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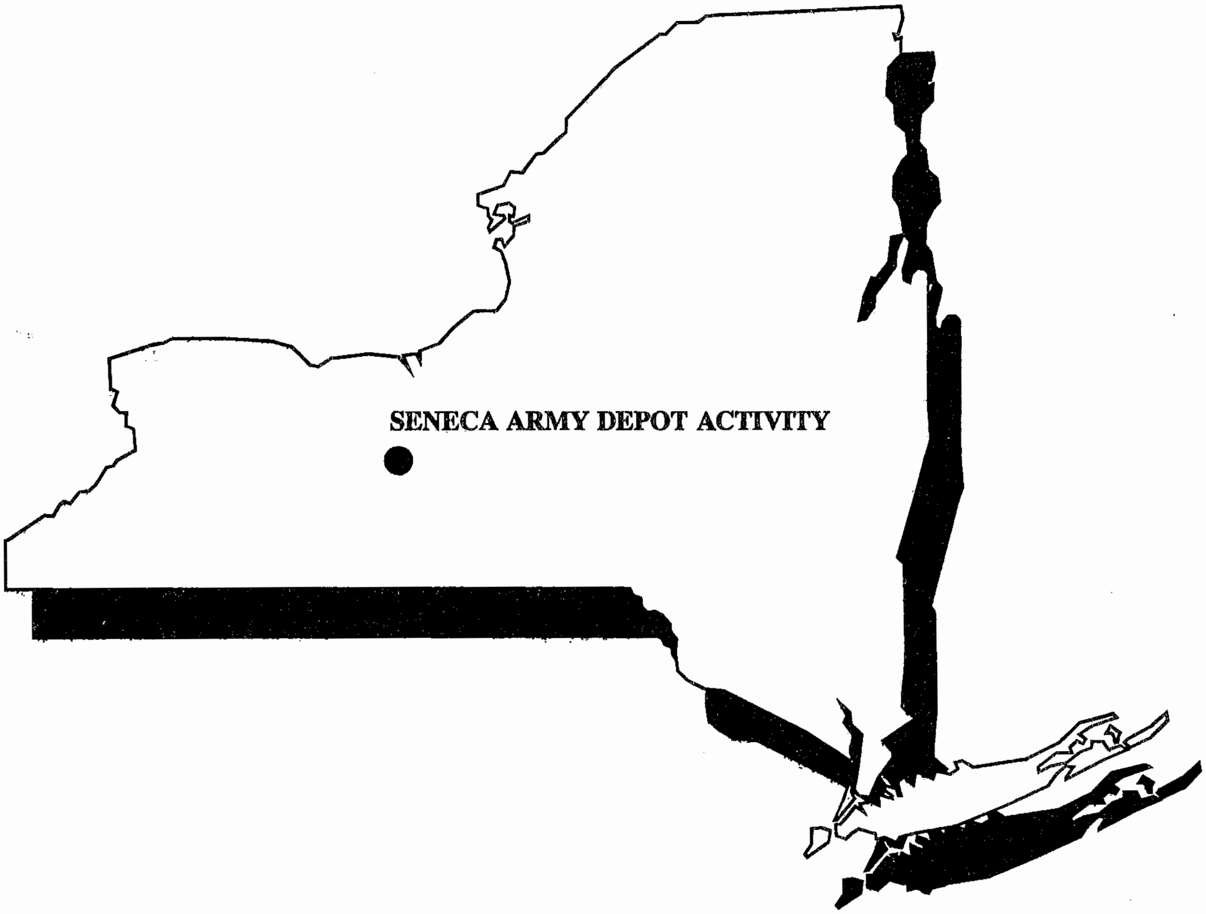

DRAFT
SEAD-66
PROJECT SCOPING PLAN FOR PREFORMING A CERCLA REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) AT THE PESTICIDE STORAGE AREA NEAR BUILDINGS 5 AND 6, SENECA ARMY DEPOT ACTIVITY

NOVEMBER 1996

PROJECT SCOPING PLAN
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
AT SEAD-66
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared For:

Seneca Army Depot Activity
Romulus, New York

Prepared By:

Parsons Engineering Science, Inc.
Prudential Center
Boston, Massachusetts

726510

November 1996

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LIST OF ACRONYMS

1,2-DCA	1,2-Dichloroethane
1,2-DCE	1,2-Dichloroethylene (total)
AA	Atomic absorption
AMC	U.S. Army Material Command
AN	Army-Navy
AOC	Areas of Concern
APCS	Air Pollution Control System
AQCR	Genesee-Finger Air Quality Control Region
ARAR	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
BOD	Biological Oxygen Demand
CEC	Cation exchange capacity
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CLP	Contract Laboratory Program
cm	Centimeters
cm/sec	Centimeters per second
COD	Chemical Oxygen Demand
Cr	Chromium
$CaCO_3$	Calcium Carbonate
CRT	Cathode ray tube
DARCOM	Development and Readiness Command
DERA	Defense Environmental Restoration Account
DO	Dissolved oxygen
DOT	Department of Transportation
DQO	Data Quality Objective
DRMO	Defense, Revitalization and Marketing Office
EM-31	Electromagnetic
EPA	Environmental Protection Agency
ESI	Expanded Site Inspections
FS	Feasibility Study
ft	Feet
ft/ft	Feet per foot
ft/sec	Feet per second
ft/yr	Feet per year
GA	Classification: The best usage of Class GA waters is as a source of potable water supply. Class GA waters are fresh groundwaters
GC	Gas chromatograph

LIST OF ACRONYMS
(CONT.)

gpm	Gallons per minute
GPR	Ground penetrating radar
GRI	Gas Research Institute
GSSI	Geophysical Survey Systems, Inc.
HSWA	Hazardous and Solid Waste Amendments
IAG	Interagency Agreement
Koc	Organic carbon coefficient
lb	pound
L/min	Liters per minute
MCL	Maximum Contaminant Level
mg/l	Milligram per liter
mg/kg	Milligrams per kilogram
MHz	Megahertz
Miniram	Minature Real-Time Aerosol Meter
mL	Milliliter
mmhos/m	Millimhos per meter
MSL	Mean sea level
MW	Monitoring Well
NA	Not analyzed or not available
NBS	National Bureau of Standards
NGVD	National Geologic Vertical Datum
NO_2/N	Nitrite-Nitrogen
NO_3/N	Nitrate-Nitrogen
NPL	National Priority List
NTU	Nephelometric turbidity units
NYSDEC	New York State Department of Environmental Conservation
OVM	Organic Vapor Meter
Pb	Lead
PAH	Polynuclear Aromatic Hydrocarbon
Parsons ES	Parsons Engineering Science, Inc.
PCB	Polychlorinated biphenyls
PCOC	Potential Contaminants of Concern
PID	Photoionization detector
ppm	parts per million
ppmv	parts per million per volume
PSCR	Preliminary Site Characterization Report
QA	Quality Assurance

LIST OF ACRONYMS
(CONT.)

QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RAGS	EPA Risk Assessment Guidance for Superfund
RCRA	Resource Conservation and Recovery Act
RF	Response factor
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RQD	Rock Quality Designation
SB	Soil boring
SCS	Soil Conservation Service
SD	Sediment sample
SEAD	Seneca Army Depot (old name)
SEDA	Seneca Army Depot Activity
sec	Seconds
SOW	Statement of Work
SS	Soil sample
SVO	Semivolatile Organic Compounds
SW	Surface water sample
SWMU	Solid Waste Management Unit
TAGM	Technical and Administrative Guidance Memorandum
TAL	Target analyte list
TCL	Target compound list
TDS	Total dissolved solids
TKN	Total Kjeldahl Nitrogen
TOC	Total Organic Carbon
TOX	Total Organic Halogens
TRPH	Total Recovered Petroleum Hydrocarbons
TP	Test Pit
UCL	Upper Confidence Level
ug/g	Micrograms per gram
ug/kg	Micrograms per kilogram
ug/mg	Micrograms per milligram
ug/L	Micrograms per liter
USACE	United States Army Corps of Engineers
USAEHA	United States Army Environmental Hygiene Agency

LIST OF ACRONYMS
(CONT.)

USATHAMA	United States Army Toxic and Hazardous Materials Agency
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

The purpose of this Project Scoping Plan is to outline the work proposed for a Remedial Investigation/Feasibility Study (RI/FS) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at SEAD-66, the Pesticide Storage Area near Buildings 5 and 6, at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This RI/FS Scoping Plan outlines work to be conducted at SEAD-66 based upon recommendations specified in the SWMU Classification Report (Parsons ES, 1994); limited sampling of surface soils on the site was performed as part of this report. This plan is based upon a conceptual site model that identified potential source areas, release mechanisms, and receptor pathways; determined data requirements for an evaluation of risks to human health and the environment; and developed a task plan to address the data requirements that have been identified. The primary objective of the RI/FS is to gather hydrogeological, chemical, and geotechnical data to characterize the nature and extent of impact to the media, and the nature and extent of risks to human health and the environment. This information will be used to support the remedial options evaluated in the FS. These actions will comply with applicable or relevant and appropriate requirements (ARARs) and take into account the risks to human health and the environment.

This work will be performed as part of the United States Army Corps of Engineers (USACOE) remedial response activities under CERCLA. It will follow the requirements of the New York State Department of Environmental Conservation (NYSDEC), the U.S. Environmental Protection Agency, Region II (EPA), and the Interagency Agreement (IAG). The site is referred to as a SWMU because the Army elected in the Federal Facilities Agreement to combine RCRA and CERCLA obligations and the Army uses RCRA terms to describe the units.

This Project Scoping Plan provides site-specific information for the RI/FS project at SEAD-66. The Generic Installation RI/FS Workplan (Parsons ES, August 1995) is designed to serve as a foundation for this document and provides generic information that is applicable to all RI/FS site activities at SEDA.

