammals as part of their diet.

The USEPA recommends that the one foot minimum thickness soil cover used on both the Ash Landfill and the Non Combustible Fill Landfill should be considered "clean fill" and cover existing surface soil concentrations equal to or greater than 60 ppm lead, 2 ppm cadmium, 200 ppm for zinc, and 0.1 ppm for acenaphthene. The proposed plan should state that these values are consistent with the U.S. Fish and Wildlife Service publication, *Evaluating Soil Contamination, Biological Report 90,(2), July 1990.* The excavated debris pile areas should contain post-excavation surface soil concentrations equal to or less than the concentrations listed above or be covered with one foot minimum thickness of "clean fill" if residual contaminant concentrations exceed the ecologically protective limits listed above. It is essential that the residual chemical concentrations left after remediation of the debris piles and both landfills are protective of terrestrial receptors and will not act as contaminant sources to any adjacent wetlands or surface water bodies, USEPA also recommends that the soil cover be vegetated with native plant species to ensure that the cover will remain stable.

Response #2 Agreed; The vegetative cover will be one-foot thick and will be vegetated with native plants. The Ash Landfill and the Non Combustible Fill Landfill (NCFL) will be covered with a vegetative cover. The extent of the cover will be to the extent of the area of the ash for the Ash Landfill and the boundary of the NCFL landfill. The NCFL is easily distinguishable from the surrounding area due to the rise in elevation.

Disagree; The Army disagrees with the abovementioned clean-up goals for several reasons. While the Army has agreed to place a vegetative cover over the areas with the highest metals concentration, the ecological assessment performed during the RI did not indicate adverse conditions for ecological receptors. Ecological exposure point concentrations were all below soil concentrations considered to be representative of chronic toxicity. However, since individual areas, such as the Ash Landfill and the NCFL, did contain elevated concentrations of metals, the vegetative cover would prevent future exposure and was considered appropriate as an added level of protection to the cover that currently is in place. Therefore, the goals, proposed by EPA, are not consistent with what would be necessary to prevent exposure to the areas where these concentrations are the highest. These clean-up levels would require the Army to cover areas beyond the Ash Landfill and the NCFL. This would be a particular problem for cadmium. Cadmium concentrations were measured in several areas, including background locations, above the proposed EPA clean-up level of 2 ppm. For example, cadmium at boring B-23, located approximately 1750 feet away from the Ash Landfill, in the 0-2 foot interval was 2.1 ppm. At the background borings B-8 and B-9, cadmium was measured at 2.6 and 2.3 ppm, respectively, in the 0-2 foot interval. In the surface samples collected from borings B-19, B-25 and B-24, east of the Ash Landfill and across West Smith Farm Road, cadmium was 3.7, 2.3 and 2.7 ppm, respectively. Therefore, the 2 ppm level for cadmium would require a vegetative cover over nearly the entire site, which would be hundreds of acres. This would be cost prohibitive and overly protective. Further, the table, Table 3 from the U.S. Fish and Wildlife Service publication, *Evaluating Soil Contamination, Biological Report 90,(2), July 1990*, that EPA references as the basis for the proposed clean-up levels, states that a level of cadmium of between 1 to 6 ppm is protective for agricultural redevelopment. This table also indicates that these levels for cadmium are for protection of human health, not for ecological receptors. For residential/parkland redevelopment, the clean-up level for cadmium is 4 ppm. Since the future intended use of the site is for conservation/recreational use, the 4 ppm value for residential/parkland would seem to be more appropriate levels of protectiveness. The proposed lead clean-up of 60 ppm is less of a problem in requiring a vegetative cover over widespread areas. Again, the clean-up value for lead in soil for residential/parkland redevelopment is 500 ppm. For zinc, the proposed clean-up level of 200 ppm would require a vegetative cover well beyond the boundary of the Ash Landfill and the NCFL. Again, the criteria for zinc for residential/parkland redevelopment is 800 ppm. In summary, the Army will agree to place a vegetative cover over the Ash Landfill and the NCFL but will not agree to place the cover beyond these areas, which would be required if EPA's proposed clean-up values were adopted. In many instances, the vegetative cover would be placed over areas that are considered to be background.

Secondly, the human health risk assessment considered exposure to current off-site residents, current and future on-site hunters, future on-site construction workers and future on-site residents. The results of the human health and ecological risk assessment indicated that site conditions are within the EPA target risk range of $1x10^{-4}$ and $1x10^{-6}$ for human health risk, with the exception of risk associated from residential exposure. The risk from residential exposure was due primarily from ingestion of groundwater for drinking.

An extensive ecological evaluation at the Ash Landfill site was also conducted during the RI. This effort included: fish trapping, fish counting, fish identification, benthic macroinvertibrate sampling and counting, small mammal species trapping and counting. In addition, a vegetation survey was performed, identifying major vegetation and understory types. The field ecological survey identified a diverse and healthy population of ecological species. No overt acute toxic impacts were evidenced during the field evaluation. Elevated levels of metals was identified as providing possible long term chronic impacts, which the Army is willing to address through the removal of the debris piles and construction of a vegetative cover over the Ash Landfill and the NCFL.

Thirdly, the ecological risk assessment identified both the deer mouse and the mallard as two potential ecological endpoint receptors for soil. Soil and sediment screening concentrations for chronic toxicity were derived for the deer mouse and the mallard. The derived concentration for protection of ecological receptors from exposure to lead in soil for the deer mouse was 800 mg/kg. The concentration for lead in sediment for the mallard was 139 mg/kg. The soil exposure concentration was determined to be 265 mg/kg, which is below the 800 mg/kg value. The sediment exposure concentration for lead in sediment was determined to be 96 mg/kg, which is below the 139 mg/kg value. Since the habitat of the mallard is aquatic, not terrestrial, the soil exposure concentration value, of 265 mg/kg, should not be compared to the sediment-derived value for protection of the mallard, which is 139 mg/kg. Based upon this, the ecological risks from lead to aquatic and terrestrial species are acceptable.

Finally, there is precedence within the State of New York where metals above the levels proposed by EPA could remain on-site. For example, New York State requirements for land application of sewage sludge and septage establish guidelines for allowable metals in soil. Although the requirements for the application sewage sludge involve a rigorous permitting and monitoring program, it does provide another guideline criteria that is useful in assessing what concentrations of metals may be protective in soil. Land application of sewage sludge has positive benefits as fertilizer for crops and vegetation. Many of these crops are used for consumption by cattle and the State of New York has established allowable concentrations of metals in soil that are considered protective. Presumably, such concentrations would not be toxic to vegetation or other, non-domesticated, wildlife species who may also inadvertently use the area as a source of food. These values are therefore considered worthy of consideration in attempting to establish levels that are protective of ecological receptors, especially since the requirements for land application of sewage sludge do not prohibit other ecological receptors from exposure. Section 360-4.4(a) of 6 NYCRR , Part 360, Title 6 of the Official Compilation of Codes, Rules and Regulations for the State of New York Department of Environmental Conservation describe the operational requirements for the land application of sewage sludge and septage. This section indicates that the sewage sludge and septage destined for land application must not exceed the following contaminant concentrations:

Parameter	Maximum Concentration (mg/kg-dry weight)
Cadmium	25
Lead	1000
Zinc	2500

As previously mentioned, the will Army agree to place a 12-inch vegetative cover over the Ash Landfill and the NCFL as an added protective measure against ecological and human exposure to metals and PAHs in the landfills. However, we are unwilling to adopt criteria that would require additional remedial measures at other locations. This would be overly protective and would require the Army to commit to a clean-up, costing potentially huge sums, whose only justification is adoption of a value from a table used by the Province of Ontario for protection of agricultural use, which is not an anticipated future use for the site.

General
Comment #3 The areal extent of the VOC contaminated soil removal action (Area A and Area B) should also be covered with 12 inches minimum thickness clean fill and vegetated with native plant species. These soils also contained metals and PAHs exceeding the levels described above. The soils were excavated, treated for VOC contamination, stockpiled and the treated soil then used to fill the excavations, but the metals and PAHs remain.

Response #6 Disagree; Areas A and Area B have been excavated and remediated during the Interim Removal Measure (IRM) conducted by the Army in 1994 and 1995. The concentration of metals in these areas varied. The concentration of metals in several of these areas were below the proposed EPA clean-up levels prior to the IRM. For example lead in the 0 to 2 foot elevation ranged from 200 mg/kg to 8 mg/kg in Areas A and B, see Figure 4-39 from the RI, prior to the IRM. Only three locations were above 60 mg/kg and these were associated with the Ash Landfill, which will be covered. From the RI, the concentration of these three (3) metals, zinc, cadmium and lead the mean of the RI data was evaluated to provide a reasonable representation of what the current conditions are at the site, since process produced a soil that is thoroughly mixed. Fifteen (15) soil borings were performed during the RI in Areas A and B. These borings include: B-2, B-15, B-27, B-28, B-29, B-30, B-31, B-32, B-36, B-37, B-38, B-39, B-46, B-47 and B-48. Soil samples were collected and analyzed from the several depths including the surface, 0-2', 2'-4', 4'-6' and 6'-8'. A total of 49 soil samples, corresponding to 61 analyses, were analyzed for organic and inorganic contaminants. The mean concentration of lead in these samples is 30 ppm; for cadmium, the mean is 1.5 ppm; for zinc, the mean is 75.9 ppm. This data suggests that the soil in this area is below the EPA target levels for protection of ecological receptors. As a result, there is no justification to place an additional 1-foot of vegetative cover over an area that has been treated to reduce or eliminate the organic compounds and has reduced the inorganic components of concern.

Comment #7 The soil removal action already has caused the loss of wetlands and the 12-inch soil cover of the remedial action eventually will cause the loss of additional wetlands at the Ash Landfill. The required wetland mitigation plan should be mentioned in the proposed plan and record of decision and later be developed as part of the remedial design for the Ash Landfill operable unit.

Response #7 Agreed; Reference has been made that a wetland mitigation plan be added in the alternatives involving excavation and the vegetative cover.

Comment #8 Each soil-remediation alternative should be clarified to discuss what actions will be taken on the Ash Landfill, Non-Combustible Landfill, Debris Piles and Bend in the Road soils.

Response #8 Agreed; No further action is anticipated for the Bend in the Road soils for any alternative. Additional details regarding the extent of actions has been added to the soil remediation alternatives.

Comment #9 Each migration control alternative should address treatment of the portion of the contaminant plume that has migrated beyond SEDA property. In addition, each alternative should include appropriate off-site groundwater monitoring.

Response #9 Agreed; The potential for migration has been addressed through the reference to a contingency plan that will be implemented if there is a threat to off-site drinking water wells. Each migration control alternative has a reference to the contingency plan for off-site threats.

Comment #10 With regard to the risk levels associated with the groundwater contaminant plume, the EPA would like to review particular aspects of the risk calculations performed for the groundwater ingestion exposure pathway. Specifically, calculation of the exposure point concentration for select contaminants (vinyl chloride, 1,2 dichloroethene and trichloroethene) is requested. This request is motivated by the inordinately small values obtained from deriving the 95% Upper Confidence Limit (UCL) on the log-transformed data for the aforementioned contaminants. Our review will be significantly expedited, if the Army provides the entire date sets evaluated for each of the three contaminants, and all calculations.

Response #10 Agreed; Since the CERCLA process has progressed to the PRAP stage, the RI and the FS have been subject to EPA critique, several times, and are considered to be final documents. This data has been made available to EPA for review.

Comment #11 The LRA has determined that future land use of the Ash Landfill is to be "Conservation/ Recreation". Many locations of the document refer to future land use as, "a wildlife management area," "wildlife area", etc. The text should be corrected.

Response #11 Agreed; The reference to "wildlife management area" has been deleted and replaced with "conservation/recreational area"

Specific Comments

PURPOSE OF PROPOSED PLAN

Comment #1 The first sentence should be revised to read, "This Proposed Plan describes...at the Ash Landfill **operable unit**..".

Response #1 Agreed; The phrase operable unit has been added.

Comment #2 The last sentence should be revised to read, "The final decision regarding the selected remedy...after the U.S. Army, **EPA and NYSDEC** have taken..."

Response #2 Agreed; The phrase EPA and NYSDEC has been added.

COMMUNITY ROLE IN SELECTION PROCESS

Comment #1 The first sentence should read, "the U.S. Army, **EPA and NYSDEC** rely on public input..."

Response #1 Agreed; The phase EPA and the NYSDEC has been added.

Comment #2 Top of page 2: Romalus should be change to Romulus.

Response #2 Agreed; The typographical error has been changed.

SITE BACKGROUND

Comment #1 This section should briefly discuss which SEADs make up the Ash Landfill operable unit and briefly describe the previous activities at each. A Figure of the Ash Landfill operable unit should be referenced and included in the proposed plan. SEDA's fence line, property boundary line, plume, Conrail Railroad and all SEADs should be shown to scale.

Response #1 Agreed; The SWMUs that comprise the Ash Landfill OU have been identified in the text. Figure 2 has been included that identifies the fence line, the property boundary and the railroad. Figure 3 and 4 have been added that depicts the location of the groundwater plumes before the IRM and after the IRM.

Paragraph 2,

The first sentence should be revised to read, "The Ash Landfill **operable unit**.."

Agreed; The text operable unit has been added.

The second sentence should be revised to read, "The **operable unit** is bounded...".

Agreed; The text operable unit has been added.

The third sentence should be revised to read, "Beyond the Depot's ... along Route 96A are farmland..."

Agreed; The comma after Route 96A has been deleted.

REMEDIAL INVESTIGATION SUMMARY

Comment #1 This section should mention when the Remedial Investigation Report was completed.

Response #1 Agreed; The date that the RI report was finalized was added.

Comment #2 The discussion of the removal action within the RI Summary is confusing to the reader. Three paragraphs in this section discuss the soil removal action. They should be moved from the RI Summary, provided with the heading "Removal Action" and inserted to follow the remedial investigation results or the risk assessment summaries.

Response #2 Agreed; A new section titled "Non-Time Critical Removal Action Summary" has been added. Portions of the "Remedial Investigation Summary" pertaining to the Non-Time Critical Removal Action were moved to the new section.

Comment #3 Page 2, column 2 :
paragraph 1 : The last sentence should be revised to read. "The constituents of concern ... at the Ash Landfill **operable unit**."

Response #3 Agreed; The text operable unit has been added.

Comment #4 paragraph 2- This paragraph discusses the soil removal action. In addition to the Action Memorandum prepared by Parsons ES, the July 1995 final report for the Ash Landfill Immediate Response prepared by IT Corporation should also be mentioned. The last sentence mentions the clean-up criteria for the project.

Response #4 Agreed; Reference to the July 1995 final report has been added.

Comment #5 These cleanup criteria should be briefly explained, along with how this removal contributes to the efficient performance of the long-term remedial action.

Response #5 Agreed; Additional text has been added that describes how this removal action has made a positive contribution to the long-term remedial action.

Comment #6 Paragraph 3: The paragraph should mention which regulatory, standards were met before the treated water was discharged in the nearby field.

Response #6 Agreed; The regulatory standards that were met prior to discharge to the field have been added.

<u>Soil</u>

Comment #1 Page 2: first column, first paragraph: The second sentence should be revised to read, "This would also ... impacted groundwater **associated with the operable unit."**

Response #1 Agreed; The text has been modified to include this phrase.

Comment #2 2nd column, last paragraph: This paragraph should include the maximum concentration of each contaminant of concern mentioned.

Response #2 Agreed; The maximum concentration of each contaminant of concern has been added to the text.

Comment #3 lst sentence - The hyphenation of the word "1,2-dichloroethene" should be corrected.

Response #3 Agreed; The hyphen has been removed.

Comment #4 Page 3, first paragraph:
Sentence 5 - "post prove-out" should be defined. The first time **"TCLP"** is used in the document, the full name should be used.

Response #4 Agreed; The text has been modified to describe that a prove-out test was performed prior to full scale operation. The reference to post prove-out testing has been removed and replaced with post-treatment testing, which includes all the testing that has been performed following thermal treatment. The full name of the term TCLP has been used the first time it was mentioned.

Comment #5 The last two sentences discuss lead concentrations and TCLP. The text should explain why the maximum lead concentration of 814 mg/kg is greater than the range maximum of 401 mg/kg for soils analyzed via TCLP. Also discuss whether the soil was determined to be RCRA hazardous waste.

Response #5 Agreed; The text has been modified to indicate that the maximum concentration of lead from the TCLP test was 814 ug/L, not 814 mg/kg. The range of TCLP concentrations has also been corrected. The text also states that no soil was found to exceed the TCLP test for the RCRA characteristic of toxicity.

<u>**Surface Water and Sediment**</u>

Comment #1 Regarding surface water, the concentration of iron should be included along with the NYSDEC water quality value that was exceeded.

Response #1 Agreed; The maximum concentration of iron detected has been added along with the NYSDEC water quality value.

Comment #2 Regarding sediment, the highest concentration of each metal exceeding NYSDEC guidelines should be included, with the value that was exceeded.

Response #2 Agreed; The maximum value of each metal exceeding the NYSDEC guideline and the guideline has been added.

<u>**Groundwater**</u>

Comment #1 The plume boundary should be defined in this section, discussing contaminant concentrations at the leading edge determined from quarterly monitoring results-

Response #1 Agreed; The discussion has been expanded to include data from the quarterly monitoring.

Comment #2 Sentence 2 should be revised to read: "**Recent quarterly monitoring results indicate that** this plume extends westward, **approximately 225 feet past** the depot boundary."

Response #2 Agreed; The text has been revised to indicate that one round of quarterly monitoring detected 1,2-DCE at a well 225 feet beyond the depot boundary.

Comment #3 Sentence 3 should read: "...located within the area considered to be the source area prior to **the soil removal action.**"

Response #3 Agreed; The text has been modified to remove remediation and replace it with "the soil removal action".

Comment #4 Last sentence: "Vertically, the plume is believed to be restricted to the upper fill/weathered shale aquifer and is not present in the deeper competent shale aquifer" should be deleted from the paragraph. The previous sentence concerning the residential wells in the more competent portion of the bedrock appears to contradict the belief about vertical migration. If residents can draw water out of that zone, why can't there be enough fractures in that zone to allow for the downward vertical migration of contaminants?

Metals concentrations within the plume should be briefly discussed.

Response #4 Disagree; There is no contradiction in the sentence that states that the farmhouse wells are drawing water from the bedrock aquifer and the belief that the plume is not migrating vertically. The origin of the water drawn into the farmhouse wells is not known and is likely drawing water from deep bedrock wells that may extend to the deep limestone aquifer. Packer testing performed during the RI indicated that the bedrock shale aquifer is not a high yielding bedrock aquifer. The vertical packer testing performed during the RI indicated that the hydraulic conductivity of the bedrock is low, i.e. 1×10^{-6} cm/sec. In order to obtain sufficient yield, domestic wells in the area are drilled very deep, i.e. 200 to 300 feet or more. There is no contradiction since the shallower glacial till aquifer is not connected to the deeper aquifer. On-site vertical connection tests performed during the RI between the glacial till aquifer and the bedrock wells installed to a depth of 20 feet into shale showed virtually no connection. Given the depths of domestic wells and the distance from the site we do not feel that there is a connection between these two aquifers.

These two statements are consistent. From the years of monitoring of the farmhouse wells the deep bedrock water, drawn from the bedrock farmhouse well, has always been non-detectable for the chlorinated ethenes, which suggests that the plume has not migrated vertically. If the on-site bedrock aquifer was migrating vertically then it should be detected in the on-site bedrock monitoring wells or the farmhouse data.

Agreed; A discussion regarding the concentration of metals in the plume has been added. This discussion concludes that the concern of metals exceedances in groundwater was attributed to turbidity.

SUMMARY OF SITE RISK

Human Health Risk Assessment

Comment #1 The text should explain where current on-site residents, employees, hunters and construction workers currently get drinking water, and after the base closes, where future on-site residents, employees, hunters and construction workers will get drinking water.

Response #1 Agreed; The text has been modified to identify the location of drinking water for the various receptors.

Comment #2 Page 3, column 2, paragraph 2: Xylene and toluene are not PAH compounds. The text should be corrected.

Response #2 Agreed; The text has been modified to indicate that xylene and toluene are not PAH compounds.

Comment #3 Page 4, Column 1, paragraph 2, With the concentrations of TCE, 1,2-DCE and Vinyl Chloride at 51,000, 130,000 and 23,000 ug/IL (respectively) in groundwater, the text should explain why or how it was determined that none of the receptors are in danger of exceeding the EPA risk range for groundwater ingestion. Were concentrations from the leading edge of the plume used instead of maximum concentrations for the risk assessment calculations? Do receptors receive drinking water from another source? The expected receptor scenarios (off-site residents, on-site hunters and on-site construction workers) should be emphasized.

Response #3 Agreed; The text has been modified to indicate that non of the current receptors are in danger of exceeding the EPA target risk range. The 95^{th} UCL of the mean groundwater concentration was used to compute the future on-site residential risk. The 95^{th} UCL of the mean groundwater concentration of the off-site drinking water wells were used to compute the off-site risk due to ingestion of groundwater. The concentrations from the leading edge of the plume were not used to assess the off-site drinking water since data was available from the existing off-site drinking water well. Additionally, there is no data to confirm that the leading edge of the plume has migrated off-site. MW-56 did have a low level detection of 1,2-DCE but this detection has not been confirmed with subsequent sampling events.

Comment #4 Column 2. Paragraph 1: According to what authority is there no residential future land use currently planned for the property located off-site and adjacent to the Ash Landfill?

Response#4 The statement in the PRAP does not focus on what the future off-site land use will be, instead the statement describes what the proposed future use of the Ash Landfill Operable Unit will be. The statement does not place any restriction or limitation on the adjacent off-site parcel. However, for the Ash Landfill Operable Unit parcel, the Local Redevelopment Authority has determined that the Ash Landfill Operable Unit is within an area that has been designated for conservation/recreational use, not residential. It is unclear what the intent of this comment is but it appears to be a rhetorical question indicating EPA's concern that the Army does not have control over private property.

Regarding the future use of the adjacent property, obviously, the Army has no control over what the future use of the adjacent land. However, the Army is committed to protecting human health and the environment and there is numerous instances associated with this site that highlight this fact. For example, the $6M soil treatment IRM that eliminated the source of groundwater contamination in 1994 and the installation of a reactive barrier wall to prevent the migration of the plume off-site. The Army has also installed and performed an extensive monitoring program and has disclosed the results of the monitoring to the adjacent property owner. Additionally, numerous public meetings have been held and will be held in the future to provide the adjacent property owners with the vital information to prevent exposure to drinking water. However, should an adjacent property owner decide to install a residential drinking water well at the SEDA property boundary, the Army would continue to provide adequate protection to ensure that the public health is protected. This protection would include monitoring the drinking water quality and could possibly include purchase of the property or may involve providing carbon adsorption vessels at the point of consumption to ensure that no contamination impacts human health. At this time there is no indication that such a future use of the property is planned.

Comment #5 Last sentence: This sentence conflicts with information on page 3, and is incorrect. It states that the till/weathered shale aquifer is unlikely to yield sufficient quantities of water for residential use. However, on page 3, first column, it says "At least one of the farmhouse wells draws water from the till/weathered shale aquifer and the remaining two wells derive water from the bedrock aquifer." Not only does the till/weathered shale aquifer yield enough water for residential use, so does the massive bedrock zone.

Response #5 Disagree; First, the construction details of the farmhouse well that draws water from the till/weathered shale aquifer is unknown and may not be of similar thickness or geological material to the geological conditions at the Ash Landfill Operable Unit. It is possible that the thickness of the till may be thicker at this location or may yield more water than the conditions on-site. In any event, based upon interviews with the farmer, during the various sampling events, it is known that the shallow well was a large diameter, hand dug well that does not yield sufficient water to be a useful source of water. This well is an old well and had to be replaced a long time ago with a deeper bedrock well in order to provide sufficient water for domestic use. The shallow well is frequently dry but is occasionally used to water livestock or water the garden. In any case, from the sampling of the Ash Landfill wells and the hydrological testing that has been performed, it is clear that if a shallow well were to be installed on-site as a source of drinking water, the water supply would be of poor quantity, turbid, high in iron and hardness and would most likely not meet the requirements of the Department of Health as a source of potable water. Water supply well drillers typically drill deep bedrock wells to supply water. It is unclear why EPA would choose to ignore the extensive amount of hydrological data that has been accumulated at the site and continues to suggest that the shallow till aquifer is a suitable source of potable water. During various times of the year the thickness of this aquifer is decrease to 2 feet. Clearly, this aquifer is unsuitable as a sustained supply for drinking water. Further, the Army is intent on preventing such as use through a land use restriction. No changes to the text has been made as the Army believe that this is a true statement.

Comment #6 Paragraph 2: The first sentence should be corrected to read, "Although risks **exist for** potential future residents using groundwater for drinking **at SEDA, the Local** Redevelopment Authority (LRA) does not intend...".

Response #6 Agreed; The text has been changed.

<u>Ecological Risk Assessment</u>

Comment #1 Page 5, 1st column, 1st full paragraph: This paragraph should include the maximum concentration of lead, zinc, cadmium and acenaphthene detected in surface soils. See general comments above.

Response #1 Agreed; The maximum concentrations of lead, zinc, cadmium and acenaphthene have been added to the text.

Comment #2 3rd sentence: Federal AWQC should also be included as ARARs for Kendaia Creek.

Response #2 Agreed; Reference to the federal AWQC has been added.

Comment #3 5th sentence: When discussing metal exceedances, this sentence should indicate the media referred to.

Response#3 Agreed; Reference has been made to the media that exceedances have been observed.

Comment #4 Last sentence - The argument that the use of the wetlands by aquatic species is unlikely since the wetlands are dry during the majority of the year may be valid but it would also make the argument that terrestrial species would come into contact with these dry wetland soils more often valid also. Site data shows that metals were found in several sediment samples exceeding NYSDEC sediment guidelines.

Response #4 Disagreed; Risks due to aquatic exposure to sediment were computed during the ecological risk assessment as well as the risks due to terrestrial exposure due to exposure from on-site soils. The mallard was considered to be the aquatic receptor that would be exposed to sediment, since there are no fish in the wetlands. The point of this statement was that the use of the on-site wetlands as a resource for aquatic species was limited to periodic times of the year when the wetlands were filled with water, therefore the exposure would be even less that what was considered by the ecological risk assessment. The ecological assessment indicated that the exposure point concentration of metals in sediment was less than the concentrations considered to be protective, therefore the site sediment conditions were acceptable.

If the wetlands are used by terrestrial species then the sediment criteria should not be used for comparison since according to the NYSDEC guidance for sediment, "sediment can be loosely defined as a collection of fine-, medium-, and course- (sic) grain minerals and organic particles that are found at the bottom of lakes [and ponds], rivers [and streams], bays, estuaries and oceans. Sediment are essential components of aquatic [and marine] ecosystems. A comparison of TAGM soil guideline values to those wetland sediments that are dry, i.e. no longer aquatic environment but rather a terrestrial environment, was not performed during the ecological risk assessment, therefore there is no comparison to refer back to. The on-site wetland sediment data appears in the same range as the soil data and it seems as though the conclusions from consideration of the on-site sediment from a terrestrial standpoint would remain as is.

No changes to the text have been made.

SCOPE AND ROLE OF ACTION

REMEDIAL ACTION OBJECTIVES

Comment #1 Page 5, 2nd column, 1st bullet - The NYSDEC soil cleanup TAGM values for inorganics and PAHs are only protective for human receptors. Since the Ash Landfill area is designated as a future Conservation/Recreation area, soil cleanup values should be protective of ecological receptors as well. The depth of soil cover should be discussed with the concentrations of contaminants remaining after cover is provided. The reference to the US Fish and Wildlife guidance document should be included to support the soil cleanup concentrations. See general comments above.

Response #1 Disagreed; EPA has referenced Table 3 of the US Fish and Wildlife guidance document *Evaluating Soil Contamination, July 1990*, and proposed clean-up levels of 60 ppm lead, 2 ppm cadmium, 200 ppm for zinc, and 0.1 ppm for acenaphthene. The Army disagrees with these values for clean-up, as described in the general comment response, but will agree to a vegetative cover over the Ash Landfill and the NCFL to provide a barrier to ecological exposure.

Comment #2 2nd bullet: The sentence should be corrected to read, "Comply with ARARS for New York State GA groundwater quality **standards and Federal MCLs**.".

Response #2 Agreed; The term "standards and Federal MCLs" has been included.

Comment #3 4th bullet: The word "possible" should be deleted from the sentence. It has already been established that the VOC plume has migrated off-site.

Response #3 Disagreed; The statement simply states that preventing possible off-site migration is an objective of the remedial action. There is no data that confirms that the plume has migrated off-site. The concentration of DCE has been non-detectable for the last several rounds of data monitoring. The highest concentration of DCE has been below the NYSDEC GA standard. It is possible, however, that the plume may migrate off-site. No changes to the text has been made.

SUMMARY OF REMEDIAL ALTERNATIVES

Comment #1 On page 8 and possibly other locations in the document, there are statements which conclude that, (MC-1) "No Monitoring or security measures will be undertaken." or "Since these measures are promulgated by... additional measures may be required." These statements could lead the reader to believe that an alternative has already been selected, instead of just proposed. Will should be replaced with would whenever describing any of these alternatives in the proposed plan.

Response #1 Agreed; The references to will has been replaced with would.

Comment #2 1st paragraph, last sentence should read "In addition, ... preference for treatment as a...

Response #2 Agreed; The word "the" before treatment has been removed.

Comment #3 The bullets describing the two categories should be called, "Soil/sediment source **remediation**" and "Groundwater **remediation"** instead of "control".

Response #3 Disagreed; Changing the word from source control to source remediation and groundwater control to groundwater remediation would require changes from SC to SR and MC to MR. This would not be consistent with the FS and does not change the intent of the phrase SC and MC. There is no need to make this change.

SC REMEDIAL ALTERNATIVES

Comment #1 Page 5, column 2: Bullet 2, SC-2: This statement refers to "both landfills"- The name of each landfill should be provided instead.

Response #1 Agreed; The name of both landfill has been added.

Comment #2 The last paragraph, which also continues onto Page 6, should be deleted from this section and included in the "Evaluation of Alternatives" section.

Response #2 Agreed; This paragraph has been moved.

Comment #3 Page 6, 1st column, 1st paragraph, 1st full sentence should read "Overall protection of human health and **the environment and** compliance with

Response #3 Agreed; The phrase "the environment and" has been added.

Alternative SC-1: the No-Action" Alternative

Comment #1 2nd sentence should read "There are no costs associated with **the** no-action option."

Response #1 Agreed; the word "the" has been added.

Alternative SC-3: Excavation of the Ash Landfill and Debris Piles/Consolidation at the NCFL/Cap the NCFL

Comment #1 The text should clarify the extent (depth, volume, etc.) of excavation for each; the Ash Landfill, Debris Piles and Bend in the Road soils. See general comments above.

Response #1 Agreed; The depth of the excavation has been added.

Comment #2 lst full paragraph, 3rd sentence should read "Because the soils ... dermal **contact** or ingestion...."

Response #2 Agreed; The word contact has been added.

Comment #3 2nd column, 3rd full paragraph, 1st sentence should read "Alternative SC-3 is effective,.... following the elimination of the VOCs."

Response #3 Agreed; The second "the" has been eliminated.

Comment #4 Last sentence should read "Because the ... constituents of concern **to groundwater."**

Response #4 Agreed; The phrase "to groundwater" has been added.

Alternative SC-4: Excavation/Soil Washing/Backfill Coarse Fraction/Solidify FineFraction/Cap

Comment #1 Neither the title nor the text of this alternative mentions which soils will be treated with this technology. Clarification should be provided. See general comments above.

Response #1 Agreed; Clarification has been added.

Comment #2 Page 6, last paragraph-. The first sentence should be revised to read, "...and processed to -segregate the coarse fractions..".

Response #2 Agreed; The text has been modified from course to coarse.

Comment #3 Page 7, lst column, 1st full paragraph, 3rd sentence should read "The success of ... concentrations of the metals **are** not high.

Response #3 Agreed; The change from is to are has been made.

Comment #4 3rd full paragraph, 2nd sentence should read "Solidification/stabilization .... and/or **insoluble** forms."

Response #4 Agreed; The change has been made.

Comment #5 The third sentence should be corrected to read, "The primary goals ... decrease the solubility **of** ____?____ and mobility of the soil,..."

Response #5 Agreed; The term metals has been added after the word soil.

Comment #6 Page 7, 2nd column, 1st paragraph, 8th sentence - Is the solidified mass considered the chemical barrier that would prevent the leaching of the residual materials?

Response #6 Agreed; The text has been modified to clarify that the solidified mass is a chemical barrier against leaching.

Alternative SC-5; Excavation of Debris Piles/Disposal in an off-site, Non-hazardous Subtitle D landfill

Comment #1 This section should state the depth of soil cover and the concentrations of contaminants remaining after cover is provided, The Bend in the Road soils should also be covered. See general comments above.

Response #1 Agreed; The thickness of the soil cover will be 12-inches. However, the Army does not believe that the "Bend in the Road" soils should be covered.

Comment #2 Last paragraph, last sentence states that if tests indicate soils are not suitable for disposal in a Subtitle D " landfill, other on-site options would be considered. The text should also state the off-site options available.

Response #2 Agreed; The off-site options such as disposal has been added.

MIGRATION CONTROL ALTERNATIVES

Comment #1 Page 8, 1st column, 2nd paragraph: This paragraph should be deleted from this section and included in the "Evaluation of Alternatives" section. However, it requires modification as it is confusing to the reader. For example, there is no explanation as to why a no action alternative meets the threshold criteria while active remedies which remove contaminants from the aquifer (interceptor trenches would passively remove contaminants) would not meet the threshold criteria.

Response #1 Agreed; The paragraph has been moved. There are no references to the no action alternative as meeting the threshold criteria. However, a sentence has been added that MC-1 the no action alternative is not the threshold criteria but was retained as a baseline alternative.

Comment #2 2nd sentence should read "Overall protection of human health **and the environment** and compliance...."

Response #2 Agreed; The phrase "and the environment" has been added.

Comment #3 The fourth sentence states that MC-4 and MC-7 were eliminated from consideration because they did not meet threshold criteria reasons requirements. Please explain why the requirements were not met.

Response #3 Agreed; Text has been added explaining why MC-4 and MC-7 were eliminated.

Alternative MC-1: No-Action

Comment #1 It is stated that there is implied degradation of the chlorinated volatile organics in the ground water plume. The presence of the degradation product, vinyl chloride, is not mentioned in this section. Further, vinyl chloride is considered to be a more toxic chemical than its parent compound.

Response #1 Agreed; It is agreed that vinyl chloride is a more toxic compound that its parent compound but has not been detected in downgradient plume wells. However, vinyl chloride was only detected in the source area wells, i.e. MW-44. This area has been remediated and the vinyl chloride in this area has been remediated. Eventually, the endpoint of the biodegradation process is chloride, ethene/ethane, carbon dioxide and water. There is no requirement to change the text and therefore no change has been made.

Comment #2 The no-action remedy does not meet the threshold criteria. No action would not be protective of human health and the environment and a no action remedy does not comply with ARARS. The "Evaluation of Alternatives" section needs to state this latter information clearly.

Response #2 Agreed; A statement has been added that states that the no action alternative is not protective. However, if the groundwater is not ingested then there is no exposure and there is no risk. The text states that groundwater concentrations exceed the GA standard, therefore additional measures may be required.

Comment #3 First paragraph, last sentence - The LRA, not the Army has already decided the future use of the Ash Landfill will be Conservation/Recreation. The text should be corrected here and at any other locations in the text.