1.2 REPORT ORGANIZATION

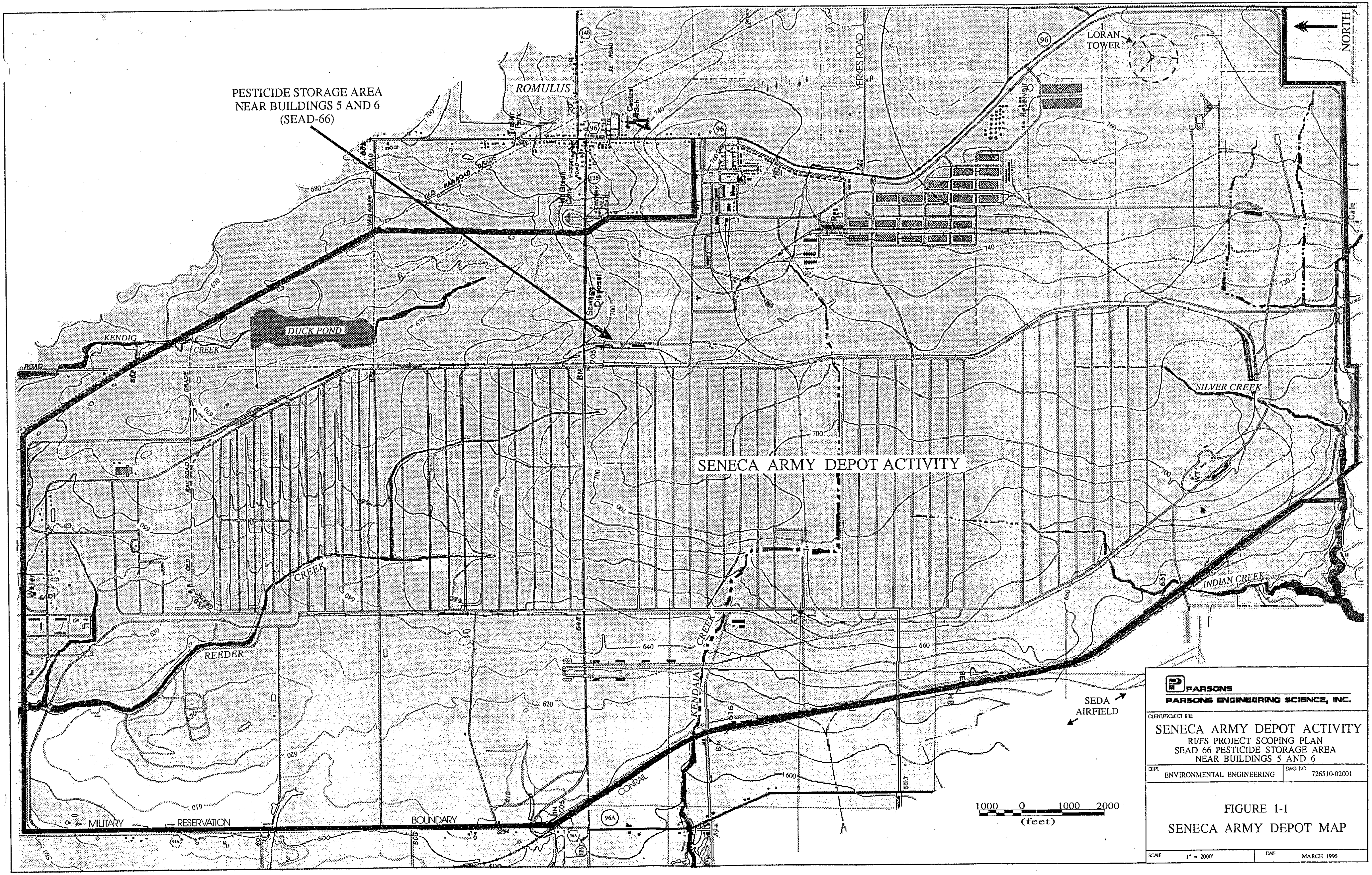
The remaining sections of this report are organized to describe the overall site conditions, provide a scoping of the RI/FS, and to provide task plans for the RI and FS. Section 2.0 presents a description of regional geologic and hydrogeologic site conditions. Section 3.0 discusses scoping of the RI/FS including the conceptual site model, the results of previous investigations, identification of potential receptors and exposure scenarios, scoping of potential remedial action technologies, preliminary identification of ARARs, data quality objectives, and data gaps and needs. The task plans for the RI and FS are discussed in Sections 4.0 and 5.0, respectively. Section 6.0 discusses scheduling and staffing. Section 7.0 lists the references cited in the Scoping Plan. Appendices A through F provide additional supplemental information to the topics discussed in this report.

1.3 SITE BACKGROUND

SEAD-66 is the Pesticide Storage Area near Buildings 5 and 6 located in the east-central portion of the Seneca Army Depot Activity (SEDA) in Romulus, NY (Figure 1-1). The exact location where pesticides were stored is unknown, but it has been reported that pesticides were stored in a structure located in the vicinity of Buildings 5 and 6. A small metal shed adjacent to Building 5 may have been used for pesticide storage, or a concrete pad adjacent to Building 6 may have been used (Figure 1-2).

To investigate the possibility of a release, a limited sampling program was performed in December, 1993 and the results were included in the SWMU Classification Report (Parsons ES, 1994). The analytical data indicate that both pesticide compounds and a polychlorinated biphenyl (PCB) compounds have been released to the surface soil at SEAD-66.

In accordance with the decision process outlined in the Interagency Agreement (IAG) between the U.S. Army Corps of Engineers (USACE), the U.S. Environmental Protection Agency (EPA) Region II, and the New York State Department of Environmental Conservation (NYSDEC), SEAD-66 is classified as a Low Priority Area of Concern (AOC) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This RI/FS Project Scoping Plan along with the Generic Installation RI/FS Workplan outlines the recommended approach and methodologies for completion of a RI/FS at this site in accordance with EPA CERCLA guidelines.


PESTICIDE STORAGE AREA
NEAR BUILDINGS 5 AND 6
(SEAD-66)

PARSONS
PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD 66 PESTICIDE STORAGE AREA
NEAR BUILDINGS 5 AND 6

DEPT. ENVIRONMENTAL ENGINEERING
DWG NO. 726510-02001

FIGURE 1-1
SENECA ARMY DEPOT MAP

SCALE 1" = 2000'
DATE MARCH 1996

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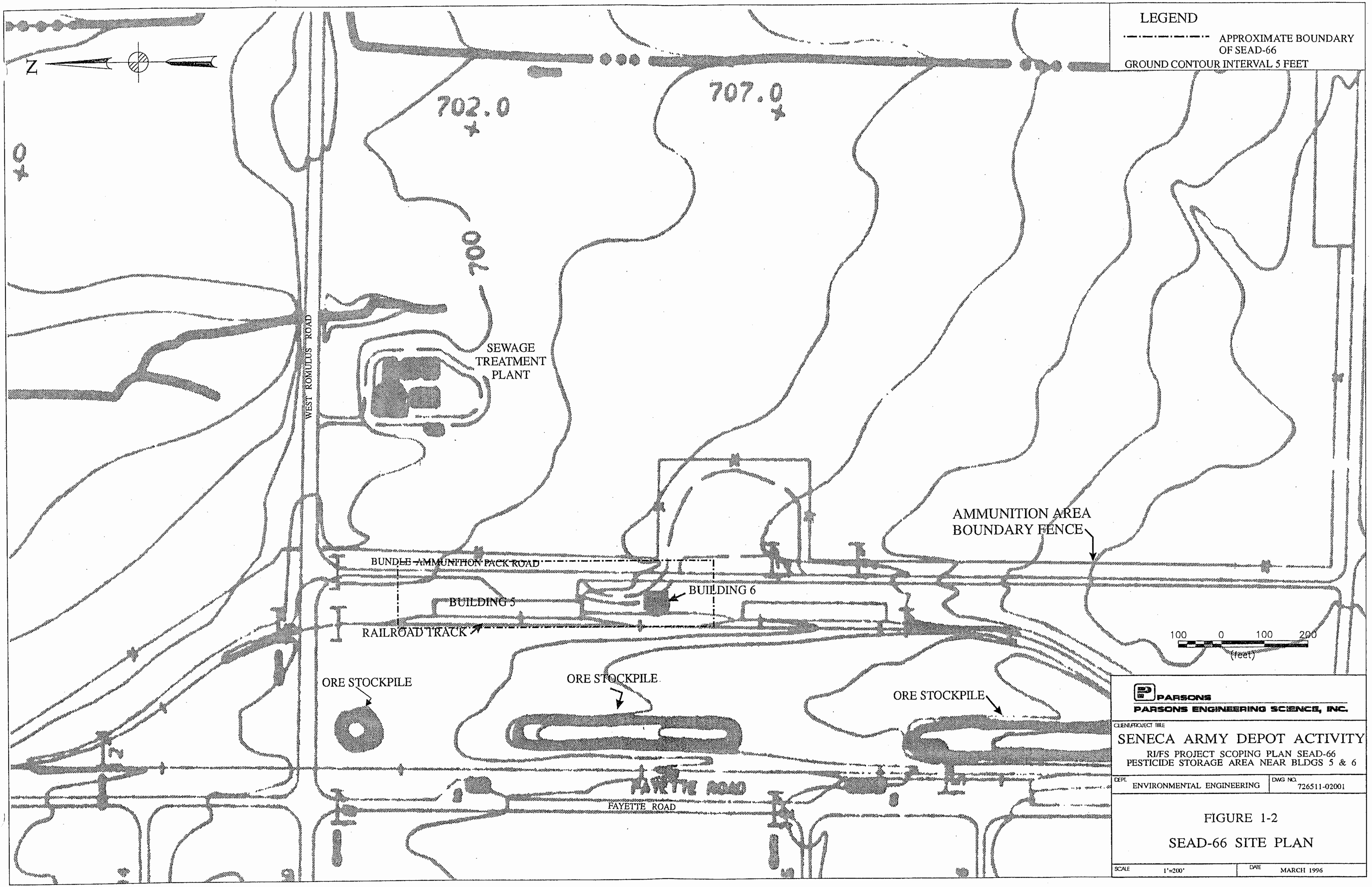

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

RI/FS PROJECT SCOPING PLAN SEAD-66
PESTICIDE STORAGE AREA NEAR BLDGS 5 & 6

DEPT. ENVIRONMENTAL ENGINEERING

DWG NO. 726511-02001

FIGURE 1-2

SEAD-66 SITE PLAN

SCALE 1'=200'

DATE MARCH 1996

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2.0 SITE CONDITIONS

2.1 PHYSICAL SETTING

The physical setting of SEDA is described in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

2.2 REGIONAL GEOLOGICAL SETTING

The geological setting of SEDA is described in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

2.3 REGIONAL HYDROGEOLOGICAL SETTING

The hydrogeological setting of SEDA is described in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

3.0 SCOPING OF THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY RI/FS

This section describes the current understanding of SEAD-66 based upon the results of the Limited Sampling Program. This includes the development of a conceptual site model describing all known contaminant sources and receptor pathways. This conceptual site model will be used to develop and implement additional studies that may be required to fully assess risks to human health and the environment. Other considerations which are discussed are data quality objectives (DQOs) and potential remedial actions for SEAD-66. These considerations will also be integrated into the scoping process to ensure that adequate data is collected to complete the RI/FS process for this AOC.