Response #3 Agreed; The statement that the LRA has decided that the future use of the Ash Landfill will be conservation/recreational use has been added.

Comment #4 Page 8, Column 1, last paragraph continuing to column 2: This paragraph should be deleted. EPA has sent numerous letters refuting the Army's beliefs that steady state conditions have been achieved and that a naturally occurring cleansing process is remediating the plume. In fact, historical monitoring data from well MW-56 shows that the plume is continuing to migrate off SEDA property. If the Army has a problem with deleting this paragraph, we should schedule a conference call to resurrect this issue in order to avoid pages of added text to the proposed plan which attempt to defend the Army's position.

Response #4 Agreed; The paragraph has been deleted.

Comment #5 Column 2, 2nd paragraph, Sentence 1 should be revised to read: "Although current and intended land uses ... groundwater quality standards have been exceeded **and the contaminants have migrated approximately 225 feet off SEDA property."**

Response #5 Agreed; The following statement has been added, "Detections of low levels of DCE in an off-site well suggest that the plume may extend as far as 225 feet beyond the SEDA property. These detections have not been confirmed in recent quarterly monitoring samples. The off-site detections of DCE have not been measured above the GA groundwater standard."

Comment #6 Sentence 2 should be corrected to read, "Since these values are promulgated by the State of New York **and the federal government"**.

Response #6 Agreed; The phase has been added.

Alternative MC-2: Provide Alternate Water with Natural Attenuation

Comment #1 The expected treatment time for natural attenuation should be included.

Response #1 Agreed; The expected time has been added.

Comment #2 Paragraph 2 should state that the water line would be constructed off SEDA property and the text should include the requirements of installing such a water line. Be reminded that the purpose of BRAC is to transfer government owned property, not to acquire it.

Response #2 Agreed; A sentence has been added to indicate the requirements of the water supply line. We are aware of the purpose of BRAC, however, transferring property at the Ash Landfill Operable Unit does not mean that a water supply line cannot be installed. The current water supply system on the base will be transferred and this line will be an extension of this system.

Comment #3 3rd paragraph, lst sentence should read "Option MC-2 considers natural processes..."
Response #3 Agreed; The capital P of Processes has been changed to processes.

Comment #4 3rd sentence is not true. The RI results indicate that state and federal standards for heavy metals and semivolatiles have been exceeded. The text should be corrected.
Response #4 Agreed; This statement has been changed to state that heavy metals and volatiles have exceeded the groundwater standards. However, only one well, MW-44, located in the former source area, had GA exceedances during the RI for three semi-volatiles, phenol, naphthalene and pentachlorophenol. This well and soil surrounding this well were excavated, treated and replaced during the IRM. Groundwater in this area was also pumped, treated and discharged. Semi-volatile organics were not exceeded at any other well on the site, therefore, the text has been modified to reflect this.

Comment #5 Last paragraph: this paragraph ignores the fact that monitoring wells exist between the SEDA boundary and the farmhouse and that there are quarterly results for these wells. An explanation should be provided.
Response #5 Agreed; Reference to existing monitoring wells between the farmhouse and the SEDA boundary have been added.

Alternative MC-3 Air Sparging of Plume

Comment #1 Page 9, 1st column 1st paragraph, 2nd sentence should read "in situ by VOCs."
Response #1 Agreed; An s has been added to the end of VOC.

Comment #2 3rd sentence should read "An air sparging ... for groundwater remediation."
Response #2 Agreed; The word "and" has been removed.

Comment #3 4th sentence should read "The advantages of in-situ air sparging **are:...**"
Response #3 Agreed; The word "are" has replaced "is".

Comment #4 3rd paragraph, sentence 6 should read , "If required, sparging systems...".
Response #4 Agreed; A comma has been added after the word "required".

Alternative MC-3a Funnel-and-Gatel In-situ Treatment

Comment #1 The text on page 9 should mention that this alternative is considered to be an innovative treatment technology, therefore requiring treatability testing.
Response #1 Agreed; The text has been modified to describe the demonstration study the Army has conducted for the last year.

Comment #2 Table 3 states that this remedy will comply with ARARS, but the text on page 9 states that iron filings have been demonstrated to be effective in treating chlorinated solvents. RI investigation results indicate that metals, other VOCs and SVOCs also exceeded ARARs. How will ARAR compliance be met for these compounds?
Response #2 Disagree; There is no need to comply with ARARs for metals and semi-volatiles since there are no exceedances of the GA or federal standards if

turbidity is accounted for. The RI data and the groundwater monitoring data does not indicate that there are exceedances for any SVOCs, other than the one well, MW-44, which has been remediated. Exceedances for metals, such as lead, copper, chromium, nickel, antimony, and zinc appear randomly dispersed thoughout the site, suggesting that the exceedances are not related to source, and influenced by turbidity. Filtered versus unfiltered data also suggest that turbidity is a factor. The Army believes that, other than for VOCs, there is no need to monitor groundwater for metals or SVOCs.

Comment #3 Page 1 0, column 1, top of page: The last sentence for this section should discuss treatment time for this alternative.

Response #3 Agreed; The operation and maintenance timeframe of 10 years has been added.

Alternative MC-5

Comment #1 Page 10, 1st column, 3rd paragraph, 3rd sentence should read "Flow fluctuations are ...."

Response #1 Agreed; An "s" has been added to the end of "fluctuation".

Comment #2 Last paragraph: The first sentence should be corrected to read, "For this option, ...remedial action objectives which are **NYSDEC Class** GA groundwater quality standards **and Federal MCLS."**

Response #2 Agreed; The changes to the text have been added.

Comment #3 2nd column,1st paragraph, 1st full sentence should read, "Trays or column packing **are** used..."

Response #3 Agreed; The word "are" has replaced the word "is".

Comment #4 4th paragraph: -The third sentence should be corrected to read, "in this case .... requirements for **NYSDEC** Class **C** surface water ..."

Response #4 Agreed; The classification had been changed to NYSDEC Class C.

EVALUATION OF ALTERNATIVES

Comment #1 On page 11, this heading exists, but no text has been provided.

Response #1 Agreed; Text has been added.

Comment #2 The NCP requires a detailed analysis on a limited number of alternatives that represent viable approaches to remedial action after evaluation in. a screening stage. The detailed analysis consists of an assessment of individual alternatives against each of nine evaluation criteria and a comparative analysis that focuses upon the relative performance of each alternative against those criteria. The nine criteria are categorized into three groups: Threshold Criteria, Primary Balancing Criteria, and Modifying Criteria.

Overall protection of human health and the environment and compliance with ARARs are threshold requirements that each alternative must meet in order to be eligible for selection. The primary balancing criteria are long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness, implementability; and cost. State and community acceptance are the modifying criteria.

The EPA proposed plan boilerplate model (pages 4 & 5) can be followed, describing the nine evaluation criteria and providing a comparative analysis of the alternatives based upon the evaluation criteria. Attachment 1 is an example of how the "Evaluation of Alternatives" section was handled in another proposed plan.

Response #2 Agreed; Additional text has been added under this section that provides a summary of the alternative evaluation process.

PREFERRED ALTERNATIVE

Comment #1 As we discussed in December 1996 and on September 23, 1997, a contingency remedy should also be included for groundwater. The *EPA Guidance for Preparing Superfund Decision Documents (OSWER Directive 9355.3-02)* recommends a contingency remedy in the proposed plan and record of decision when an innovative treatment technology is selected and the performance potential is to be verified through additional testing during the Remedial Design. On September 23, you informed me that the contingency remedy would be MC-3, Air Sparging. According to the proposed plan, Air Sparging is the most costly remedy, with the longest treatment time. Why would it be selected?

Response #1 Air sparging was selected as a contingency for control of off-site migration of the plume. It was selected to avoid installation of a groundwater treatment facility. Since the preferred alternative is MC-3a, an in-situ alternative, the contingency should also be an in-situ alternative, i.e. MC-3. The monitoring program would be focused on ensuring protection of off-site migration, should sentry wells indicate that the plume is migrating off-site. Such a condition would indicate that the off-site farmhouse drinking water supply was at risk. Under the plan, either a line of air sparging points or a trench with sparge points would be placed perpendicular to the flow of groundwater to reduce the concentration of groundwater to acceptable levels. The capital cost for the alternative, MC-3, was comparable to other "pump and treat" alternatives for remediation of the entire site and included both air sparging and vapor recovery of the sparged vapors. The vapors would be treated with activated carbon prior to discharge. This in-situ alternative was considered advantageous over other pump and treat options because it provides greater flexibility to implement because the sparge points can be installed with or without trenches and could be placed wherever the plume concentrations were considered to be necessary. Another advantage of MC-3 is that this alternative does not require extracting water from an aquifer that may go dry or nearly dry at certain times of the year. It is also likely that the costs will be less than the alternative priced in the FS, since trenches, vapor recovery and vapor treatment may not be required. This would be likely, since the location where the air sparging points would be placed would be low in concentration. Other options should also be considered including recent progress that has been made in the field of in-situ degradation of chlorinated plumes using additives such as vegetable oil or hydrogen release compounds. These options provide alternatives to pump and treat alternatives that were not considered, since these technologies were not available at the time the FS was prepared in 1995-1996.

Comment #2 This section should include the rationale for the preference by profiling the preferred alternative against the evaluation criteria and highlighting how it compares to the other alternatives (major advantages and disadvantages). EPA provided Superfund Proposed Plan boiler plate language to SEDA and its contractor which gives examples of how this can be addressed.

Response #2 Agreed; The rationale for the preferred alternative has been added.

Comment #3 Last paragraph: The third sentence is not true. RI investigation results indicate that metals and SVOCs also exceeded ARARs in groundwater. As a result. the preferred groundwater alternative should also address VOCS, SVOCs and metals.

Response #3 Disagree; The only chemicals of concern for groundwater are volatile chlorinated ethenes, i.e. trichloroethene and 1,2-dichloroethene. SVOCs exceeded GA standards at only one well, MW-44. This well was located within the most impacted area of the site, where the IRM was performed. The soil/groundwater surrounding this well was excavated and treated during the IRM. Following this, the well was replaced with MW-44a and sampled. There are currently no exceedances for SVOCs in groundwater. The metals exceedances in groundwater are turbidity related. This conclusion is based upon several factors. First, the spatial locations of metal exceedances were randomly dispersed around the site. This is a strong indication that there is no specific source for the metals causing the exceedances, especially since the exceedances are small. Further, since these locations do not correspond to the known sources, i.e. the Ash Landfill or the NCFL, it is unreasonable to expect that the areas surrounding where the exceedances were observed correspond to sources. Soil sampling data collected during the installation of these monitoring wells site did not indicate that a source of metal contamination was present. Secondly, it has been known for many years that turbidity influences groundwater samples for metals. Turbidity related sampling issues for metals has been an on-going dilemma for many years and was especially prevalent during the RI. During the first round of samples collected filtered samples were in compliance yet the unfiltered were not. Sampling techniques for metals were still under development during the second round of sampling of the RI, conducted in 1992-1993. Since that time, low-flow sampling techniques were refined and used to collect samples during the quarterly monitoring events. This data collected during the years after the RI was completed did not confirm or in many cases did not even detect the presence of these same metals in groundwater at these same locations. This data has been provided to EPA in the past but can be provided again, if necessary. No changes to the text have been made.

GLOSSARY

Comment #1 A glossary of technical terms used in this proposed plan would benefit the community while reading this document and should be included.

Response #1 Agreed; A glossary of technical terms used in this proposed plan has been added at the end of the PRAP.

Table 2, Individual Evaluation of Source Control Options

Comment #1 Any revisions to the text should not contradict the table and vice versa.
Response #1 Agreed; There should not be any contradictions.

REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

Comment #1 Alternative SC-1 No Action: The statement should be corrected to read, **"The Army believes** attenuation is expected....".
Response #1 Agreed; The phase "The Army believes" has been added.

Table 3, Summary of Detailed Evaluation of Migration Control Options

Comment #1 **COMPLIANCE WITH ARARS:** EPA does not agree that ARAR compliance will be met by MC-2-. Natural Attenuation.
Response #1 Agreed; The text has been changed to indicate that the alternative does not comply with ARARs.

Comment #2 **LONG-TERM EFFECTIVENESS AND PERMANENCE:** Magnitude of Residual Risk-. For Alternatives MC-1 and MC-2. EPA does not agree with the conclusions. The source of contaminants has been removed from the soil, but not from the groundwater. Contaminants will continue to migrate and may increase the volume of water contaminated.
Response #2 Agreed; The text has been changed to indicate that contaminants will migrate for MC-1. However, even if migration does occur for MC-2 there is little residual risk from ingestion of groundwater since water will be supplied to residences. How can there be residual risk if there is no exposure pathway?

Comment #3 **PERMANENCE:** The conclusions for Alternatives MC-3, MC -3a, MC-5 and MC-6 are not correct 5 ug/L will not meet ARARs, for each contaminant of concern. The federal MCL for vinyl chloride is 2 ug/L and the NY State standard for benzene in groundwater is 0.7 ug/L.
Response #3 Agree; The reference to the 5 ug/L has been replaced. The new text states that permanence will be reached once with the NYSDEC and Federal Groundwater Quality Standards are attained.

Comment #4 **REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT:** Alternatives MC-1 and MC-2: EPA does not agree with this justifications. If there were biodegradation occurring, there may be a reduction of toxicity depending on the degradation products. However in this case, vinyl chloride is more toxic than the original contaminants. Natural attenuation does not reduce the mobility and potentially increases the volume of water that is affected.
Response #4 Agree; To avoid any continued delays in finalizing the PRAP we have added that natural attenuation may not be sufficient in preventing migration of pollutants. We have added that vinyl chloride is more toxic than the parent compound and is more mobile. Although vinyl chloride is a toxic breakdown product of 1,2-DCE, vinyl chloride has not been measured in any on-site or off-site monitoring wells, other than MW-44a, which is the most contaminated well.

Comment #5 **SHORT-TERM EFFECTIVENESS:** Time Until Action is Complete: Table 3 and the text pertaining to Migration Control Alternatives on pages 8 through 11 contradict each other. The document should be corrected so that the sections, are in agreement.

Response #5 Agreed; The table and the text have been updated to be correct.

Comment #6 Alternative MC-3 - The text on pages 8 and 9 says nothing regarding completion time.

Response #6 Agreed; The text has been changed to indicate that the completion time is 6 to 9 months.

Comment #7 Alternatives MC-3/MC-3a - the estimated years of completion in the table do not agree with the text.

Response #7 Agreed; The table has been changed to match the text.

Comment #8 Alternative MC-5 - The table states 10 years, but the text states 4-8 years.

Response #8 Agreed; The table has been changed to match the text.

Comment #9 Alternative MC-6 - The table estimates 10 years but the text says 4-8 years.

Response #9 Agreed; The table has been changed to match the text.

Comment #10 **IMPLEMENTABILITY:** Technical.Feasibility: Alternative MC-2: EPA has sent numerous letters refuting the Army's belief that a naturally occurring cleansing process is remediating the plume. In fact, historical monitoring data from well MW-56 shows that the plume is continuing to migrate off SEDA property. At the very least, qualify the statement discussing reductions from natural mechanisms by stating either that, "**The Army believes**..." or that "Reductions from natural mechanisms **may be** occurring and may continue to occur."

Response #10 Agreed; The change has been made to the table that indicates that natural degradation may be occurring and may attain levels that are protective. Monitoring will be performed to ensure protection.

Comment #11 Ability to Obtain Approvals and Coordinate with Other Agencies: Alternative MC-1: Off-site migration has already occurred. Therefore, the word **"potential"** should be deleted.

Response #11 Agree; The word "potential" has been removed.

Comment #12 Alternatives MC-5 and MC-6: No construction permits are required, but the Army must meet the applicable substantive requirements. The last sentence in each, "EPA and NYSDEC will provide input." should be deleted.

Response #12 Agreed; The phrase has been deleted.

COST

Total Present Worth Cost:

Comment #1 Alternative MC-3 - The text on pages 8 and 9 says nothing regarding completion time.

Response #1 Agreed; The completion time has been added.

Comment #2	Alternative MC-3/MC-3a - the estimated years of completion in the table do not agree with the text.
Response #2	Agreed; The table has been changed to be consistent with the text.
Comment #3	Alternative MC-5 - The table states 10 years, but the text states 4-8 years.
Response #3	Agreed; The table and the text have been made to be consistent.
Comment #4	Alternative MC-6 - The table estimates 10 years, but the text says 4-8 years.
Response #4	Agreed; The table and the text have been made to be consistent.

Response to Comments

From

United States Environmental Protection Agency (US EPA)

Draft Final Proposed Remedial Action Plan (PRAP)

Ash Landfill

Seneca Army Depot Activity, Romulus, NY

Comments Dated February 12, 2001

This is regarding the above referenced Draft Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill prepared by Parsons Engineering-Science (Parsons ES) for SEDA through the U.S. Army Corps of Engineers New York District and Huntsville Division.

General Comment No. 1: First, as you know, the proposed plan is a document to facilitate public involvement in the remedy selection process. Accordingly, grammatical propriety plays a critical part in the presentation of this document. Additionally, the font size used in the text of the document is below what is considered standard font size (EPA uses 10 pt, Arial True Text Font for these types of documents). The amount of typographical and grammatical errors found within this "draft final" version of the document can only be judged as careless. I am enclosing our mark-up copy for your reference. Please note that EPA may choose not to accept any future documents with smaller than standard text font sizes, and will not spend time correcting typographical errors and rewriting sentences to make sense of a document that is required to be easily readable and understood by the public. The Army itself should proof read and review all documents before submitting them to the regulatory agencies for review.

Response: Agreed. The document has been reformatted as suggested. Typographical and grammatical errors have been corrected.

General Comment No. 2: The remedy includes the excavation of debris and a vegetative cover over the landfill to address the contaminant sources, and an iron reactive wall for the groundwater contamination. However, there is no mention of institutional controls or 5-year reviews as per CERCLA Section 121 (c), NCP Section 300.430 (f) (4) (ii), and OSWER Directives 9355.7-02 (May 23, 1991), 9355.7-02A (July 26, 1994), and 9355.7-03 (December 21, 1995). Both must be included as components of the preferred remedy, or for any other remedy that does not result in unlimited and unrestricted use.

Response: Agreed. Institutional controls and 5-year reviews are required per CERCLA Section 121 (c), NCP section 300.430 (f) (4) (ii), and OSWER Directives 9355.7-02 (May 23, 1991), 9355.7-02A (July 26, 1994), and 9355.7-03A (December 21, 1995). Institutional controls will consist of deed restrictions to prevent future owners from performing certain actions at the site including use of the site groundwater for potable water and disturbance of the landfill areas. The deed restrictions will be placed in the property files associated with the site. A mechanism for enforcing the deed restrictions will be implemented.

Section 300.430 (f)(4)(ii) of the NCP states that "if a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action". Since waste materials and contaminated groundwater will remain onsite following remediation, five-year reviews will be required. The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment. The five-year review involves document review, ARAR review, interviews, inspection/technology review and reporting.

The preferred alternative for the Ash Landfill Operable Unit will contain 5-year review and institutional control provisions.

General Comment No. 3: It also appears that the present-worth costs were calculated based on a 10 percent interest rate. Recent guidance recommends a range of 5 to 7 percent. Therefore, the present worth cost estimates need to be recalculated.

Response: Disagree. The present-worth costs are developed for comparative purposes screening remedial alternatives. Although the 10 percent interest rate is somewhat high, it is reflected in the costs of all alternatives. Additionally, the present-worth costs using a 10 percent interest rate are presented in Feasibility Study (FS). Recalculations of the costs in the PRAP would result in the costs, which are different, than the costs presented in the FS.

General Comment No. 4: The proposed plan should include page numeration and appendixes with figures and tables identified with the text.

Response: Agreed. Page numeration and appendices tabs have been added.

General Comment No. 5: The Response to Comments and a redline/strikeout of the draft PRAP should not be a bound part of the PRAP. They may be submitted separately if intended to illustrate how comments have been addressed.

Response: Agreed. The redline/strikeout version of the draft PRAP has been removed. A separate redline/strikeout version of the draft-final PRAP is provided separately.

Specific Comment No. 1: Purpose *of Proposed Plan, 1st column, Page 1*: Please add a paragraph with a brief description of the preferred remedy.

Response: Agreed. A brief description of the preferred remedy has been added.

Specific Comment No. 2: Remedial *Investigation (RI) Summary, 2nd Paragraph, Page 2: Explain* possible sources for the Volatile Organic Compounds (VOCs) contaminants since the landfill is alleged to have been used mainly for domestic waste.

Response: Agreed. The following sentences have been added to the text: "The source of the Volatile Organic Compounds was most likely the three alleged solvent dump areas located at the "Bend in the Road", northwest of the Ash Landfill. The source of the VOCs that were allegedly disposed in this area is unknown."

Specific Comment No. 3: *Non Time Critical Removal Action (RA) Summary, 1st Column, 1st Paragraph, 5th Sentence, Page 3:* Please replace word "eliminated risk" with "reduced risks to acceptable levels."

Response: Agreed. The requested change was made.

Specific Comment No. 4: *Non Time Critical Removal Action (RA) Summary, 1st Column, 1st Paragraph, 3rd to last Sentence, Page 3: Please* identify VOCs cleanup criteria (e.g., NYSDEC Class GA groundwater).

Response: Agreed. The text has been modified to identify the VOC cleanup criteria for soil, the NYSDEC TAGM values.

Specific Comment No. 5: *Non Time Critical Removal Action (RA) Summary, 2nd Column, 4th Paragraph, 2nd Sentence, Page 3: The* statement "thermal treatment is not effective in removing metals from soil," is technically correct. However, a discussion of what can be said about metals should follow.

Response: Since the soils were removed for offsite disposal and treatment was not necessary, a discussion on metals treatment was not included. The TCLP testing was performed to determine if the soils exhibited hazardous characteristics and required treatment prior to disposal. The soils did not exhibit hazardous characteristics.

Specific Comment No. 6: *Non Time Critical Removal Action (RA) Summary, 2nd Column, last Paragraph, 2nd to last Sentence, Page 3: The* text, "total concentrations of lead in soil were not measured during the IRM" is inconsistent with the sentence that follows, which discusses the measurements of lead in soil made within the IRM area. That mix of conflicting actions within the same paragraph may be confusing to the general public. Please re-work the paragraph.

Response: Agreed. The sentence "Total concentrations of lead in soil were not measured during the IRM" has been removed.

Specific Comment No. 7: *Also, the* continuation of this paragraph at the top of page 4, the given concentrations of lead show no criteria (e.g., 95% UCL, background) to compare with.

Response: Agreed. A sentence has been added to the end of the paragraph which reads " The TAGM cleanup criteria for lead is 24.8 mg/kg."

Specific Comment No. 8: *Non Time Critical Removal Action (RA) Summary, 2nd Column, 3rd Paragraph, 2nd Sentence, Page 4: Please* discuss the Low Stress (low-flow) Purging and Sample Procedure in this section.

Response: Agreed. The text has been modified to state that the EPA Region II Low Stress (low-flow) Purging and Sampling Method was used to reduce the turbidity in the groundwater samples.

Specific Comment No. 9: Summary *of Site Risk, 2nd Column, 2nd, 3rd, and 4th Paragraphs, Page 5: Please* provide the calculated cancer risks and hazard index (HI) for the on-site residential use scenario (the worst case scenario).

Response: Agreed. A sentence has been added to the beginning of the 4th paragraph which states "the carcinogenic risks for potential future residents using groundwater for drinking at SEDA is 1.4 x 10^{-3}, and the HI is 3.2". Additionally, the carcinogenic risks and HI have been added as requested in Paragraph 2 and 3.

Specific Comment No. 10: Summary *of Site Risk, 1st Column, Page 6: Please* state whether the NYSDEC certified the non presence of endangered or threatened species at this site. Also, discuss the four-step process used for assessing site-related ecological risks in light of EPA guidance, and state whether it went beyond the screening level stage.

Response: Agreed. In the *Rare Species Survey, Seneca Army Depot Activity* (U.S. Department of the Interior Fish and Wildlife Services, September 1996), it is stated that no federally listed endangered or threatened species was identified at SEDA. NYSDEC reviewed and certified this document on December 23, 1996.

The ecological risk assessment was performed in accordance with the *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA)* (October 1994). This guidance outlines a four step process for completing ecological risk assessments as described in the PRAP: site description, contaminant-specific impact assessment, ecological effects of remedial alternatives, and fish and wildlife requirements for implementation of remedial actions. In support of these requirements, the following tasks were completed:

- qualitative and quantitative characterization of ecological communities and dominant nondomesticated plant and animal species in the area of the Ash Landfill;
- selection of receptor species;
- identification of chemicals of potential concern for ecological receptors;
- identification of exposure pathways from the Ash Landfill to target species;
- assessment of exposure of receptors to chemicals of potential concern;
- assessment of the toxicity of chemicals of potential concern for each receptor group or species;
- characterization of risk; and
- estimation of risk uncertainty.

Current guidance outlines an eight step process for conducting ecological risk assessments as summarized in EPA's *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA, June 1997). This guidance was not available at the time that the risk assessment was completed. Based on this eight-step process, the ecological risk assessment, which was performed as part of the RI, met the requirements for the screening level risk assessment.

Specific Comment No. 11: Scope *and Role of Action, 1st Column, Page 6: Please* add a table with brief description of the 25 areas subject to remedial investigation at SEDA. Also, include a discussion about the future land use for the site, and its influence on the decision making process.

Response: Agreed. There are actually 13 areas subject to remedial investigation at SEDA. A table (Table 6) showing these 13 areas has been added. The following paragraph has been added to this section:

"The future land use of the site is listed by the Local Redevelopment Authority (LRA) as recreational/conservation. Cleanup levels, remedial action objectives and remedial alternatives were selected consistent with this intended future land use."

Specific Comment No. 12: Summary *of Remedial Alternatives, 2nd Column, Page 6: The* font for the title should be bold for consistency.

Response: Agreed. The title font has been bolded for consistency.

Specific Comment No. 13: Evaluation *of Alternatives, State Acceptance, 1st Column, Page 15: Please* indicate whether the State has ever preliminarily concurred with the preferred remedy.

Response: In NYSDEC's letter to the Army dated April 6, 2001 concerning the PRAP, NYSDEC states that "because the preferred alternative in the Draft-Final version of this PRAP is technologically equivalent and as stringent or more so than in the Draft PRAP that the NYSDEC conditionally occurred with in a letter dated October 9, 1997, the NYSDEC also finds the latest iteration of the PRAP acceptable." The Army believes that this letter indicates that the Department has preliminarily concurred with the preferred remedy.

Specific Comment No. 14: Evaluation *of Alternatives, Summary, 1st Column, Page 15: Please* include definition of "threshold criteria" in the Glossary.

Response: Agreed. The definition of threshold criteria has been added to the glossary.

Specific Comment No. 15: Preferred *Alternative, 2nd Column, 3rd Paragraph, Page 15: Please* add the requirement to establish vegetative soil cover in addition to the maintenance of it.

Response: Agreed. The paragraph has been rewritten as follows:
"Based on an evaluation of the various options, the U.S. Army recommends Alternative SC-5. This alternative includes excavation and off-site disposal of the debris piles, establishment and maintenance of a vegetative soil cover for the Ash Landfill and NCFL for source control, and installation of three in-situ permeable reactive barrier walls filled with a 50/50 mixture of sand and zero valence iron (MC-3a) for migration control of the groundwater plume as the preferred remedy for the site."

Specific Comment No. 16: Preferred *Alternative, 2nd Column, 5th Paragraph, 5th Sentence, Page 15: The* explanation for the contingency plan should be more comprehensive. Include trigger criteria, provision for alternate drinking water supply, and say what the contingency plan is (if alternative 3).

Response: Agreed. The furthest downgradient permeable reactive barrier wall will be located immediately upgradient of the western property line. Three additional shallow monitoring wells will be installed between this wall and the property line. These wells will be used to assess the effectiveness of the barrier wall.

A contingency plan will be developed as part of this preferred alternative. The contingency plan will include additional monitoring and air sparging, as necessary. Following installation of the reactive walls, groundwater from monitoring well MW-56 (see Figure 2 for location) will be analyzed and the VOC results will be compared to the Class GA groundwater standards (trigger criteria). If a statistical analysis of the data for this well shows exceedances of Class GA standards, additional remedial action will be required. Temporary wells will be installed in the vicinity of MW-56, and the results will be used to develop an approach for air sparging. A description of the air sparging process is summarized in Alternative MC-3. If concentrations at MW-56 continue to exceed the trigger values following air sparging, an activated carbon system for the farmhouse water supply system will be installed or public water will be delivered to the house. More extensive air sparging will be performed until trigger values are no longer exceeded.

Specific Comment No. 17: Preferred *Alternative, 2nd Column, 4th Paragraph, 2nd to last Sentence, Page 15:* Please cite by specific reference and provide a more explicit discussion of what the NCP goal against off site disposal is referred to in this sentence. Otherwise, please remove the statement. EPA is uncertain that the Army interpretation of this goal is consistent with its own.

Response: Agreed. The statement that "and is therefore consistent with the goals of the NCP against off-site disposal" has been removed.

Specific Comment No. 18: Preferred *Alternative, 2nd Column, last Paragraph, 5th Sentence, Page 15: Please* note that remaining residual contamination requires five-year reviews and institutional controls.

Response: Agreed. The following paragraph has been added to the end of the section:
"Since this alternative will result in contaminants remaining at the site which exceed levels which allow unlimited use and unrestricted exposure, institutional controls and five-year reviews will be required. Institutional controls will consist of deed restrictions to prevent future owners from ingesting site groundwater and disturbing the landfill cap. The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment and will consist of document review, ARAR review, interviews, inspection/technology review and reporting."

Specific Comment No. 19: Table *5, SC-2: The* long-term criterion incorrectly states "on-site" landfill. Please correct to off-site landfill.

Response: Agreed. The correction was completed.

Response to Comments from the United States Environmental Protection Agency

Subject: Draft Final Proposed Remedial Action Plan (PRAP) for the Ash Landfill
Seneca Army Depot
Romulus, New York

Comments Dated: December 12, 2001

Date of Comment Response: July 3, 2002

General Comments:

Comment: No references to *Figure 3* were found throughout the document. Please eliminate Figure 3 or refer to it within the text.

Response: Figure 3 has been eliminated, and the numbering for the remaining figures has been updated.

Comment: The Ash Landfill Operative Unit (OU) is comprised of five SWMUs (SEAD-3, 6, 8, 14 & 15) of which SEAD-3 (Ash Cooling Pond), and SEAD-15 (Incineration Building) are not properly addressed and discussed within the PRAP document. If no action is proposed at these sites (SEAD-3 & 15), a detailed explanation of the basis for such a proposal needs to be provided within the PRAP. The current PRAP is incomplete without information on SEAD-3 & 15.

Response: Agreed. The text has been revised to provide additional information on both SEAD-3 and SEAD-15. Specifically, there have been the following text additions:

- Additional historical information on site investigation and findings has been added to the last paragraph of the first column on p. 5, under the subheading **Soil**. This text is intended to supplement the existing historical text information on pages 2 and 3 of the PRAP.
- Text to address potential contamination issues within SEAD-15 (Abandoned Incinerator Building) has been added to ***SUMMARY OF SITE RISK*** in the second column of p. 6.
- Text indicating that no further action is planned for SEAD-3 and SEAD-15, based on prior UST removal and investigations has been added to end of the second paragraph under the heading ***PREFERRED ALTERNATIVE***.

Specific Comments:

Comment 1: Page 1, 1st Column: Given the accessibility of digital information, and the intention to get as much public participation as possible, comments provided via electronic mail systems should be accepted by the Army. Please provide an e-mail address to receive public comments for this document.

Response 1: Disagree. The Army requests that all comments be formally submitted to the Army in writing.

Comment 2: Page 1, 2nd Column: Please indicate how the off-site migration of the groundwater contamination affecting the farmhouse water supply system will be controlled.

Response 2: To date, none of the water supply wells on the farmhouse property have been impacted by contamination from groundwater emanating from the Ash Landfill. With the installation of the proposed permeable reactive barrier along the western boundary of the site, groundwater from the site will be treated *in situ* and no further off-site contaminant migration is expected. As for the existing groundwater contamination downgradient of the proposed barrier, current data indicates that the contaminants of concern are naturally attenuated through a combination of degradation and/or dilution to an extent that applicable groundwater standards will not be exceeded at the farmhouse water supply wells.

Comment 3: Page 2, 2nd Column: NPL means National *Priorities* List, not National *Priority* List. Please correct.

Response 3: Agreed. Text has been revised from *Priorities* to *Priority*.

Comment 4: Page 5, 2nd Column: Show and identify surface water and sediment/wetlands on the included Figures.

Response 4: Although seasonal drainage is present at the site during some portions of the year, there are no permanent surface water bodies to delineate at the Ash Landfill operable unit. Wetlands delineation has been provided on Figure 2 and Figure 4, with a legend entry provided indicating the symbol used for depicting wetland areas at this site.

Comment 5: Page 6, 2nd Column: *Figure 5* in the text should be bolded for consistency.

Response 5: Agreed. Font for the original *Figure 5* (revised to *Figure 4* with the elimination of the reference to Figure 3, as indicated under responses to General Comments) has been bolded.

Comment 6: Page 8, 2nd Column: Please discuss risks for sediments, and indicate whether remediation is required.

Response 6: The following text has been added to the text on p. 9 of the PRAP, under the section entitled ***SUMMARY OF REMEDIAL ALTERNATIVES***:

> As discussed in Section 6 of the RI Report, the human health risk assessment conducted during the RI determined that the site hazard index and total cancer risk for exposure to sediment in on-site wetlands are within the acceptable EPA risk range. However, the ecological risk assessment suggested that, based upon a comparison with all available state

and federal guidelines, in addition to literature information, there may exist a slight threat due to the presence of nine metals (arsenic, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc). During the 1994 Interim Remedial Measure (IRM) for the Ash Landfill, the sediments representing the potential slight risk were excavated. These materials were thermally treated with soil excavated from the "Bend in the Road" area. Following treatment, post prove-out sampling showed that the soils and sediments met the project-specific cleanup goals and were used as backfill at the "Bend in the Road" area and in the excavated wetland areas. Further remediation for wetland sediments is not required.

Comment 7: Page 9, 2nd Column: The title for alternative SC-2 indicates off site disposal for the excavated material. However, the text indicates the consolidation of those excavated materials into the NCFL. Also, there seems to be another inconsistency with regard to the depth of excavation for SC-2 at 10 feet versus SC-3 at 2 feet. Please explain these apparent inconsistencies.

Response 7: For alternative SC-2, the consolidation of excavated materials from the Debris Piles (SEAD-14) and Ash Landfill (SEAD-6) at the NCFL (SEAD-8) would occur as an interim step between excavation of soils at these two SEADs and off-site disposal of this material. As part of alternative SC-2, the material that would be disposed off-site includes the materials excavated at SEAD-6 and SEAD-14, and soil and debris at the NCFL. For alternative SC-3, the excavated material from the Debris Piles and Ash Landfill would be consolidated at the NCFL and covered with an engineered barrier, such as 12" of clay or a geomembrane. Under alternative SC-3, soils at the NCFL would be capped in-place following consolidation with excavated materials from the Debris Piles and Ash Landfill.

As indicated in Section 4 of the Ash Landfill Remedial Investigation (RI) Report, the majority of contamination at the Debris Piles and Ash Landfill is in shallow (e.g. 0-2 feet below land surface) soils. Section 4 of the RI further indicates that the depth of some contaminants, such as PAHs, at the NCFL was observed to extend "as deep as 10 feet" below land surface. Because both alternatives (SC-2 and SC-3), require excavation of contaminated soils at the Debris Piles and Ash Landfill for consolidation at the NCFL and that the majority of contamination in these two SEADs was observed in the top 2 feet of soil, the depth of excavation is anticipated to be approximately 2 feet below land surface at these two SEADs. Alternative SC-2 further indicates that soils in the NCFL will be excavated and disposed off-site in a Subtitle D landfill. Because the depth of contamination has been observed to a depth up to 10 feet below land surface, this alternative further anticipates that excavation to a depth of 10 feet would be required at some locations in the NCFL. Thus, the maximum depth of anticipated excavation for SC-2 would be 10 feet (at the NCFL), and 2 feet at the Debris Piles and Ash Landfill. Under alternative SC-3, soils in the NCFL would not be excavated because this alternative proposes to cap NCFL materials in-place. Thus, the maximum depth of anticipated excavation for SC-3 would be 2 feet at the Debris Piles and Ash Landfill because no excavation would be required at the NCFL under this alternative.

To address this comment, text has been added to the first paragraph under Alternative SC-2 (p. 9/10) such that this paragraph reads as follows (new text is italicized and underlined):

> This option consists of excavating contaminated soils from the Ash Landfill, the NCFL, the debris piles, and consolidating them at the NCFL. The results of the RI indicate that these areas are well-defined localized areas that are less than 10 feet deep *in the NCFL and less than 2 feet deep at the Ash Landfill and the debris piles. Based on this finding, the expected depth of excavation at the Ash Landfill and debris piles would be 2 feet, whereas the expected depth of excavation at the NCFL will be 10' or less. The results from the RI further indicate that contaminated soils in all three locations* could be removed with standard construction equipment. *Following consolidation of contaminated soils at the NCFL*, the excavated materials would be transported to an off-site Subtitle D landfill *for disposal*. Clean backfill materials would then be transported to the site and used to fill the excavated areas. A vegetative cover would be established over the backfilled area. A Subtitle D landfill refers to a solid waste landfill that meets the NYSDEC and USEPA Subtitle D landfill construction specifications.

Further clarification has also been added to the second paragraph under Alternative SC-3 (p. 10) such that this paragraph reads as follows (new text is italicized and underlined):

> The first step in this option is excavation. An excavation plan would be developed using previous RI data to delineate the extent of removal. A wetland mitigation plan would also be developed. The maximum volume to be excavated is approximately 32,400 cubic yards, which includes all the soils except those in the NCFL. The expected depth of the excavation in soils *outside of the NCFL* would be approximately 2 feet. *Under this alternative, excavation would not be performed on soils in the NCFL, as soil in the NCFL* would remain in-place and be capped. The excavation would be accomplished with standard construction equipment, such as a front-end loader or bulldozer. The excavated soil would be immediately transported to the NCFL where it would be consolidated and eventually capped.

Comment 8: Page 10, 2nd Column: Contaminants will remain at this site above levels that allow for unlimited/unrestricted use. Therefore, provide the type(s) of institutional controls the Army is planning to implement for Alternative SC-3.

Response 8: Agreed. The last paragraph under the discussion of Alternative SC-3 on p. 10 has been revised to include language relating to the types of institutional controls for this alternative.

Comment 9: Page 11, 2nd Column: Contaminants will remain at this site above levels that allow for unlimited/unrestricted use. Therefore, provide the type(s) of institutional controls the Army is planning to implement for Alternative SC-5. Also, the requirement for 5-year review is missing for this alternative.

Response 9: Agreed. A paragraph has been added to the discussion of Alternative SC-5 on p. 12 that includes language relating to the types of institutional controls and the requirement of a 5-year review for this alternative.

The following comment/responses from the USEPA (October 29, 2002) will be integrated into the Final Proposed Plan following the public comment period.

Response to Comments from the United States Environmental Protection Agency

Subject: Final PRAP for the Ash Landfill
Seneca Army Depot
Romulus, New York

Comments Dated: October 29, 2002

Date of Comment Response: December 11, 2002

Specific Comments:

Comment 1: Page 2, 1st Column, 4th Paragraph: Please update the address to receive comments and include your e-mail address.

Response 1: The mailing address has been added. The Army is not willing to receive comments via email.

Comment 2: Page 10 and 11, SC-2 and 4: Please provide an explanation for the differences between volumes of soil addressed by these two alternatives.

Response 2: The volume for the Alternative SC-2 is incorrect. The excavation volume for both alternatives is 68,700 cubic yards. The volume will be corrected.

Comment 3: Page 13, MC Alternatives: Please provide a brief explanation as to evaluations of the effectiveness of the existing wall (e.g., pilot, treatability study, etc.). Provide references as appropriate.

Response 3: Agreed. As requested by the New York State Department of Environmental Conservation (NYSDEC) in their comment letter dated October 11, 2002, several paragraphs on the demonstration project and subsequent evaluations involving the reactive iron wall have been added to the Remedial Investigation Summary, Groundwater section. The paragraphs are as follows:

> "In December 1998, a 650-foot long permeable reactive iron wall was installed approximately 100 feet east of the railroad tracks near the property line. The wall was installed as a demonstration project to show that the reactive iron wall could be effective in reducing the concentrations of chlorinated ethenes through reductive dechlorination. The wall was constructed by placing a mixture of 50 percent zero valent reactive iron granules and 50 percent sand in a trench with a width of 14 inches and a depth ranging from 6 to 12 feet. Eleven monitoring wells were installed upgradient, downgradient and within the wall to monitor its effectiveness. Groundwater sampling has been performed at these wells since the wall installation.

The first four rounds of groundwater sampling in the vicinity of the wall were evaluated to determine if the reactive iron wall technology was effective in destroying TCE in groundwater and would be appropriate for full-scale remediation (Draft Feasibility Memorandum for Groundwater Remediation Alternatives Using Zero Valent Iron Reactive Wall at the Ash Landfill, Parsons, August 2000). The report concluded that the technology was viable. However, it appeared that some breakthrough of TCE and DCE may be occurring due to higher groundwater velocities resulting in inadequate reaction time within the wall.

Column and batch testing was performed in August 2001 using site groundwater and reactive iron to determine if the retention time in the existing wall was sufficient to allow for complete destruction of the TCE. As detailed in the Bench-Scale Treatability Report for the Ash Landfill, Seneca Army Depot Activity, Romulus, NY (Envirometal Technologies, Inc., September 25, 2001), the reactive iron wall will degrade chlorinated ethenes below NYSDEC Class GA standards if sufficient reaction time is allowed. Future walls will be designed to allow sufficient reaction time within the wall.

Three additional rounds of sampling have been conducted on the Ash Landfill wells (Groundwater Monitoring Reports, Ash Landfill, Parson, March 2002, July 2002 and November 2002). The results have been generally consistent with the previous two rounds."

Comment 4: Page 15, 1st Column, 3rd Paragraph, MC3-a: The word "situ" is repeated within the title. Also, this page was repeated.

Response 4: Agreed. The title will be revised as noted. The duplicate page will be removed.

Comment 5: Page 16, 1st and 2nd Column: Figure 6 does not exist. Please correct. Also, please better explain how the addition of more reactive walls speed up the treatment by at least 45 years (1st Column, last paragraph). Provide a discussion as to how often the iron filings are expected to need replacement, especially in light of breakthrough?

Response 5: Agreed. Figure 3 showing the location of the farmhouse was not provided. With the inclusion of this figure, Figures 3, 4 and 5 will be relabeled as Figures 4, 5 and 6.

Two additional reactive iron walls will reduce the treatment time to 15 years. The third wall will be installed to work in conjunction with the existing demonstration wall. The third wall will address the design changes identified in the demonstration project. The following sentence will be added to the third paragraph on Page 16: "Wall design modeling presented in the Feasibility Memorandum showed that the addition of two more walls upgradient of the existing wall will segment the plume and minimize the travel distances needed before it passes through a reactive iron wall."

Agreed. Eight sentences will be added to the third paragraph of Page 16 to state "Theoretical calculations show that carbonate precipitation could reduce the porosity of the wall to the porosity of the surrounding aquifer in approximately 18 years. The reduced porosity would limit groundwater flow through the wall resulting in groundwater mounding behind the wall. Groundwater mounding would cause groundwater to pass around the ends of the wall. There is no historic evidence from previous installation of reactive iron walls at other sites or at the Ash Landfill to suggest that fouling of the wall materials inhibits the destruction of TCE. Based on the technical information presented above, the Army does not expect breakthrough or need for replacement of iron filings throughout the life of this project. If it is determined at a later date that the breakthrough of future walls leading to exceedances of groundwater standards is occurring, maintenance options will be evaluated.

In order to prevent mounding of groundwater, the iron/aquifer interface will be agitated with overlapping 1-foot augers if groundwater elevation monitoring shows that groundwater mounding is occurring. The agitation would break up the precipitation and increase porosity. This effort would be expected if the projected treatment time of 15 years is exceeded and mounding is found to occur.

BCT Agenda
18 March 2003

TRANSFER AGREEMENT – S Absolom & Pat Jones ONLY IF APPROVED
- What is new
- Programmatic changes
- Schedules
- Rail Road license

SEAD 50 and 54 Completion Report – Tom Battaglia lead
- Review of DATA
- Review of Maps
- Discussion of effort to meet acceptable closure
- Site Transfer – S Absolom & Pat Jones

PID FOST
- EPA remaining Concerns - Julio Vazquez
- NYSDEC remaining Concerns – Alicia Thorn

19 March 2003

Conservation Area FOST- S Absolom
- Schedule
- Agreements for site restriction
- Review of retained property boundaries

Open Burning Grounds- Tom Battaglia
- Residual contamination map
- Plan to completion of project

Inhibited Red Fuming Nitric Acid site - SEAD 13 – Todd Heino
- History of Effort
- Path forward

Ammunition Washout Plant- SEAD 4 Todd Heino
- History of Effort
- Status of site response to comments

Deactivation Furnaces SEAD 16/17- Todd Heino
- Proposed Remediation Areas
- Proposed Remedial Action Objectives

Chronology of Events
SEAD-4
RI/FS at the Munitions Washout Facility
Seneca Army Depot Activity

Date	Action	Attachment
September-94	SEAD-4 classified as a High Priority AOC in SWMU Classification Report	
1994/1995	ESI Field Work Conducted at SEAD-4	
May 1995	ESI Report recommends RI/FS for SEAD-4	
October-96	Final SEAD-4 Project Scoping Plan for RI/FS	
November-98	RI/FS Fieldwork Commences	
November-99	Draft RI Report Issued	
January-00	Received comments from NYSDEC on Draft RI Report. Comments on specifics of ERA	
March-00	Received comments from EPA on Draft RI Report. Comments on comparison of metals to background, ERA.	
June-00	Draft-Final RI Report Issued	
July-00	Received comments from NYSDEC on Draft-Final RI. VOC investigation near Bldg. 2084. F&W recommend remediating soils to background. Proceed with FS.	
October-00	Received comments from EPA on Draft-Final RI. Move ahead with FS.	
January-01	Final RI Report Submitted	
February-01	Parsons collects Headspace analyses from soil borings near Building 2084 in response to NYSDEC comments	
	Ecological Risk Assessment (ERA) revised to evaluate soil and sediment as the same media	
July-01	Draft Feasibility Study Report	
September-01	Received EPA comments on FS Report. Specific comments on HHRA and ERA.	Yes
September-01	AEC, SEDA, and Parsons meet- ERA revised	Yes
October-01	Received NYSDEC comments on FS Report. F&W reject risk-based CUGs. Drainage ditches are aquatic.	
November-01	Parsons surveys the drainage ditches at SEAD-4 to determine if sediment or soil is present	
January-02	Draft-Final FS Report with responses and revised ERA submitted	
March-02	Received comments from EPA on Draft-Final FS and revised ERA. Consider GW as separate OU. Additional RA comments.	Yes
April-02	Received comments from NYSDEC on Draft-Final FS. F&W again reject CUGs.	Yes
January-03	Requested and received clarification on NYSDEC comments. No additional clarification provided.	
February-03	Submitted Responses to Comments on the Draft Final FS and Revised Final RI. Addressed EPA RA comments. Proposed no excavation based on revised future use.	Yes

Table 1
Comparison of Proposed Soil Clean-Up Goals for SEAD-4 to Toxicity Benchmark Values and Remediation Criteria

Chemical	Proposed Clean-up Goal (mg/kg)	Toxicity Benchmark Values (mg/kg)			Remediation Criteria (mg/kg)			CUG at OB Grounds [7]
	Parsons [1]	Oak Ridge Earthworm Benchmark [2]	Oak Ridge Microbial Benchmark [2]	Oak Ridge Terrestrial Plant Benchmark [3]	Dutch Intervention Value [4]	CCME [5]	MOE Soil Remediation Criteria [6]	
Chromium (Total)	324	**0.4**	10	1	380	64~87	750~1000	
Chromium (III)								
Lead	167	500	900	**50**	530	70~600	200~1000	60/500

Table 3. Fish + Wildlife

Notes:

1. Parsons. 2001. Draft Feasibility Study at SEAD-4. Table 2-2.

2. Efroymson, R.A., Will, M.E., Suter II, G.W. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process. Earthworm benchmark based on Cr(VI) toxicity and microbial benchmark based on Cr(III) toxicity.

3. Efroymson, R.A., Will, M.E., Suter II, G.W., Wooten, A.C. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision.

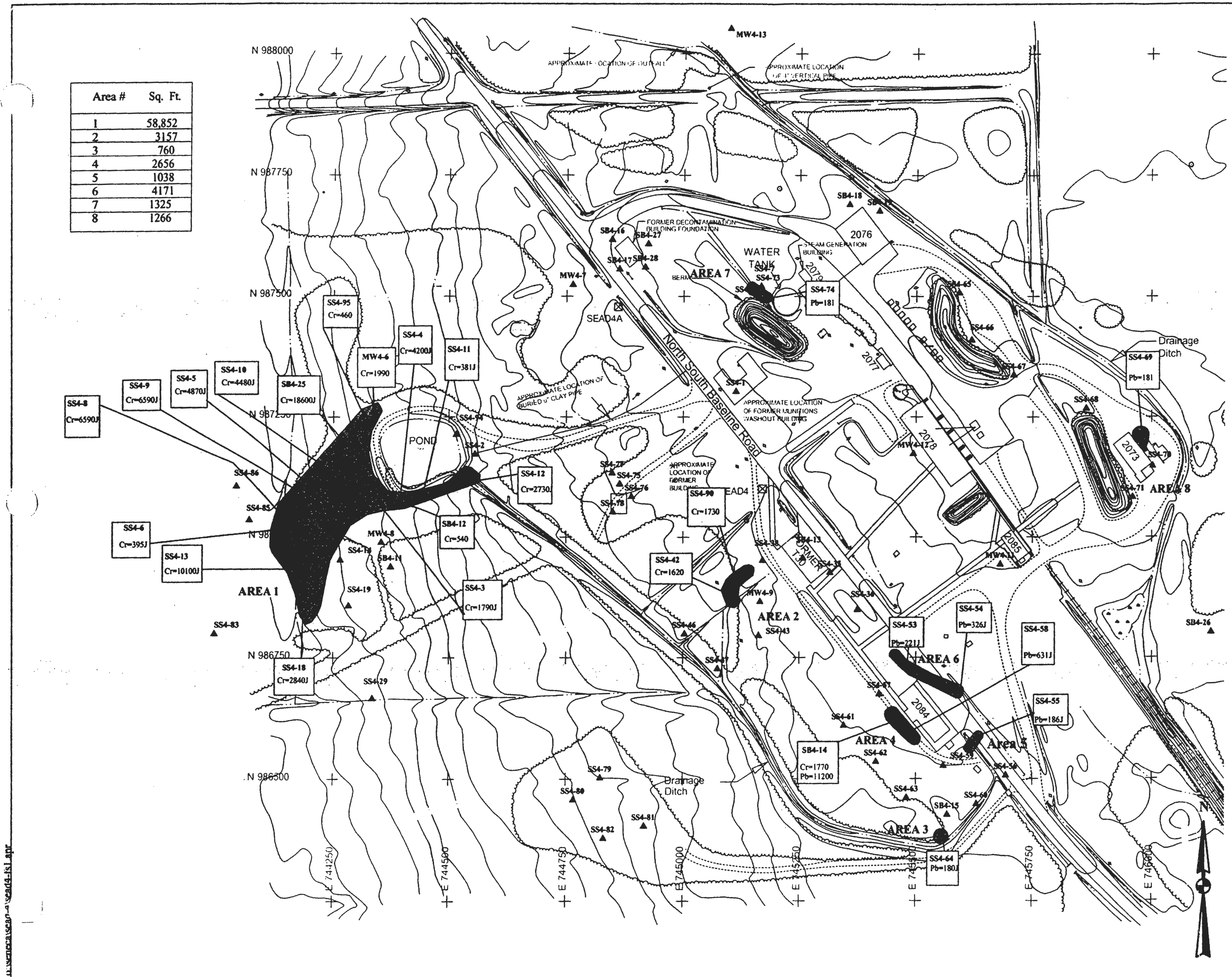
4. Dutch Ministry of Housing, Spatial Planning and the Environment. 2000. Circular on Target Values and Intervention Values for Soil Remediation.

5. Canadian Council of Ministers of the Environment. 1999. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health. http://www.ec.gc.ca/ceqg-rcqe/Soil.pdf. Soil quality guidelines vary depending on different land use.

6. MOE, 1999. Guideline for use at Contaminated Sites in Ontario. Soil remediation criteria vary depending on different land use and soil type.

7. Parsons, 1999. Final Open Burning (OB) Grounds Record of Decision (ROD). Soils containing lead concentrations above 60 ppm was proposed to be covered and soils with lead concentrations greater than 500 mg/kg was proposed to be remediated.

Bold indicates NYSDEC recommended CUGs. NYSDEC in their comments dated October 3, 2001 suggested all natural resource components be protected including plants, invertebrates, and heterotrophic process. The toxicity benchmarks published by the EPA Oak Ridge Risk Assessment



Area #	Sq. Ft.
1	58,852
2	3157
3	760
4	2656
5	1038
6	4171
7	1325
8	1266

LEGEND

SB4-14 Cu=1770 Pb=11200 — Surface Soil Sample Location with LOC_ID and Case 2 exceedance analyte with value

AREA 1 — Extent of contaminated surface soil according to Case 2 remedial action with area number

Total area of Case 2 surface soil contamination= 73,225 sq ft

Analyte	Units	Eco Goals
Lead	MG/KG	167
Chromium	MG/KG	324

Note:

The metals are reported in units of MG/KG.
The higher value between a sample and duplicate sample was reported.

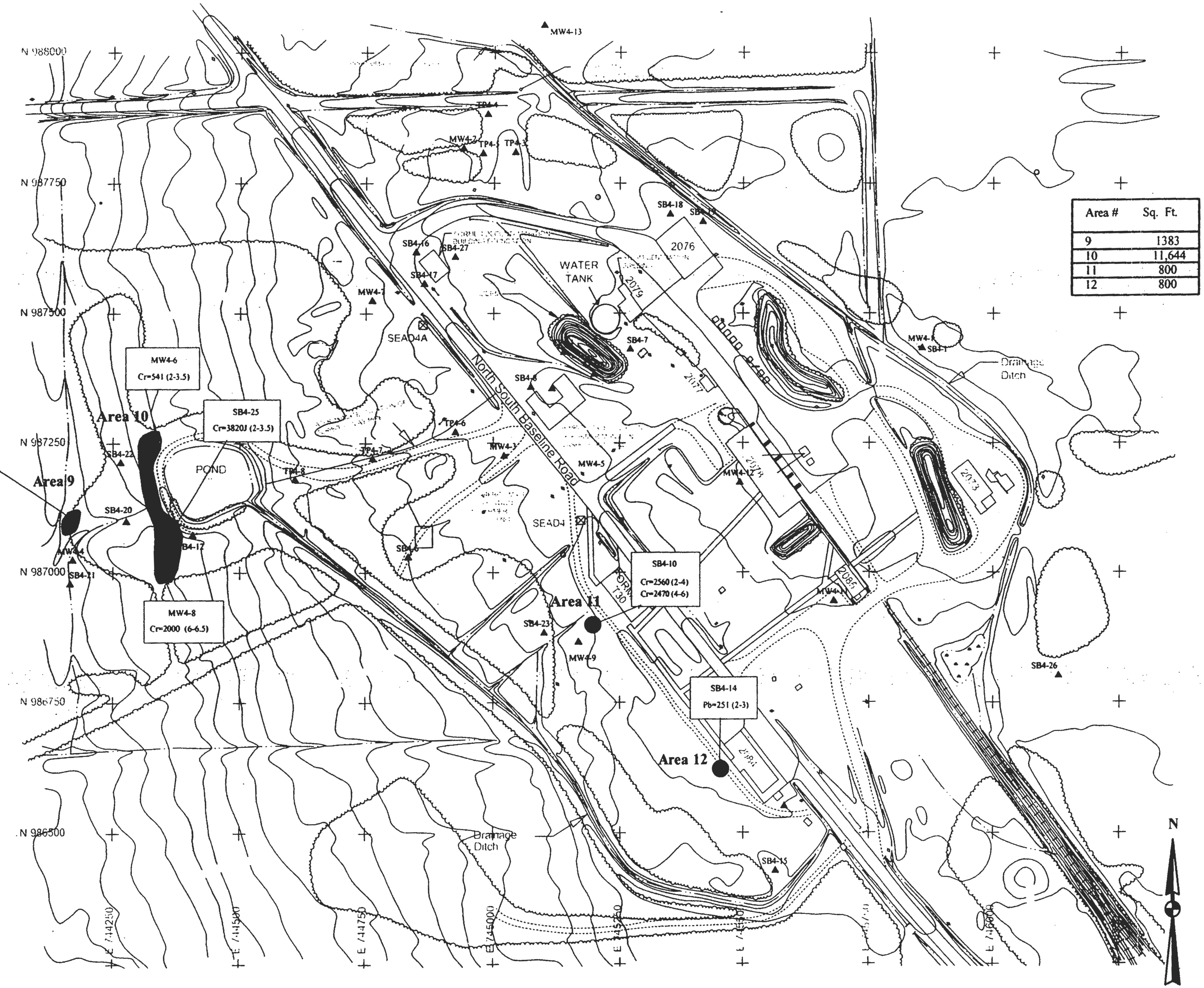
200 0 200
(feet)

PARSONS
PARSONS ENGINEERING SCIENCE, INC.

SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-7
CASE 2 REMEDIAL ACTION OBJECTIVE
SURFACE SOIL (0 - 1 FEET)

SCALE	DATE	REV
1:200	MAY 2001	SHEET 1 OF 1



LEGEND

SB4-10 Cu=2560 (2-4)	Subsurface Soil Sample Location with LOC_ID and Case 2 exceedance analyte with value (in mg/kg) and depth interval (feet)
AREA 1	Extent of contaminated subsurface soil according to Case 2 remedial action with area number

Total area of Case 2 subsurface soil contamination= 14.627 sq ft

Area #	Sq. Ft.
9	1383
10	11,644
11	800
12	800

Analyte	Units	Eco Goals
Lead	MG/KG	167
Chromium	MG/KG	324

Note:

The higher value between a sample and duplicate sample was reported.
No exceedances of SVOC criteria in subsurface soils.

200 0 200
(feet)

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SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-8
CASE 2 REMEDIAL ACTION OBJECTIVE
SUBSURFACE SOIL (1 - 3 FEET)

SCALE	DATE	REV
1:200	MAY 2001	SHEET 1 OF 1

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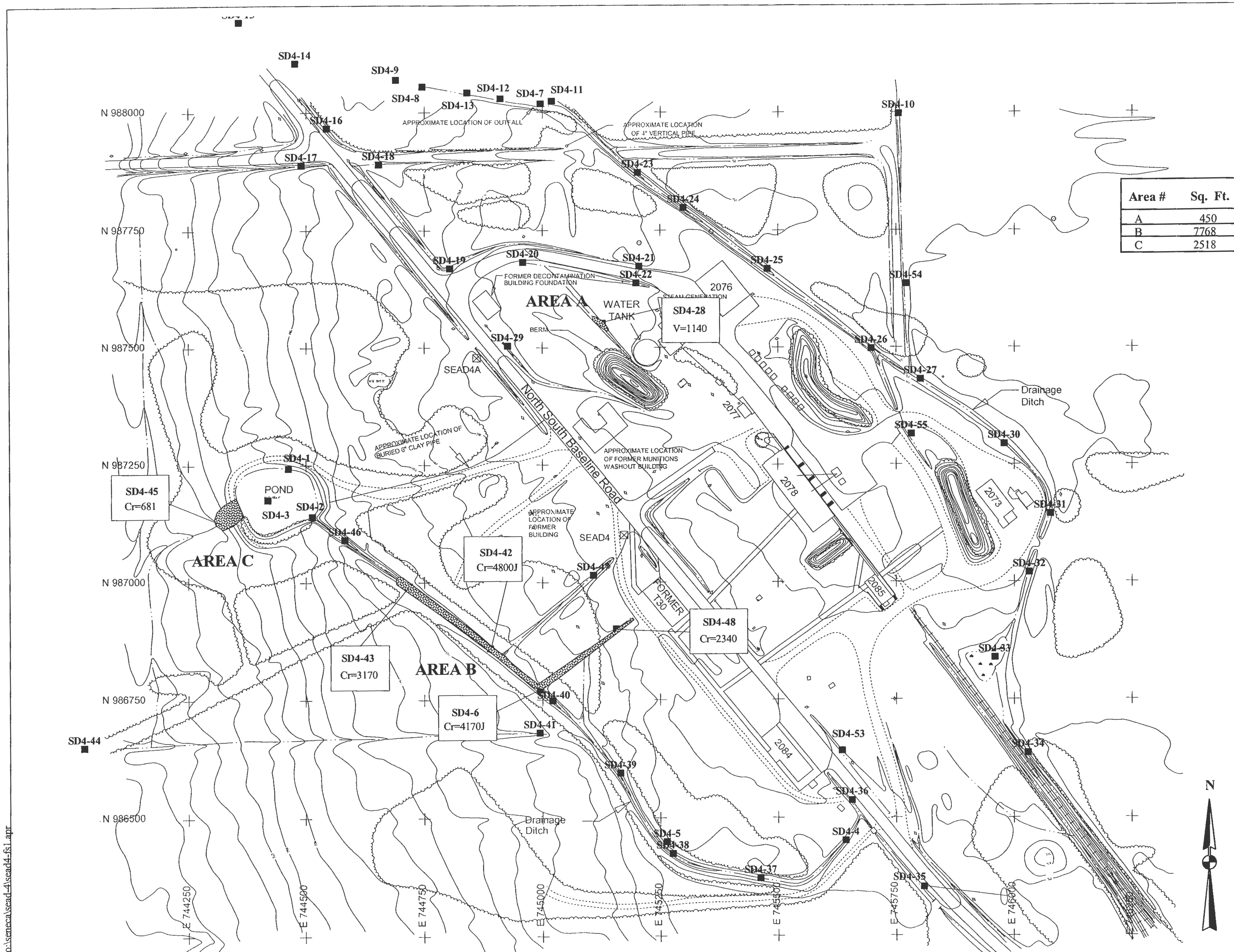

Area #	Sq. Ft.
A	450
B	7768
C	2518

LEGEND

SB4-14 Cu=1770 Pb=11200 — Surface Soil Sample Location with LOC_ID and Case 2 exceedance analyte with value

Extent of contaminated surface soil according to Case 2 remedial action with area number

AREA 1

Total area of Case 2 soil in ditches = 10,736 sq ft

Analyte	Units	Eco Goals
Chromium	MG/KG	324

Notes:

The metals are reported in units of MG/KG.

The higher value between a sample and duplicate sample was reported.

Hotspot removal at SD4-28 for Vandium

200 0 200

(feet)

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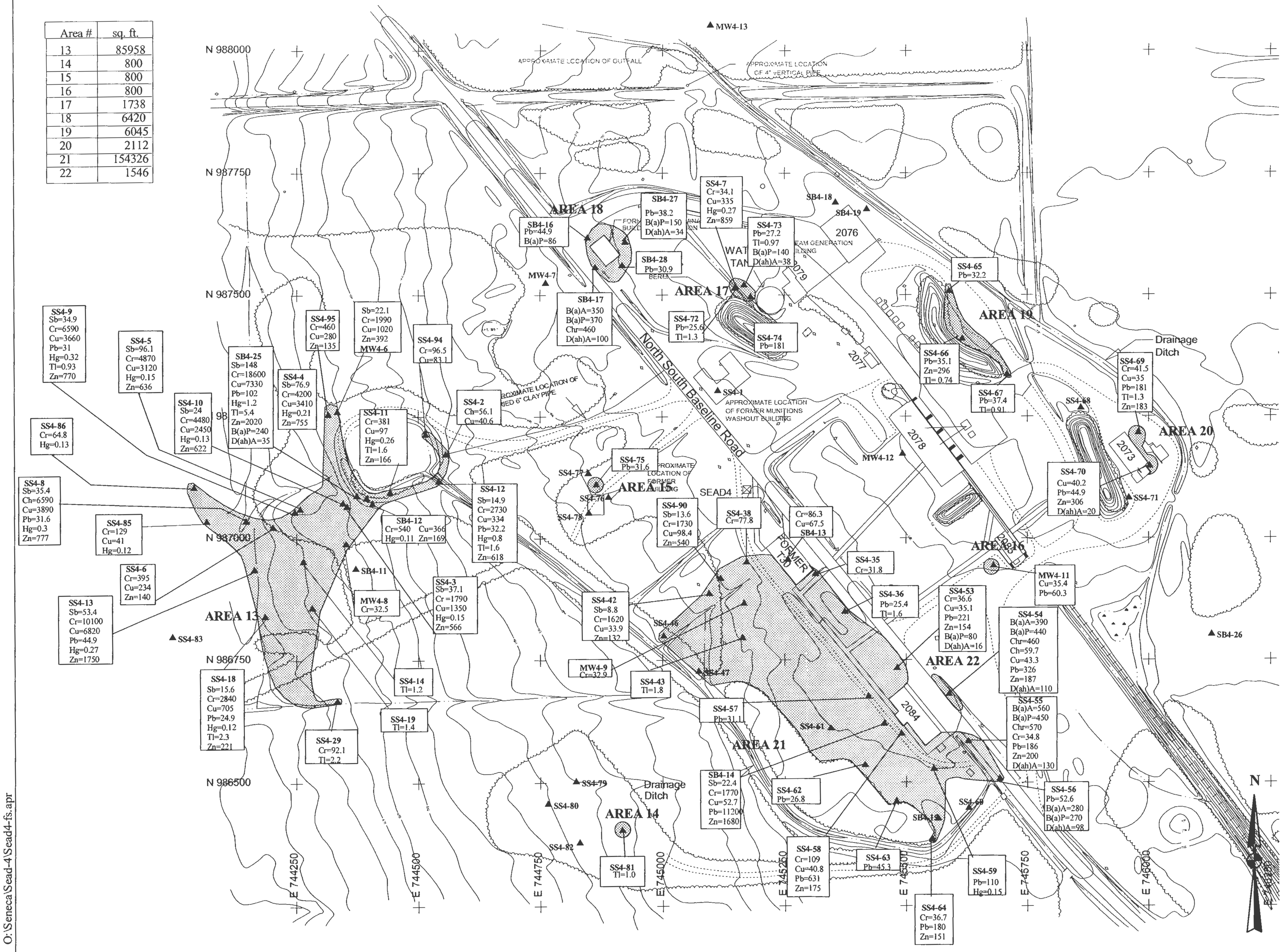
SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-9
CASE 2 REMEDIAL ACTION OBJECTIVE
SOIL IN DITCHES

SCALE	DATE	REV
1:200	FEB 2002	SHEET 1 OF 1

Area #	sq. ft.
13	85958
14	800
15	800
16	800
17	1738
18	6420
19	6045
20	2112
21	154326
22	1546



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LEGEND

SS4-20 Cu=35.4 Pb=60.3 — Surface Soil Sample Location with LOC_ID and Case 3 exceedance analyte with value

AREA 1 — Extent of contaminated surface soil according to Case 3 remedial action with area number

Total area of Case 3 surface soil contamination= 260,545 sq ft

Analyte	Units	Background or TAGM
Lead	MG/KG	24.8
Zinc	MG/KG	110
Copper	MG/KG	33
Antimony	MG/KG	6
Thallium	MG/KG	0.7
Mercury	MG/KG	0.1
Chromium	MG/KG	30
Benzo(a)anthracene	UG/KG	224 or MDL
Benzo(a)pyrene	UG/KG	61 or MDL
Chrysene	UG/KG	400
Dibenzo(a,h)anthracene	UG/KG	14 or MDL

Note:
Benzo(a)anthracene= B(a)A
Benzo(a)pyrene= B(a)P
Chrysene= Chr
Dibenz(a,h)anthracene= D(a,h)A

Benzo(a)anthracene, Benzo(a)pyrene, Chrysene and Dibenz(a,h)anthracene are reported in units of UG/KG. The metals are reported in units of MG/KG.

The higher value between a sample and duplicate sample was reported.

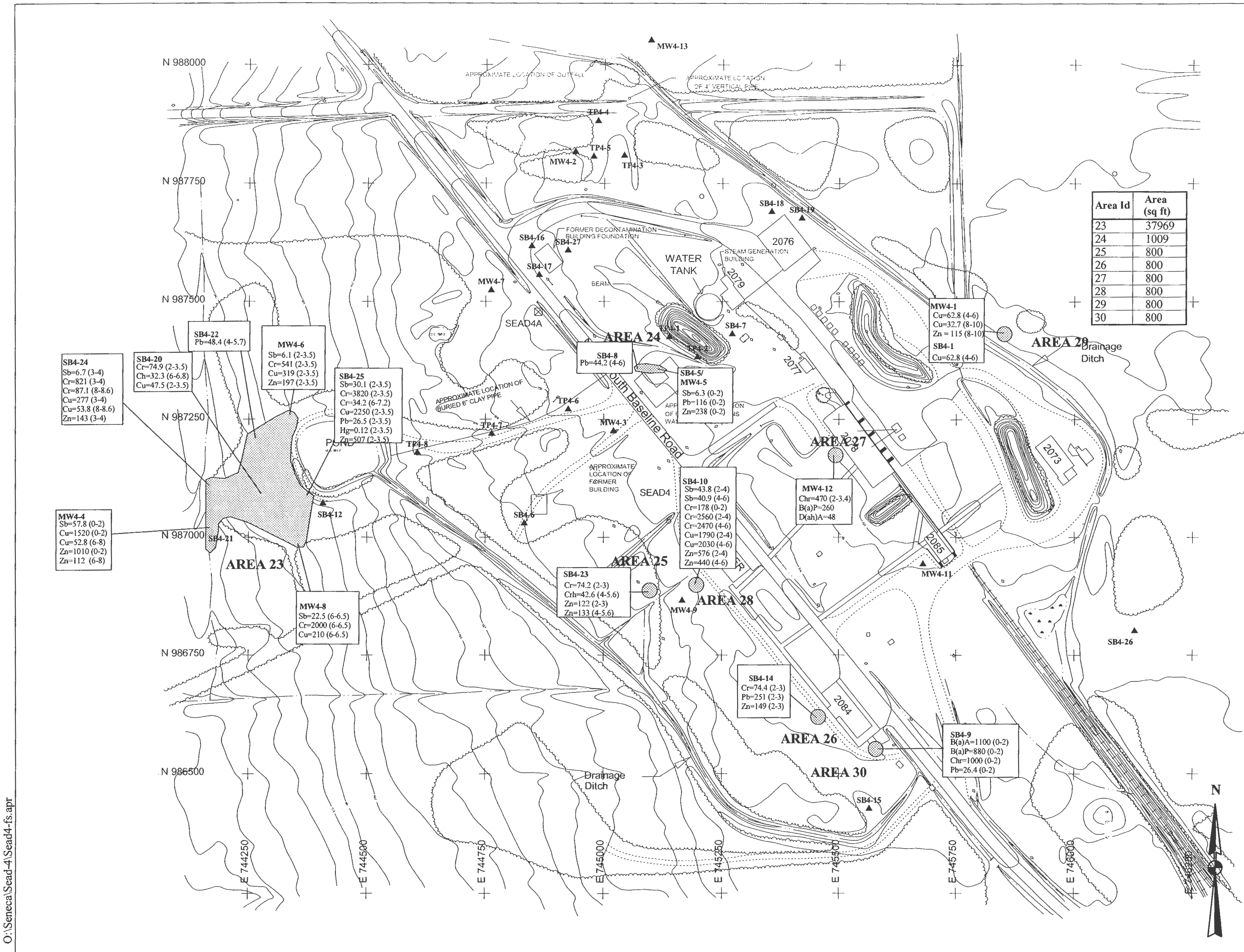
200 0 200
(feet)

PARSONS

SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-10
CASE 3 REMEDIAL ACTION OBJECTIVE SURFACE SOIL

SCALE	DATE	REV
1:200	JAN 2002	SHEET 1 OF 1



Area Id	Area (sq ft)
23	37969
24	1009
25	800
26	800
27	800
28	800
29	800
30	800

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LEGEND

SS4-20 Cu=35.4 (4-6) Pb=60.3 (4-6) — Subsurface Soil Sample Location with LOC_ID and Case 3 exceedance analyte with value and depth interval (feet)

AREA 1 — Extent of contaminted subsurface soil according to Case 3 remedial action with area number

Total area of Case 3 subsurface soil contamination= 43,778 sq ft

Analyte	Units	Background or TAGM
Lead	MG/KG	24.8
Zinc	MG/KG	110
Copper	MG/KG	33
Antimony	MG/KG	6
Thallium	MG/KG	0.7
Mercury	MG/KG	0.1
Chromium	MG/KG	30
Benzo(a)anthracene	UG/KG	224 or MDL
Benzo(a)pyrene	UG/KG	61 or MDL
Chrysene	UG/KG	400
Dibenzo(a,h)anthracene	UG/KG	14 or MDL

Note:
Benzo(a)anthracene= B(a)A
Benzo(a)pyrene= B(a)P
Chrysene= Chr
Dibenz(a,h)anthracene= D(a,h)A

Benzo(a)anthracene, Benzo(a)pyrene, Chrysene and Dibenz(a,h)anthracene are reported in units of UG/KG. The metals are reported in units of MG/KG.