3.1 CONCEPTUAL SITE MODEL

The conceptual site model for SEAD-66 takes into account both site conditions and accepted pollutant behavior to formulate an understanding of the site. These will serve as a basis for determining necessary additional studies for the RI. The model was developed by evaluating the following aspects:

- **Historical usage;**
- **Physical site characteristics:** This considers the physical aspects of environmental conditions and the effect these conditions may have on potential pollutant migration; and
- **Environmental fate of constituents:** This considers the fate and transport of residual materials in the environment based upon known chemical and physical properties.

3.1.1 Physical Site Characterization

3.1.1.1 Physical Site Setting

The Pesticide Storage Area near Buildings 5 and 6 is located in the east-central portion of SEDA. Building 5 is located approximately 100 feet north of Building 6. Building 5 is an elongate building, approximately 350 feet long and 45 feet wide. It is located on the Bundle Ammunition Pack Road and has three driveway areas between the road and the loading docks. The metal shed that is suspected to be the former pesticide storage area is adjacent to Building 5 on the south side. Building 6 is much smaller, approximately 50 feet by 50 feet. The concrete pad that is also suspected of being a former pesticide storage area is located adjacent to Building 6 on the south side. Both buildings are located approximately 40 to 50 feet from the road. North-south trending railroad tracks are located approximately 20 feet to the west of the two buildings.

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

Access to the site is restricted since it is located within the Ammunition Storage Area.

3.1.1.2 Site Geology

Although no intrusive work has been completed at the site, it is expected that the geologic units would be the same as those that have been discovered at 27 other sites at SEAD. Specifically, till is expected to be the uppermost unit on the site. Below the till black shale is believed to exist, and there is likely to be a thin weathered shale zone at the contact with the basal portion of the till.

3.1.1.3 Site Hydrology and Hydrogeology

The site hydrology can not be well defined for SEAD-46 because a detailed topographic map has yet to be produced. However, based on the 5-foot topographic contours shown on Figure 1-2, SEAD-66 is located near the divide between the Reeder Creek watershed and the Kendig Creek watershed. Run-off from the site is directed into the Kendig Creek watershed by roadside drainage ditches. Run-off is directed from SEAD-66 into the feeder creek for the Duck Pond, a large surface water body located approximately 1 mile to the north of SEAD-66.

Although no aquifer characterization has been performed at SEAD-66, the groundwater flow direction is estimated to be to the north-northwest based on local topography.

3.1.2 Results of Previous Investigations

3.1.2.1 SWMU Classification Report

The SWMU Classification Report (Parsons ES, 1994) describes a Limited Sampling Program that was performed at SEAD-66 in December 1993. Eight (8) surface soil samples (0-2") were collected and analyzed for Target Compound List (TCL) pesticides according to the NYSDEC Contract Laboratory Program (CLP) Statement of Work (SOW). The samples were collected from locations around the metal shed and concrete pad that are suspected to have been pesticide storage areas. Samples were also collected between Buildings 5 and 6 and in the loading dock area of Building 5. The results of the analyses are presented in Table 3-1, and the sample locations are shown in Figure 3-1.

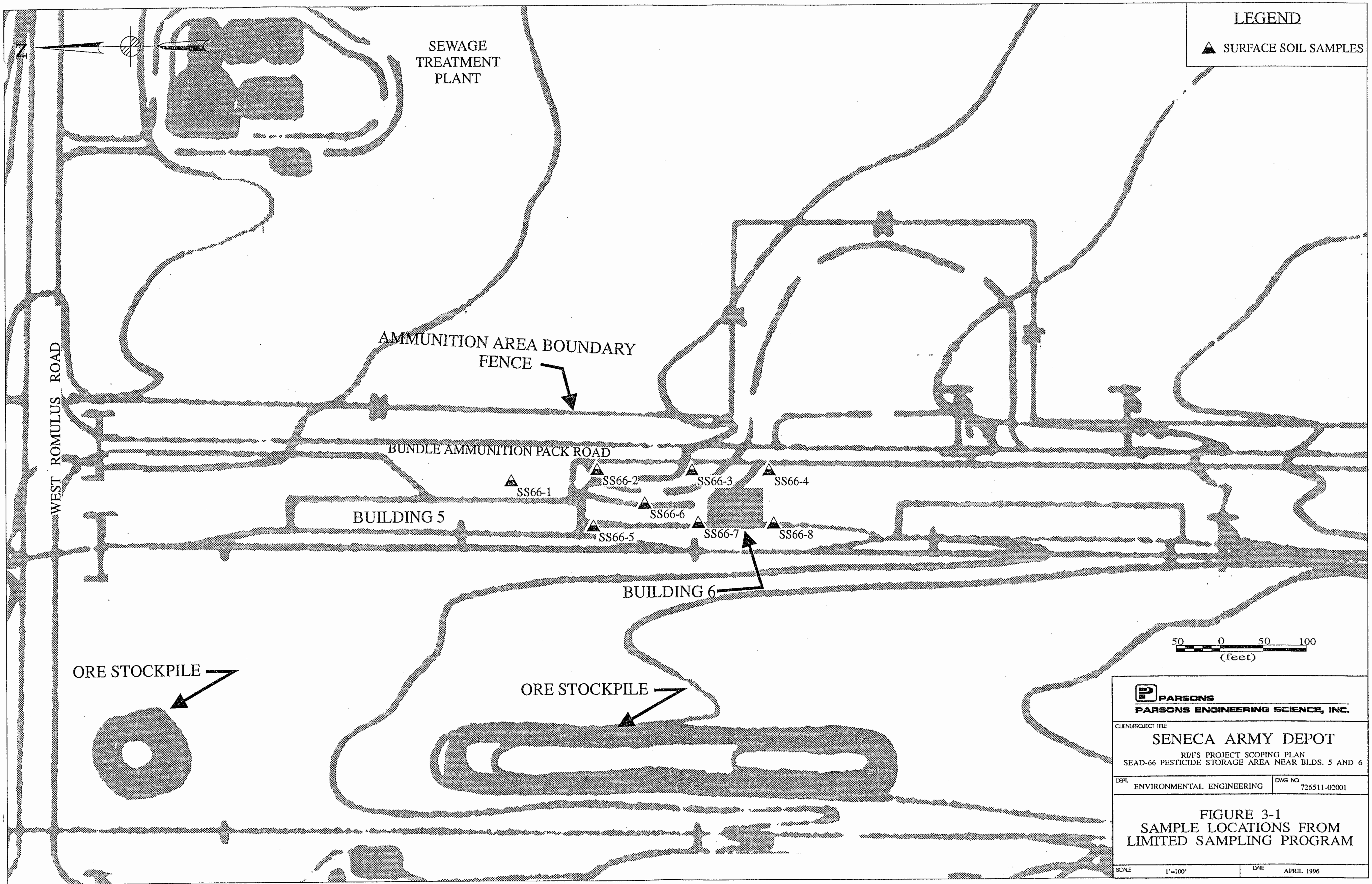
Seven (7) pesticide compounds and 1 PCB compound were detected in the surface soil samples. The compounds 4,4'-DDE and 4,4'-DDT were detected in all but one of the samples and were the only compounds to be detected above the NYSDEC Technical and Administrative Guidance

Table 3-1

Surface Soil Analysis Results

SEAD-66 Remedial Investigation
Seneca Army Depot Activity

	MATRIX		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	SITE		SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66	SEAD-66
	DEPTH(FT.)		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
	DATE		12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93	12/17/93
	ES ID	NYSDEC	SS66-1	SS66-2	SS66-3RE	SS66-4	SS66-5	SS66-6	SS66-7	SS66-8	SS66-9
	LAB ID	TAGM	207164	207165	207166	207167	207168	207169	207170	207171	207172
COMPOUND	UNITS										(SS66-1DUP)
alpha-BHC	ug/Kg	110	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
beta-BHC	ug/Kg	200	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
delta-BHC	ug/Kg	300	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
gamma-BHC (Lindane)	ug/Kg	60	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	39	2.1 U
Heptachlor	ug/Kg	100	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
Aldrin	ug/Kg	41	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
Heptachlor epoxide	ug/Kg	20	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
Endosulfan I	ug/Kg	900	3.2	4.3	9.4 J	11 U	2.3 UJ	2.1 U	2 UJ	19 U	6
Dieldrin	ug/Kg	44	3.5 U	4.4 U	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U	4 U
4,4'-DDE	ug/Kg	2100	4.5 J	2.5 J	3.1 J	110 J	4.7 J	4 U	4 J	8700	11 J
Endrin	ug/Kg	100	3.5 U	4.4 U	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U	4 U
Endosulfan II	ug/Kg	900	3.5 U	4.4 U	4.1 UJ	22 U	3.5 J	2.5 J	4 UJ	48 J	4 U
4,4'-DDD	ug/Kg	2900	3.5 U	4.4 U	4.1 UJ	11 J	2.7 J	4 U	4 UJ	560 J	4 U
Endosulfan sulfate	ug/Kg	1000	3.5 U	4.4 U	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U	4 U
4,4'-DDT	ug/Kg	2100	3.5 J	4.4 U	5.5 J	170	9.4 J	2 J	25 J	36000	10 J
Methoxychlor	ug/Kg	10,000	18 U	23 U	21 UJ	110 U	23 UJ	21 U	20 UJ	190 U	21 U
Endrin ketone	ug/Kg	-	3.5 U	4.4 U	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U	4 U
Endrin aldehyde	ug/Kg	-	3.5 U	4.4 U	4.1 UJ	22 U	4.5 UJ	4 U	4 UJ	37 U	4 U
alpha-Chlordane	ug/Kg	-	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	1.3 J	16 J	2.1 U
gamma-Chlordane	ug/Kg	540	1.8 U	2.3 U	2.1 UJ	11 U	2.3 UJ	2.1 U	2 UJ	19 U	2.1 U
Toxaphene	ug/Kg	-	180 U	230 U	210 UJ	1100 U	230 UJ	210 U	200 UJ	1900 U	210 U
Aroclor-1016	ug/Kg	1000	35 U	44 U	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U	40 U
Aroclor-1221	ug/Kg	1000	72 U	89 U	84 UJ	450 U	92 UJ	82 U	81 UJ	740 U	82 U
Aroclor-1232	ug/Kg	1000	35 U	44 U	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U	40 U
Aroclor-1242	ug/Kg	1000	35 U	44 U	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U	40 U
Aroclor-1248	ug/Kg	1000	35 U	44 U	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U	40 U
Aroclor-1254	ug/Kg	1000	43	44 U	31 J	220 U	45 UJ	40 U	24 J	370 U	80
Aroclor-1260	ug/Kg	1000	35 U	44 U	41 UJ	220 U	45 UJ	40 U	40 UJ	370 U	40 U
Total Solids	%W/W	-	93	74.6	79.9	75.3	73	82	82.6	99	82.3