The higher value between a sample and duplicate sample was reported.

200 0 200
(feet)

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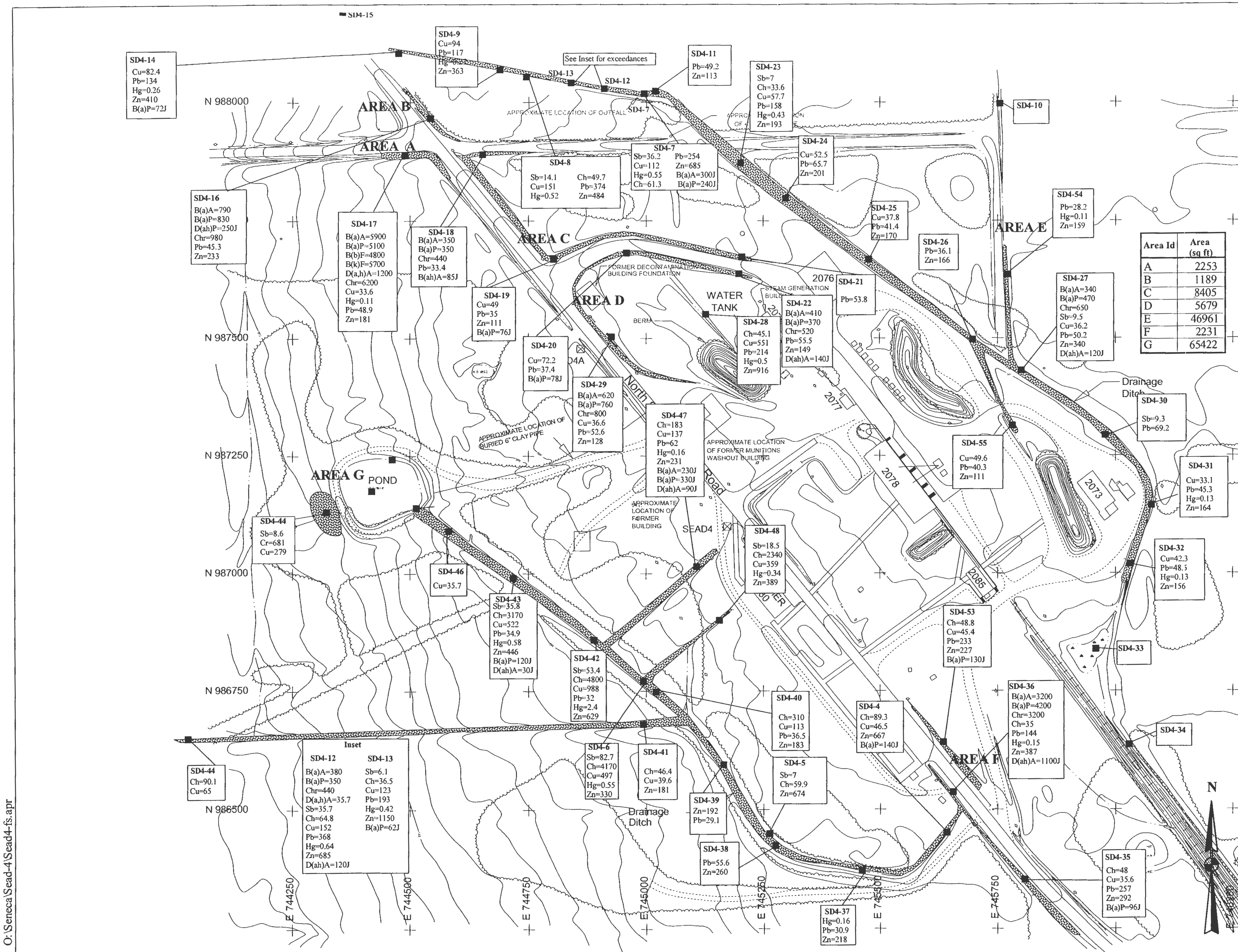
SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-11
CASE 3 REMEDIAL ACTION OBJECTIVE
SUBSURFACE SOIL

SCALE	DATE	REV
1:200	JAN 2002	SHEET 1 OF 1



LEGEND

SS4-20 Cu=35.4 Pb=60.3 — Sediment Sample Location with LOC_ID and Case 3 exceedance analyte with value

AREA A — Extent of contaminated sediment according to Case 3 remedial action with area number

Total area of Case 3 soil contamination= 110,906 sq ft

Area Id	Area (sq ft)
A	2253
B	1189
C	8405
D	5679
E	46961
F	2231
G	65422

Analyte	Units	Background or TAGM
Lead	MG/KG	24.8
Zinc	MG/KG	110
Copper	MG/KG	33
Antimony	MG/KG	6
Thallium	MG/KG	0.7
Mercury	MG/KG	0.1
Chromium	MG/KG	30
Benzo(a)anthracene	UG/KG	224 or MDL
Benzo(a)pyrene	UG/KG	61 or MDL
Chrysene	UG/KG	400
Dibenzo(a,h)anthracene	UG/KG	14 or MDL

Note:
Benzo(a)anthracene= B(a)A
Benzo(a)pyrene= B(a)P
Chrysene= Chr
Dibenz(a,h)anthrancene= D(a,h)A

Benzo(a)anthracene, Benzo(a)pyrene, Chrysene and Dibenz(a,h)anthrancene are reported in units of UG/KG.
The metals are reported in units of MG/KG.

The higher value between a sample and duplicate sample was reported.

200 0 200
(feet)

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SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-12
CASE 3 REMEDIAL ACTION OBJECTIVE
SOIL IN DITCHES

SCALE	DATE	REV
1:200	JANUARY 2002	SHEET 1 OF 1

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LEGEND

SS4-20 Cu=35.4 Pb=60.3 — Sediment Sample Location with LOC_ID and Case 4 exceedance analyte with value

Extent of contaminated sediment according to Case 4 remedial action with area number

AREA 1

Total area of Case 4 sediment contamination= 21,234 sq ft

Analyte	Unit	Criteria
Chromium	MG/KG	26

The metals are reported in units of MG/KG.

The higher value between a sample and duplicate sample was reported.

Criteria for metals are NYSDEC LEL; criteria for all other parameters is NYSDEC HHB.

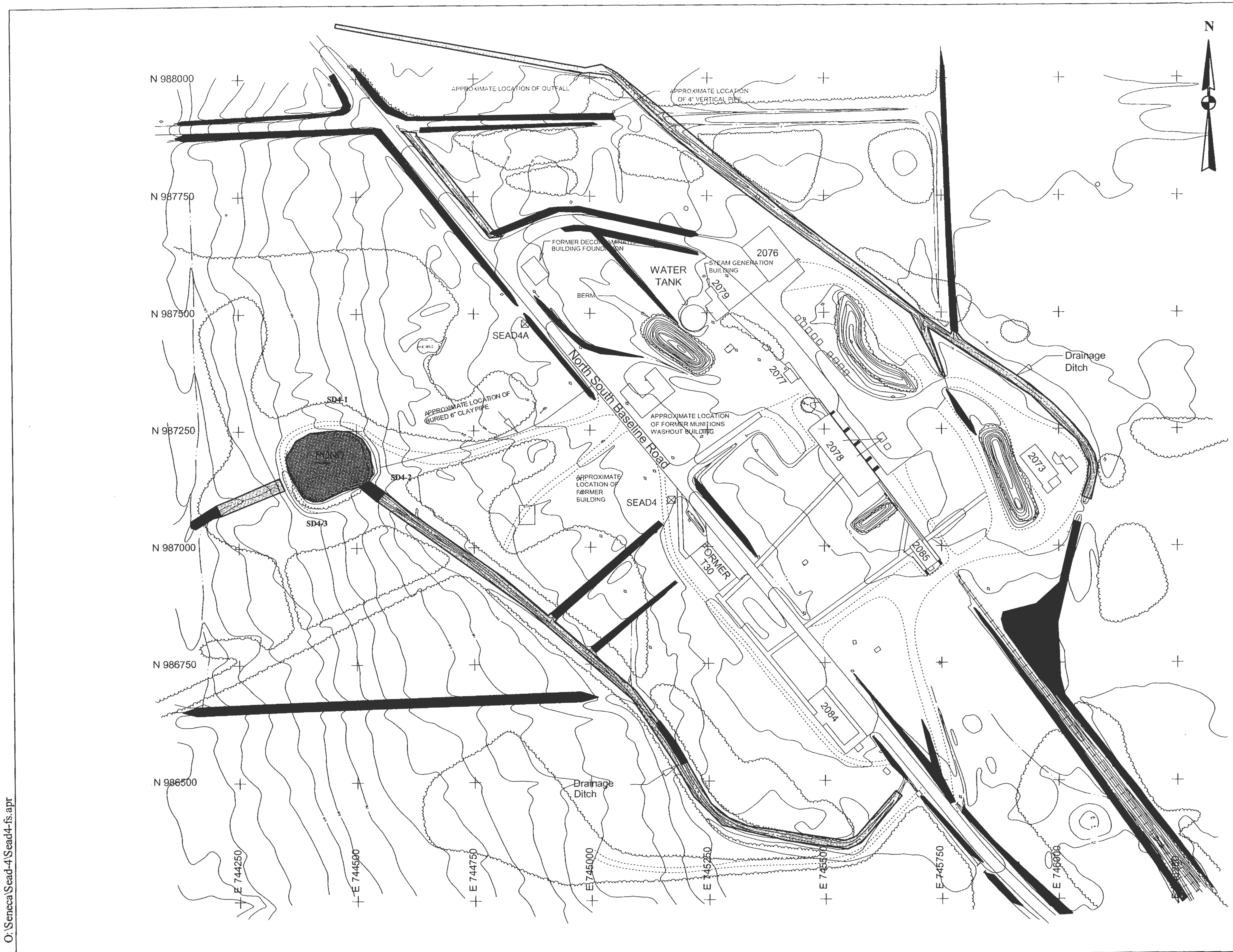
200 0 200
(feet)

PARSONS

SENECA ARMY DEPOT ACTIVITY
FEASIBILITY STUDY
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 2-13
CASE 4 REMEDIAL ACTION OBJECTIVE
SEDIMENT LAGOON AREA

SCALE	DATE	REV
1:200	JANUARY 2002	SHEET 1 OF 1



LEGEND

Sediment - supportive of an aquatic environment

Drainage Ditch - not supportive of an aquatic environment

Soil

200 0 200
(feet)

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SENECA ARMY DEPOT ACTIVITY
REMEDIAL INVESTIGATION
SEAD-4 MUNITIONS WASHOUT FACILITY

FIGURE 7-1
SOIL CHARACTERIZATION
WITHIN THE DITCHES AT SEAD-4

SCALE 1:200	DATE JAN 2002	REV SHEET 1 OF 1

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Table 1

Comparison of Proposed Soil Clean-Up Goals for SEAD-4 to Toxicity Benchmark Values and Remediation Criteria

Chemical	Proposed Clean-up Goal (mg/kg)	Toxicity Benchmark Values (mg/kg)			Remediation Criteria (mg/kg)			CUG at OB Grounds [7]
	Parsons [1]	Oak Ridge Earthworm Benchmark [2]	Oak Ridge Microbial Benchmark [2]	Oak Ridge Terrestrial Plant Benchmark [3]	Dutch Intervention Value [4]	CCME [5]	MOE Soil Remediation Criteria [6]	
Chromium (Total)	324	**0.4**	10	1	380	64~87	750~1000	
Chromium (III)								
Lead	167	500	900	**50**	530	70~600	200~1000	60/500

Table 3. Fish + Wildlife

Notes:

1. Parsons. 2001. Draft Feasibility Study at SEAD-4. Table 2-2.

2. Efroymson, R.A., Will, M.E., Suter II, G.W. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process. Earthworm benchmark based on Cr(VI) toxicity and microbial benchmark based on Cr(III) toxicity.

3. Efroymson, R.A., Will, M.E., Suter II, G.W., Wooten, A.C. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision.

4. Dutch Ministry of Housing, Spatial Planning and the Environment. 2000. Circular on Target Values and Intervention Values for Soil Remediation.

5. Canadian Council of Ministers of the Environment. 1999. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health. http://www.ec.gc.ca/ceqg-rcqe/Soil.pdf. Soil quality guidelines vary depending on different land use.

6. MOE, 1999. Guideline for use at Contaminated Sites in Ontario. Soil remediation criteria vary depending on different land use and soil type.

7. Parsons, 1999. Final Open Burning (OB) Grounds Record of Decision (ROD). Soils containing lead concentrations above 60 ppm was proposed to be covered and soils with lead concentrations greater than 500 mg/kg was proposed to be remediated.

Bold indicates NYSDEC recommended CUGs. NYSDEC in their comments dated October 3, 2001 suggested all natural resource components be protected including plants, invertebrates, and heterotrophic process. The toxicity benchmarks published by the EPA Oak Ridge Risk Assessment

Response to the Comments from New York State Department of Environmental Conservation

Subject: Draft-Final Feasibility Study at the Munitions Washout Facility (SEAD-4) January 2002
and Revised Final Remedial Investigation at the Munitions Washout Facility (SEAD-4) January 2002
Seneca Army Depot
Romulus, New York

Comments Dated: April 4, 2002

Date of Comment Response: February 12, 2003

General Comments:

General Comment No. 1: As stated in the Department's October 31 2001 letter, the Division of Fish, Wildlife and Marine Resources find the proposed cleanup goals of 324 ppm for chromium (total) and 167 ppm for lead unacceptable. Those proposed cleanup goals do not protect all components of the Seneca Army Depot environment. They are only indicative of the risk to two species; dove and short-tail shrew. The proposed cleanup goals should provide for protection for all elements that make for a complete and healthy environment including plants, earthworms, etc.

Response No. 1: Disagreed. Recently, the Army has received indications from the Seneca County Industrial Development Agency that a future reuser of SEAD-4 will be interested in using the buildings and grounds at SEAD-4, and conduct light industrial activities. The buildings are structurally sound and could be used by the reuser. Since this area most likely would be used for industrial activities, the Army believes that the ecological cleanup goals that were proposed by the Army in the Feasibility Study are no longer appropriate. The Army will propose land use restrictions to this site to limit activities to industrial requirements. These restrictions will be further described in the proposed plan for this site.

The SEAD-4 area is of little value to the ecological community, and would not serve as a desirable habitat for this community. Most likely, ecological receptors will inhabit unaffected areas adjacent to the impacted areas of SEAD-4, thereby avoiding areas where minimal ecological risk exists. The areas where ecological risk exists represent only 2 acres of the entire 7,585 acres of the
03
conservation/recreation area (0.2 percent).

Based on this, the Army believes that human health should be the driver considered in developing cleanup goals for the site. Since the human health risk from debris within the buildings, remediation of the soils at SEAD-4 is no longer proposed.

The Army does recognize that land use restrictions will be required to limit the site to industrial use (excluding the child in day care scenario).

General Comment No. 2: The Army's evaluation for the unrestricted use scenario is unacceptable in that it does not represent a full analysis using the seven evaluation criteria. The Army should perform a full analysis of an unrestricted use scenario against the seven evaluation criteria, not just a simple cost comparison. This full evaluation should be conducted as outlined in the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA; Interim Final, October 1988.

Response No. 2: Agreed. The unrestricted use scenario will be analyzed using the seven evaluation criteria.

General Comment No. 3: A common component of both Alternatives 2 and 3 is Case 4, which proposes sediment cleanup criteria for the "'man-made lagoon" of less than 26 ppm chromium. Alternatives 2 and 3 were also evaluated under both Case 2 (protection of ecological receptors, prevent ingestion/direct contact with metals in soils, and prevent/minimize migration of metals to groundwater) and Case 3 (pre-disposal conditions) for surface, subsurface soil and "ditch soil" contamination. Case 2 proposes soil cleanup criteria of lead less than 167 ppm and chromium less than 324 ppm. Case 3 proposes site specific background levels as soil cleanup criteria for 11 COCs, two of which are lead and chromium. For Alternative 2, the Army is proposing to cleanup the lagoon sediments to less than 26 ppm chromium while proposing to cleanup the upstream "ditch soils" to 324 ppm chromium. Wouldn't the contamination upstream in the ditch soils be washed downstream into the lagoon? How does the Army propose to prevent recontaminating the lagoon sediment under the Alternative 2 option? It appears that the corresponding cleanup criteria for the specific media that was chosen for the OB Grounds would be appropriate for this site as well.

Response No. 3: The Army is no longer proposing to perform remediation of the lagoon since no human health risk exists under a industrial use scenario. Additionally, the Army proposes to remove the temporary berm at the end of the storm water control basin and allow this "lagoon" to return to its natural condition. The storm water in this area will be allowed to follow its natural watercourse.

General Comment No. 4: In the USEPA's March 14, 2002 comment letter regarding the Draft-Final FS, the USEPA recommended that the groundwater media be broken into a separate operable unit to move forward with the proposed soil/sediment remedy. Another possibility of moving forward with the soil/sediment remedy would be to propose long-term groundwater monitoring. However, this subject may be agreed upon at the next BCT meeting therefore we suggest that this topic be added to the next BCT meeting agenda.

Response No. 4: Previously, the Army has indicated that long-term groundwater monitoring may be necessary at SEAD-4. Upon further review of the groundwater data, the Army believes that groundwater monitoring is not necessary at SEAD-4. Two rounds of groundwater sampling were conducted during the remedial investigation (RI): the first in March/April 1999 and the second round in July 1999. In the second round of sampling, there were no detections of VOCs, and the concentrations of metals were significantly lower. Turbidity data shows that in both rounds of sampling, there is a clear correlation between elevated metal concentrations and high turbidity values. Table 1 presents the concentrations of metals in each round.

Round 1 was not conducted using low-flow sampling methods, which contributed to higher turbidity and, consequently, higher concentrations of metals. Round 2 sampling was conducted using a low-flow method; hence the turbidity values, and the concentrations, were significantly lower. In Round 1, several metals including individual VOCs, antimony, thallium, chromium and selenium were detected at concentrations exceeding NYSDEC's Class GA standards. In Round 2, these parameters were either detected at concentrations below the standards or not detected. Although some metals including aluminum, manganese, and sodium exceeded the GA standards in Round 2 of sampling, the values detected are consistent with background. Based on these results, groundwater exceedances are attributable to suspended solids in the water, and not representative of groundwater concentrations. Accordingly, the Army does not intend to perform long-term monitoring of groundwater at SEAD-4.

General Comment No. 5: Please submit a map of SEAD-4 outlining the areas classified as wetlands, identifying state regulated, federal regulated and non-regulated wetlands.

Response No. 5: The Army will provide a plan showing the storm water drainage ditches that are classified as wetlands.

Specific Comments:

Specific Comment 1: Army's Response #6: A statement is made that "it is the Army's understanding that NYSDEC has not disagreed with the approach of investigating the cost of unrestricted use for comparison purposes." If this statement is meant to explain that the state does not disagree with a cost comparison as the sole criteria used to compare a restricted use alternative with an unrestricted use alternative, then the statement is surprising. Clearly cost is a part of the feasibility analysis, but we reiterate that it is only one of the seven evaluation criteria. The NYSDEC has stated in several of their letters (dated January 4, 2001, February 21, 2001, October 3, 2001, and November 13, 2001) that a full analysis of an alternative that would achieve unrestricted use should be performed against the seven evaluation criteria, not just simple cost comparison. A cost comparison is insufficient in presenting a full comparison of the advantages and disadvantages of a range of alternatives, from unrestricted use to a restricted use scenario that requires institutional controls and long-term monitoring.

Response 1: See response to General Comment No. 2.

Specific Comment 2: Replacement page 2-23, Section 2.5.3. Soil in the Ditches: A statement is made that a "hotspot removal will be conducted at the SD4-28 to remove the vanadium." However, besides being depicted in Table 2-1, this is not stated anywhere else in the document, not in the remedial action objectives, cleanup criteria, not outlined in any of the remedial alternatives. Please reconcile.

Response 2: See response to General Comment No. 1

Specific Comment 3: Table 1: The column titled Proposed Clean-up Goal should be renamed to what it actually is i.e. Calculated Soil Concentrations at the LOAEL for Dove and Short-Tailed Shrew. Also, Table 1 should include the Seneca Army Depot background values for chromium and lead. The levels, when listed in Table 1, should then be compared to determine the best overall protection to human health and the environment. In addition, each cleanup goal should also then be evaluated for its ability to restore the site to pre-release conditions.

Response 3: Disagreed: Although NYSDEC disagreed with the proposed cleanup goals, the column heading is correct. The column does present the Army's Proposed Cleanup Goal.

Please see response to General Comment No. 1 for other comments.

Comment 4: Table 2-1: If a hot spot is proposed (see comment #2) as part of Case 2 (ecological soils cleanup values using a HQ of 1), then the cleanup criteria for Case 3 (pre-disposal conditions), should be at least if not more stringent of vanadium than Case 2. This should be indicated as such.

Response 4: Agreed. Since Case 3 addresses remediation of ditch soils, the vanadium hotspot, SD4-28, is included in the area slated for remediation under this scenario. Table 2-1 has been revised to clarify this point.

Response to the Comments From United States Environmental Protection Agency

Subject: Draft Final FS and Revised Final RI for SEAD-4
Seneca Army Depot Activity
Romulus, New York

Comments Dated: March 14, 2002

Date of Comment Response: February 12, 2003

General Comments:

Your response regarding inconclusive groundwater sampling results (Response to Comment 3 and 12) proposes a supplemental groundwater investigation, not a remedy. Therefore, EPA recommends that this portion of the site (groundwater media) be addressed under a separate operable unit (OU) in order to move forward with the proposed soil remedies.

Response: Disagree. In previous responses, the Army has indicated that long-term groundwater monitoring may be necessary. Upon further review of the groundwater data, the Army believes that groundwater monitoring is not necessary at SEAD-4. Two rounds of groundwater sampling were conducted during the remedial investigation (RI): the first in March/April 1999 and the second round in July 1999. In the second round of sampling, there were no detections of VOCs, and the concentrations of metals were significantly lower. Turbidity data shows that in both rounds of sampling, there is a clear correlation between elevated metal concentrations and high turbidity values. Table 1 presents the concentrations of metals in each round.

Round 1 was not conducted using low-flow sampling methods, which contributed to higher turbidity and, consequently, higher concentrations of metals. Round 2 sampling was conducted using a low-flow method; hence the turbidity values, and the concentrations, were significantly lower. In Round 1, several metals including individual VOCs, antimony, thallium, chromium and selenium were detected at concentrations exceeding NYSDEC's Class GA standards. In Round 2, these parameters were either detected at concentrations below the standards or not detected. Although some metals including aluminum, manganese, and sodium exceeded the GA standards in Round 2 of sampling, the values detected are consistent with background. Based on these results, groundwater exceedances are attributable to suspended solids in the water, and not representative of groundwater concentrations. Accordingly, the Army does not intend to perform long-term monitoring of groundwater at SEAD-4.

I. Remedial Investigation Report

Comment 1: *Section* 7.2.3 *Ecological COPCs (page* 7-10): Screening out of COPCs based on frequency of detection should not be done as part of a SLERA. During the refinement of COPCs as part of the BERA process, frequency of detection may be considered in consultation with BTAG. Based upon the number of samples collected, location of samples, and overall data adequacy this may or may not be acceptable. Refer to "The Role of Screening-Level Risk Assessment and Refining Contaminants of Concern in Baseline Ecological Risk Assessments," Eco Update (EPA 540/F-01/014) for additional information.

Response 1: Agreed. Based on a conference call between Parsons and the EPA on January 29, 2002 (see attached meeting notes), frequency of detection will not be used to screen out COPCs as part of a SLERA. All the constituents that failed the screening test (either by exceeding the benchmark values or not having a benchmark value) were carried through the HQ calculation. Frequency of detection has been addressed in Section 7.6 (Further Refinement of Contaminants of Concern) to support the decision of the refinement of chemicals of concern. The ecological risk assessment has been revised to reflect these changes.

Comment 2: The correct spelling of the author of the Oak Ridge soil criteria document is "Efroymson" (page 7-12).

Response 2: Agreed. The text has been revised.

Comment 3: It is inappropriate to screen out COPCs based upon their relation to background data (pages 7-14,7-17, etc). Refer to the Eco Update indicated above.

Response 3: Agreed. Based on a conversation between Parsons and the EPA on January 29, 2002 (as attached), COPCs are no longer eliminated based on the background concentrations. Rather, a risk management section (Section 7.7) has been added to present the Army's position that when background is the major contributor to the elevated HQs for the COPCs, these constituents do not warrant further evaluation. Tables presenting background comparisons (i.e., Tables 7-2A, 7-2B, and 7-2C) have been removed and the remaining tables in Section 7.0 have been renumbered. The ecological risk assessment in Appendix H has been revised accordingly.

Comment 4: Table H.7A: Ditch sediments are now considered ditch soils and they are screened against appropriate soil guidelines. It should be indicated whether the depth of collection was from the top 6" or from the top 12".

Response 4: Agreed. The depth of collection was from the top 6". The table has been revised to include this information.

Comment 5: It should be noted that the referenced sediment guidance values in Table H.7B are from NYSDEC, 1999 and not from USEPA, 1999.

Response 5: Acknowledged. It should be noted that the NYSDEC (1999) document was referenced in Table H.7B as versus the USEPA (1999).

Comment 6: Table H.9: Please indicate whether the maximum surface water concentrations were from the pond or drainage ditch.

Response 6: Agreed. The locations of the maximum surface water concentrations for COPCs were SW4-13, SW4-19, and 4Pipe, which were all located in drainage ditches. A note has been included in Table H.9 to indicate that the locations where the maximum surface water concentrations were detected (i.e., SW4-13, SW4-19, and 4Pipe) are in drainage ditches.

Comment 7: Table H.12: An explanation should be provided as to when CFs are used; specifically it is unclear why CFs were not used to calculate a NOAEL from a LOAEL, or for study duration (Tables H.12 & H.13).

Response 7: Agreed. An endpoint conversion factor (CF) was used in the case where a NOAEL was used to estimate the LOAEL or a LOAEL was used to estimate the NOAEL. According to the USEPA Ecological Risk Assessment Guidance for Superfund (USEPA 1997), a standard practice to derive a NOAEL when a LOAEL, but not a NOAEL value, is available, is to multiply the LOAEL by 0.1. Therefore, to derive a NOAEL from a LOAEL, an endpoint CF of 0.1 was applied to the LOAEL. Conversely, a CF of 10 was applied to a NOAEL in order to derive a LOAEL.

In addition, a study duration CF was used to normalize the exposure duration. If the exposure duration was subchronic [less than 90 days for rodents; less than 10 weeks for birds (Sample et al. 1996)], a study duration CF of 0.1 was applied to standardize the value for chronic exposure.

The total CF is the product of the endpoint CF and the study duration CF.

It should be noted that Table H.12 has been replaced by Tables H.12A and H.12B, which present NOAEL values for the meadow vole and the short-tailed shrew, respectively. Similarly, Table H.13 has been replaced by Tables H.13A and H.13B, which present LOAEL values for the meadow vole and the short-tailed shrew, respectively. A note has been included in each of the above tables (i.e., Tables H.12A, H.12B, H.13A, H.13B) to clarify the use of the CFs.

Comment 8: Tables H.35, H.37: Calculated Ditch Soil Exposure -Meadow Vole and Calculated Ditch Soil Exposure-Short Tailed Shrew: Certain variables used in the calculation of exposure dose should be provided; specifically BW, I_p, CF (for organics, inorganics a default of 0.2 is used), I_a, and I_s. These variables should be provided similar to the variables provided for the Red-tailed hawk calculations in Table H.39 and the Mourning Dove calculations in Table H.41.

Response 8: Agreed. Tables H.35 and H.37 have been revised to include the values of the variables (BW, I_p, CF, I_a, and I_s). In addition, variables such as body weight and wildlife intake rate for the ecological receptors are presented in Table H.16.

Comment 9: The discussion that NOAEL max HQs were greater than one but less than five should be removed from the second paragraph on page 7-38 (section 7.6.2 Identification of Soil COCs) and throughout the document. Discussion of "low HQs" should be removed from the discussion on page 7-39.

Response 9: Agreed. The text has been revised to address the comment.

Comment 10: Calculations based on a hawk site foraging factor of 10% are found on Table 7-7, not Table 7-6. This should be corrected in the first paragraph on page 7-39.

Response 10: Agreed. The text has been revised to address the comment. It should be noted that since Tables 7-2A/B/C have been removed from the document, Tables 7-6 and 7-7 have been renumbered as Tables 7-5 and 7-6, respectively.

Comment 11: Antimony, copper and zinc should be retained as COCs for surface soil, based on the summary of HQs for the shrew in Table 7-3 (pages 7-39 and 7-40).

Response 11: Acknowledged. It should be noted that Table 7-3 has been renumbered as Table 7-2. In addition, bioaccumulation factor (BAF) values for inorganics (as presented in Table H.15) have been updated and the USEPA recommended values presented in the Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (USEPA, 1999) have been adopted for the risk characterization. The updated Table (i.e., Table 7-2) is attached.

As shown in Table 7-2, for the dove the hazard quotients associated with the maximum detected copper concentration were slightly above 1 (i.e., 2.0 and 1.6 for NOAEL and LOAEL scenarios, respectively). The max HQs for the shrew were greater than one (6.5 and 5.0, respectively, for the NOAEL and LOAEL scenarios). As discussed in Section 7 of the RI, it was assumed that the contaminant was 100% bioavailable for the screening level ERA. However, this assumption is very conservative. Copper binds relatively strongly to soils. This adsorption to soils is less affected by pH than other metals, making copper less likely to become bioavailable in the acidic conditions of an animal's digestive tract (ATSDR, 1990). In addition, the average copper concentration at the site poses no significant risk to any wildlife receptors. Therefore, copper is not expected to pose adverse effects at the site and should not be considered a COC.

For zinc, the NOAEL max hazard quotient for the shrew and the dove were slightly above one (1.6 and 1.9 for the shrew and the dove, respectively). Similarly, the 100% bioavailability for zinc is a very conservative assumption, and therefore, zinc is not expected to pose any adverse effects and should not be considered a COC.

For antimony, the maximum detected concentration is associated with elevated HQs for the shrew (i.e., 115 and 12 for the NOAEL and LOAEL scenarios, respectively). The mean HQs for the shrew were 6.4 and 0.6 for the NOAEL and LOAEL scenarios, respectively. All the other HQs are less than one. It should be noted that the toxicity reference value (TRV) identified for antimony (i.e., 0.149 mg/kg-day) is based on a drinking water study where antimony potassium tartrate was used. Antimony potassium tartrate is used as mordant in the textile and leather industry, pesticide, and insecticide. Based on the historical use of the site (ammunition washout), antimony compounds such as antimony alloys and antimony oxides are expected to be the predominant components at the site. A literature review of the toxicity data for antimony trioxide and elemental antimony indicates that the NOAELs published are greater than 50 mg/kg-day. If the alternative TRV (i.e., 50 mg/kg-day) were used, all HQs for antimony would be less than 1. Based on the above discussion, it is concluded that antimony is not expected to pose any adverse effects and should not be considered a COC.

Comment 12: Antimony should be retained as a COC for ditch soil, based on the summary of HQs for the shrew in Table 7-5 (page 7-44). In the discussion of vanadium (first paragraph page 7-46) it should be noted whether the HQ for the mean concentration (excluding the hot spot area) was greater than "1 ". It is unclear why site foraging factors for the dove are discussed for zinc. Zinc should be retained as a COC based on HQs calculated for the shrew (page 7-46).

Response 12: Acknowledged. It should be noted that Table 7-5 has been renumber as Table 7-4. In addition, BAF values for inorganics (as presented in Table H.15) have been updated and the USEPA recommended values presented in the Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities (USEPA, 1999) have been adopted for the risk characterization. The updated Table (i.e., Table 7-5) is attached.

As discussed in the response to Comment 11, the HQs for antimony were based on a very conservative TRV for antimony potassium tartrate. Based on the historical use of the site (ammunition washout), antimony compounds such as antimony alloys and antimony oxides are expected to be the predominant components at the site. A literature review of the toxicity data for antimony trioxide and elemental antimony indicates that the NOAELs published are greater than 50 mg/kg-day. If the alternative TRV (i.e., 50 mg/kg-day) were used, all HQs for antimony would be less than 1. Based on the above discussion, it is concluded that antimony is not expected to pose any adverse effects and should not be considered as a COC.

The text has been revised to indicate that the HQ for the mean vanadium concentration (excluding the hot spot area) is greater than "1" and therefore, vanadium in ditch soil is considered a COC. However, as the mean vanadium concentration (excluding the hot spot area) is lower than two times of the background, the Army's risk management position (as presented in Section 7.7) is that vanadium does not warrant further evaluation for the ditch soil at SEAD-4.

For zinc the NOAEL Max HQ was slightly above one (i.e., 1.1) for the dove. All the other HQs for the other receptors were less than 1 for the dove. As a result, zinc in ditch soil is not considered a COC.

Comment 13: The reevaluation of surface water data based on samples SW4-1 and SW4-2 should be shown in a Table, so it is clearly understood why there are no longer COPCs for surface water (page 7-48).

Response 13: Agreed. Table 7-7, which presents the hazard quotients for surface water in the pond, has been added to the text.

Comment 14: A primary measurement endpoint is not the calculation resulting in a LOAEL max HQ (page 7-50).

Response 14: Agreed. The text has been revised to address the comment.

II. Feasibility Study

Comment 1: All comments noted above regarding selection of COCs and the SLERA are also applicable to the Feasibility Study.

Response 1: Acknowledged. Refer to the above response to comments regarding selection of COCs and the SLERA. In summary, in the revised SLERA, all the constituents that failed the screening test (either by exceeding the benchmark values or by not having a benchmark value) were carried through the HQ calculation. COPCs were no longer eliminated based on the background concentrations or on a low frequency of detection. Rather, frequency of detection has been addressed in Section 7.6 (Further Refinement of Contaminants of Concern) to support the decision of the refinement of chemicals of concern. In addition, a risk management section (Section 7.7) has been added to present the Army's position that when background is the major contributor to the elevated HQs for the COPCs, these constituents do not warrant further evaluation. The ecological risk assessment in Appendix H has been revised accordingly.

Comment 2: NYSDEC TAGM values are not appropriate ecological screening values for soils (page 1-15).

Response 2: Acknowledged. It should be noted that the NYSDEC TAGMs were not used as screening values, as shown in Table H.5 of the RI. The statement has been revised to clarify that the NYSDEC TAGM was considered an ARAR, but not an ecological screening value

Comment 3: Upon completion of Steps 1 and 2 of the ERA a SMDP is reached, rather than at the end of Step 3.

Response 3: Agreed. The SLERA presented in the SEAD-4 RI is comprised of Steps 1 and 2 as described in EPA's supplemental ERAG guidance (June 2001). An additional step was taken to refine the COCs as part of Step 3 in accordance with ERAGs.

The Army has chosen to implement this additional step, providing information to support the elimination or retention of COPCs. It is understood that ERAGs recommends a Scientific Management Decision Point (SMDP) prior to starting the baseline risk assessment process. The Army's inclusion of Step 3 in the RI is not an attempt to circumvent the SMDP, but rather it is a method to provide input up front. The Army would be happy to discuss the adequacy of the data with respect to the findings of the screening risk assessment with the EPA, and the Army proposes to schedule a meeting in the near future.

The text has been revised to reflect that SLERA (including Steps 1 and 2 of ERAGS) and an additional step to refine the COCs (as part of Step 3 of ERAGS) have been presented in the RI report.

Comment 4: The cleanup activities recommended for Case 2 and Case 3 are confusing as it appears that different values are being used to clean up chromium and lead in surface soil depending upon whether (page 2-28).

Response 4: Acknowledged. The different cases represent different cleanup goals; consequently, the cleanup goals for chromium and lead vary among the different cases. Case 2 would be protective of ecological receptors and would remediate the site in accordance with its proposed future use, conservation/recreation. In accordance with 6 NYCRR 375–1.10, Case 3 was presented, which provides cleanup goals that would restore the site to its pre-disposal condition.

Comment 5: The reevaluation of surface water data based on samples SW4-1 and SW4-2 should be shown in a table so that it is clearly understood why there are no longer COPCs for surface water.

Response 5: Agreed. Table 7-7, which presents the hazard quotients for surface water in the pond, has been added to the text.

Comment 6: The cleanup activities recommended for Case 2 and Case 3 are confusing as it appears that different values have been used to cleanup chromium and lead in surface soils. Ecologically protective numbers have been developed and TAGM values are also being used. The latter are considerably lower than the concentration derived to be protective of ecological receptors (page 2-28).

Response 6: Acknowledged. The different cases represent different cleanup goals; consequently, the cleanup goals for chromium and lead vary among the different cases. Case 2 would be protective of ecological receptors and would remediate the site in accordance with its proposed future use, conservation/recreation. In compliance with 6 NYCRR 375–1.10, Case 3 was presented, which provides cleanup goals that would restore the site to its pre-disposal condition. Case 3 is a theoretical scenario that would result in unrestricted use for the site and would enable the site to be used for residential use. While the current land use determination for this site is conservation/recreation, the more conservative residential use cleanup scenario, Case 3, received further theoretical consideration in this process for cost comparison purposes.

III. Response to Comments on the FS

Comment 1: All comments are acceptable with the following exception: As noted for the Feasibility Study, all comments regarding COCs and the revised SLERA are applicable to the Response To Comments.

Response 1: Acknowledged. All comments regarding COCs and the revised SLERA have been addressed. In summary, all the constituents that failed the screening test (either by exceeding the benchmark values or by not having a benchmark value) were carried through the HQ calculation. COPCs are no longer eliminated based on the background concentrations or on a low frequency of detection. Rather, frequency of detection was been addressed in Section 7.6 (Further Refinement of Contaminants of Concern) to support the decision of the refinement of chemicals of concern. In addition, a risk management section (Section 7.7) has been added to present the Army's position that when background is the major contributor to the elevated HQs for the COPCs, these constituents do not warrant further evaluation. The ecological risk assessment in Appendix H has been revised accordingly.

Response to Comments
From
United States Environmental Protection Agency (US EPA)

Subject: Draft Feasibility Study at the Munitions Washout Facility, SEAD-4
Seneca Army Depot Activity, Romulus, NY

Comments Dated: September 28, 2001

Date of Comment Response: January 15, 2002

General Comments:

1. There is an inconsistent description of unacceptable human health risks from exposure to the interior of the on-site buildings. The third paragraph on Page 1-2, Section 1.1, indicates that unacceptable health risks are present at SEAD-4 from the presence of metals in the debris that are present in the interior of the on-site buildings. This is confirmed on page 2-5, in the last paragraph of Section 2.3.1 where it is stated that lead may pose an unacceptable risk to the indoor worker upon regular exposure to interior building debris.

   However, the second paragraph on Page 2-4, Section 2.3.1 indicates that Aroclor-1254 (a PCB) is the chemical driving the risk to the future worker. The primary exposure routes are the ingestion of and dermal exposure to the PCBs in the indoor dust.

   Section 2.5.1 indicates that the material and debris in the interior of the buildings at SEAD-4 are media of concern because risks exceeded EPA allowable ranges due to the ingestion of and dermal exposure to the PCBs in the indoor dust. No mention is made here or in the development of cleanup standards regarding the presence of lead, which may be causing unacceptable risk levels.

   The Remedial Action Objectives (RAO)-related discussions and tables should be revised to address cleanup goals that are also protective with regard to lead. Any confirmatory sampling done in conjunction with the RAO for Case 1 should include confirmation that unacceptable levels of lead have also been removed.

Response 1: Agreed. Unacceptable human health risks are due to the presence of Aroclor-1254 and lead in the debris that is present in the interior of the buildings. The text in the third paragraph on page 1-2 has been revised.

The text on page 2-4 discusses the results of the human health risk assessment. The second paragraph on page 2-4 states that the quantitative results indicate that risk to the indoor park worker are due to exposure to Aroclor-1254 in the indoor dust. The qualitative analysis of lead is discussed later in the text of the same section. Based on a comparison to the screening level of 400 mg/kg, there is risk from exposure to debris containing lead in the interior of the buildings. Lead has been added as a compound of concern in the debris found in the interior of the buildings.

It will be difficult to conduct confirmatory sampling in the buildings since the remedial action is to remove all material and debris from the buildings. However, some type of confirmatory sampling for Case 1 will be presented in a Remedial Action Workplan.

2. The discussions in the text regarding the results of the ecological risk assessment do not correspond to the ecological risk tables presented in Appendix B. Specific instances are described in detail in the following specific comments. However, due to these discrepancies, the calculation of ecological soil cleanup goals for chromium and lead presented in Table 2-2 are questionable. One of two actions can be taken to solve this problem:

   - More information should be provided in the FS showing how the remediation goals presented in the text correspond to the ecological risk data presented in Appendix B, or

   - The ecological cleanup goals should be reevaluated with respect to the LOAEL mean HQ values that exceed 1.0 as presented in Appendix B.

Response 2: Acknowledged. The screening level ecological risk assessment (SLERA) has been revised since the Final RI Report has been submitted. Revisions to the risk assessment included separation of total chromium data from hexavalent chromium data and the use of the appropriate toxicity values for each compound. The revised SLERA will be submitted with this Draft Final FS Report.

In addition, a more detailed discussion has been added to Section 2.5.2 concerning the development of the cleanup goals for soil at the site.

3. The FS states that the intended future land use of SEAD-4 has been determined by the LRA, in conjunction with the Army, to be "Conservation/Recreation Area." Alternative 2 specifies a one-foot vegetative cap with filter fabric. While a vegetative cap with filter fabric appears to be an appropriate method to isolate the contaminated surface and subsurface soils from potential receptors, the depth of the vegetative cover may be insufficient to achieve this goal. The FS does not state the specific Conservation /Recreation Area reuse intended for SEAD-4.

   The vegetative cover must be thick enough to prevent plant roots from coming in contact with the contaminated soil or penetrating the filter fabric. A vegetative cover depth of 18 inches appears to be more appropriate for grassy areas that would be mowed fairly regularly. However, if trees or woody vegetation are allowed to grow in the capped sections of SEAD-4, the depth of vegetative cover may need to be three feet or greater to accommodate deeper root depths. A drainage layer may be required above the filter fabric if the filter fabric will not adequately drain infiltration.

Response 3: Acknowledged. The vegetative cap is intended to decrease exposure of wildlife from direct contact with soils primarily containing concentrations of chromium above the cleanup goal. The thickness of the cap is proposed to be 12-inches. Most likely the area of the cap will not be mowed and trees and woody vegetation would eventually grow on the cap. Many plants are not harmed by various metal contaminants and tie them up in their root systems. Several plants are known to be tolerant of chromium. During the November 29, 2001 visit by Parsons' plant physiologist, Sally Newman, to investigate the drainage ditches and pond at SEAD-4, she observed that vegetation was present in the area of the proposed cap with high concentrations of chromium in the surface soils. As part of the proposed re-vegetation process, chromium-tolerant plants, including those already growing in the area, could be used to revegetate the cap. The details would be presented in the Remedial Design Work Plan.

At this point, the specific reuse for SEAD-4, other than being designated as part of the Conservation/Recreation Area, has not been identified.

Specific Comments:

Comment 1: Section 2.3.2, Page 2-6: This section discusses the ecological risk assessment results. It is stated in the last paragraph on Page 2-6 that in Step 3 of the ERA process, alternative toxicity values and mean exposures based on mean concentrations were considered when evaluating contaminants of concern (COCs). The last sentence of this paragraph states that the results of the Step 3 evaluation identified chromium and lead as COCs for soil. According to Table B-2 in Appendix B, antimony, copper, and zinc LOAEL mean HQ values greater than one were calculated for the shrew and a zinc LOAEL mean HQ greater than one was calculated for the hawk. It is unclear why these constituents are not considered COCs for soil.

In addition, it is stated in the same sentence of the text that the results of the Step 3 evaluation identified chromium, copper, and zinc as COCs for sediment. According to table B-5, an aluminum LOAEL mean HQ greater than one was calculated for the great blue heron. It is unclear why aluminum is not considered a COC for sediment.

Response 1: Acknowledged. As stated above, the SLERA has been revised and will be submitted with the Draft Final FS Report. Due to the conservative nature of the assumptions in Step 2 of the SLERA, additional evaluation was required to more fully characterize potential ecological risks and to determine if further evaluation is warranted. In accordance with EPA guidance, this additional evaluation was performed as part of the problem formulation in Step 3. Alternative toxicity values and mean exposures based on mean concentrations were considered when evaluating contaminants of concern (COC). In addition, HQs for the hawk were recalculated using a conservative estimate of the site foraging factor of 10% based on a site size of 30 acres and a foraging range of 576 acres. The results of the Step 3 problem formulation of the revised SLERA concluded that chromium and lead are the compounds of concern for soil.

Step 3 of the revised ERA states that aluminum was eliminated as a compound of concern because the foraging range of the great blue heron is approximately 1.6 acres and the size of the man-made lagoon is 0.7 acres. Comparison of the data indicated that the calculated HQs were overestimated by a factor of approximately 2.

<u>Comment 2</u>: <u>Section 2.3.2, Page 2-7</u>: The first paragraph on Page 2-7 discusses results of the ecological risk assessment with regard to surface water receptors. It is stated in this paragraph that cadmium, cobalt and vanadium were not detected in surface water and that the NOAEL HQ values were less than one for aluminum, iron, manganese, and zinc with regard to the largemouth bass. However, in Table B-5 HQ values were calculated for cadmium, cobalt, and vanadium, indicating that these chemicals were detected in surface water samples. In addition, maximum and mean HQ values greater than one were calculated for iron. These discrepancies should be addressed and the text should be revised as appropriate.

<u>Response 2</u>: The referenced paragraph discusses the re-calculation of risk for the largemouth bass in Step 3 of the SLERA using only the surface water samples collected from the man-made lagoon at the site. Cadmium, cobalt, and vanadium were not detected in the two surface water samples collected from the lagoon (SW4-1 and SW4-2). The text has been revised to clarify that re-calculation of the HQs for the largemouth bass in Step 3 used only the surface water samples collected from the man-made lagoon.

<u>Comment 3</u>: <u>Section 2.4.1, Page 2-10</u>: The Army indicates that the found subsurface contamination pose no risk to human health or the environment. However, the RI reports a maximum concentration of Chromium at 3,820 ppm, with 17 samples exceeding the TAGM value of 10 ppm. The impact of the subsurface soil contamination to the groundwater needs to be addressed within the FS.

<u>Response 3</u>: Acknowledged. The subject of the referenced statement from Section 2.4.1 does not refer to all subsurface contamination. The sentence actually states that "The remaining organic and inorganic constituents which were detected in the subsurface soil samples are considered to pose no human health or environmental risk due to their detection at concentrations which were below or only slightly above their respective TAGM values." Antimony, copper, chromium, and zinc were detected at concentrations above the respective NYSDEC TAGM values in the subsurface soils. However, the results of the human health risk assessment indicated that exposure to these compounds in the subsurface soils does not pose a risk to human health. Based on the results of the SLERA, exposure to soils with concentrations of chromium above 324 mg/kg and lead above 167 mg/kg would pose a threat to ecological receptors.

The remedial action objective for soil is to address surface and subsurface soils with concentrations of chromium and lead exceeding the cleanup goals, which are listed above. Remediation of soils to these values is considered adequate to provide protection to potential ecological receptors.

Chromium was detected in several soil samples exceeding the TAGM value of 29.6 ppm. A maximum concentration of 3,820 mg/kg of chromium was detected at a depth of 2-3.5 feet in SB4-25, which is located southwest of the man-made lagoon. The concentrations of chromium detected in the groundwater samples from monitoring well MW4-4, which is located downgradient of SB4-25, were below the NYSDE GA criteria of 50 ug/L. Groundwater from MW4-4 had no exceedances of the NYSDEC GA or EPA MCL criteria.

In Round 1 of the groundwater sampling during the RI program, aluminum, antimony, chromium, iron, manganese, selenium, sodium, and thallium were detected at concentrations exceeding the NYSDEC GA or EPA MCL criteria. In Round 2 of sampling during the RI, only aluminum, iron, manganese, and sodium were found at concentrations exceeding the respective criteria. Therefore, it was concluded that the groundwater data for SEAD-4 is inconclusive and additional groundwater sampling has been proposed as part of the remedial action for the site. Following the remedial action, the Army will assess the groundwater data to determine if additional action is required. Long-term monitoring may be required if additional data shows exceedances of the NYSDEC GA or EPA MCL criteria.

Comment 4: Table 2-1: This table presents the RAGs for each of the six cases at SEAD-4. Case 4 involves the excavation of contaminated sediment to protect ecological receptors. Clean up criteria are presented for Aroclor 1254, antimony, arsenic, chromium, copper, mercury, nickel and zinc. However, it is stated in Section 2.5.6 that ecological concerns in sediment involve only chromium, copper, and zinc. It is therefore unclear why clean up criteria for Aroclor 1254, antimony, arsenic, mercury and nickel are presented in Table 2-1. This discrepancy should be addressed.

Response 4: Agreed. Table 2-1 has been revised to list the cleanup criteria for sediment as chromium, which was determined to be the compound of concern in sediment based on the revised SLERA.

Comment 5: Table 2-1: Case 3 contains the remedial action objective of restoring SEAD-4 to pre-disposal conditions. The cleanup goals for semivolatiles are NYSDEC TAGM values or method detection limits. Table 2-1 states that the cleanup criteria for benzo(a)anthracene, benzo(a)pyrene and dibenzo(a,h)anthracene are all <330ug/kg. NYSDEC TAGM 4046 states that the cleanup criteria for benzo(a)anthracene, benzo(a)pyrene and dibenzo(a,h)anthracene are <224 ug/kg, <61 ug/kg and <14 ug/kg, respectively, or the method detection limit. It appears that the FS incorrectly referenced the CRQL for these contaminants. This discrepancy should be addressed.

Response 5: Agreed. The cleanup goals for the referenced compounds have been revised to the referenced criteria or the MDL.

Comment 6: Section 2.5.1, Page 2-14: The text states that the RAG for building material and debris is to remove debris present in Buildings 2073, 2076, 2078, 2079, 2084 and 2085. The RI states that Building 2077 was used as a condensate return station. This building appears to be the only standing building that has not been sampled. Identify the reasons for not sampling Building 2077.

Response 6: Review of the Project Scoping Plan for SEAD-4 (Parsons, 1996) indicates that sampling in the buildings was determined based on historical use. Building 2077 was used for general storage and as a condensate return station and was an unlikely source of contamination. For this reason, the building was not sampled.

Comment 7: Section 2.5.2, Page 2-17: This section discusses the media-specific remediation goals for soil. It is stated in the fourth paragraph of this section that the results of the SLERA indicated that the terrestrial receptor with the highest HQ values due to exposure to site soils is the short-tailed shrew. It is assumed that this statement is referring to the calculation of the soil cleanup goal for lead. This statement, however, does not correspond to the data presented in Appendix B. Table B-2 shows that the lead LOAEL mean HQ for the shrew is 1.0 while the lead LOAEL mean HQ for the hawk is 10. It is unclear why the hawk was not used to calculate the soil cleanup goal for lead since it has a higher HQ value.

Response 7: As discussed above, the HQs for the hawk were re-calculated in Step 3 of the SLERA. Table B-4 presents the results of the re-calculation of the HQs for the hawk with the site foraging factor of 10%. The resulting HQ values for the hawk with foraging factor of 10% are less than the HQ values for the shrew. The text has been revised to include a discussion of the re-calculation of HQs for the hawk.

Comment 8: Table 2-2: This table presents the calculated ecological soil cleanup goals for chromium and lead. The dove was chosen as the receptor for modeling the chromium cleanup goal. It is unclear why the dove was chosen instead of the hawk since the chromium LOAEL mean HQ for the dove was 2.8 while the chromium LOAEL mean HQ for the hawk was 16. Justification for the selection of the dove should be provided in the text or the chromium soil cleanup goal should be recalculated base on the hawk exposure parameters.

Response 8: Calculation of the HQs for the hawk in Step 2 of the SLERA used the assumption that the site foraging factor was 100% (Table B-2). In Step 3 of the revised SLERA, the HQs for the hawk were recalculated using a conservative estimate of the site foraging factor of 10% based on a site size of 30 acres and a foraging range of 576 acres. The revised HQs for the hawk are presented in Table B-4 of Appendix B in the FS Report. Because of this, the chromium LOAEL mean HQ for the hawk was reduced to 1.6. A footnote has been added to Tables B-2 and B-3 referencing Table B-4 for the re-calculated HQs for the hawk. Text has been added to include a discussion of the re-calculation of the HQs for the hawk.

Comment 9: Section 2.5.4, Page 2-20: This section indicates that RAO for groundwater includes ongoing monitoring. Since PCBs were the risk driver in groundwater, it is recommended that concentrations of PCBs also be monitored during these efforts to confirm that PCBs are not an ongoing constituent of concern in groundwater. In addition, the monitoring would serve to confirm whether the PCBs detected in groundwater are representative of the groundwater plume at this site.

Response 9: Acknowledged. Aroclor-1260 was detected in only one monitoring well in Round 2 of the groundwater sampling event conducted during the RI program and not in Round 1. Furthermore, the concentration of Aroclor-1260 (0.079 ug/L) detected in Round 1 at MW4-7 was below the NYSDEC GA groundwater criteria of 0.09 ug/L. For these reasons, Aroclor-1260 was not included in the list of compounds for groundwater monitoring in the FS. Furthermore, the data does not indicate that a plume is evident at the site.

Aroclor-1260 has been added to the list of compounds for analysis in groundwater and will be sampled at monitoring well MW4-7 only.

Comment 10: Section 2.5.5, Page 2-21: This section indicates that RAO for surface water includes ongoing monitoring. Since PAHs were the risk driver in surface water, it is recommended that concentrations of PAHs also be monitored during these efforts to confirm that PAHs are not an ongoing constituent of concern in surface water. In addition, the monitoring would serve to confirm whether the PAHs detected in surface water are representative of the surface water at this site.

Response 10: Acknowledged. Excess RME cancer risk and hazard indices for the future resident are due primarily to dermal contact with surface water. These results are due to exposures estimated from the detection of benzo(a)pyrene in one surface water sample (SW4-13). These results are considered highly uncertain due to the low number of samples containing this compound and the low concentrations encountered in the sample. Furthermore, the concentration in the surface water sample was below the Class C criteria. For these reasons, benzo(a)pyrene was not included in the list of compounds to be analyzed in surface water. However, benzo(a)pyrene has been added to the list of compounds for analysis in surface water. Samples will be collected from location SW4-13.

Comment 11: Section 3.3.2.2, Page 3-8: The text states that sediments exceeding the cleanup criteria under Case 5 will be excavated and disposed off-site. Table 2-1 states that Case 5 provides the RAO for surface water and Case 4 provides the RAO for sediments. Revise text to state that sediments exceeding the cleanup criteria under Case 4 will be excavated and disposed off-site. Apply comment to entire FS.

Response 11: Agreed. The text has been revised in regard to Case 4 and sediment criteria.

Comment 12: Section 3.3.2.3, Page 3-9: The text states that long-term groundwater monitoring will not be necessary for Alternative 3-Off-Site Disposal. However, Section 4.3 states that both Alternatives 2 and 3 will include semi-annual site groundwater monitoring for VOCs and metals at six monitoring wells in SEAD-4. Both Alternatives 2 and 3 should contain long-term groundwater monitoring. Clarify this discrepancy.

Response 12: Disagree. The semi-annual groundwater monitoring program referenced in Section 4.3 will be conducted as part of the remedial action objective for groundwater. In Round 1 of the groundwater sampling during the RI program, aluminum, antimony, chromium, iron, manganese, selenium, sodium, and thallium were detected at concentrations exceeding the NYSDEC GA or EPA MCL criteria. In Round 2 of sampling during the RI, only aluminum, iron, manganese, and sodium were found at concentrations exceeding the respective criteria. Therefore, it was concluded that the groundwater data for SEAD-4 is inconclusive and additional groundwater sampling has been proposed as part of the remedial action for the site. Following the remedial action, the Army will assess the groundwater data to determine if additional action is required. Long-term monitoring may be required if additional data show exceedances of the NYSDEC GA or EPA MCL criteria.

For Alternative 3, the off-site disposal alternative, soils with concentrations of chromium and lead exceeding the cleanup goals will be removed and disposed of off site. No long term groundwater monitoring would be required for this alternative if the additional groundwater data collected as part of the remedial action objective for groundwater show that there is no impact to groundwater.

Response to Comments
From
New York State Department of Environmental Conservation (NYSDEC)

Subject: Draft Feasibility Study at the Munitions
Washout Facility, SEAD-4
Seneca Army Depot Activity, Romulus, NY

Comments Dated: October 3, 2001

Date of Comment Response: January 15, 2001

General Comments:

The Division of Fish and Wildlife find the proposed cleanup levels of lead (167 ppm) and chromium (327 ppm) unacceptable in the ability to protect natural resources for a conservation/recreation area. The proposed cleanup levels do not account for possible synergistic effects from the many highly elevated metal concentrations at the site. All natural resource components need to be protected including plants, invertebrates. and heterotrophic processes. Attached is data from Will and Suter that contain screening values for metals which are protective of all the natural resource components.

Eight metals, specifically aluminum, antimony, beryllium, cadmium, iron, magnesium, manganese, and sodium were detected at concentrations in the on-site groundwater above the NY AWQS Class GA or EPA MCL standards. Benzene and ethyl benzene were also detected above the NYS Class GA standards. One of the proposed remedial action objectives in this draft is to monitor the groundwater for metals and VOCs on a semi-annual basis for one year prior to any remedial actions and for one year on semi-annual basis after completion of all remedial actions. The army then proposes to use the groundwater data "to establish potential trends in groundwater quality and if on a statistical basis, the concentrations of metals present in groundwater at SEAD-4 require any further actions." NY Class GA standards are ARARs. At a very minimum, long term monitoring would be required in order to prove that ARARs are no longer exceeded. A statistical analysis based on four sampling events is inadequate.

Nine metals were detected at concentrations in the on-site surface water above NYS Class C surface water standards. This draft proposes as one of its remedial action objectives to monitor the surface water semi-annually for one year before any remedial actions take place. It is then proposed that "the surface water sampling results would be compared to the Class C surface water standards for selected metals to assess if any trends (either increasing or decreasing) in surface water quality are evident and to assess the effects of potential remedial actions performed on soils and sediments." NYS Class C surface water standards are ARARs and at a very minimum, long-term monitoring would be required in order to prove that ARARs are no longer exceeded. Two sampling events are insufficient to indicate any trends in surface water concentrations.

successional old field vegetation and that many areas of SEAD-4 are rapidly succeeding into shrubland. Successional south hardwood communities were also observed on the site.

The development of the proposed cleanup goals for chromium and lead was based on the assumptions used in the screening-level ecological risk assessment (SLERA) for SEAD-4. As stated in the Uncertainty Section of the SLERA, the assumptions used for the screening-level ecological risk assessment were very conservative in accordance with Ecological Risk Assessment Guidance for Superfund (ERAGS) process (EPA, 1997). For example, ERAGS specifies that 100% be used for the area-use factor for terrestrial animals and that the bioavailability of contaminants at the site be assumed as 100%. The proposed cleanup goal for chromium was limited by mourning doves. According to the United States Department of Agriculture (USDA) Forest Service Database, mourning doves in the northern half of the breeding range are known to migrate in the fall to winter quarters in various southern locations, returning to breeding grounds in the spring. Therefore, a more realistic value for the area-use factor for the mourning dove is 0.5. This change alone would increase the proposed cleanup goal for chromium to 648 mg/kg. For lead, a bioaccumulation factor (BAF) of 2.1 was used to estimate the cleanup goal based on the short-tailed shrew. If a median BAF value of 0.266 was adopted as summarized in the USEPA Ecological Soil Screening Level Guidance (2000) document and used by Efroymson (1997), the cleanup goal for lead would be 278 mg/kg. In comparison, the preliminary remediation goal recommended by Efroymson for the short-tailed shrew is 740 mg/kg for lead, which is higher than the proposed cleanup goal for lead at SEAD-4 and the revised cleanup goal based on a BAF of .0266.

Although the proposed cleanup goals for SEAD-4 are higher than the toxicological benchmarks, the cleanup goals are comparable with other remediation criteria such as MOE, CCME, and the Dutch Intervention Values. The attached Table 1 presents a comparison of the proposed soil cleanup goals with the cleanup goals developed for the OB Grounds at SEDA, the Dutch Intervention Values, the Canadian Soil Quality Guidelines, and the generic soil criteria in Ontario. The basis for each set of criteria is described below:

- "Guideline for Use at Contaminated Sites in Ontario" (MOE, 1999) presents effects-based generic soil quality criteria for different land use scenarios, which replaced "Guideline for the Decommissioning and Clean-up of Sites in Ontario" (MOE, 1989). The effects-based generic soil quality criteria were calculated to protect human health and ecological receptors (including plants).

- The Dutch Intervention Values are based on an integration of the human and ecotoxicological effects. Ecotoxicological effects are quantified in the form of concentration in the soil above which 50% of the potentially present species and processes may experience negative effects.

- Canadian Council of Ministers of the Environment (CCME) presents generic soil quality criteria which define a "no-adverse effect" level for all types of environmental receptors for residential properties.

- The ROD for the OB Grounds located at SEDA states that soil containing lead concentrations above 60 mg/kg will be covered to protect terrestrial ecological receptors and soil with lead concentrations above 500 mg/kg will be remediated to protect human health.

In general, the proposed cleanup goals are comparable to the remediation goals set by MOE, CCME, Netherlands, and Efroymson. Although the proposed cleanup goals exceed the toxicity benchmarks recommended by NYSDEC, they were based on site-specific considerations and would be protective of the environment at the site.

Remediation of soils at SEAD-4 to protect all natural resource components may not be in the best interest of the overall environment. Removal of the contamination may cause more long-term ecological harm due to wide spread destruction of a habitat than leaving it in place.

In addition, a comparison of the affected area at SEAD-4 with the overall conservation/recreation area indicates that the impact to the habitat in the conservation/recreation area is minimal. Under the Reuse Plan and Implementation Strategy for Seneca Army Depot, SEAD-4 has been included in the conservation/recreation area, which encompasses approximately 7,585 acres. The area at SEAD-4, which has concentrations of lead and chromium exceeding the proposed cleanup goals, is approximately 2 acres, or .03% of the total acreage of the conservation/recreation area.

As discussed above, assumptions used in the SLERA were very conservative. Therefore, the resulting HQ values calculated in the SLERA are not considered a measure of risk but a measure of the level of concern. As stated in Step 3 of the SLERA, an HQ greater than one indicates that a compound is a potential contaminant of concern and additional evaluation is required.

The Army believes that the remedial actions proposed for soil at SEAD-4 meet the intent of TAGM #4046 and are protective of the environment. The proposed remedial actions for soil were developed to ensure that the human health risks from potential exposures to constituents in debris and material within the buildings are eliminated. Furthermore, groundwater will be monitored and groundwater use may be restricted at the site if necessary. The proposed remedial actions will decrease future exposure of wildlife from direct ingestion of and/or direct contact to soil with concentrations of chromium and lead above the proposed cleanup goals as well as other co-located metals.

Groundwater

Please note that the eight metals that were detected at concentrations exceeding the NYSDE GA or EPA MCL criteria at SEAD-4 are aluminum, antimony, chromium, iron, manganese, selenium, sodium, and thallium.

The reason for proposing to monitor groundwater for one year prior to and for one year after the remedial actions is that the data collected from two rounds of groundwater sampling during the RI are inconclusive. For several compounds, a concentration was detected above the GA or MCL criteria in one round of sampling and was undetected or below the criteria in the second round of sampling. The VOCs, antimony, and thallium were detected at concentrations above the respective criteria in round 1 of sampling and not detected in round 2. Chromium and selenium were detected at concentrations above the respective criteria in round 1 and below the criteria in round 2.

Additional groundwater sampling is required to determine if there is an exceedance of the NYSDEC GA or EPA MCL criteria and if the detections that exceeded the criteria were a result of high turbidity in the samples. Following the remedial action, the Army will assess remaining concentrations in the groundwater to determine if additional action is required. Long term monitoring may be required if additional data shows exceedances of the NYSDEC GA or EPA MCL criteria. The text has been revised to clarify this and the reference to a statistical analysis has been removed.

Surface Water

The surface water at the site is not classified by NYSDEC because the drainage ditches and man-made lagoon are either intermittent and/or not recognized as established streams or creeks. Because the drainage ditches form the headwater for Indian Creek, the lower portion of which is designated as Class C surface water by NYSDEC, the Class C standards were used to provide a basis of comparison for the SEAD-4 data. The Class C standards are not strictly applicable to the surface water at SEAD-4.

The surface water data collected during the RI field investigation was collected in only one round of sampling. The Army proposes sampling the surface water at four locations within the drainage ditches and analyzing for metals and benzo(a)pyrene. Surface water samples would be collected semi-annually for one year prior to and one year after the remedial action at the site resulting in four samples from each location. Following the remedial action, the Army will be better able to assess the effects of the remedial actions performed on soils and sediments and to determine if additional action is required.

Detailed Analysis

The use of institutional controls including access control, land use restrictions, and the possible restriction of groundwater use, has been added to the list of components common to remedial alternatives 2 and 3 (Section 4.3). The report considers clean up for conservation/recreation use and makes reference to the future use of the property being conservation/recreation, which, by definition, will necessitate the imposition of a land use restriction. Institutional controls will be part of the overall remedial strategy to restrict exposure to those activities involving conservation/recreation. Institutional controls are discussed in the evaluation of long-term effectiveness and permanence for the alternatives.

Unrestricted/residential land use has been evaluated. Two levels of soil protection, unrestricted/residential land use (Case 3) and conservation/recreation (Case 2), have been developed for each remedial alternative in terms of cost. For unrestricted/residential land use, TAGM criteria have been used to determine the volume of soil requiring remediation.

The evaluation factor that will be affected by increasing the level of protectiveness is cost. Increasing the level of protectiveness will increase the volume of soil requiring remediation, which will affect the cost for each alternative. Even though the screening and evaluation of the alternatives was performed based on the conservation/recreation future use, costs were developed separately for each level of protection. As stated in the text, this approach has avoided the redundancy of evaluating each alternative for the EPA criteria for each level of protectiveness.

Evaluation Criteria

Evaluation of the remedial alternatives against the criteria, compliance with ARARs and SCGs, has been added to Section 4, Detailed Analysis of Presumptive Remedies. The two criteria, State/agency acceptance and community acceptance, will be assessed following the comment period for the FS report and the proposed plan.

Remediation Implementation

The depth of soil restoration has been estimated based on surface and subsurface soil data collected from the site during the RI program. The collection of confirmatory samples for the excavation areas will be required as stated in the text. The specific number of confirmatory samples that will be collected and the details of the implementation of the remediation will be presented in a cleanup verification work plan.

Specific Comments:

Comment 1: Page 1-3, Section 1.2.1, Site Description: The first sentence states that "SEDA is an active military facility." Please correct.

Response 1: Agreed. The text has been revised.

Comment 2: Page 1-4, Section 1.2.1, Site Description: In the last paragraph, it states that "Building 2073 is the only building at the facility that is currently used." Please specify what the building is currently being used for.

Response 2: Agreed. Building 2073 is no longer being used since SEDA has been closed. The text has been revised.

Comment 3: Page 2-4, Section.2.3.1, Human Health Risk Assessment: In the third paragraph, for the future indoor park worker, please include a discussion on inhalation.

Response 3: Agreed. A discussion on inhalation has been added to the text.

Comment 4: Page 2-8, Section 2.4, ARAR-Based Remedial Action Objectives: The draft states that surface water at this site is found in "two man-made drainage ditches and a man-made lagoon." It continues to state that Class C standards were used as a basis for comparison for the surface water in the ditches. However, the draft does not specify what ARARs are applicable to the lagoon surface water. Please clarify.

Response 4: The surface water at the site is not classified by NYSDEC because the drainage ditches and man-made lagoon are either intermittent and/or not recognized as established streams or creeks. Because the drainage ditches form the headwater for Indian Creek, the lower portion of which is designated as Class C surface water by NYSDEC, the Class C standards were used to provide a basis of comparison for the SEAD-4 data. The Class C standards are not strictly applicable to the surface water at SEAD-4. The text has been revised to clarify this.