PARSONS
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CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
RI/FS PROJECT SCOPING PLAN
SEAD-66 PESTICIDE STORAGE AREA NEAR BLDS. 5 AND 6

DEPT. ENVIRONMENTAL ENGINEERING
DWG NO. 726511-02001

FIGURE 3-1
SAMPLE LOCATIONS FROM
LIMITED SAMPLING PROGRAM

SCALE 1"=100'
DATE APRIL 1996

GRAPHICS\SENECA\SEAD-66\SAMPLES.CDR

Memorandum (TAGM) values. Both of the exceedances occurred in one sample, SS66-8. In this sample, 4,4'-DDE and 4,4'-DDT were detected at concentrations of 8,700 ppb and 36,000 ppb, respectively. One (1) PCB compound, Aroclor-1254, was detected in four of the eight samples between 24 ppb and 80 ppb. All other concentrations in the samples were well below the NYSDEC TAGM of 1,000 ppb.

3.1.3 Data Summary and Conclusions

The Limited Sampling Program at SEAD-66 consisted of surface soil sampling. No previous sampling data were available for SEAD-66 prior to this sampling program. The results of the Limited Sampling Program at SEAD-66 were documented in the SWMU Classification Report (Parsons ES, 1994). This section will summarize the data collected to date and draw conclusions as to the likely environmental impacts those constituents have made to the site.

Sampling at SEAD-66 focused upon surface soil (0-2") impacts in the immediate vicinity of Buildings 5 and 6. This was based upon the premise that the principle source of the impacts in this area would be the soil in the areas where pesticides were suspected to have been stored. The locations where samples were collected are shown in Figure 3-1. The chemical analyses of the samples collected in the suspected storage areas indicate that surface soil has been impacted by pesticides and one PCB compound. The chemical analysis data is presented in Table 3-1. The principal pesticides detected above NYSDEC TAGM values were 4,4'-DDE and 4,4'-DDT. Elevated levels of a PCB compound were reported for some samples, but this compound was not present in any discernible pattern.

Based upon the results of the investigation conducted at SEAD-66, a threat to human health and the environment may exist due to the presence of pesticides in surface soil. The potential for impacts to surface water and sediment due to run-off and erosion is small due to the site topography and the immobility of pesticide compounds in soil. No information exists concerning the potential for volatilization of contaminants from soil to air or for infiltration of contaminants from soil to groundwater. Additional data is required to further evaluate these pathways in the overall evaluation of risks.

3.1.4 Environmental Fate of Constituents at SEAD-66

3.1.4.1 Pesticides

The potential contaminants of concern (PCOC) at SEAD-66 are pesticides and their environmental fate is discussed below. The Generic Installation RI/FS Workplan addresses all PCOCs, site-wide, as constituents of concern. The discussion below is meant to provide a wide range of fate and transport characteristics that will be further defined for the RI/FS report. A summary of fate and transport characteristics for the constituents of concern is presented in Table 3-2.

Table 3 - 2

Summary of Fate and Transport Parameters For Selected Organic Compounds

SEAD-66 Remedial Investigation
Seneca Army Depot Activity

COMPOUND	SOLUBILITY (mg/l)	VAPOR PRESSURE (mmHg)	HENRY'S LAW CONSTANT (atm-m³/mol)	Koc (ml/g)	Kow	HALF - LIFE (days)	BCF
Pesticides/PCBs							
beta-BHC	0.24	2.80E-07	4.47E-07	3.80E+03	7.94E+03		
gamma-BHC (Lindane)	7.8	0.00016	7.85E-06	1.08E+03	7.94E+03	Neg. Deg.	250
Heptachlor	0.18	0.0003	8.19E-04	1.20E-04	2.51E+04	Neg. Deg.	3600-37000
Aldrin	0.18	6.00E-06	1.60E-05	9.60E+04	2.00E+05	Neg. Deg.	3890-12260
Endosulfan I	0.16	0.00001	3.35E-05	2.03E+03	3.55E+03		
Heptachlor epoxide	0.35	0.0003	4.39E-04	2.20E+02	5.01E+02	Neg. Deg.	851-66000
Dieldrin	0.195	1.78E-07	4.58E-07	1.70E+03	3.16E+03	Neg. Deg.	3-10000
4,4'-DDE	0.04	6.50E-06	6.80E-05	4.40E+06	1.00E+07	Neg. Deg.	110000
Endrin	0.024	2.00E-07	4.17E-06	1.91E+04	2.18E+05	Neg. Deg.	1335-49000
Endosulfan II	0.07	0.00001	7.65E-05	2.22E+03	4.17E+03		
4,4'-DDD	0.16	2.00E-09	3.10E-05	2.40E+05	3.60E+05		
Endosulfan sulfate	0.16			2.33E+03	4.57E+03		
4,4'-DDT	0.005	5.50E-06	5.13E-04	2.43E+05	1.55E+06	Neg. Deg.	38642-110000
Endrin aldehyde							
alpha-Chlordane	0.56	0.00001	9.63E-06	1.40E+05	2.09E+03	Neg. Deg.	400-38000
Aroclor-1254	0.012	0.00008	2.70E-03	4.25E+04	1.07E+06	42	10E4-10E6
Aroclor-1260	0.0027	0.000041	7.10E-03	1.30E+06	1.38E+07	Neg. Deg.	10E4-10E6

Notes:
Koc = organic carbon partition coefficient
Kow = octanol-water partition coefficient
BCF = bioconcentration factor
Neg. Deg. = Negligible Biodegradation

References:
1. IRP Toxicology Guide
2. Basics of Pump-and-Treat Ground-Water Remediation Technology (EPA, 1990).
3. Handbook of Environmental Fate and Exposure Data (Howard, 1989).
4. Soil Chemistry of Hazardous Materials (Dragun, 1988)
5. Hazardous Waste Treatment, Storage, and Disposal Facilities, Air Emissions Models (EPA, 1989).
6. USATHAMA, 1985
7. Values for Koc not found were estimated by: logKoc = 0.544logKow + 1.377 (Dragun, 1988).

Chlordane

The following information was obtained from "Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Vol. III, Pesticides (ed. Philip H. Howard, Lewis Publishers, 1991).

Chlordane has been released in the past into the environment primarily from its application as an insecticide. Technical grade chlordane is a mixture of at least 50 compounds. If released to soil, chlordane may persist for long periods of time. Under field conditions, the mean degradation rate has been observed to range from 4.05-28.33%/yr with a mean half-life of 3.3 years. Chlordane is expected to be generally immobile or only slightly mobile in soil based on field tests, soil column leaching tests and estimated K_{OC} estimation; however, its detection in various ground waters in NJ and elsewhere indicates that movement to ground water can occur. Adsorption to sediment is expected to be a major fate process based on soil adsorption data, estimated Koc values (24,600-15,500), and extensive sediment monitoring data. The presence of chlordane in sediment core samples suggests that chlordane may be very persistent in the adsorbed state in the aquatic environment.

If released to water, chlordane is not expected to undergo significant hydrolysis, oxidation or direct photolysis. Sensitized photolysis in the water column may be possible, however. The observation that 85% of the chlordane originally present in a sealed glass jar under sunlight and artificial light in a river die-away test remained at the end of two weeks and persisted at that level through week 8 of the experiment; this indicates that chlordane will be very persistent in aquatic environments.

Although sufficient biodegradation data are not available, it has been suggested that chlordane is very slowly biotransformed in the environment which is consistent with the long persistence periods observed under field conditions. Bioconcentration is expected to be important based on experimental BCF values which are generally above 3,200.

If released to the atmosphere, it will be expected to be predominantly in the vapor phase. Chlordane will react in the vapor-phase with photochemically produced hydroxyl radicals at an estimated half-life rate of 6.2 hr suggesting that this reaction is the dominant chemical removal process. Soil volatility tests have found that chlordane can volatilize significantly from soil surfaces on which it has been sprayed, particularly moist soil surfaces; however, shallow incorporation into soil will greatly restrict volatile losses.

The detection of chlordane in remote atmospheres (Pacific and Atlantic Oceans; the Arctic) indicates that long range transport occurs. It has been estimated that 96% of the airborne reservoir of chlordane exists in the sorbed state which may explain why its long range transport is possible without chemical transformation. The detection of chlordane in rainwater and its observed dry deposition at various rural locations indicates that physical removal via wet and dry deposition occurs in the environment.

Lindane

The following information was obtained from "Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Vol. III, Pesticides (ed. Philip H. Howard, Lewis Publishers, 1991).