Comment 5: Page 2-10, Section 2.4.2, Soil In Ditches: The draft states that the soil found in the ditches at SEAD-4 are similar to those found at Seneca Open Burning Grounds. It continues that because the macro invertebrate sampling in the drainage swales were "pre-dominantly non-aquatic" therefore "nature of the soils found in the ditches is expected to be terrestrial instead of aquatic." A simple visual comparison of sediments/soils in one stream to another that is located more than 3 miles away to rule out whether there is aquatic life in the streams is not valid. As with the Open Burning Grounds site, there should be macroinvertebrate sampling to confirm the presence/absence of aquatic life in the streams. Considering that this site is planned for a conservation/recreation re-use, has the Army ever performed a wetlands assessment for this site?

Response 5:, A site visit was conducted at the SEAD-4 area on November 29, 2001 by a Parsons plant physiologist, Sally Newman, Ph.D., for the purpose of determining the aquatic or terrestrial nature of the drainage ditches located on the site. The following information has been added to Section 1 of the FS Report.

Prior to the site visit, information from existing reference sources was gathered about the site and the following information was found.

> The USDA Soil Conservation Service Soil Survey Map for Seneca County shows two soil types are found at SEAD-4: Angola (AnA-0-3% slopes and AnB-3-8% slopes) and Darien (DaA-0-3% slopes). Neither soil type is listed as hydric in the USDA-NRCS Soil Survey Division's list of <u>Hydric Soils of the United States</u> (www.Statlab.iastate.edu/soils/hydric).
>
> The USGS Topographical Survey Map (Ovid Quadrant) showed no streams and only one small pond at SEAD-4. Topography was nearly flat.
>
> The United States Fish and Wildlife Service's National Wetland Inventory Map (Ovid Quadrant) identified only one tiny cluster of Paulustrine Emergent Marsh (PEM) wetlands along the northern perimeter of SEAD-4.

At the site, the following observations were made. Vegetation on the site is dominated by autumn olive (*Elaeagnus umbellate*) and poverty grass (*Aristida dichotomy*). Both autumn olive and poverty prefer dry, disturbed soils. In the majority of ditches at SEAD-4, the vegetation was dominated by upland species of grasses and forbs as rated by Reed, P.B., Jr. (1988)in <u>The National List of Plant Species that Occur in Wetlands: Northeast (Region1).</u> In some places, the ditches had been excavated down into the seasonal high groundwater table and supported wetland communities dominated by cattails and rushes.

The pond identified by the USGS topographical map consisted of an excavated stormwater detention pond. The source of the water in the pond was groundwater due to the depth of the excavation. During rainfall events, the pond can also receive stormwater runoff from a drainage ditch, which enters the pond at its southeast corner. No water was flowing in the drainage ditch at the time of the site visit. The pond was equipped with an elevated stormwater overflow pipe, which exited the pond on its west side. At the time of the site visit, the water level in the pond was approximately 6 to 7 feet below the overflow pipe. This pipe is the pond's only outlet.

The wetland cluster identified by the NWI map was found to be associated with a stormwater management swale on the northern perimeter of SEAD-4. The swale consisted primarily of saturated soils although some pockets of water ranging from 0 to 6 inches were also present. No defined stream channel was present, but, rather, the area consisted of a broad poorly defined wetland. Vegetation ranged from shrubs (within a wooded area) to cattails (along the road).

As the USGS topographical map indicated, SEAD-4 has no source of hydrology other than rainfall (i.e. no streams are present which conduct water onto the site). The site was found to have excellent stormwater management. The rainwater, when present, migrates down nearly level, shallow ditches that essentially act as level spreaders, allowing the water time to filter into the ground. In Angola and Darien soils, seasonal high groundwater can be at 0.5-1.5 feet. In some locations, the stormwater ditches were excavated down into the groundwater, enabling these areas to remain saturated for a long enough duration to sustain limited wetland vegetation (generally cattails or silky dogwood in the wettest swales and rushes mixed in with upland field grasses and forbs in the others). No ditches with perennial flowing water were present.

Information contained in Dates and Byrne (1997) *Living Waters, Using Benthic Macroinvertebrates and Habitat to Assess Your River's Health*, River Network, Montpelier, VT is useful in assessing the habitat value of SEAD-4's stormwater ditches for macroinvertebrates. Benthic macroinvertebrate organisms are generally found in flowing waters. A current velocity of 0.5 to 2.5 feet per second supports the most diverse communities. Their habitat ranges from shallow, fast moving, rocky bottom areas known as riffles; to deeper, slower moving sandy and gravely bottom areas known as runs; to deep, slow moving muddy-bottom areas known as pools. The cobbly condition of riffles supports the widest variety of macroinvertebrates. Runs contain a smaller variety. And, the uniform bottoms of pools, with smaller soil particle sizes like sands and silts, provide very limited living spaces and surfaces for macroinvertebrates to hold onto. Thus, pools support only a very limited variety of macroinvertebrates. Some macroinvertebrates are very sensitive to temperature levels and fluctuations. Temperature also affects the amount of dissolved oxygen that the water can hold, with cold water holding the most. Macroinvertebrates are sensitive to water level fluctuations, since dry areas are no longer available for living, feeding, and breeding areas for aquatic organisms.

None of the ditches or wetland swales at the SEAD-4 represents adequate habitat for aquatic macroinvertebrate organism. The stormwater ditches at SEAD-4 do not contain waters moving at a current velocity of 0.5 to 2.5 feet per second. No riffles or cobble bottoms are present. The ditch bottoms are, generally, well vegetated with a grasses and rushes. The soils in the ditches are composed of small soil particle sizes like loams and clays. When present, the shallow nature of the water in the ditches provides little insulation against temperature fluctuations. And, the intermittent nature of the water supply (rainfall) in the ditches would cause the ditches to be undependable living and breeding grounds for aquatic macroinvertebrates.

The only area of the site with a consistent water supply is the pond. This detention pond does not possess flowing water and the bottom is coated with silt and algae. As indicated by Dates and Byrne, the uniform bottom of pools supports only a very limited variety of macroinvertebrates.

During the site visit, an overview assessment of the SEAD-4 wetlands was also made. Wetlands on the site are limited to the deepest of the stormwater swales. No wetlands exist at SEAD-4 outside of the stormwater ditch system. Stormwater management is a necessary and beneficial activity, which can create wetlands where none existed before. Nationwide Wetlands Permit #41 (Reshaping Existing Drainage Ditches) of the Code of Federal Regulations 33 Part 330 reads: "This nationwide permit does not apply to reshaping drainage ditches constructed in uplands, since these areas are not waters of the United States, and thus no permit from the Corps is required". The ditches at SEAD-4 were carved into upland soils Angola and Darien. In addition all the wetland swales on the site are isolated, none of them border on waters of the United States (streams, ponds, and lakes). Due to a recent Supreme Court ruling, it is no longer clear whether isolated wetlands can be regulated. The Corp's current policy is to examine these isolated areas on a case by case basis. It is probably unlikely that, upon review, the ACOE would take jurisdiction over this ditch system.

The following conclusions were made concerning SEAD-4:

(1) Only the pond at SEAD-4 has permanent water and may support aquatic life; therefore, the NYSDEC's Technical Guidance for Screening Contaminated Sediments (1999) is applicable to the sediment at the pond bottom. Aquatic receptors should be assessed for the area.
(2) All the other drainage swale areas at SEAD-4 are nonwetlands or not regulated as wetlands. There is no evidence that the areas support the living, feeding, and breeding activities of benthic organisms, i.e., aquatic macroinvertebrates, and allow them to complete their life cycles. In addition, the sediment screening levels established by NYSDEC are based on toxic effects for benthic macroinvertebrates. Therefore, the NYSDEC's guidance should not be applied to these areas. In addition, no aquatic receptors or exposure via preying aquatic/benthic biota should be evaluated.

Comment 6. Page 2-14, Section 2.5, Media Specific Remediation Goals: The draft states that "the determination to accept the residential use cleanup scenario value will be considered if the cost comparison show that the additional cost to achieve a lower cleanup level is affordable." The following statement, "this approach is consistent with NYSDEC's September 21, 1998 letter to the Army and the Army's October 1, 1998 to NYSDEC," is incorrect and should be removed from the text. NYSDEC's letter of September 21, 1998 states that it is a "New York State regulatory requirement to restore sites to pre-release conditions to the extent feasible."

Response 6: Acknowledged. The reference to NYSDECs September 21, 1998 has been removed from the text. However, it is the Army's understanding that NYSDEC has not disagreed with the approach of investigating the cost of unrestricted use for comparison purposes.

Comment 7: Page 3-6, Section 3.3.1, Presumptive Remedy Selection Process: In the last sentence of the first paragraph, please correct the typographical error.

Response 7: Agreed. The text has been revised.

Comment 8: Page 3-9, Section 3.3.2.3, Alternative 3 – Off-Site Disposal: This alternative assumes backfilling with common fill and topsoil. Though this may be necessary in some areas for safety it is not likely needed in all areas for a conservation area. It would be simpler to just grade it rather it than have the extra expense of bringing in backfill.

Response 8: Agreed. The text has been revised to include this as an option.

Comment 9: Page 4-8, Section 4.4.1, Definition of Alternative 2: The proposed soil cover for surface soils exhibiting residual contamination may be applicable to NYCRR Part 360, as the contaminated soil may be considered a solid waste.

Response 9: The proposed cover will be a vegetative cover that will prevent exposure to the metals that are contained in the soil beneath. The proposed vegetative cover will be 12-inches thick but will not include all the components of a landfill closure cap such as a gas venting layer nor a low permeability soil barrier. The vegetative cover will not meet the requirements of NYCRR Part 360. A cap required by NYCRR Part 360 is not considered necessary since the metals are not leaching and the risk to terrestrial receptors due to ingestion can be prevented by a vegetative cover.

Comment 10: Page 4-10, Section 4.4.2.1, Short-term Protectiveness: In the second paragraph, please specify how far "away" the site is located from the SEDA boundary.

Response 10: Agreed. The text has been revised to state that the site is located approximately 1750 feet away from the SEDA boundary.

Comment 11: Page 4-28, Section 4.7, Conclusion: A simple cost comparison is not sufficient in order to demonstrate the advantages versus disadvantages for remedial alternatives that allow unrestricted use in comparison to those that require institutional controls and long-term monitoring. See general comments above.

Response 11: Disagree. As stated in the Response to the general comments, the unrestricted/residential land use has been developed as one level protectiveness for each remedial alternative. Each of the alternatives includes two levels of soil protection including unrestricted/residential land use and conservation/recreation land use. The evaluation factor that will be affected by increasing the level of protectiveness is cost. Increasing the level of protectiveness will increase the volume of soil requiring remediation, which will affect the cost for each alternative. As stated in the text, this approach has avoided the redundancy of evaluating each alternative for each EPA criteria for each level of protection.

Comment 12: Figures 2-10 through 2-12: The tables in the legend of each figure are difficult to read. Please make them legible.

Response 12: Agreed. The figures have been revised.

BCT Agenda
13/14 August 2003

13 August 2003 1330 hours

Conservation Area FOST- review of comments to understand meaning. Proposed responses as may be determined at the time of the meeting.

Comments on the IC PRAP as may be available at the time of the BCT.

August 14, 2003 - 0830 hours

A review of the status of the following documents-
SEAD 12 supplemental work plan
SEAD 25/26 draft ROD
SEAD 11 AM / DD
SEAD 13 AM / DD

How to close out of SEAD 64A and 64D Process to follow under the Solid waste regulations.

Review of the site Data for SEAD 50/54. Additional needs?

Construction completion report for SEAD 5, 39, 40 24, and 67. What changes from SEAD 50/54 are needed in format to facilitate review of the document?

Tour Airfield

BCT Agenda
16/17 September 2003

16 Sept 2003   1330 hours

Conservation Area Transfer update-   FOST, Transfer agreement, ROD, etc

SEAD 50/54 Update-   Status of Statistical review, Response to comments, time line for completion.

Ash Landfill ROD-   Contingency alternative,   Cost of Action,   Review of proposed changes in design of reactive barriers.

Discussion on the Army guidance to take action when IC dispute hold up ROD.   What site are applicable, and what do needs to go into the letter to the action

17 September-

Discussion and walk through of the RCRA Closure of SEAD 17 and SEAD 72.

Discussion and site tour of the proposed additional sampling to develop an anthropogenic background data set for the PID and Warehouse area.

DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600

REPLY TO
ATTENTION OF

DAIM-ED-R (200)

AUG 0 6 2002

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Interim Guidance on Environmental Restoration Records of Decision

1. Reference memorandum, DUSD(ES), 4 Jun 02, SAB (enclosure 1).

2. Enclosure 1 provides guidance to the Services when documenting remedial actions, particularly those containing land use controls. The Army must incorporate this guidance into the environmental restoration decision process.

3. This interim guidance outlines general risk-based elements to be incorporated into records of decision (RODs), as well as specific elements to be incorporated into RODs addressing remedial actions that include land use restrictions. This guidance also provides:

a. Model ROD documentation language acknowledging policy-level disagreement; and

b. Model language for a transmittal letter forwarding a Component-signed ROD for EPA signature.

4. Should a substantive dispute arise with a regulator pursuant to implementation of this guidance, the issue will immediately be elevated in accordance with the enclosed 25 Apr 02 ACSIM memorandum, Interim Notification Guidance on Documenting and reviewing Land Use Controls developed under the Army Environmental Restoration Program (enclosure 2).

5. My points of contact are Ms. Susan Abston (DAIM-ED-R), (703) 693-0679, email susan.abston@hqda.army.mil, or facsimile (703) 697-0338; and Ms. Angela Atkins, (703) 693-0642, email angela.atkins@hqda.army.mil.

2 Encls

Larry J Lust
LARRY J. LUST
Major General, GS
Assistant Chief of Staff
for Installation Management

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION,
TECHNOLOGY
AND LOGISTICS

JUN 4 2002

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE ARMY (ENVIRONMENT, SAFETY, AND OCCUPATIONAL HEALTH)
DEPUTY ASSISTANT SECRETARY OF THE NAVY (ENVIRONMENT)
DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE (ENVIRONMENT, SAFETY, AND OCCUPATIONAL HEALTH)
STAFF DIRECTOR, ENVIRONMENT AND SAFETY, DEFENSE LOGISTICS AGENCY SUPPORT SERVICES (DSS-E)

SUBJECT: Interim Guidance on Environmental Restoration Records of Decision

The purpose of this memorandum is to clarify documentation requirements for remedial actions, to include specifically those containing land use restrictions, in Records of Decision (RODs) required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). General guidance on documenting the remedy decision is contained in paragraph 23.1 of the September 28, 2001, Management Guidance for the Defense Environmental Restoration Program (DERP). More specific guidance that Components should consider on the appropriate content of RODs is contained in the U.S. Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) July 1999 guidance document 9200.1-23P, A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents.

Using the CERCLA framework, DERP employs a risk management approach to take necessary and appropriate response action to protect human health and the environment from unacceptable risk(s) resulting from past contamination. When remedial action is taken, it must be documented in a ROD as required by CERCLA and its implementing regulation, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This requirement fully applies to remedies that have a use restriction component. The DoD as the lead agency has the obligation to move expeditiously through the cleanup process to address risks to human health and the environment. To facilitate this progress, Components are to follow this guidance to finalize and issue RODs.

All RODs need to focus on the risk and action(s) selected to address risk. Thus, the ROD needs to clearly:

- describe the risk(s) necessitating remediation;
- document risk exposure assumptions and reasonably anticipated land uses;
- state the remedial action objective(s);
- describe the remedy in general terms, specify the components of the remedy, and basis for the selection; and
- list the entity(ies) responsible for implementing and maintaining the selected remedial action.

These elements are consistent with the guidance contained in the DERP Management Guidance and OSWER 9200.1-23P.

In cases where use restrictions are selected as part of the remedy to address risk and exposure to any remaining residual contaminants, use controls are employed to manage the future use of the property. Where this type of use control is an integral component of the remedial action, the ROD (as stated in the OSWER guidance) needs to generally describe:

- the remedial action objective(s) of the use restrictions;
- the specific controls proposed to effectuate the restriction(s) "(e.g., deed restrictions such as easements and covenants, deed notices, land use restrictions such as zoning and local permitting, ground-water use restrictions, and public health advisories)";
- the area/property covered by use restriction and associated control(s);
- the duration of the control(s), if not permanent; and
- the "entities responsible for implementing and maintaining controls (e.g., property owner, town zoning authority, State health agency)."

These elements are consistent with the guidance contained in DoD's January 17, 2001, Policy on Land Use Controls (LUCs) Associated with Environmental Restoration Activities. Use controls must be identified and described in the ROD only when selected as remedial components necessary to protect human health and the environment from unacceptable risk. In addition, a Component may voluntarily choose to implement supplemental physical, legal, or administrative measures that reinforce the selected use controls, as addressed in DoD's March 2, 2001, Guidance on Land Use Control Agreements with Environmental Regulatory Agencies. These supplemental measures may be documented in voluntary agreements, non-enforceable arrangements, and internal documents, all of which normally would be included in the information repository for the site. However, such supplemental measures shall not be included in the ROD or any post-ROD enforceable documents. Examples of supplemental measures that are not to be included are:

- provisions for periodic monitoring or visual inspections of use restrictions and controls (other than CERCLA five-year reviews);

- certifications and reports to regulators associated with monitoring or inspections; and
- requirements for land use control implementation or assurance plans.

The April 23, 2001, DUSD(I&E) moratorium memorandum precluding Components from entering Federal Facility Agreements (FFAs), or modifying existing FFAs, that include Land Use Control Assurance or Implementation Plans, Operation and Maintenance Plans, Remedial Action Completion Reports, Site Closeout Reports, Five-Year Reviews, or any other similar post-ROD documents remains in effect pending resolution of current discussions between DoD and EPA. Similarly, the May 25, 2001, DUSD(I&E) clarification letter that states this moratorium also preclude including such documents, plans, reports, or reviews as an enforceable term, condition, provision, requirement, or deliverable in an FFA, ROD, or other similarly enforceable arrangement remains in place.

While finalizing a ROD, should a Component encounter regulator demands to include in RODs, or other post-ROD enforceable documents, provisions that conflict or deviate from DoD policy and guidance, the issue(s) shall be immediately elevated within the Component. We are working with EPA at a policy level to resolve differences in legal and policy interpretations. In general, if the only substantive disputes are the supplemental land use restriction and control issues or other post-remedy implementation, maintenance, completion or review provisions, then you should note in the ROD and Responsiveness Summary the nature of the dispute and that the ROD may be amended at a later time based upon resolution of the policy-level disagreement. As long as the Component can establish that EPA does concur with the underlying physical remedy, the Component may and shall unilaterally issue and then execute the ROD respecting those consensus elements of the physical remedy. Attached are model language and statements to be included in such ROD documentation. The elevation of and any dispute related to such specific use restriction and control, or other post-remedy issues, should not and must not be allowed to impede execution of those remedial selection and ROD elements for which there is agreement. My point of contact for this matter is Mr. Shah A. Choudhury, at (703) 697-7475.

John Paul Woodley

John Paul Woodley, Jr.
Assistant Deputy Under Secretary of Defense
(Environment)

Attachment:
As stated

Model ROD documentation language acknowledging policy-level disagreement:

The [Component] acknowledges that the US EPA maintains specific provisions respecting [inspection, monitoring, reporting, maintaining and enforcing LUCs/ICs], and provisions for developing an [Operation and Maintenance Plan], [Five-Year Review Report], [Land Use/Institutional Control Implementation Plan], [Remedial Action Completion Report], [Site Closeout Report],[and others, as appropriate] are required components of remedy selection and the ROD. The [Component] acknowledges that US EPA maintains that without such specific provisions the remedy is not fully protective. It is the position of the [Component] that such provisions are not part of required remedy selection or the ROD; therefore, the [Component] has not identified these provisions as remedial components in this ROD. The [Component] has at attachment ___ included these disputed provisions; however, they are not thereby made a term, condition, provision or requirement of this ROD or the selected remedy, but are for purposes of illustration and information only. The [Component] acknowledges that, pursuant to 42 USC Sec. 9620(e)(4)(A) and 40 CFR Sec. 300.430(f)(4)(iii), the Administrator of the EPA has sole remedial action selection authority at Federal facilities on the NPL if EPA and the [Component] are unable to agree on remedy selection. It is EPA's position that the disputed provisions described above fall within the meaning of "remedy" and EPA's remedy selection authority. The [Component] expressly reserves its position that these disputed provisions do not fall with the meaning of "remedy" or EPA's remedy selection authority. The [Component] commits to subsequently revising this ROD, in accordance with the procedural requirements of CERCLA and the NCP, if (a) DoD subsequently determines and agrees programmatically to include such provisions as components of the remedy selected and the ROD, or (b) DoD is directed to include such provisions at the conclusion of a dispute resolution process involving EPA and [Langley Air Force Base or other installation, as appropriate]. The [Component] expressly reserves its right to invoke any applicable federal inter-agency dispute resolution process to resolve whether the specific provisions are within the scope of the EPA Administrator's authority to select remedies. The [Component] expressly acknowledges that by EPA signing and concurring with the remedy selected and identified by the [Component] in this ROD, EPA is not waiving or prejudicing its position that such provisions respecting [LUC/IC inspection, monitoring, reporting, maintenance and enforcement], and provisions for developing an [Operation and Maintenance Plan], [Five-Year Review Report], [Land Use/Institutional Control Implementation Plan], [Remedial Action Completion Report], [Site Closeout Report], [and others, as appropriate] are required components of the remedy selection process and the ROD and that without such provisions the remedy is not fully protective.

DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON, DC 20310-0600

REPLY TO
ATTENTION OF

DAIM-ED-R

APR 2 5 2002

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Interim Notification Guidance on Documenting and Reviewing Land Use Controls (LUCs) developed under the Army Environmental Restoration Program

1. Reference memorandum, SFIM-AEC-ERP, 17 Aug 01, subject: Interim Army Management Plan for Land Use Controls Associated with Environmental Restoration Activities.

2. This memorandum is to clarify appropriate steps for documenting and reviewing LUCs in environmental restoration decision documents (DDs) or Records of Decision (RODs) at Army active and transferring installations, and at Formerly Used Defense Sites (FUDS). This topic has been a source of recent disagreements between the Department of Defense (DOD) and the U.S. Environmental Protections Agency (EPA) that have stalled the restoration process at a number of DOD installations. Accordingly, this guidance provides a process to be used until further guidance is developed to avoid such potential delays.

3. The major Army commands (MACOM), U.S. Army Corps of Engineers (USACE) divisions, installations, and USACE districts shall immediately notify the Office of the Director of Environmental Programs (ODEP) if a regulatory agency refuses to sign a DD/ROD because of land use control issues. In support of timely execution of environmental cleanup and protection of human health and the environment, the affected installations and USACE districts shall submit their DDs/RODs subject to such disagreement through their chain of command to ODEP for further guidance.

4. Active and transferring installations shall notify the U.S. Army Environmental Center (USAEC) of any DD/ROD that the installation anticipates to be controversial to the EPA, state regulatory agency, or the public in general regarding land use controls. Such notification should occur as soon as the issue has been identified but no later than during review of the draft DD/ROD by the USAEC. The point of contact at the USAEC is Mr. Derek Romitti, (410) 436-1506, fax (410) 436-1548, electronic mail Derek.romitti@aec.apgea.army.mil.

Encl 2

5. At FUDS properties, the USACE districts through their USACE division shall notify Headquarters, USACE of any DD or ROD that the district anticipates to be controversial to the EPA, state regulatory agency, or the public in general regarding land use controls. Such notification should occur as soon as the issue has been identified but no later than during review of the draft DD/ROD by the USACE. The point of contact at the USACE is Mr. Julian Chu, (202 761-4695, fax (202) 761-1960, electronic mail julian.t.chu@hq02.usace.army.mil.

6. The Army shall continue to follow the process for documenting LUCs outlined in the referenced Army Interim Land Use Control Management Plan. More specifically, the Army shall include the following information about LUC(s) in the decision document:

- the type of land use control;
- the reasonably anticipated future land use;
- the location and source of the contamination that the control addresses;
- the role of the LUC in achieving the remedial action objective;
- the means for terminating and/or modifying the control.

7. The Army shall not include details pertaining to LUC enforcement, monitoring, or reporting in the decision document. Such details should be documented instead in a secondary implementation plan. On a case-specific basis, the Army may enter voluntary agreements with regulatory agencies that identify LUC implementation activities and responsibilities. Such agreements will not be appended to – or otherwise associated with – formal remedial decision documents.

8. My points of contact in the ODEP for this action are: Susan Abston, (703) 693-0679, fax (703) 697-0338, e-mail susan.abston@hqda.army.mil; or Angela Atkins, (703) 693-0642, e-mail angela.atkins@hqda.army.mil.

VR,

R. L. VAN ANTWERP
Major General, GS
Assistant Chief of Staff
for Installation Management

Received 21 Jun 02

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
INSTALLATIONS AND ENVIRONMENT
110 ARMY PENTAGON
WASHINGTON DC 20310-0110

21 JUN 2002

CF.
action ED
info BRAC
info AEC

MEMORANDUM THRU ~~DIRECTOR OF THE ARMY STAFF~~ 21 Jun 02

FOR ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT

SUBJECT: Interim Guidance on Environmental Restoration Records of Decision

This memorandum forwards the subject interim guidance for your implementation by all Army activities involved in Army Active Sites, Base Realignment and Closure, or Formerly Used Defense Sites environmental restoration programs. The enclosed interim guidance clarifies documentation requirements for remedial actions for Department of Defense Components that contain land use restrictions in Records of Decision (RODs) required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Ray Fatz
Raymond J. Fatz
Deputy Assistant Secretary of the Army
(Environment, Safety and Occupational Health)
OASA(I&E)

Enclosure

FAX HEADER

SENECA ARMY DEPOT ACTIVITY
CARETAKER FORCE
PO BOX 9
ROMULUS, NY 14541

TO: Julio Vazquez
EPA
phone:
fax:

From: Stephen M. Absolom
Commander's Representative
phone: (607) 869-1309
fax: (607) 869-1362
email: absoloms@seneca-hp.army.mil

Regarding: BCT Agenda

10 pages including header

Proposed Plan for
Sites Requiring Institution Controls SEAD-27, SEAD-64A, and SEAD-66

Seneca Army Depot Activity

Romulus, New York

Presentation: September 16, 2003

PARSONS

Outline

- Seneca Army Depot Brief History
- SEAD-27, SEAD-64A, and SEAD-66 Brief Introduction
- Mini Risk Assessment Introduction
- SEAD-27
- SEAD-64A
- SEAD-66
- Recommendation for SEAD-27, SEAD-64A, and SEAD-66

PARSONS

Seneca Army Depot Activity
Brief History

- Approximately 10,600 acres of land owned by U.S. Government and Operated by Army since 1941 located in Seneca County, Romulus, NY
- On July 14, 1989 EPA proposed SEDA for inclusion on the National Priorities List (NPL) due to the "presence of potentially contaminated areas."
- EPA recommendation was approved and finalized on August 30, 1990.
- As a Federal NPL site, SEDA subject to requirements of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

PARSONS

Seneca Army Depot Activity
Brief History – (Continued)

- SEDA was a generator and Treatment, Storage, and Disposal Facility regulated under RCRA
- The Army identified 72 Solid Waste Management Units (SWMUs) under RCRA.
- Corrective action is required for all SWMUs under RCRA permit system, if found to be necessary.
- Remedial action goals are the same under CERCLA and RCRA; thus, the 72 RCRA SWMUs were identified in Federal Facilities Agreement (FFA) signed by the Army, EPA, and NYSDEC in 1993.

PARSONS

Seneca Army Depot Activity
Brief History – (Continued)

- SEDA designated for closure under the Department of Defense's (DoD's) Base Realignment and Closure (BRAC) process in 1995.
- Under BRAC process, goals are for the release of non-affected portions of the Depot to the surrounding community for their reuse for non-military purposes.
- As part of the BRAC process, the Army prepared an Environmental Baseline Survey (EBS) of the Depot. Based on the data from the EBS process, the Seneca Army Depot Local Redevelopment Authority (LRA) proposed future uses of various portions of the Depot.

PARSONS

SEAD-27, SEAD-64A, and SEAD-66
Brief Introduction

- SEAD-27 and SEAD-66 located in the area designated as Planned Industrial/Office Development.
- SEAD-64A located in the area designated as Warehouse Area.
- Final Mini Risk Assessment Decision Document for sites including SEAD-27, SEAD-64A, and SEAD-66 submitted in May, 2002.
- Based on the mini risk assessment and previous investigations, institutional controls are proposed for SEAD-27, SEAD-64A, and SEAD-66.

PARSONS

Mini Risk Assessment Introduction Human Health Risk Assessment

- Reasonable Maximum Human Exposure:
  - The maximum detected concentration as exposure point concentration.
  - Reasonable maximum exposure scenario.
- Acceptable Risk Limits:
  - Cancer: 10^{-4}~10^{-6}
  - Non-cancer: 1

PARSONS

Mini Risk Assessment Introduction Human Health Risk Assessment

- Receptors
  - Planned Industrial/Office Development:

    Industrial worker, construction worker, day care center worker, day care child.
  - Warehouse:

    Warehouse worker, construction worker, adult trespasser.
  - Residential:

    Adult resident, child resident .

PARSONS

Mini Risk Assessment Introduction
Ecological Risk Assessment

- Characterization of the Unit and the Ecological Communities it May Affect.
- Exposure Assessment - Reasonable Maximum Human Exposure:
  - The maximum detected concentration as exposure point concentration.
  - Reasonable maximum exposure scenario.
- Toxicity Assessment.
- Risk Characterization.

PARSONS

SEAD-27; Building 360
Site Background Information

- Site Name: Building 360 – Steam Cleaning Waste Tank.
- Location: Eastern-central portion of the Depot.
- Future Land Use: Planned Industrial/Office Development.
- Contaminants: Chlorinated compounds and xylenes.

PARSONS

SEAD-27; Building 360
Site Background Information (continued)

- Description: Old equipment was refurbished and reconstructed in building. Use of the Steam Cleaning Waste Tank began in 1976 and ceased on January 2, 1990.
- Tank closed under RCRA regulations in November 1995.

PARSONS

SEAD-27 Building 360
Previous Investigations

- 1995 Building 360 Closure Investigation
  - Soil: no exceedance of NYSDEC TAGM values
  - Groundwater: 1,1-DCA, 1,1,2,2-TCA, xylenes above NYSDEC GA
  - T-sump water: contaminants from SEAD-121C, isolated from surrounding environment
  - Concrete removal and pressure washing of metal grating and interior building surfaces

PARSONS

SEAD-27 Building 360
Previous Investigations – (continued)

- 2003 low-flow groundwater sampling
  - 1,1-DCA, 1,1,2,2-TCA, and xylenes levels below GA or MCL.
  - Vinyl Chloride exceeded GA standard (2.4 ug/L vs. 2 ug/L).
  - Aluminum, antimony, iron, lead, manganese, thallium, and zinc exceeded GA or MCL but were consistent with background.

PARSONS

SEAD-27 Building 360
Summary of Site Risk

- Industrial Scenario
  - Total cancer risks within EPA target range for all receptors
  - Total non-cancer HI less than 1 for industrial worker and day care center adult; total non-cancer HI above 1 for day care center child (HI=3)

PARSONS

SEAD-27 Building 360
Summary of Site Risk - (continued)

- Residential Scenario
  - Total cancer risks within EPA target range for both adult and child residential receptors
  - Total non-cancer HI above 1 for both adult and child residential receptors. Elevated risks due solely to exposure to groundwater
- Risks Assessed Using 2003 Groundwater Data
  - All risks are within the EPA target limits for industrial and residential receptors

PARSONS

SEAD-64A
Site Background Information

- Site Name: Garbage Disposal Area
- Location: Eastern-central portion of the Depot
- Future Land Use: Warehouse
- Contaminants: PAHs, Metals
- Description: SEAD-64A was used as garbage disposal area from 1974 to 1979. Disposed wastes suspected to be primarily household and construction debris items with some other industrial items.

PARSONS

SEAD-64A Garbage Disposal Area Previous Investigations

- 1994 ESI
  - Soil: PAHs, phenol, and metals above NYSDEC TAGM values
  - Groundwater: metals (aluminum, iron, manganese, and thallium) above GA or MCL
- 2003 low-flow groundwater sampling

  Metals (aluminum, antimony, iron, manganese, and thallium) above GA or MCL

PARSONS

SEAD-64A Garbage Disposal Area Summary of Site Risk

- Warehouse Land Use Scenario
  - Total cancer risks within EPA target range for all receptors
  - Total non-cancer HI less than 1 for all receptors

PARSONS

SEAD-64A Garbage Disposal Area
Summary of Site Risk

- Residential Scenario:
  - Total cancer risks below or at EPA upper target limit for both adult and child residential receptors
  - Total non-cancer HI at or above 1 for adult and child residential receptors. Elevated risks due solely to exposure to groundwater.
- Risk Assessed Using 2003 Groundwater Data:
  - All risks below or at the EPA target limit except that total non-cancer HI for warehouse worker = 1, for adult resident = 3, and child resident = 8 due to estimated thallium concentration found (9.9 J ug/L).

PARSONS

SEAD-66
Site Background Information

- Site Name: Pesticide Storage Area Near Building 5 and 6.
- Location: Eastern-central portion of the Depot.
- Future Land Use: Planned Industrial/Office Development.
- Contaminants: Pesticides.
- Description: SEAD-66 is suspected to be the former pesticide storage area.

PARSONS

SEAD-66
Previous Investigations

- 1993 Sampling Program:
  - Surface soil samples were collected for pesticides analysis.
  - 4,4'-DDE and 4,4'-DDT above TAGMs.

PARSONS

SEAD-66
Summary of Site Risk

- Industrial Land Use Scenario:
  - Total cancer risks within EPA target range for all receptors.
  - Total non-cancer HI less than 1 for all receptors.

PARSONS

SEAD-66
Summary of Site Risk

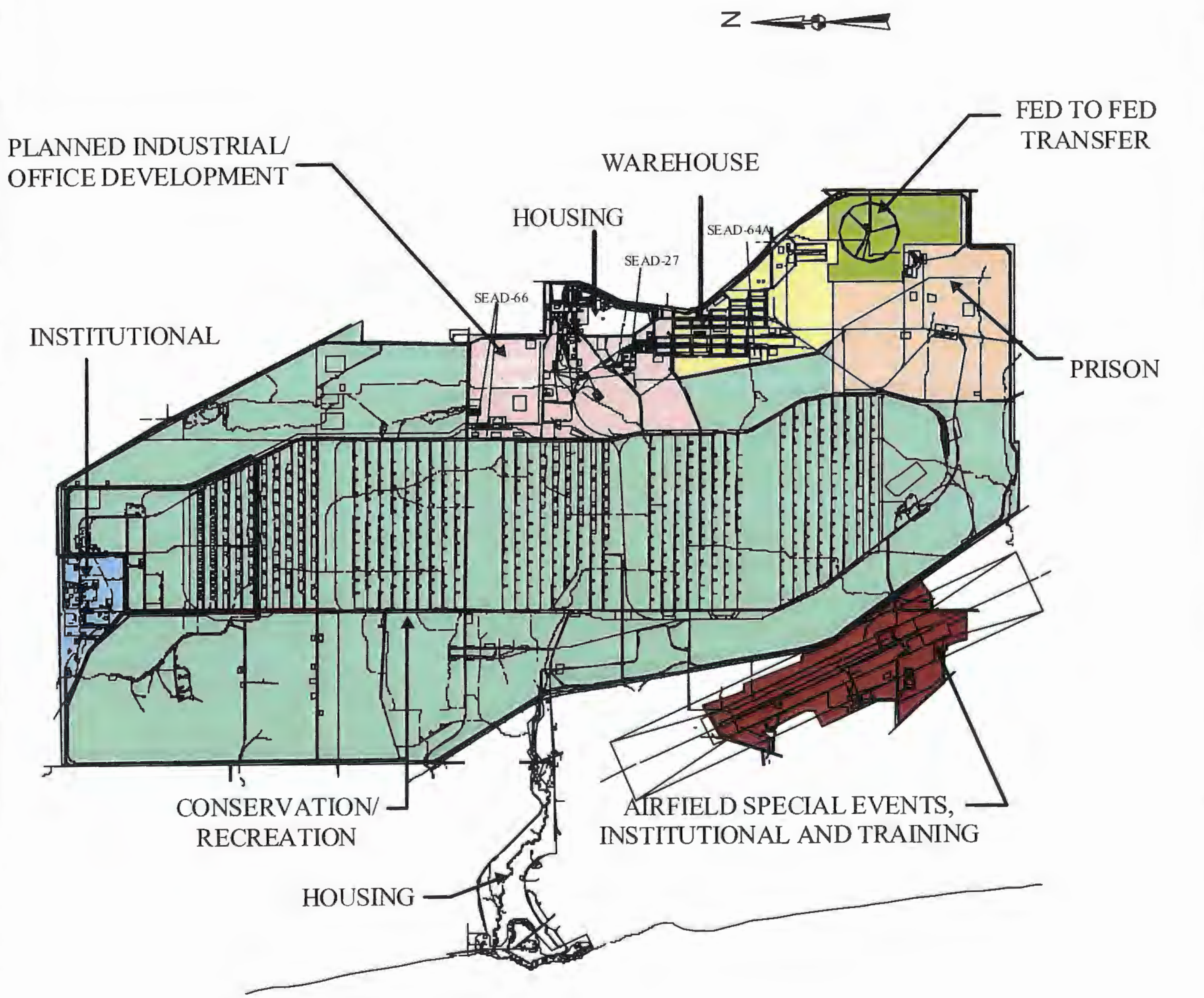
- Residential Scenario
  - Total cancer risks within EPA target range for both adult and child residential receptors.
  - Total non-cancer HI above 1 for child resident. Elevated risks due solely to exposure to 4,4'-DDT.
  - The maximum detected 4,4'-DDT concentration used in the risk assessment was 300 to 10,000 times all other measured 4,4'-DDT levels at the site.
- No Significant Ecological Risk.

PARSONS

Recommendation for
SEAD-27, SEAD-64A, and SEAD-66

- Land use restrictions:
  - Prevent residential activities, including housing and use as a daycare facility.
  - Prevent access or use of groundwater without prior Army/EPA/NYSDEC approval.
- Land use restrictions be maintained on all the property within the PID Area.
- The Army shall implement, maintain, monitor, report on, and enforce the land use restrictions.

PARSONS



Airfield

Institutional

Conservation

Prison

Federal

Warehouse

Industrial

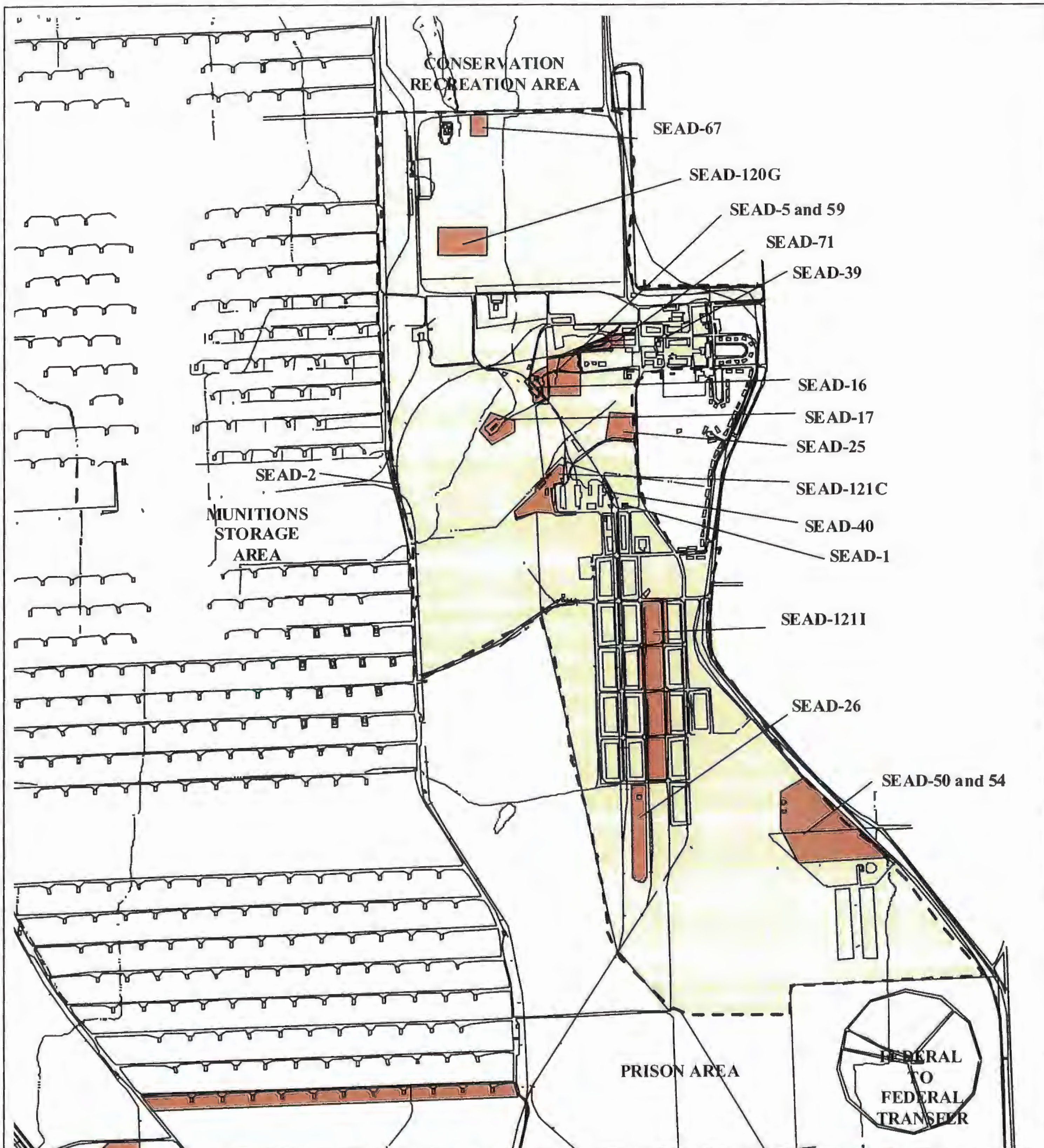
Housing

PARSONS

Seneca Army Depot Activity
Proposed Plan - IC Sites

Figure 1
Future Land Use and
Location of LUC Sites

Project: 736026-01001 | Junly2003



LEGEND

Area Covered by Restriction
No Residential Activity
No Groundwater Use

Army Property - No Unauthorized Access

PARSONS

SENECA ARMY DEPOT ACTIVITY
Record of Decision - IC Sites

FIGURE 1-2
EXTENT OF INDUSTRIAL AREA
LAND USE RESTRICTION

Job #: 741175-02900

JUNE 2003

RETAINED CONSERVATION AREA SITES

SCIDA PRIORITY / TRANSFER PLAN

September 2003

SEAD 46 &57 - AMMUNITION DISTRUCTION AREAS

FOST: May 2012
Deed: September 2012
SCIDA Priority- SEAD 46 #8
SEAD 57 # 14

DECOMMISIONING SURVEYS

FOST: September 2003
Deed: September 2003 (With access restrictions)
SCIDA Priority- #11

SEAD 63 - MISCELLANEOUS COMPONENTS BURIAL SITE

FOST: May 2004
Deed: September 2004
SCIDA Priority - # 9

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

FOST: May 2005
Deed: September 2005
SCIDA Priority - # 13

SEAD 11 - OLD LANDFILL

FOST: June 2007
Deed: September 2007
SCIDA Priority - # 11

SEAD 13 - INHIBITED RED FUMING NITRIC ACID (IRFNA)

FOST: March 2005
Deed: September 2005
SCIDA Priority - # 8

SEAD 4 - MUNITIONS WASHOUT FACILITY

FOST: May 2005
Deed: September 2006
SCIDA Priority- #11

SEAD 12 - RADIATION SITE

FOST: March 2010
Deed: September 2010
SCIDA Priority - #9

SEAD 48 – PITCHBLEND STORAGE IGLOOS

FOST: March 2006
Deed: September 2006
SCIDA Priority - #11

SEAD 23 - OPEN BURNING GROUNDS

FOST N/A (See SEAD 115)
Deed N/A (See SEAD 115)
SCIDA Priority - #16

SEAD 118 - ORDNANCE AND EXPLOSIVE SITES

FOST: March 2006
Deed: September 2005
SCIDA Priority- EOD Area 2& 3 # 8
Grenade Training Range # 14

SEAD 24 - POWDER BURNING AREA

FOST: May 2004
Deed: September 2005
SCIDA Priority- #13

SEAD 115 - OPEN BURNING / OPEN DETONATION

FOST: April 2007
Deed: September 2007
SCIDA Priority- #16

SITES NOT PREVIOUSLY PRIORITIZED BY SCIDA

SEAD 64B- GARBAGE DISPOSAL AREA

FOST: August 2004
DEED: September 2004
SCIDA Priority - NOT Prioritized – NFA site to be treated separately

SEAD 64D- GARBAGE DISPOSAL AREA

FOST: August 2004
DEED: September 2004
SCIDA Priority - NOT Prioritized – NFA site to be treated separately

SEAD 70- CONSTRUCTION DEBRIS AREA

FOST: August 2004
DEED: September 2004
SCIDA Priority - NOT Prioritized – NFA site to be treated separately

Retained PID Sites
SCIDA PRIORITY / TRANSFER PLAN
September 2003

SEAD 59 & SEAD 71- PAINT DISPOSAL AREAS

FOST: November 2004
Deed: September 2005
LRA Priority- 5

SEAD 16- ABANDONED DEACTIVATION FURNACE

FOST: December 2005
Deed: September 2006
SCIDA Priority - 10

SEAD 17 - DEACTIVATION FURNACE

FOST: December 2005
Deed: September 2006
SCIDA Priority - 10

SEAD 25 - FIRE DEMONSTRATION AREA

FOST: Mar 2005
Deed: September 2005
SCIDA Priority - 4

SEAD 26 - FIRE TRAINING AREA

FOST: March 2005
Deed: September 2005
SCIDA Priority - 4

SEAD 121 - EBS SITE – INDUSTRIAL

FOST: April 2006
Deed: September 2006
SCIDA Priority- 6

SEAD 50 - TANK FARM STORAGE
SEAD 54 - ASBESTOS STORAGE
FOST: November 2003
Deed: December 2003
SCIDA Priority- 1

SEAD 38 - BUILDING 2079 BOILER BLOW DOWN PIT
SEAD 39 - BUILDING 121 BOILER BLOW DOWN PIT
SEAD 40 - BUILDING 319 BOILER BLOW DOWN PIT
SEAD 41 – BUILDING 718 BOILER BLOW DOWN PIT (Kids Peace already transferred)

FOST: May 2004
Deed: September 2004
SCIDA Priority – SEAD 39,40 #7
SEAD 38 #11

SEAD 5 - SLUDGE PILES

FOST: May 2004
Deed: September 2004
SCIDA Priority- 5

SEAD 67 - DUMPSITE EAST OF STP4

FOST: May 2004
Deed: September 2004
SCIDA Priority - 7

DECOMMISIONING SURVEYS (PIDArea)

FOST: June 2003
Deed: September 2003
SCIDA Priority- ASAP (to be part of Leaseback)

RCRA Closure (BLDG 301 and 307)

FOST: April 2004
Deed: September 2004
SCIDA Priority- Not provided

BCT Agenda
18 November 2003
Conference Call
1330 hours

SEAD 50/54- Completion report status. Discuss FFA Paragraph 10.6.b.1 Completion report to ROD eliminating proposed plan and subsequent iterations if agreement that no further action is needed.

IC ROD for PID Area - Status of comments.

Congressional Language inserted into the Military Construction Program bill- What does this mean to us all.

BASE REALIGNMENT AND CLOSURE ACCOUNT
New York--Seneca Army Depot.--The conferees expect the Army to comply fully with environmental remediation and building maintenance requirements as required under the BRAC process at Seneca Army Depot. The conferees direct the Army to provide a report to the Military Construction Subcommittees by March 15, 2004, detailing the current status of cleanup at Seneca Army Depot, and to include a schedule for conveying the property to the local economic development authority.

(Transfer Agreement Schedule provided separately)

SEAD 16/17 Deactivation Furnace- Discussion on industrial standard for Arsenic levels. EPA suggesting Background level as clean up objective.

Small Arms Range Airfield- Discussion of project and Schedule work.

SEAD 59/71 - Remaining soil stock pile. Do not meet Background levels and are not regulated. Proposal is to consider it construction debris/fill that is exempt under NYSDEC Reg part 360.

Anita Singh
<asingh@lmepo.com>

08/18/2003 01:11 PM
Please respond to asingh; Please respond to asingh

To: Julio Vazquez/R2/USEPA/US@EPA
cc: Gareth Pearson/LV/USEPA/US@EPA, Marion Edison/LV/USEPA/US@EPA, Tehli <Tehli@lmepo.com>
Subject: Re: [Fwd: RE: Data Tables]

Julio,

The use of an appropriate value (e.g., 95% percentile, 95% UTL, 95% UCL, Max etc.)as a cleanup goal depends upon the objective. If site versus background means are to be compared, then 95% UCL should be used. If individual site observations need to be compared with the background threshold value, then a 95% percentile or a 95% UTL may be used. Max is typically used when only a small backgorund data set is available. For the present site, enough site data as well as backround data are available. It will be more appropriate to use a 95% percentile or a 95% UTL as the background cleanup goal (rather than the maximum value). Outliers should also be screened out in such as evaluation. For example, for arsenic, a more appropriate (than 21.5)cleanup goal is 8.25 which is the 95% percentile of the background data set as reported in the background spreadsheet. Observation 21.5 appears to represent an outlier.

Power assessment comes into play when two hypotheses are compared. So far no hypotheses have been compared.
I plan to compare the null hypothesis: Site mean <= backgorund mean versus the alternative that Site mean>background mean.
Rejection of the null hypothesis leads to the conclusion that mean site concentration is significantly higher than the background mean concentration. However, since enough site and background data are available,power achievement should not be an issue.

Is that what you want us to do?

Anita

Vazquez.Julio@epamail.epa.gov wrote:

>Anita:
>
>I had some additional discussions with the Army regarding the data set
>for SEAD-50/54 and the use of the site-wide background data set. One of
>my main questions is which value from the background data set should be
>used as cleanup goal (max, mean, 95 UCL, 95 percentile, etc.). How do
>we confirm that a cleanup sample belongs to the background population?
>Which number should the cleanup contractor use to stop excavation (the
>Army used the maximum value of the background data set; the reason the
>overall cleanup population came below that maximum value was due to the
>excavation the 6" lift intervals used by the removal contractor).
>
>As you can see, I am trying to come up with a decision rule that is
>technically defensible. Thank you for your assistance.
>
>Julio F. Vazquez, RPM
>U. S. EPA, Region 2

>
>
>
>
>

> Anita Singh

> <asingh@lmepo.com> To: Julio
Vazquez/R2/USEPA/US@EPA, ...eth
> >
Pearson/LV/USEPA/US@EPA, ...li <Tehli@lmepo.com>, Marion
> Edison/LV/USEPA/US@EPA

> 0 18/2003 11:44 cc:

> AM Subject: [Fwd: RE:
Data Tables]
> Please respond to

> asingh

>

>

>
>
>
>
>
>Julio,
>
>The chemist from Weston Solutions who reviewed and validated Seneca Site
>
>data just called.
>She suggeted that I use data with all qualifiers (except U qualifier) as
>
>they appear in the Excel
>spreadsheet. All data w . U qualifier should be replaced by half of the
>
>reported value. I will
>use this approach while comparing site versus background concentrations
>for AS, Hg, and ZN.
>This comparison will be perfromed separately for each of the 7 areas of
>concern.
>
>Anita
>
>-------- Original Message --------
>Subject: RE: Data Tables
>Date: Thu, 14 Aug 2003 ..2:53 -0400
>From: "Kane, Christopher ." <C.Kane@WestonSolutions.com>
>To: "'Vazquez.Julio@ep... .epa.gov'" <Vazquez.Julio@epamail.epa.gov>
>CC: absoloms@seneca-hp... .mil, "'asingh@lmepo.com'"
><asingh@lmepo.com>, "Q... y, Diane"
><Diane.Quigley@WestonS... ons.com>, "Freeman, Amanda"
><Amanda.Freeman@Weston... ions.com>, "Kane, Christopher G."
><C.Kane@WestonSolution... m>,
>"'Thomas.C.Battaglia@n... .usace.army.mil'"
><Thomas.C.Battaglia@na... usace.army.mil>

>
>
>
>Here is the list of qua. ·iers that were utilized in the data. The
>chemist
>that reviewed/validate: data is out until Monday but I will have her
>follow up with Anita di ·tly on data processing questions (relating to
>those results that wer :ified).
>
>Results that are quali: with double letters simply mean there were
>two
>qualifiers vs. one
>
>
>Chris.
>-----Original Message-----
>From: Vazquez.Julio@ep: l.epa.gov
>[mailto:Vazquez.Julio@ ail.epa.gov]
>Sent: Tuesday, August 1 , 2003 9:21 AM
>To: Kane, Christopher
>Cc: absoloms@seneca-hp. .mil
>Subject: Re: Data Tabl
>
>
>Chris:
>
>Can you please explain data qualifiers below? Thanks.
>
>Julio F. Vazquez, RPM
>U. S. EPA, Region 2
>----- Forwarded by Juli zquez/R2/USEPA/US on 08/12/2003 09:19 AM
>-----
>
>
> Singh
>
> cc: Gareth
>Pearson/LV/USEPA/US@EP
> Subject: Re: Data Tables
>
> /2003 10:36
>
> A
>
> respond to
>
>
>
>
>
>
>
>
>
>
>
>Julio,
>
>Thanks for the inform .
>
>I noticed that several fiers have been in used in the site data

>sets.
>Please clarify how should we treat them.
>
>Specifically, how should the data with the following qualifiers be
>treated?
>
>B, E, J, N, R, U, BN, HN, NE, UJ, and UN
>
>Thanks.
>
>Anita
>
>Vazquez.Julio@epamail.epa.gov wrote:
>
>
>
>>Anita,
>>
>>I just got off the phone with the Removal Action contractor and this is
>>what he indicated regarding the subject matter.
>>
>>1. Area 1a, b, and c was done to run the statistics because the
>>spreadsheets were to big to manipulate.
>>2. Arsenic, Mercury and Zinc were three AOCs, and were sampled on each
>>grid. The all-metals suit (included lead) was ran at every fourth
>>sample.
>>
>>I would prefer that you check Arsenic, Mercury and Zinc (the AOCs)
>>instead of Arsenic and Lead as previously indicated. Please let me
>>
>>
>know
>
>
>>if you need anything else.
>>
>>Julio F. Vazquez, RPM
>>U. S. EPA, Region 2
>>
>>PS - I also spoke to the Army's consultant re:background data set. The
>>red numbers are the individual duplicates that were averaged into the
>>blue numbers within the set.
>>
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>
>(See attached file: Qualifier List.pdf)
>
>
>

BCT Agenda
16 December 2003
Seneca Army Depot Activity
1330-1600 Hours

IC ROD for PID Area - Discuss responsiveness summary comments

ASH LANDFILL ROD- Discuss the Revaluation of technology and cost. Discuss a significant difference in a ROD vs enhancements determined appropriate in design.

STATUS OF COMMENTS – various sites.

DISCUSS Testing of OFF-Site backfill

Guidance on the Resolution of the Post-ROD Dispute

November 25, 2003

MEMORANDUM

SUBJECT: Guidance on the Resolution of the Post-ROD Dispute

FROM: James E. Woolford, Director
Federal Facilities Restoration and Reuse Office, OSWER

David J. Kling, Director
Federal Facilities Enforcement, OECA

TO: Superfund National Program Managers, Regions 1 - 10
Office of Regional Counsel, Regions 1-10

The purpose of this memorandum is to confirm the resolution of the post-Record of Decision (ROD) dispute as described in the October 2,2003 letter from Raymond Dubois, Jr., Deputy Under Secretary of Defense (Installations & Environment) and confirmed by Marianne Horinko, Acting Administrator for EPA on October 24,2003, and to provide guidelines for implementation of this resolution. (See Attachments 1 and 2 for the letters). Regions should begin discussions immediately, resources permitting, with the Services on RODs and other documents that have been delayed by the dispute. We recognize that there is a tremendous backlog of work to be accomplished, and Regions need to prioritize which projects to address. Obviously, those projects that most directly will help the Agency meet its strategic goals and objectives such as NPL construction completions, should receive higher consideration.

Regions should apply the revised Navy Principles, which are ready to implement, to RODs and Federal Facility Agreements/Interagency Agreements (FFAs/IAGs). We understand that the Army and the Defense Logistics Agency (DLA) will use the Navy Principles, as well. Regions should also consider, on a site-specific basis, alternate language for RODs and FFAs/IAGs that the Air Force may propose. (See Attachment 2). We have been told that as a result of the post-ROD resolution, DoD will suspend its 72-hour review requirement for RODs and FFAs/IAGs that conform to either the Air Force or Navy Principles. This should expedite approvals. We also understand that DoD will suspend or modify any of its current policies that are inconsistent with these Principles.

As you can see in Attachment 1, the Navy Principles provide extensive discussion and direction regarding the regulatory oversight role in the remedy implementation phase, including requirements for operation and maintenance of the remedy (including any engineered and non- engineered portions) and developing RODs, Remedial Designs, Remedial Action Work Plans, documents memorializing remedial action completion, and FFAs/IAGs at Federal facilities on the National Priorities List. Given the collaboration with our offices and the Regions by the Navy and the Army in developing these Principles, we anticipate that you will find implementation to be straightforward.

While EPA did not work with the Air Force in developing its "Principles of Agreement for Performance-Based Records of Decision in Environmental Restoration" (and the details of how these Principles would apply in practice is not yet known), EPA agreed that our Headquarters and Regional offices would give full and fair consideration of the Air Force's Principles on a site-specific basis. Consistent with EPA's and the Air Force's responsibilities to ensure the long-term viability of land use controls and to enter into FFA/IAGs at NPL sites, Regions should work with the Air Force to address any issues of concern that may arise as you consider application of the Air Force's Principles in the development of a site-specific ROD. Issues of concern and solutions developed, if any, should be shared with our office contacts-Allison Abernathy of FFRRO and Sally Dalzell of FFEO. As we develop experience with the Air Force Principles, additional guidance will be provided.

As you know, CERCLA and the National Contingency Plan (NCP), as well as EPA's related policy and guidance, provide for a great deal of flexibility in remedy selection, implementation and operations and maintenance. As a program, we have also encouraged innovation to streamline the CERCLA processes to increase overall efficiency, reduce costs and expedite cleanup. There are a few basic tenets that must be met as we move forward with the Navy and Air Force Principles.

<

li> Remedies must be consistent with CERCLA and the NCP. Consequently, whether remedies are developed using the Navy or Air Force Principles, when evaluated in their totality, they must meet the nine criteria established by the NCP.

- It is EPA's position that CERCLA does not authorize the Services to issue RODs unilaterally. Please advise us if you are aware of a situation where a Service intends to issue a ROD unilaterally.

- Primary documents, described in existing FFAs/IAGs, are enforceable. At installations with no FFAs/IAGs, it is our expectation that, at a minimum, the final remedial design document will be subject to EPA review and approval along with the remedial action workplan, consistent with the 1988 EPA/DOD Model IAG.

- Based upon our current familiarity with the Navy Principles, these principles should be used as a point of departure at this time in any discussions with Federal agencies and the Services, including the Air Force. The Navy Principles articulate the minimum criteria for what to include in a ROD, Remedial Design (RD)/Remedial Action Work Plan for Institutional Controls (ICs), and for all post-ROD documents from DoD. Although a ROD, RD/Remedial Action Work Plan does not have to exactly reflect the Navy Principles, it is our expectation that they will provide substantially similar information, requirements, objectives, etc., as is described in the Navy Principles' "General

Procedures."

- Based on our experience at several sites, we expect that the Air Force will propose placing all the IC detail directly into the ROD. This approach may work well at sites where the facility has an existing and effective facility-wide system to implement and monitor the necessary land use control system and the IC requirements are simple and unlikely to change with time. At a minimum, the IC detail in the ROD should be functionally consistent with the ROD and RD IC elements described in the Navy Principles.

- If a Service proposes to eliminate post-ROD documents such as the Operation and Maintenance Plan and a Document Memorializing Remedial Action Completion, Regions should consider this only where the requirements for the substantive information in these documents are detailed in the ROD or we are requiring the actions through an enforceable document elsewhere. [1] When placing the substantive requirements in the ROD, it is our expectation that EPA will continue to receive appropriate post-ROD documents for information purposes. In all cases, EPA must review and approve all post-ROD actions needed to ensure protective cleanups. However, EPA does not have to review and approve monitoring reports.

- Depending on site-specific circumstances it may not be possible to place all the necessary detail in the ROD (e.g, if there is a lack of comprehensive base-wide monitoring system for land use controls, the implementation actions are not decided at the time of the ROD, or if many areas require ICs and these areas have a range of different IC needs, etc.) In such instances, additional enforceable requirements subject to EPA's oversight authority would be required to ensure a protective remedy. It will also be necessary to provide mechanisms in the ROD for revisiting the effectiveness of the measures/objectives during the remedy implementation process (RD, RA or O&M stages).

- Where using only a ROD to describe ICs, Regions must ensure that only the institutional control remedy design details and a the engineering design details of the remedy are included in the ROD. The engineering details would ordinarily be contained in the Remedial Design (RD). The engineering requirements for the remedy must still be described in a separate RD.

- Regions should work to reduce document size, review time, and revisions, whenever and wherever possible.

- It is EPA's position that EPA must concur on documentation for site close-out. The scope and terminology for such documentation are to be considered by an EPA-DoD task force. The task force will examine potential consolidation and streamlining of close-out and de-listing documents. In the meantime, Regions should accept Remedial Action Completion Reports or documents containing equivalent information.

[1]For instance, in some FFAs such as the Region 9 March Air Force Base FFA, tho Air Force is required at the completion of the remedial action to prepare a project closeout report that all requirements of the agreement have been completed. EPA and the State must concur on the Air Force's determination that the agreement has been satisfied.

Please continue to coordinate closely with our office contacts - Allison Abernathy of FFRRO and Sally Dalzell of FFEO - on IC language prior to selecting a remedy and signing all draft and draft final Federal Facility RODS and Institutional Control Remedial Designs until further notice. Please allow two weeks review time at headquarters, although we expect to complete our review in much less time. If you have questions on how to proceed, please contact Allison Abernathy at 703-603-0052 or Sally Dalzell at 202-564-2583.

Attachments

cc: Marianne Horinko, Office of Solid Waste and Emergency Response
JP Suarez, Office of Enforcement and Compliance Assurance
Tom Dunne, Office of Solid Waste and Emergency Response
Barry Breen, Office of Solid Waste and Emergency Response
Steven Shimberg, Office of Enforcement and Compliance Assurance
Susan Bromm, Office of Site Remediation Enforcement
Robert Springer, Office of Solid Waste
Mike Cook, Site Remediation and Technology Innovation
Linda Garczynski, Office of Brownfields Cleanup and Redevelopment
Stephen Lufiig, Land Revitalization Group
Earl Salo, Office of General Counsel
Federal Facility Leadership Council

Attachment 1 for EPA's Guidance on the Resolution of the Post-ROD Dispute 11/25/03:
EPA Response Letter to DoD's Post-ROD Principles, October 24, 2003

Attachment 2 for EPA's Guidance on the Resolution of the Post-ROD Dispute 11/25/03:
DoD Principles and Procedures for Specifying, Monitoring, and Enforcement of Land Use Controls and Other Post-Record Of Decision (ROD) Action, October 2, 2003

RETAINED CONSERVATION AREA SITES
SCIDA PRIORITY / TRANSFER PLAN
September 2003

SEAD 46 &57 - AMMUNITION DISTRUCTION AREAS

FOST: May 2012
Deed: September 2012
SCIDA Priority- SEAD 46 #8
SEAD 57 # 14

DECOMMISIONING SURVEYS

FOST: September 2003
Deed: September 2003 (With access restrictions)
SCIDA Priority- #11

SEAD 63 - MISCELLANEOUS COMPONENTS BURIAL SITE

FOST: May 2004
Deed: September 2004
SCIDA Priority - # 9

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

FOST: May 2005
Deed: September 2005
SCIDA Priority - # 13

SEAD 11 - OLD LANDFILL

FOST: June 2007
Deed: September 2007
SCIDA Priority - # 11

SEAD 13 - INHIBITED RED FUMING NITRIC ACID (IRFNA)

FOST: March 2005
Deed: September 2005
SCIDA Priority - # 8

SEAD 4 - MUNITIONS WASHOUT FACILITY

FOST: May 2005
Deed: September 2006
SCIDA Priority- #11

SEAD 12 - RADIATION SITE

FOST: March 2010
Deed: September 2010
SCIDA Priority - #9

SEAD 48 – PITCHBLEND STORAGE IGLOOS

FOST: March 2006
Deed: September 2006
SCIDA Priority - #11

SEAD 23 - OPEN BURNING GROUNDS

FOST N/A (See SEAD 115)
Deed N/A (See SEAD 115)
SCIDA Priority - #16

SEAD 118 - ORDNANCE AND EXPLOSIVE SITES

FOST: March 2006
Deed: September 2005
SCIDA Priority- EOD Area 2& 3 # 8
Grenade Training Range # 14

SEAD 24 - POWDER BURNING AREA

FOST: May 2004
Deed: September 2005
SCIDA Priority- #13

SEAD 115 - OPEN BURNING / OPEN DETONATION

FOST: April 2007
Deed: September 2007
SCIDA Priority- #16

SITES NOT PREVIOUSLY PRIORITIZED BY SCIDA

SEAD 64B- GARBAGE DISPOSAL AREA

FOST: August 2004
DEED: September 2004
SCIDA Priority - NOT Prioritized – NFA site to be treated separately

SEAD 64D- GARBAGE DISPOSAL AREA

FOST: August 2004
DEED: September 2004
SCIDA Priority - NOT Prioritized – NFA site to be treated separately

SEAD 70- CONSTRUCTION DEBRIS AREA

FOST: August 2004
DEED: September 2004
SCIDA Priority - NOT Prioritized – NFA site to be treated separately

Retained PID Sites
SCIDA PRIORITY / TRANSFER PLAN
September 2003

SEAD 59 & SEAD 71- PAINT DISPOSAL AREAS

FOST: November 2004
Deed: September 2005
LRA Priority- 5

SEAD 16- ABANDONED DEACTIVATION FURNACE

FOST: December 2005
Deed: September 2006
SCIDA Priority - 10

SEAD 17 - DEACTIVATION FURNACE

FOST: December 2005
Deed: September 2006
SCIDA Priority - 10

SEAD 25 - FIRE DEMONSTRATION AREA

FOST: Mar 2005
Deed: September 2005
SCIDA Priority - 4

SEAD 26 - FIRE TRAINING AREA

FOST: March 2005
Deed: September 2005
SCIDA Priority - 4

SEAD 121 - EBS SITE – INDUSTRIAL

FOST: April 2006
Deed: September 2006
SCIDA Priority- 6

SEAD 50 - TANK FARM STORAGE
SEAD 54 - ASBESTOS STORAGE
FOST: November 2003
Deed: December 2003
SCIDA Priority- 1

SEAD 38 - BUILDING 2079 BOILER BLOW DOWN PIT
SEAD 39 - BUILDING 121 BOILER BLOW DOWN PIT
SEAD 40 - BUILDING 319 BOILER BLOW DOWN PIT
SEAD 41 – BUILDING 718 BOILER BLOW DOWN PIT (Kids Peace already transferred)

FOST: May 2004
Deed: September 2004
SCIDA Priority – SEAD 39,40 #7
SEAD 38 #11

SEAD 5 - SLUDGE PILES

FOST: May 2004
Deed: September 2004
SCIDA Priority- 5

SEAD 67 - DUMPSITE EAST OF STP4

FOST: May 2004
Deed: September 2004
SCIDA Priority - 7

DECOMMISIONING SURVEYS (PIDArea)

FOST: June 2003
Deed: September 2003
SCIDA Priority- ASAP (to be part of Leaseback)

RCRA Closure (BLDG 301 and 307)

FOST: April 2004
Deed: September 2004
SCIDA Priority- Not provided

[Federal Register: September 13, 2001 (Volume 66, Number 178)]
[Proposed Rules]
[Page 47612-47618]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr13se01-23]

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 300

[FRL-7054-4]

National Priorities List for Uncontrolled Hazardous Waste Sites, Proposed Rule No. 37

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule.

SUMMARY: The Comprehensive Environmental Response, Compensation, and Liability Act (``CERCLA'' or ``the Act''), requires that the National Oil and Hazardous Substances Pollution Contingency Plan (``NCP'') include a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The National Priorities List (``NPL'') constitutes this list. The NPL is intended primarily to guide the Environmental Protection Agency (``EPA'' or ``the Agency'') in determining which sites warrant further investigation. These further investigations will allow EPA to assess the nature and extent of public health and environmental risks associated with the site and to determine what CERCLA-financed remedial action(s), if any, may be appropriate. This proposed rule proposes to add 17 new sites to the NPL; 16 sites to the General Superfund Section of the NPL and one site to the Federal Facilities Section. (Please note that one of the sites is being reproposed to the NPL.)

DATES: Comments regarding any of these proposed listings must be submitted (postmarked) on or before November 13, 2001.

ADDRESSES: By Postal Mail: Mail original and three copies of comments (no facsimiles or tapes) to Docket Coordinator, Headquarters; U.S. Environmental Protection Agency; CERCLA Docket Office; (Mail Code 5201G); 1200 Pennsylvania Avenue NW., Washington, DC 20460.

By Express Mail or Courier: Send original and three copies of comments (no facsimiles or tapes) to Docket Coordinator, Headquarters; U.S. Environmental Protection Agency; CERCLA Docket Office; 1235 Jefferson Davis Highway; Crystal Gateway #1, First Floor; Arlington, VA 22202.

By E-Mail: Comments in ASCII format only may be mailed directly to superfund.docket@epa.gov. E-mailed comments must be followed up by an original and three copies sent by mail or express mail.

For additional Docket addresses and further details on their contents, see section II, ``Public Review/Public Comment,'' of the SUPPLEMENTARY INFORMATION portion of this preamble.

FOR FURTHER INFORMATION CONTACT: Yolanda Singer, phone (703) 603-8835, State, Tribal and Site Identification Center, Office of Emergency and Remedial Response (Mail Code 5204G); U.S. Environmental Protection Agency; 1200 Pennsylvania Avenue NW., Washington, DC 20460; or the Superfund Hotline, Phone (800) 424-9346 or (703) 412-9810 in the Washington, DC, metropolitan area.

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Background

A. What Are CERCLA and SARA?

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9601-9675 (``CERCLA'' or ``the Act''), in response to the dangers of uncontrolled releases of hazardous substances. CERCLA was amended on October 17, 1986, by the Superfund Amendments and Reauthorization Act (``SARA''), Public Law 99-499, 100 Stat. 1613 et seq.

B. What Is the NCP?

To implement CERCLA, EPA promulgated the revised National Oil and Hazardous Substances Pollution Contingency Plan (``NCP''), 40 CFR part 300, on July 16, 1982 (47 FR 31180), pursuant to CERCLA section 105 and Executive Order 12316 (46 FR 42237, August 20, 1981). The NCP sets guidelines and procedures for responding to releases and threatened releases of hazardous substances, pollutants, or contaminants under CERCLA. EPA has revised the NCP on several occasions. The most recent comprehensive revision was on March 8, 1990 (55 FR 8666).