Lindane is used as an insecticide on hardwood logs and lumber, seeds, vegetables and fruits, woody ornamentals, hardwood forests, livestock and pets, and existing structures. When released to water, lindane is not expected to volatilize significantly. Lindane released to acidic or neutral water is not expected to hydrolyze significantly, but in basic water, significant hydrolysis may occur. At a pH of 9.3, the hydrolysis half-life of lindane in water was measured to be about 4 days (95 hr.). Transport to the sediment should be slow and result predominantly from diffusion rather than settling. Release of lindane to soil will most likely result in volatilization and slow leaching of lindane to ground water. Lindane in the atmosphere is likely to be subject to dry and wet deposition. The estimated half-life for the reaction of vapor phase lindane with atmospheric hydroxyl radicals is 2.3 days. Lindane may slowly biodegrade in aerobic media and will rapidly degrade under anaerobic conditions. Lindane has been reported to photodegrade in water in spite of the lack of a photoreactive center, but photolysis is not considered to be a major environmental fate process. Lindane will bioconcentrate slightly in fish. Monitoring data indicate that lindane is a contaminant in air, water, sediment, soil, fish and other aquatic organisms, wildlife, food, and humans. Human exposure result primarily from food.

Endosulfan

The following information was obtained from "Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Vol. III, Pesticides (ed. Philip H. Howard, Lewis Publishers, 1991).

Endosulfan is used as an insecticide against a variety of insects on a variety of crops. Technical endosulfan is composed of -endosulfan and -endosulfan. Release of endosulfan isomers to soil will most likely result in biodegradation and in hydrolysis, especially under alkaline conditions. Endosulfan isomers on the soil surface may photolyze. Volatilization and leaching are not expected to be significant due to the high estimated soil-sorption coefficients of the isomers. When release to water, endosulfan isomers are expected to hydrolyze readily under alkaline conditions, and more slowly at neutral and acidic pH values (half-lives=35.4 and 150.6 days for pH 7 and 5.5, respectively; half-lives=37.5 and 187.3 days for pH 7 and 5.5, respectively). Volatilization and biodegradation are also expected to be significant. Endosulfan released to the atmosphere will react with photochemically generated hydroxyl radicals with an estimated half-life of 1.23 hr. Bioconcentration of endosulfan is expected to be significant. Isomers of endosulfan are contaminants in air, water, sediment, soil, fish and other aquatic organisms, and food. Human exposure results primarily from food, and by occupational exposure.

DDT

The following information was obtained from "The Installation Restoration Program Toxicology Guide," Vol. III, Arthur D. Little, Inc. June 1987.

From 1946 to 1972, DDT was one of the most widely used agricultural insecticides in the world. During this time, DDT played an important role in many phases of agriculture and in the eradication of malaria, typhus and plague. As of January 1, 1973, all uses of DDT in the United States were cancelled with the exception of emergency public health however, it is still used extensively in some tropical countries.

DDT is expected to be highly immobile in the soil/groundwater environment when present at low dissolved concentrations. Bulk quantities of DDT dissolved in an organic solvent could be transported through the unsaturated zone as the result of a spill or improper disposal of excess formulations. However, the extremely low solubility of DDT and its strong tendency to sorb to soils results in a very slow transport rate in soils.

In general transport pathways can be assessed by using an equilibrium-partitioning models. These calculations predict the partitioning of low soil concentrations of DDT among soil particles, soil water, and soil air. Due to its strong tendency to sorb to soil, virtually all of the DDT partitions to the soil particles of unsaturated top soil, with negligible amounts associated with the soil water or air. Even in saturated deep soil, which is assumed to contain no soil air and a smaller organic carbon fraction, almost all of the DDT is retained on the soil.

DDT is characterized by a strong tendency to sorb to organic carbon. Researchers report an arithmetic mean K_{OC} of 670,200 for 17 reported values; the corresponding geometric mean was log $K_{OC} = 5.48$. As with all neutral organic chemicals, the extent of sorption is proportional to the soil organic carbon content. In soils with little organic carbon (e.g., clays) the extent of sorption may also depend upon soil properties such as surface area, cation exchange capacity and degree of hydration.

The apparent sorption of DDT to soils and sediments is lessened, and thus its mobility is enhanced by the presence of dissolved organic matter in solution. Investigators found the sorption of DDT to a natural freshwater sediment to be reduced by 75% in the presence of 6.95 mg/L of dissolved organic carbon (in the form of humic acid extracted from another sediment). The apparent water solubility of p,p'-DDT was found to be significantly enhanced (roughly 2-5 times) in the presence of 100 mg/L of humic and fulvic acids. (Sorption will decrease with increasing water solubility). The partitioning of p,p'-DDT between soil-derived humic acid and water was approximately 4 times greater than with soil fulvic acids and 5-7 times greater than with aquatic (freshwater) humic and fulvic acids. These findings indicated that the mobility of DDT in natural waters may be several times greater than predicted (though probably still small) when the effect of dissolved organic matter is present. In waters containing large concentrations of dissolved organic material, such as swamps and bogs, this may be especially important.

The vapor pressure of DDT at 25°C has been given as 2.6×10^{-10} atm with estimates of its Henry's law constant at 25°C ranging from 2.8×10^{-5} to 2.0×10^{-6} atm m^3/mol. Volatilization is expected to be an important loss process in aquatic environments with the half-life for DDT on the order of several hours to several days. The presence of sediment particles, which would adsorb DDT from solution, would significantly reduce volatilization losses.

In soils, volatilization is much slower. Using soil of 1.25% organic carbon to which DDT was applied uniformly to a depth of 1 cm at the rate of 1 kg/hectare, researchers calculated volatilization half-lives of 497 and 432 days when water evaporation rates were 0.0 and 5.0 mm/day, respectively. The corresponding figures when the same quantity of DDT was mixed to a depth of 10 cm were 2300 and 2069 days.

Similar results were obtained by Liechtenstein et al. who studied the persistence of technical DDT (84% p,p', 15% o,p') in agricultural loam soil with crops over a 15 year period. Calculated half-lives for both isomers fell between 4.0 and 4.7 years for DDT applied at 10 pounds/acre; somewhat longer half-lives were measured for applications of 100 pounds/acre. These half-lives should be taken as upper limits of the volatilization rate since other processes such as leaching and degradation contribute to the DDT loss.

In tropical soils, the loss of DDT has been found to be much more rapid. El Zorgani found a half-life of less than three weeks for DDT applied at an initial concentration of 6.65 ppm to the soil surface beneath a cotton crop in the Sudan. The loss of the o,p' isomer was several times greater than for the p,p' isomer; and insignificant fraction of the loss could be accounted for by conversion to p,p'-DDE. A half-life 110 days has been reported for DDT in Kenya where it was found to sublime directly into the atmosphere without conversion to DDE.

The rate at which DDT degrades in the soil/groundwater environment is dependent on the conditions under which it is present. The pH strongly affects the rate of aqueous hydrolysis. Over the pH range typical of natural waters (pH 5-9), Wolfe et al. found the pseudo-first-order rate constant (k_{obs}) at 27°C could be expressed as:

$$k_{obs} = 1.9 \times 10^{-9} + 9.9 \times 10^{-3} \ [OH-]$$

where k_{obs} is in s^{-1} and [OH-], the concentration of the hydroxide ion, is in moles/liter. Hydrolysis half-lives of roughly 81 days, 8 years and 12 years at pH 9, 7, and 5, respectively, result from the rate constant obtained from this equation. The hydrolysis product of p,p'-DDT is p,p'-DDE.

A photolysis half-life of 5 days was measured for DDT when it was present in natural water exposed to summer sunlight, although no photolysis was observed when the chemical was present in pure water. Again, p,p'-DDE is a degradation product. A similar half-life of 8 days was observed by other researchers for p,p'-DDT applied as a thin film (0.67 $\mu g/cm^2$) to glass plates and exposed to light of environmentally important wavelengths (maximum intensity at 300 nm). The degradation of DDT by ultraviolet light was found to be more effective when the DDT was present in humus-free soil than in soil containing humus.

DDT has been found to undergo a biotic, reductive dehalogenation to DDD in the presence of Fe(II) porphyrin. It has been suggested that the Fe(III) porphyrin, which results from the oxidation of the Fe(II) porphyrin in this process, is reconverted to the Fe(II) porphyrin in the presence of reduced organic material. Dehydrochlorination of DDT to DDE (removal of a hydrogen and chlorine atom to form a double bond) has also been observed in model systems containing reduced porphyrins and in the natural environment.

One study found the degradation of DDT to be little affected by pH but greatly affected by redox conditions. Under strongly reducing conditions (Eh = 150 mV), over 90% of the DDT was degraded within a few days. The authors note that this is an unusually rapid rate.

The half-life for the decomposition of DDT in aerobic soils has been reported to be in the range of 10-14 years compared to half-lives of 28-33 days in moist soils incubated under anaerobic conditions. DDE is the major degradation product in aerobic soil, and it is believed to be produced predominantly by chemical processes. Under anaerobic conditions DDD is the major metabolite.

The bacterial and fungal cometabolism of DDT has been observed in the laboratory and has been suggested to be potentially important in the field as well. In these reactions, bacteria which are not able to use DDT as their sole carbon source grow on non-chlorinated analogues of DDT, but degrade DDT in the process.

Information on the fate and transport parameters of DDT (i.e., solubility, vapor pressure, Henry's Law Constant, K_{oc}, K_{ow}, half-life and BCF) are provided in Table 3-1.

DDD

The following information was obtained from "The Installation Restoration Program Toxicology Guide," Vol. III, Arthur D. Little, Inc. June 1987.

DDD, no longer manufactured commercially, is still found as an impurity in the pesticide DDT and the miticide dicofol. It is also the major breakdown product of DDT under anaerobic conditions. The p,p' isomer of DDD is the third largest component of the technical DDT product after the two DDT isomers accounting for >4% of the mixture. It is present in somewhat lower concentrations in dicofol. In one study of several dicofol products, DDD was present in amounts ranging from 0.1 to 2.5% of the amount of dicofol.

Like DDT, DDD is expected to be highly immobile in the soil/groundwater environment when present at low dissolved concentrations. Bulk quantities of DDD dissolved in an organic solvent could be transported through the unsaturated zone as a result of a spill or the improper disposal of excess formulations. However, the extremely low solubility of DDD and its strong tendency to sorb to soil organic carbon results in a very slow transport rate in soils.

In general, transport pathways can be assessed by using an equilibrium partitioning models. These calculations predict the partitioning of low soil concentrations of DDD among soil particles, soil water, and soil air. Due to its strong sorption to soil, virtually all of the DDD partitions to the soil particles of unsaturated top soil and negligible amounts to the soil air or water. Even in saturated deep soil, which is assumed to contain no soil air, and a smaller organic carbon fraction, almost all of the DDD is retained on the soil.

DDD, like DDT, is characterized by a strong tendency to sorb to soil organic carbon. While only one measured K_{oc} value for DDD was found ($\log K_{oc} = 5.38$) it is consistent with the value obtained for DDT, as would be expected based on the similarity of their structures and their octanol water partition coefficients (DDD $\log K_{ow} = 5.56$). As with all neutral organic chemicals, the extent of DDD sorption is proportional to the soil organic carbon content. In soils with little organic carbon (e.g., clays) the extent of sorption may also depend upon such soil properties as surface area, cation exchange capacity, and degree of hydration.

The sorption of DDD to soils is lessened and thus its mobility is enhanced by the presence of dissolved organic matter in solution. The apparent solubility of DDT was increased several times in solutions containing humic and fulvic acids. Because the sorption behavior of DDD is expected to be much like that of DDT, its mobility in natural waters may be several times greater than predicted (though probably still small) if dissolved organic matter is present. In waters containing large concentrations of dissolved organic matter, such as swamps and bogs, this may be especially important.

The vapor pressures of the p,p' and o,p' - isomers of DDD at 30°C have been measured as 1.3×10^{-9} and 2.5×10^{-9} atm, respectively. The Henry's law constant estimated by use of the average vapor pressure of the two isomers and an aqueous solubility of 20 ppb is 3.1×10^{-5} atm m^3/mol. This value is almost identical to that for DDT and roughly an order of magnitude less than that for DDE.

Experimental evidence indicates that DDT volatilization from water occurs at about one-third the rate for DDT, which may seem at odds with the similar estimates for the Henry's law constants for these two compounds. Given the uncertainties involved in measuring both the aqueous solubilities and the vapor pressures of these compounds, from which H is estimated, the findings cannot be considered inconsistent. Using a factor of one-third for the difference in the rate of volatilization of DDD and DDT, a volatilization half-life for DDD ranging from a day to less than a month has been estimated.

Volatilization of DDD from soils can be expected to be much slower than from water because of the strong tendency of DDD to sorb to soil. Using wet river bed quartz sand in 15 mm deep petri dishes, researchers measured volatilization losses of p,p'-DDD (present initially at 10 ppm) that corresponded to a volatilization half-life of roughly 170 days, slightly more than twice that for p,p'-DDT under the same conditions. Because these experiments were conducted with a relatively thin layer of soil with a small organic carbon fraction, the actual volatilization rate of DDD in the field would be expected to be lower. If the relative volatilization rates of DDD and DDT in the field were the same as those observed by researchers the volatilization half-life of DDD from soil could be assumed to be double the value of one to several years for DDT.

Hydrolysis of DDD can be expected to be extremely slow under environmental conditions. Over the pH range typical of natural waters (pH 5-9), the pseudo-first-order rate constant (k_{obs}) at 27°C could be expressed as:

$$k_{obs} = 1.1 \times 10^{-10} + 1.4 \times 10^{-3} [OH-]$$

where k_{obs} is in s^{-1} and [OH-], the concentration of the hydroxide ion, in moles/liter. Hydrolysis half-lives of roughly 1.6, 88, and 190 years at pH 9, 7, and 5, respectively, correspond to the rate constant estimated from this equation. These estimates are consistent with the observations of Eichelberger and Lichtenberg that no DDD, initially present in river water at 20 ppb, degraded over an eight week period (within 2.5%).

No information was found on the photolysis of DDD in natural waters. Direct photolysis of DDD (i.e., in pure water) is believed to be slower than that for DDT which is estimated to have a half-life of over 150 years. However, DDT in natural water has been estimated to have a photolysis half-life of 5 days when exposed to sunlight in mid-June; DDD might be expected to have a similar half-life based on the similar structure of the two chemicals.

Data on the biodegradation of DDD are limited. In aquatic systems, biotransformation is believed to be slow, although a model ecosystem study has shown DDD to be more biodegradable than either DDT or DDE. The ketone analogue of DDD (i.e., p,p'-dichlorobenzophenone) has been suggested as the end product of the biodegradation of DDD in the environment. DDD undergoes dehydrochlorination to 2,2-bis-(p-chlorophenyl)-1-chloroethylene, reduction to 2,2-bis-(p-chlorophenyl)-1-chlorethane, dehydrochlorination to 2,2-bis-(p-chlorophenyl)-ethylene, reduction to 1,1-bis-(p-chlorophenyl)-ethane and eventual oxidation to bis-(p-chlorophenyl)-acetic acid (DDA), the ultimate excretory product of higher animals. DDD has also been observed to degrade in anaerobic sewage sludge.

The above discussion of fate pathways suggests that DDD is moderately volatile, very strongly sorbed to soil, and has a high potential for bioaccumulation. Information on the fate and transport parameters (i.e., solubility, vapor pressure, Henry's Law Constant, K_{OC}, K_{OW}, half-life and BCF) are provided in Table 3-1.

DDE

The following information was obtained from "The Installation Restoration Program Toxicology Guide," Vol. III, Arthur D. Little, Inc. June 1987.

The presence of DDE in the environment is primarily the result of the use of the insecticide DDT and the miticide dicofol. DDE is the principal degradation product of DDT under aerobic conditions, and it has been found to equal roughly 1-3% of the weight of dicofol in the technical mixture. Like DDT, DDE exists as both an o,p' and a p,p' isomer, with the o,p' and the p,p' isomers of DDT degrading to the respective DDE isomer. Because technical DDT consists of 65-80% p,p' - DDT and 15-21% o,p' - DDT, the p,p' - DDE isomer might be expected to predominate in the environment. In dicofol, however, the o,p' isomer typically makes up 80-90% of the DDE present. The two isomers of DDE are considered individually below where data are available.

Like DDT, DDE is expected to be highly immobile in the soil/groundwater environment when present at low dissolved concentrations. Bulk quantities of DDE dissolved in an organic solvent (e.g., as a contaminant in dicofol) could be transported through the unsaturated zone as a result of a spill or improper disposal of excess formulations. However, the extremely low solubility of DDE and its strong tendency to sorb to soils would result in a very slow transport rate in soils.

In general, transport pathways can be assessed by using an equilibrium partitioning model. These calculations predict the partitioning of low soil concentrations of DDE among soil particles, soil water and soil air. Due to its strong tendency to sorb to soil, virtually all of the DDE partitions to the soil particles of unsaturated topsoil, with negligible amounts associated with the soil water or air. Even in saturated deep soil, which is assumed to contain no soil air and a smaller organic carbon fraction, almost all of the DDE is retained on the soil.

DDE is characterized by a strong tendency to sorb to organic matter in soils and in sediments. Only one value, log K_{OC} = 5.17 was found in the literature for the soil organic carbon partition coefficient. A log K_{OC} value of roughly 5 has been suggested based on log K_{OW} measurements of 5.69 for the p,p' isomer and 5.78 for the o,p' isomer. Using the geometric mean of these K_{OW} values and a regression equation, a log K_{OC} value of 5.41 is estimated. As with all neutral organic chemicals, the extent of sorption is proportional to the soil organic carbon content. In soils with little organic carbon (e.g., clays), the extent of sorption may also depend upon soil properties such as surface area, cation exchange capacity, and degree of hydration.

The apparent sorption of DDE to soils and sediments (like that of DDT), is lessened, and thus its mobility is enhanced by the presence of dissolved organic matter. DDT concentrations were found to be higher in aqueous solutions containing humic and fulvic acids. Because the sorption behavior of DDE is expected to be much like that of DDT, its mobility in natural waters may be several times greater than predicted (though probably still small) if dissolved organic matter is present. In waters containing large concentrations of dissolved organic matter such as swamps and bogs, this may be especially important.

The vapor pressure of p,p'- isomer of DDE at 20°C has been given as 8.7×10^{-9} atm and that of the o,p' isomer as 8.2×10^{-9} atm. A somewhat lower value of roughly eight times the vapor pressure of DDT has been suggested. Using the average vapor pressures for the two isomers to estimate the Henry's law constant, a value of 1.9×10^{-4} atm m^3/mol is obtained.

This estimate is roughly an order of magnitude larger than the Henry's law constant for DDT. Because volatilization losses for DDT are expected to be important, the same is also true for DDE. DDE has been found to volatilize from distilled and natural waters five times faster than DDT. Since the volatilization half-life for DDT has been reported to range from several hours to several days (see Section 57.2.1.3) proportionately shorter half-lives would be expected for DDE.

In soils, volatilization of DDE is much slower. Using wet river bed, quartz sand in 15 mm deep petri dishes, researchers measured volatilization losses of p,p'-DDE (present initially at 10 ppm) that corresponded to a half-life of roughly 40 days. This value may be more indicative of an upper limit of the volatilization rate because soils of higher organic matter content would tend to sorb more of the DDE, and the rate of volatilization would be expected to be lower from thicker layers of soil. In the same study and under the same conditions, the o,p' isomer of DDT took 50% longer to reach half its initial concentration; p,p'-DDT took twice as long. This suggests that the volatilization of DDE in the field may occur at a rate somewhat greater than that for DDT, which has been found to have a volatilization half-life of one to several years. The observation that the volatilization rate of DDE from soil is not several times the rate for DDT, given that it has an order of magnitude larger Henry's law constant, may be explained by its strong sorption to soil, which tends to impede volatilization.

DDE is the hydrolysis product of DDT and is quite resistant to further hydrolysis. A hydrolysis half-life of over 120 years at pH 5 and 27°C has been given. Thus, hydrolysis is not expected to be an environmentally significant process.

Several studies have examined the aqueous photolysis of DDE. One study found that DDE in the aqueous phase of sediment suspensions exposed to ultraviolet light of wavelength > 300 nm had a half-life of roughly 13 to 17 hours. Under the same conditions, DDE equilibrated with sediment for 60 days (i.e., sorbed to the sediment) photodegraded much more slowly. To reach 25% of its initial concentration, roughly seven half-lives were needed instead of the expected two, and little further degradation occurred. The authors suggested that over time, part of the DDE diffused into the sediment particles and became unavailable for photolysis. Another study found the thin film photodegradation rate of p,p'-DDE to be about 90% of that for p,p'-DDT, and the half-life of DDE in aquatic systems at 40°N latitude has been estimated to range from one day in summer to six days in winter. These findings suggest that photolysis of DDE may be an important loss process, as it is for DDT. However, for photolysis to occur, the chemical must be exposed to sunlight, which often is not the case for a large fraction of the amount sorbed to soils or deep sediments.