As required under section 105(a)(8)(A) of CERCLA, the NCP also includes ``criteria for determining priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action and, to the extent practicable, taking into account the potential urgency of such action for the purpose of taking removal action.'' ``Removal'' actions are defined broadly and include a wide range of actions taken to study, clean up, prevent or otherwise address releases and threatened releases (42 U.S.C. 9601(23)).

C. What Is the National Priorities List (NPL)?

The NPL is a list of national priorities among the known or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The list, which is appendix B of the NCP (40 CFR part 300), was required under section 105(a)(8)(B) of CERCLA, as amended by SARA. Section 105(a)(8)(B) defines the NPL as a list of ``releases'' and the highest priority ``facilities'' and requires that the NPL be revised at least annually. The NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of public health and environmental risks associated with a release of hazardous substances. The NPL is only of limited significance, however, as it does not assign liability to any party or to the owner of any specific property. Neither does placing a site on the NPL mean that any remedial or removal action necessarily need be taken. See Report of the Senate Committee on Environment and Public Works, Senate Rep. No. 96-848, 96th Cong., 2d Sess. 60 (1980), 48 FR 40659 (September 8, 1983).

For purposes of listing, the NPL includes two sections, one of sites that are generally evaluated and cleaned up by EPA (the ``General Superfund Section''), and one of sites that are owned or operated by other Federal agencies (the ``Federal Facilities Section''). With respect to sites in the Federal Facilities section, these sites are generally being addressed by other Federal agencies. Under Executive Order 12580 (52 FR 2923, January 29, 1987) and CERCLA section 120, each Federal agency is responsible for carrying out most response actions at facilities under its own jurisdiction, custody, or control, although EPA is responsible for preparing an HRS score and determining whether the facility is placed on the NPL. EPA generally is not the lead agency at Federal Facilities Section sites, and its role at such sites is accordingly less extensive than at other sites.

D. How Are Sites Listed on the NPL?

There are three mechanisms for placing sites on the NPL for possible remedial action (see 40 CFR 300.425(c) of the NCP): (1) A site may be included on the NPL if it scores sufficiently high on the Hazard Ranking System (``HRS''), which EPA promulgated as appendix A of the NCP (40 CFR part 300). The HRS serves as a screening device to evaluate the relative potential of uncontrolled hazardous substances to pose a threat to human health or the environment. On December 14, 1990 (55 FR 51532), EPA promulgated revisions to the HRS partly in response to CERCLA section 105(c), added by SARA. The revised HRS evaluates four pathways: Ground water, surface water, soil exposure, and air. As a matter of Agency policy, those sites that score 28.50 or greater on the HRS are eligible for the NPL; (2) Each State may designate a single site as its top priority to be listed on the NPL, regardless of the HRS score. This mechanism, provided by the NCP at 40 CFR 300.425(c)(2) requires that, to the extent practicable, the NPL include within the 100 highest priorities, one facility designated by each State representing the greatest danger to public health, welfare, or the environment among known facilities in the State (see 42 U.S.C. 9605(a)(8)(B)); (3) The third mechanism for listing, included in the NCP at 40 CFR 300.425(c)(3), allows certain sites to be listed regardless of their HRS score, if all of the following conditions are met:

The Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the release.

EPA determines that the release poses a significant threat to public health.

EPA anticipates that it will be more cost-effective to use its remedial authority than to use its removal authority to respond to the release.

EPA promulgated an original NPL of 406 sites on September 8, 1983 (48 FR 40658). The NPL has been expanded since then, most recently on June 14, 2001 (66 FR 32235).

E. What Happens to Sites on the NPL?

A site may undergo remedial action financed by the Trust Fund established under CERCLA (commonly referred to as the ``Superfund'') only after it is placed on the NPL, as provided in the NCP at 40 CFR 300.425(b)(1). (``Remedial actions'' are those ``consistent with permanent remedy, taken instead of or in addition to removal actions. * * *'' 42 U.S.C. 9601(24).) However, under 40 CFR 300.425(b)(2) placing a site on the NPL ``does not imply that monies will be expended.'' EPA may pursue other appropriate authorities to remedy the releases, including enforcement action under CERCLA and other laws.

F. How Are Site Boundaries Defined?

The NPL does not describe releases in precise geographical terms; it would be neither feasible nor consistent with the limited purpose of the NPL (to identify releases that are priorities for further evaluation), for it to do so.

Although a CERCLA ``facility'' is broadly defined to include any area where a hazardous substance release has ``come to be located'' (CERCLA section 101(9)), the listing process itself is not intended to define or reflect the boundaries of such facilities or releases. Of course, HRS data (if the HRS is used to list a site) upon which the NPL placement was based will, to some extent, describe the release(s) at issue. That is, the NPL site would include all releases evaluated as part of that HRS analysis.

When a site is listed, the approach generally used to describe the relevant release(s) is to delineate a geographical area (usually the area within an installation or plant boundaries) and identify the site by reference to that area. As a legal matter, the site is not coextensive with that area, and the boundaries of the installation or plant are not the ``boundaries'' of the site. Rather, the site consists of all contaminated areas within the area used to identify the site, as well as any other location to which contamination from that area has come to be located, or from which that contamination came.

In other words, while geographic terms are often used to designate the site (e.g., the ``Jones Co. plant site'') in terms

of the property owned by a particular party, the site properly understood is not limited to that property (e.g., it may extend beyond the property due to contaminant migration), and conversely may not occupy the full extent of the property (e.g., where there are uncontaminated parts of the identified property, they may not be, strictly speaking, part of the ``site''). The ``site'' is thus neither equal to nor confined by the boundaries of any specific property that may give the site its name, and the name itself should not be read to imply that this site is coextensive with the entire area within the property boundary of the installation or plant. The precise nature and extent of the site are typically not known at the time of listing. Also, the site name is merely used to help identify the geographic location of the contamination. For example, the ``Jones Co. plant site,'' does not imply that the Jones company is responsible for the contamination located on the plant site.

EPA regulations provide that the ``nature and extent of the problem presented by the release'' will be determined by a Remedial Investigation/Feasibility Study (``RI/FS'') as more information is developed on site contamination (40 CFR 300.5). During the RI/FS process, the release may be found to be larger or smaller than was originally thought, as more is learned about the source(s) and the migration of the contamination. However, this inquiry focuses on an evaluation of the threat posed; the boundaries of the release need not be exactly defined. Moreover, it generally is impossible to discover the full extent of where the contamination ``has come to be located'' before all necessary studies and remedial work are completed at a site. Indeed, the boundaries of the contamination can be expected to change over time. Thus, in most cases, it may be impossible to describe the boundaries of a release with absolute certainty.

Further, as noted above, NPL listing does not assign liability to any party or to the owner of any specific property. Thus, if a party does not believe it is liable for releases on discrete parcels of property, supporting information can be submitted to the Agency at any time after a party receives notice it is a potentially responsible party.

For these reasons, the NPL need not be amended as further research reveals more information about the location of the contamination or release.

G. How Are Sites Removed From the NPL?

EPA may delete sites from the NPL where no further response is appropriate under Superfund, as explained in the NCP at 40 CFR 300.425(e). This section also provides that EPA shall consult with states on proposed deletions and shall consider whether any of the following criteria have been met: (i) Responsible parties or other persons have implemented all appropriate response actions required; (ii) All appropriate Superfund-financed response has been implemented and no further response action is required; or (iii) The remedial investigation has shown the release poses no significant threat to public health or the environment, and taking of remedial measures is not appropriate. As of August 23, 2001, the Agency has deleted 239 sites from the NPL.

H. Can Portions of Sites Be Deleted From the NPL as They Are Cleaned Up?

In November 1995, EPA initiated a new policy to delete portions of NPL sites where cleanup is complete (60 FR 55465, November 1, 1995). Total site cleanup may take many years, while portions of the site may have been cleaned up and available for productive use. As of August 23, 2001, EPA has deleted 24 portions of 23 sites.

I. What Is the Construction Completion List (CCL)?

EPA also has developed an NPL construction completion list (``CCL'') to simplify its system of categorizing sites and to better communicate the successful completion of cleanup activities (58 FR 12142, March 2, 1993). Inclusion of a site on the CCL has no legal significance.

Sites qualify for the CCL when: (1) Any necessary physical construction is complete, whether or not final cleanup levels or other requirements have been achieved; (2) EPA has determined that the response action should be limited to measures that do not involve construction (e.g., institutional controls); or (3) The site qualifies for deletion from the NPL.

As of August 23, 2001, there are a total of 773 sites on the CCL. For the most up-to-date information on the CCL, see EPA's Internet site at http://www.epa.gov/superfund.

II. Public Review/Public Comment

A. Can I Review the Documents Relevant to This Proposed Rule?

Yes, documents that form the basis for EPA's evaluation and scoring of the sites in this rule are contained in dockets located both at EPA Headquarters in Washington, DC and in the Regional offices.

B. How Do I Access the Documents?

You may view the documents, by appointment only, in the Headquarters or the Regional dockets after the appearance of this proposed rule. The hours of operation for the Headquarters docket are from 9 a.m. to 4 p.m., Monday through Friday excluding Federal holidays. Please contact the Regional dockets for hours.

Following is the contact information for the EPA Headquarters docket: Docket Coordinator, Headquarters, U.S. EPA CERCLA Docket Office, Crystal Gateway #1, 1st Floor, 1235 Jefferson Davis Highway, Arlington, VA 22202, 703/603-9232. (Please note this is a visiting address only. Mail comments to EPA Headquarters as detailed at the beginning of this preamble.)

The contact information for the Regional dockets is as follows:

Ellen Culhane, Region 1 (CT, ME, MA, NH, RI, VT), U.S. EPA, Superfund Records Center, Mailcode HSC, One Congress Street, Suite 1100, Boston, MA 02114-2023; 617/918-1225.

Dennis Munhall, Region 2 (NJ, NY, PR, VI), U.S. EPA, 290 Broadway, New York, NY 10007-1866; 212/637-4343.

Dawn Shellenberger (ASRC), Region 3 (DE, DC, MD, PA, VA, WV), U.S. EPA, Library, 1650 Arch Street, Mailcode 3PM52, Philadelphia, PA 19103; 215/814-5364.

Lauren Brantley, Region 4 (AL, FL, GA, KY, MS, NC, SC, TN), U.S. EPA, 61 Forsyth Street, SW, 9th floor, Atlanta, GA 30303; 404/562-8127.

Janet Pfundheller, Region 5 (IL, IN, MI, MN, OH, WI), U.S. EPA, Records Center, Superfund Division SMR-7J, Metcalfe Federal Building, 77 West Jackson Boulevard, Chicago, IL 60604; 312/353-5821.

Brenda Cook, Region 6 (AR, LA, NM, OK, TX), U.S. EPA, 1445 Ross Avenue, Mailcode 6SF-RA, Dallas, TX 75202-2733; 214/665-7436.

Michelle Quick, Region 7 (IA, KS, MO, NE), U.S. EPA, 901 North 5th Street, Kansas City, KS 66101; 913/551-7335.

David Williams, Region 8 (CO, MT, ND, SD, UT, WY), U.S. EPA, 999 18th Street, Suite 500, Mailcode 8EPR-SA, Denver, CO 80202-2466; 303/312-6757.

Carolyn Douglas, Region 9 (AZ, CA, HI, NV, AS, GU), U.S. EPA, 75 Hawthorne Street, San Francisco, CA 94105; 415/744-2343.

Robert Phillips, Region 10 (AK, ID, OR, WA), U.S. EPA, 11th Floor, 1200 6th Avenue, Mail Stop ECL-110, Seattle, WA 98101; 206/553-6699.

You may also request copies from EPA Headquarters or the Regional dockets. An informal request, rather than a formal written request under the Freedom of Information Act, should be the ordinary procedure for obtaining copies of any of these documents.

C. What Documents Are Available for Public Review at the Headquarters Docket?

The Headquarters docket for this rule contains: HRS score sheets for the proposed sites; a Documentation Record for the sites describing the information used to compute the score; information for any sites affected by particular statutory requirements or EPA listing policies; and a list of documents referenced in the Documentation Record.

D. What Documents Are Available for Public Review at the Regional Dockets?

The Regional dockets for this rule contain all of the information in the Headquarters docket, plus, the actual reference documents containing the data principally relied upon and cited by EPA in calculating or evaluating the HRS score for the sites. These reference documents are available only in the Regional dockets.

E. How Do I Submit My Comments?

Comments must be submitted to EPA Headquarters as detailed at the beginning of this preamble in the ADDRESSES section. Please note that the addresses differ according to method of delivery. There are two different addresses that depend on whether comments are sent by express mail or by postal mail.

F. What Happens to My Comments?

EPA considers all comments received during the comment period. Significant comments will be addressed in a support document that EPA will publish concurrently with the Federal Register document if, and when, the site is listed on the NPL.

G. What Should I Consider When Preparing My Comments?

Comments that include complex or voluminous reports, or materials prepared for purposes other than HRS scoring, should point out the specific information that EPA should consider and how it affects individual HRS factor values or other listing criteria (Northside Sanitary Landfill v. Thomas, 849 F.2d 1516 (D.C. Cir. 1988)). EPA will not address voluminous comments that are not specifically cited by page number and referenced to the HRS or other listing criteria. EPA will not address comments unless they indicate which component of the HRS documentation record or what particular point in EPA's stated eligibility criteria is at issue.

H. Can I Submit Comments After the Public Comment Period Is Over?

Generally, EPA will not respond to late comments. EPA can only guarantee that it will consider those comments postmarked by the close of the formal comment period. EPA has a policy of not delaying a final listing decision solely to accommodate consideration of late comments.

I. Can I View Public Comments Submitted by Others?

During the comment period, comments are placed in the Headquarters docket and are available to the public on an ``as received'' basis. A complete set of comments will be available for viewing in the Regional docket approximately one week after the formal comment period closes.

J. Can I Submit Comments Regarding Sites Not Currently Proposed to the NPL?

In certain instances, interested parties have written to EPA concerning sites which were not at that time proposed to the NPL. If those sites are later proposed to the NPL, parties should review their earlier concerns and, if still appropriate, resubmit those concerns for consideration during the formal comment period. Site-specific correspondence received prior to the period of formal proposal and comment will not generally be included in the docket.

III. Contents of This Proposed Rule

A. Proposed Additions to the NPL

With today's proposed rule, EPA is proposing to add 17 new sites to the NPL; 16 sites to the General Superfund Section of the NPL and one site to the Federal Facilities Section. (Please note that the Sauget 1 site in Illinois is being reproposed to the NPL.) The sites in this proposed rulemaking are being proposed based on HRS scores of 28.50 or above. The sites are presented in Table 1 and Table 2 which follow this preamble.

B. Status of NPL

A final rule published elsewhere in today's Federal Register finalizes 11 sites to the NPL; resulting in an NPL of 1,240 final sites; 1,080 in the General Superfund Section and 160 in the Federal Facilities Section. With this proposal of 17 new sites, there are now 72 sites proposed and awaiting final agency action, 65 in the General Superfund Section and 7 in the Federal Facilities Section. (Please note that one of the 17 sites is being reproposed to the NPL.) Final and proposed sites now total 1,312. (These numbers reflect the status of sites as of August 23, 2001. Site deletions occurring after this date may affect these numbers at time of publication in the Federal Register.)

IV. Executive Order 12866

A. What Is Executive Order 12866?

Under Executive Order 12866, (58 FR 51735 (October 4, 1993)) the

Agency must determine whether a regulatory action is ``significant'' and therefore subject to OMB review and the requirements of the Executive Order. The Order defines ``significant regulatory action'' as one that is likely to result in a rule that may: (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

B. Is This Proposed Rule Subject to Executive Order 12866 Review?

No. The listing of sites on the NPL does not impose any obligations on any entities. The listing does not set standards or a regulatory regime and imposes no liability or costs. Any liability under CERCLA exists irrespective of whether a site is listed. It has been determined that this action is not a ``significant regulatory action'' under the terms of Executive Order 12866 and is therefore not subject to OMB review.

V. Unfunded Mandates

A. What Is the Unfunded Mandates Reform Act (UMRA)?

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, establishes requirements for Federal Agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit

analysis, for proposed and final rules with ``Federal mandates'' that may result in expenditures by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more in any one year. Before EPA promulgates a rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

B. Does UMRA Apply to This Proposed Rule?

No, EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments in the aggregate, or by the private sector in any one year. This rule will not impose any federal intergovernmental mandate because it imposes no enforceable duty upon State, tribal or local governments. Listing a site on the NPL does not itself impose any costs. Listing does not mean that EPA necessarily will undertake remedial action. Nor does listing require any action by a private party or determine liability for response costs. Costs that arise out of site responses result from site-specific decisions regarding what actions to take, not directly from the act of listing a site on the NPL.

For the same reasons, EPA also has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. In addition, as discussed above, the private sector is not expected to incur costs exceeding $100 million. EPA has fulfilled the requirement for analysis under the Unfunded Mandates Reform Act.

VI. Effect on Small Businesses

A. What Is the Regulatory Flexibility Act?

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996) whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

B. How Has EPA Complied With the Regulatory Flexibility Act (RFA)?

This proposed rule listing sites on the NPL, if promulgated, would not impose any obligations on any group, including small entities. This proposed rule, if promulgated, also would establish no standards or requirements that any small entity must meet, and would impose no direct costs on any small entity. Whether an entity, small or otherwise, is liable for response costs for a release of hazardous substances depends on whether that entity is liable under CERCLA 107(a). Any such liability exists regardless of whether the site is listed on the NPL through this rulemaking. Thus, this proposed rule, if promulgated, would not impose any requirements on any small entities. For the foregoing reasons, I certify that this proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities.

VII. National Technology Transfer and Advancement Act

A. What Is the National Technology Transfer and Advancement Act?

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA), Public Law 104-113, section 12(d) (15 U.S.C. 272 note), directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

B. Does the National Technology Transfer and Advancement Act Apply to This Proposed Rule?

No. This proposed rulemaking does not involve technical standards. Therefore, EPA did not consider the use of any voluntary consensus standards.

VIII. Executive Order 12898

A. What Is Executive Order 12898?

Under Executive Order 12898, ``Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,'' as well as through EPA's April 1995, ``Environmental Justice Strategy, OSWER Environmental Justice Task Force Action Agenda Report,'' and National Environmental Justice Advisory Council, EPA has undertaken to incorporate environmental justice into its policies and programs. EPA is committed to addressing environmental justice concerns, and is assuming a leadership role in environmental justice initiatives to enhance environmental quality for all residents of the United States. The Agency's goals are to ensure that no segment of the population, regardless of race, color, national origin, or income, bears disproportionately high and adverse human health and environmental effects as a result of EPA's policies, programs, and activities, and all people live in clean and sustainable communities.

B. Does Executive Order 12898 Apply to This Proposed Rule?

No. While this rule proposes to revise the NPL, no action will result from this proposal that will have disproportionately high and adverse human health and environmental effects on any segment of the population.

IX. Executive Order 13045

A. What Is Executive Order 13045?

Executive Order 13045: ``Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be ``economically

[[Page 47617]]

significant'' as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

B. Does Executive Order 13045 Apply to This Proposed Rule?

This proposed rule is not subject to Executive Order 13045 because it is not an economically significant rule as defined by Executive Order 12866, and because the Agency does not have reason to believe the environmental health or safety risks addressed by this proposed rule present a disproportionate risk to children.

X. Paperwork Reduction Act

A. What Is the Paperwork Reduction Act?

According to the Paperwork Reduction Act (PRA), 44 U.S.C. 3501 et seq., an agency may not conduct or sponsor, and a person is not required to respond to a collection of information that requires OMB approval under the PRA, unless it has been approved by OMB and displays a currently valid OMB control number. The OMB control numbers for EPA's regulations, after initial display in the preamble of the final rules, are listed in 40 CFR part 9. The information collection requirements related to this action have already been approved by OMB pursuant to the PRA under OMB control number 2070-0012 (EPA ICR No. 574).

B. Does the Paperwork Reduction Act Apply to This Proposed Rule?

No. EPA has determined that the PRA does not apply because this rule does not contain any information collection requirements that require approval of the OMB.

XI. Executive Orders on Federalism

What Are The Executive Orders on Federalism and Are They Applicable to This Proposed Rule?

Executive Order 13132, entitled ``Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ``meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ``Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ``substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under section 6 of Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. Thus, the requirements of section 6 of the Executive Order do not apply to this rule.

XII. Executive Order 13084

What Is Executive Order 13084 and Is It Applicable to This Proposed Rule?

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected tribal governments, a summary of the nature of their concerns, and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian tribal governments ``to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.''

This proposed rule does not significantly or uniquely affect the communities of Indian tribal governments because it does not significantly or uniquely affect their communities. The addition of sites to the NPL will not impose any substantial direct compliance costs on Tribes. While Tribes may incur costs from participating in the investigations and cleanup decisions, those costs are not compliance costs. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this proposed rule.

XIII. Executive Order 13175

A. What Is Executive Order 13175?

Executive Order 13175, entitled ``Consultation and Coordination with Indian Tribal Governments'' (65 FR 67249, November 6, 2000), requires EPA to develop an accountable process to ensure ``meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.'' ``Policies that have tribal implications'' is defined in the Executive Order to include regulations that have ``substantial direct effects on one or more Indian tribes, on the relationship between the Federal government and the Indian tribes, or on the distribution of power and responsibilities between the

Federal government and Indian tribes.''

B. Does Executive Order 13175 Apply to This Proposed Rule?

This proposed rule does not have tribal implications. It will not have substantial direct effects on tribal governments, on the relationship between the Federal government and Indian tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this proposed rule.

XIV. Executive Order 13211

A. What Is Executive Order 13211?

Executive Order 13211, ``Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001), requires EPA to prepare and submit a Statement of Energy Effects to the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, for certain actions identified as ``significant energy actions.'' Section 4(b) of

[[Page 47618]]

Executive Order 13211 defines ``significant energy actions'' as ``any action by an agency (normally published in the Federal Register) that promulgates or is expected to lead to the promulgation of a final rule or regulation, including notices of inquiry, advance notices of proposed rulemaking, and notices of proposed rulemaking: (1)(i) that is a significant regulatory action under Executive Order 12866 or any successor order, and (ii) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (2) that is designated by the Administrator of the Office of Information and Regulatory Affairs as a significant energy action.''

B. Is This Rule Subject to Executive Order 13211?

This proposed rule is not subject to Executive Order 13211, ``Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not a significant regulatory action under Executive Order 12866 (See discussion of Executive Order 12866 above.)

Table 1.--National Priorities List Proposed Rule No. 37, General Superfund Section

State	Site name	City/County
IA........................	Railroad Avenue Groundwater Contamination.	Des Moines.
ID........................	Stibnite/Yellow Pine Mining Area.	Yellow Mine.
IL........................	Sauget Area 1.......	Sauget and Cahokia.
IL........................	Sauget Area 2.......	Sauget.
MA........................	Hatheway and Patterson Company.	Mansfield.

ME..........................	Callahan Mine.......	Brooksville.
MO..........................	Oak Grove Village Well.	Oak Grove Village.
NC..........................	Reasor Chemical Company.	Castle Hayne.
NJ..........................	Atlantic Resources Corporation.	Sayreville.
NJ..........................	Woodbrook Road Dump.	South Plainfield.
NM..........................	McGaffey and Main Groundwater Plume.	Roswell.
NY..........................	Cayuga County Ground Water Contamination.	Cayuga County.
NY..........................	Crown Cleaners of Watertown, Inc.	Carthage.
NY..........................	Ellenville Scrap Iron and Metal.	Ellenville.
PA..........................	Franklin Slag Pile (MDC).	Philadelphia.
TX..........................	Brine Service Company.	Corpus Christi.

Number of Sites Proposed to General Superfund Section: 16.

Table 2.--National Priorities List Proposed Rule No. 37, Federal Facilities Section

State	Site name	City/County
MD..........................	Curtis Bay Coast Guard Yard.	Anne Arundel County.

Number of Sites Proposed to Federal Facilities Section: 1.

List of Subjects in 40 CFR Part 300

Environmental protection, Air pollution control, Chemicals, Hazardous substances, Hazardous waste, Intergovernmental relations, Natural resources, Oil pollution, Penalties, Reporting and recordkeeping requirements, Superfund, Water pollution control, Water supply.

Authority: 33 U.S.C. 1321(c)(2); 42 U.S.C. 9601-9657; E.O. 12777, 56 FR 54757, 3 CFR, 1991 Comp., p. 351; E.O. 12580, 52 FR 2923, 3 CFR, 1987 Comp., p. 193.

Dated: September 5, 2001.

Michael H. Shapiro,
Acting Assistant Administrator, Office of Solid Waste and Emergency Response.

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The NPL is a list of national priorities among the known or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. The list, which is appendix B of the NCP (40 CFR part 300), was required under section 105(a)(8)(B) of CERCLA, as amended by SARA. Section 105(a)(8)(B) defines the NPL as a list of ``releases'' and the highest priority ``facilities'' and requires that the NPL be revised at least annually. The NPL is intended primarily to guide EPA in determining which sites warrant further investigation to assess the nature and extent of public health and environmental risks associated with a release of hazardous substances. The NPL is only of limited significance, however, as it does not assign liability to any party or to the owner of any specific property. Neither does placing a site on the NPL mean that any remedial or removal action necessarily need be taken. See Report of the Senate Committee on Environment and Public Works, Senate Rep. No. 96-848, 96th Cong., 2d Sess. 60 (1980), 48 FR 40659 (September 8, 1983).

For purposes of listing, the NPL includes two sections, one of sites that are generally evaluated and cleaned up by EPA (the ``General Superfund Section''), and one of sites that are owned or operated by other Federal agencies (the ``Federal Facilities Section''). With respect to sites in the Federal Facilities section, these sites are generally being addressed by other Federal agencies. Under Executive Order 12580 (52 FR 2923, January 29, 1987) and CERCLA section 120, each Federal agency is responsible for carrying out most response actions at facilities under its own jurisdiction, custody, or control, although EPA is responsible for preparing an HRS score and determining whether the facility is placed on the NPL. EPA generally is not the lead agency at Federal Facilities Section sites, and its role at such sites is accordingly less extensive than at other sites.

D. How Are Sites Listed on the NPL?

There are three mechanisms for placing sites on the NPL for possible remedial action (see 40 CFR 300.425(c) of the NCP): (1) A site may be included on the NPL if it scores sufficiently high on the Hazard Ranking System (``HRS''), which EPA promulgated as appendix A of the NCP (40 CFR part 300). The HRS serves as a screening device to evaluate the relative potential of uncontrolled hazardous substances to pose a threat to human health or the environment. On December 14, 1990 (55 FR 51532), EPA promulgated revisions to the HRS partly in response to CERCLA section 105(c), added by SARA. The revised HRS evaluates four pathways: Ground water, surface water, soil exposure, and air. As a matter of Agency policy, those sites that score 28.50 or greater on the HRS are eligible for the NPL; (2) Each State may designate a single site as its top priority to be listed on the NPL, regardless of the HRS score. This mechanism, provided by the NCP at 40 CFR 300.425(c)(2) requires that, to the extent practicable, the NPL include within the 100 highest priorities, one facility designated by each State representing the greatest danger to public health, welfare, or the environment among known facilities in the State (see 42 U.S.C. 9605(a)(8)(B)); (3) The third mechanism for listing, included in the NCP at 40 CFR 300.425(c)(3), allows certain sites to be listed regardless of their HRS score, if all of the following conditions are met:

The Agency for Toxic Substances and Disease Registry (ATSDR) of the U.S. Public Health Service has issued a health advisory that recommends dissociation of individuals from the release.

EPA determines that the release poses a significant threat to public health.
EPA anticipates that it will be more cost-effective to use its remedial authority than to use its removal authority to respond to the release.
EPA promulgated an original NPL of 406 sites on September 8, 1983 (48 FR 40658). The NPL has been expanded since then, most recently on June 14, 2001 (66 FR 32235).

E. What Happens to Sites on the NPL?

A site may undergo remedial action financed by the Trust Fund established under CERCLA (commonly referred to as the ``Superfund'') only after it is placed on the NPL, as provided in the NCP at 40 CFR 300.425(b)(1). (``Remedial actions'' are those ``consistent with permanent remedy, taken instead of or in addition to removal actions. * * *'' 42 U.S.C. 9601(24).) However, under 40 CFR 300.425(b)(2) placing a site on the NPL ``does not imply that monies will be expended.'' EPA may pursue other appropriate authorities to remedy the releases, including enforcement action under CERCLA and other laws.

F. How Are Site Boundaries Defined?

The NPL does not describe releases in precise geographical terms; it would be neither feasible nor consistent with the limited purpose of the NPL (to identify releases that are priorities for further evaluation), for it to do so.
Although a CERCLA ``facility'' is broadly defined to include any area where a hazardous substance release has ``come to be located'' (CERCLA section 101(9)), the listing process itself is not intended to define or reflect the boundaries of such facilities or releases. Of course, HRS data (if the HRS is used to list a site) upon which the NPL placement was based will, to some extent, describe the release(s) at issue. That is, the NPL site would include all releases evaluated as part of that HRS analysis.
When a site is listed, the approach generally used to describe the relevant release(s) is to delineate a geographical area (usually the area within an installation or plant boundaries) and identify the site by reference to that area. As a legal matter, the site is not coextensive with that area, and the boundaries of the installation or plant are not the ``boundaries'' of the site. Rather, the site consists of all contaminated areas within the area used to identify the site, as well as any other location to which contamination from that area has come to be located, or from which that contamination came.
In other words, while geographic terms are often used to designate the site (e.g., the ``Jones Co. plant site'') in terms

of the property owned by a particular party, the site properly understood is not limited to that property (e.g., it may extend beyond the property due to contaminant migration), and conversely may not occupy the full extent of the property (e.g., where there are uncontaminated parts of the identified property, they may not be, strictly speaking, part of the ``site''). The ``site'' is thus neither equal to nor confined by the boundaries of any specific property that may give the site its name, and the name itself should not be read to imply that this site is coextensive with the entire area within the property boundary of the installation or plant. The precise nature and extent of the site are typically not known at the time of listing. Also, the site name is merely used to help identify the geographic location of the contamination. For example, the ``Jones Co. plant site,'' does not imply that the Jones company is responsible for the contamination located on the plant site.

EPA regulations provide that the ``nature and extent of the problem presented by the release'' will be determined by a Remedial Investigation/Feasibility Study (``RI/FS'') as more information is developed on site contamination (40 CFR 300.5). During the RI/FS process, the release may be found to be larger or smaller than was originally thought, as more is learned about the source(s) and the migration of the contamination. However, this inquiry focuses on an evaluation of the threat posed; the boundaries of the release need not be exactly defined. Moreover, it generally is impossible to discover the full extent of where the contamination ``has come to be located'' before all necessary studies and remedial work are completed at a site. Indeed, the boundaries of the contamination can be expected to change over time. Thus, in most cases, it may be impossible to describe the boundaries of a release with absolute certainty.

Further, as noted above, NPL listing does not assign liability to any party or to the owner of any specific property. Thus, if a party does not believe it is liable for releases on discrete parcels of property, supporting information can be submitted to the Agency at any time after a party receives notice it is a potentially responsible party.

For these reasons, the NPL need not be amended as further research reveals more information about the location of the contamination or release.

G. How Are Sites Removed From the NPL?

EPA may delete sites from the NPL where no further response is appropriate under Superfund, as explained in the NCP at 40 CFR 300.425(e). This section also provides that EPA shall consult with states on proposed deletions and shall consider whether any of the following criteria have been met: (i) Responsible parties or other persons have implemented all appropriate response actions required; (ii) All appropriate Superfund-financed response has been implemented and no further response action is required; or (iii) The remedial investigation has shown the release poses no significant threat to public health or the environment, and taking of remedial measures is not appropriate. As of August 23, 2001, the Agency has deleted 239 sites from the NPL.

H. Can Portions of Sites Be Deleted From the NPL as They Are Cleaned Up?

In November 1995, EPA initiated a new policy to delete portions of NPL sites where cleanup is complete (60 FR 55465, November 1, 1995). Total site cleanup may take many years, while portions of the site may have been cleaned up and available for productive use. As of August 23, 2001, EPA has deleted 24 portions of 23 sites.

I. What Is the Construction Completion List (CCL)?

EPA also has developed an NPL construction completion list (``CCL'') to simplify its system of categorizing sites and to better communicate the successful completion of cleanup activities (58 FR 12142, March 2, 1993). Inclusion of a site on the CCL has no legal significance.

Sites qualify for the CCL when: (1) Any necessary physical construction is complete, whether or not final cleanup levels or other requirements have been achieved; (2) EPA has determined that the response action should be limited to measures that do not involve construction (e.g., institutional controls); or (3) The site qualifies for deletion from the NPL.

As of August 23, 2001, there are a total of 773 sites on the CCL. For the most up-to-date information on the CCL, see EPA's Internet site at http://www.epa.gov/superfund.

II. Public Review/Public Comment

A. Can I Review the Documents Relevant to This Proposed Rule?

Yes, documents that form the basis for EPA's evaluation and scoring of the sites in this rule are contained in dockets located both at EPA Headquarters in Washington, DC and in the Regional offices.

B. How Do I Access the Documents?

You may view the documents, by appointment only, in the Headquarters or the Regional dockets after the appearance of this proposed rule. The hours of operation for the Headquarters docket are from 9 a.m. to 4 p.m., Monday through Friday excluding Federal holidays. Please contact the Regional dockets for hours.

Following is the contact information for the EPA Headquarters docket: Docket Coordinator, Headquarters, U.S. EPA CERCLA Docket Office, Crystal Gateway #1, 1st Floor, 1235 Jefferson Davis Highway, Arlington, VA 22202, 703/603-9232. (Please note this is a visiting address only. Mail comments to EPA Headquarters as detailed at the beginning of this preamble.)

The contact information for the Regional dockets is as follows:

Ellen Culhane, Region 1 (CT, ME, MA, NH, RI, VT), U.S. EPA, Superfund Records Center, Mailcode HSC, One Congress Street, Suite 1100, Boston, MA 02114-2023; 617/918-1225.

Dennis Munhall, Region 2 (NJ, NY, PR, VI), U.S. EPA, 290 Broadway, New York, NY 10007-1866; 212/637-4343.

Dawn Shellenberger (ASRC), Region 3 (DE, DC, MD, PA, VA, WV), U.S. EPA, Library, 1650 Arch Street, Mailcode 3PM52, Philadelphia, PA 19103; 215/814-5364.

Lauren Brantley, Region 4 (AL, FL, GA, KY, MS, NC, SC, TN), U.S. EPA, 61 Forsyth Street, SW, 9th floor, Atlanta, GA 30303; 404/562-8127.

Janet Pfundheller, Region 5 (IL, IN, MI, MN, OH, WI), U.S. EPA, Records Center, Superfund Division SMR-7J, Metcalfe Federal Building, 77 West Jackson Boulevard, Chicago, IL 60604; 312/353-5821.

Brenda Cook, Region 6 (AR, LA, NM, OK, TX), U.S. EPA, 1445 Ross Avenue, Mailcode 6SF-RA, Dallas, TX 75202-2733; 214/665-7436.

Michelle Quick, Region 7 (IA, KS, MO, NE), U.S. EPA, 901 North 5th Street, Kansas City, KS 66101; 913/551-7335.

David Williams, Region 8 (CO, MT, ND, SD, UT, WY), U.S. EPA, 999 18th Street, Suite 500, Mailcode 8EPR-SA, Denver, CO 80202-2466; 303/312-6757.