The biological degradation of DDE in aquatic environments is believed to occur very slowly if at all. In modeling the fate of DDE in a quarry, researchers considered biodegradation to be insignificant compared to loss by photolysis and volatilization. The half-life for biodegradation in sediments has also been found to be extremely slow. Using radiolabeled p,p'-DDE mixed with river sediment, other researchers measured a half-life of 1100 days based on the evolution of CO_2. In short, photolysis appears to be the only degradation process that affects DDE significantly under environmental conditions.

Information on the fate and transport parameters (i.e., solubility, vapor pressure, Henry's Law Constant, K_{oc}, K_{ow}, half-life and BCF) are provided in Table 3-1.

3.1.4.2 PCBs

Aroclor® PCBs 1016, 1242, 1254, 1260

The following information was obtained from "The Installation Restoration Program Toxicology Guide", Vol. II, Arthur D. Little, Inc., June 1987.

This section encompasses a general review of the environmental fate of polychlorinated biphenyl (PCBs) mixtures marketed in the U.S. under the name Aroclor® (Aroclor® 1016, 1242, 1254, and 1260).

Aroclor® compounds are very inert, thermally and chemically stable compounds with dielectric properties. They have been used in nominally closed systems as heat transfer liquids, hydraulic fluids and lubricants, and in open-ended systems in which they came in direct contact with the environment as plasticizers, surface coatings, inks, adhesives, pesticide extenders and for microencapsulation of dyes for carbonless duplicating paper. In 1974, use of PCBs in the United States was limited to closed systems, i.e., approximately 70% of PCBs produced were used in capacitors while the remaining 30% were utilized in transformers.

The environmental behavior of the Aroclor® mixtures is a direct function of their relative composition with respect to the individual chlorinated biphenyl species. It is important to remember that Aroclor® formulations are mixtures and the physical properties and chemical behavior of mixtures cannot be precisely defined. The individual PCBs in a pure state are generally solids at room temperature; however, due to melting point depression, Aroclor® mixtures are oily to resinous liquids at ambient temperatures.

Individual PCBs vary widely in their physical and chemical properties according to the degree of chlorination and position of the chlorines on the biphenyl structure. In general, as chlorine content increases, adsorption increases while transport and transformation processes decrease. Except for Aroclor® 1016, the last two digits in the Aroclor® number identification denote the approximate chlorine content by weight percent. The specific PCB distribution measured in environmental samples may be distorted and may not correspond to the specific Aroclor® mixture responsible for the contamination. For this reason, most of the fate and transport discussion will focus on the chlorinated biphenyl species rather than the Aroclor® mixtures.

In general, transport pathways can be assessed by using an equilibrium partitioning model. These calculations predict the partitioning of low soil concentrations of the PCB mixtures among soil particles, soil water and soil air; portions associated with the water and air phases of the soil have higher mobility than the adsorbed portion. Estimates for the unsaturated topsoil model indicate that almost all (>99.99%) of the Aroclor® formulations are expected to be associated with the stationary phase. Much less than 1% is expected to partition to the soil-water phase; therefore, only a small portion would be available to migrate by bulk transport (e.g., the downward movement of infiltrating water), dispersion and diffusion. An insignificant portion of the Aroclor® formulations is expected in the gaseous phase of the soil; diffusion of vapors through the soil-air pores up to the ground surface is not expected to be important. In saturated, deep soils (containing no soil air and negligible soil organic carbon), sorption is still expected to be the most significant fate process. Overall, groundwater underlying PCB-contaminated soils is not expected to be vulnerable to contamination.

Adsorption to soils and sediments is the major fate process affecting PCBs in the environment. PCB sorption has been studied and reviewed in a number of reports. In general, the rate of adsorption by soil materials was found to be rapid and conformed to the Freundich adsorption equation; adsorption capacity was highly correlated with organic content, surface area, and clay content of the soil materials; PCBs were reported to be unable to penetrate into the inner surfaces of clay materials. Desorption of sorbed PCB is not expected to be rapid.

Distribution coefficients for PCBs on suspended solids in Saginaw Bay have been reported to range from 4 x 10^4 to 9 x 10^4. In general, higher chlorinated isomers are more strongly sorbed; however, preferential adsorption is also dependent on ring position of the substituted chlorine; values for K_{oc} range from approximately 10^5 for dichlorobiphenyl to 10^9 for octachlorobiphenyl.

Experimental studies on the mobility of Aroclor® 1242 and 1254 in soil materials indicate that these PCBs were adsorbed strongly and remained immobile when leached with water or aqueous leachate from a waste disposal site. However, they were found to be highly mobile when leached with carbon tetrachloride. The mobilities of the PCBs were highly correlated with their solubilities in the leaching solvent and the organic content of the soil material. It should be noted that even with carbon tetrachloride, a high percentage of the PCBs were retained on the soil while some moved with the solvent front.

Additional studies were performed using different solvents and varying amounts of water. Relatively small amounts of water (9%) in methanol were shown to significantly reduce the mobility of PCBs compared to the mobility in the pure solvent.

In summary, the available data indicate that sorption of PCBs, particularly the higher chlorinated biphenyls onto soil materials, will be rapid and strong. In the absence of organic solvents, leaching is not expected to be important, and PCBs are expected to be immobile in the soil/groundwater system; PCBs will be much more mobile in the presence of organic solvents. In the case of large spills of PCB/solvent mixtures, the soil and aqueous phases may become saturated resulting in a separate oily phase which may be more mobile.

Transport of PCB vapors through the air-filled pores of unsaturated soils is not expected to be a rapid transport pathway. Modeling results indicate that a very small fraction of PCB loading will be present in the soil-air phase. On the other hand, volatilization (mostly from aqueous systems) and atmospheric transport are thought to account for the widespread, almost ubiquitous, distribution of PCBs in the environment. Several studies have shown that vapor phase transport can be a significant process for loss of PCBs from water bodies. Adsorption to organic matter, however, has been shown to compete strongly with volatilization. Adsorption onto suspended sediment has been presented as an explanation for the lower rates of volatilization exhibited for natural water bodies compared to estimated rates. Volatilization from soil was reported to be slow compared to volatilization from sand or PCB solution.

Calculated half-lives for the volatilization of Aroclor® 1242, 1248, 1254, and 1260 from 1 mm water column have been reported to range from 9.5 hours to 12.1 hours; other authors have reported half-lives on the order of 3-4 hours for di- and tetrachlorobiphenyls. Volatilization of

Aroclor® 1260 from river water was reported to be only 67% after 12 weeks; after addition of sediment, the loss dropped to 34% after 12 weeks. The Henry's law constants and volatilization half-lives do not vary widely with degree of chlorination of the PCBs.

The available data indicate that due to low water solubility, volatilization of water-borne PCBs not sorbed to sediment or suspended solids may be significant; when sorbed to soils/sediments, volatilization will be drastically reduced. However, since other fate and transport processes in the soil environment are relatively slow, volatilization of PCBs sorbed on surface soils may occur. Elevated airborne concentrations of PCBs have been measured near PCB disposal area.

PCBs have been reported to be strongly resistant to chemical degradation by oxidation or hydrolysis. However, they have been shown to be susceptible to photolytic and biological degradation. Baxter and Sutherland have shown that successive biochemical and photochemical processes contribute to the degradation of PCBs in the environment. Experimental results indicate that the highly chlorinated PCBs can be photolytically degraded, resulting in the formation of lower chlorinated species and substituted products, as well as potential formation of biphenylenes and chlorinated dibenzofurans; the presence of oxygen retards the photolytic degradation of PCBs.

There is some doubt as to the applicability of these photolysis experiments to environmental conditions, since they were generally carried out in organic solvents, often in the presence of other additives. However, since the rate of photolytic dechlorination is greatest for the highly chlorinated species (i.e., those species that are most resistant to biodegradation), photolytic degradation, although slow, may be a significant transformation process for these molecules. Furthermore, since they are rapidly adsorbed to soils, these highly chlorinated PCBs may be concentrated in the surface layers and their actual photolysis rates may be higher than expected.

Microbial degradation has been reported to be an important transformation process for PCBs. In general, the lower chlorinated PCBs were more easily degraded than the higher chlorinated species. Position of chlorine substitution on the biphenyl molecule also affected the rate of PCB degradation. Biodegradability of PCBs has been reported to be a function of the number of carbon-hydrogen bonds available for hydroxylation by microbial oxidation; adjacent unchlorinated carbons have been shown to facilitate metabolism through formation of arene oxide intermediates. Both aerobic oxidative biodegradation and anaerobic dechlorination have been identified as PCB transformation processes in Hudson River sediments. Composting studies indicate that aerobic systems exhibited greater PCB reductions than anaerobic systems (42 to 48% vs. 18 to 28% reduction after two weeks).

The biodegradation of Aroclor® 1016, 1242, 1254, and 1260 is a function of their relative content of the lower chlorinated biphenyls. Aroclor® 1016 and 1242 are largely comprised of di-, tri- and tetra-chloro biphenyls, which have been shown to be biodegraded in microbial cultures, aquatic systems, and soils at fairly rapid rates. Aroclor® 1254 and 1260 are largely comprised of higher chlorinated species and are expected to be resistant to biodegradation. In fact, Liu reported that an increase of chlorination from monochlorobiphenyls to predominantly trichlorobiphenyls (Aroclor® 1016 and 1242) and pentachlorobiphenyls (Aroclor® 1254) resulted in a corresponding decrease in degradation from 100% to 29% and 19%, respectively; similar results were reported by other authors. In an experiment with reservoir sediment, Aroclor® 1254 was degraded approximately 50% in six weeks. Using an acclimated semi-continuous activated sludge experiment with 48-hour exposure, degradation rates of 33%, 26% and 19% were determined for Aroclor® 1016, 1242, and 1254, respectively.

A study of the fate of Aroclor® 1254 in soil and groundwater after an accidental spill showed essentially no reduction in Aroclor® 1254 concentration due to biodegradation after two years. On the other hand, other authors reported moderate biodegradation of Aroclor® 1254 in soils (40% degraded in 112 days) and no degradation of Aroclor® 1260 (primarily hexa- and hepta-chlorobiphenyls). The presence of the lower chlorinated biphenyls has been shown to actually increase the rate of biodegradation of the higher PCBs through co-metabolism.

In summary, most studies have reported substantial PCB degradation in aqueous solutions; biodegradation rates are greatest for the lower chlorinated species. While adsorption of PCBs by soil and competition by native soil organisms may alter the degradation rate, several authors have reported substantial PCB degradation in soil systems. Mixed cultures of PCB-degrading microbes have been isolated from PCB-contaminated soils, suggesting that PCBs will be degraded to some extent in the environment.

3.2 PRELIMINARY IDENTIFICATION OF POTENTIAL RECEPTORS AND EXPOSURE SCENARIOS

This section will identify the source areas, release mechanisms, potential exposure pathways and the likely human and environmental receptors at SEAD-66 based upon the results of their conceptual site models, which were described in the previous section.

This section discusses the current understanding of site risks for SEAD-66 based upon the data gathered from the Limited Sampling Program. This information is used to assess whether sources of contamination, release mechanisms, exposure routes and receptor pathways developed in the conceptual site model for SEAD-66 are valid or if they may be eliminated from further consideration prior to conducting a risk assessment. Additionally, this information will determine what data are necessary to develop a better conceptual understanding of the site, in order that risk to human health and the environment can be determined, Applicable or Relevant and Appropriate Requirements (ARARs) can be defined and appropriate remedial actions can be developed.

3.2.1 Potential Source Areas and Release Mechanisms

Based upon historical knowledge, the primary contaminant source area for SEAD-66 would be soil impacted by pesticides or PCBs resulting from spills during the handling of pesticides. Potential release mechanisms from these source areas are runoff and erosion to surface water and sediment.

3.2.2 Potential Exposure Pathways and Receptors - Current Uses

The potential exposure pathways from sources to receptors based upon current use scenarios are shown in Figure 3-2. The potential for human exposure is directly affected by the accessibility to the site. Since SEAD-66 is within the Ammunition Storage Area, access is restricted.

There are two primary receptor populations for potential releases of contaminants from SEAD-66:

- Current site workers, and
- Terrestrial biota on or near the site.

The exposure pathways and media of exposure are described below as they may affect the potential receptors.

The numerical assumptions that will be used in the risk assessment for the current uses exposure scenario are listed in Table 4-1 of the generic installation RI/FS workplan.

3.2.2.1 Ingestion and Dermal Exposure Due to Surface Water and Sediment

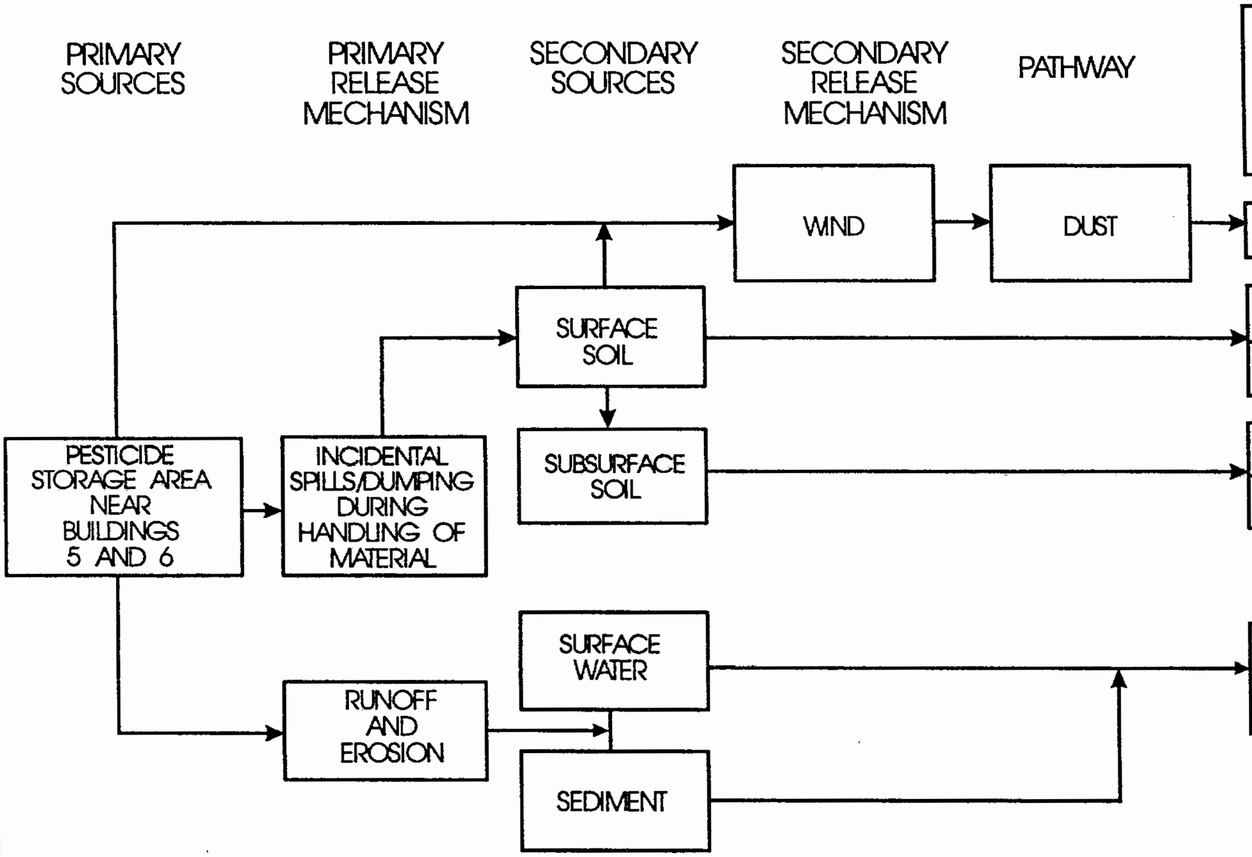
Surface water run-off is defined by the roadside drainage ditches at SEAD-66. The potential receptors of surface water and sediment by way of ingestion or dermal contact would be current site workers, and terrestrial biota.

3.2.2.2 Dust Inhalation

Dust may be released from SEAD-66 due to high wind, vehicle traffic through the area, or disturbance of the soil during site use. The receptors of dust by way of inhalation would be current site workers, and terrestrial biota.

3.2.2.3 Incidental Soil Ingestion and Dermal Contact

Incidental ingestion of and dermal contact with soil is a potential exposure pathway for current site workers, and terrestrial biota.



EXPOSURE ROUTE	RECEPTOR					
	HUMAN				BIOTA	
	FUTURE INDUSTRIAL WORKER	FUTURE CONSTRUCTION WORKER	FUTURE TRESSPASSER	CURRENT SITE WORKERS	TERRESTRIAL	AQUATIC
INHALATION	●	●	●	●	●	NA
INGESTION	●	●	●	●	●	NA
DERMAL CONTACT	●	●	●	●	●	NA
INGESTION	NA	●	NA	NA	●	NA
DERMAL CONTACT	NA	●	NA	NA	●	NA
INGESTION	NA	NA	●	NA	●	NA
DERMAL CONTACT	NA	NA	●	NA	●	NA

● PATHWAY CONSIDERED TO POSE POTENTIAL RISK

NA NOT APPLICABLE RECEPTOR

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD-66 PESTICIDE STORAGE AREA
NEAR BUILDINGS 5 AND 6

DEPT. ENVIRONMENTAL ENGINEERING

DWG NO. 726510-02001

FIGURE 3-2
EXPOSURE PATHWAY SUMMARY

SCALE NA

DATE DECEMBER 1996

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3.2.2.4 Ingestion of Groundwater

The groundwater at SEAD-66 is not used as a drinking water source. It is not anticipated that there will be direct exposure to the groundwater from the site under current uses to current site workers, visitors or terrestrial biota.

3.2.3 Potential Exposure Pathways and Receptors - Future Uses

On the basis of information contained in the Local Redevelopment Authority proposed land use for the Seneca Army Depot Activity, SEAD-66 is located within the area designated as industrial and the future exposure scenarios will be based on evaluating scenarios consistent with such land use.

The potential exposure pathways from sources to receptors based upon future use scenarios are shown in Figure 3-2. The potential for human exposure is directly affected by the accessibility to the site. Since SEAD-66 is within the Ammunition Storage Area, access is restricted.

There are four primary receptor populations for potential releases of contaminants from SEAD-66 that are consistent with the industrial designation. These include the following:

- Future industrial workers,
- Future construction workers,
- Future trespasser, and
- Terrestrial biota on or near the site.

The numerical assumptions that will be used in the risk assessment for the future uses exposure scenario are listed in Table 4-1 of the Generic Installation RI/FS Workplan.

3.3 SCOPING OF POTENTIAL REMEDIAL ACTION ALTERNATIVES

Remedial action alternatives for SEAD-66 will be formed during the FS process from the general response actions and process options for each medium or operable unit. Depending on the site, two categories of alternatives will be assembled; the two categories are designated as source control and migration control. A number of remedial action alternatives, which are available for the treatment of soils impacted by pesticides and PCBs at the site, will be considered during the development of remedial action alternatives. They include the following technologies:

- land treatment;
- off-site disposal;
- soil washing;
- low temperature thermal desorption; and
- composting.

Section 3.3.2 of the Generic RI/FS Workplan provides a description of each type of technology.

A comprehensive list of remedial response action alternatives as they pertain to SEDA is provided in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

3.4 PRELIMINARY IDENTIFICATION OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)

Identification and refinement of ARARs will be performed during the RI/FS process. As additional data is collected regarding the nature and extent of contamination, site specific conditions, and potential use of various remedial technologies, additional ARARs will be selected and existing ARARs will be reviewed for their applicability. These data will be reported in the SEAD-66 RI/FS Report.

A preliminary identification of ARARs has been performed based upon the initial site characterization data compiled by the Army. The following federal and state regulatory requirements are potentially applicable or relevant and appropriate to SEAD-66.

3.4.1 Sources Of Chemical-Specific Arars

Federal:

- Resource Conservation and Recovery Act (RCRA), Groundwater Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F)
- Clean Water Act, Water Quality Criteria (Section 304) (May 1, 1987 - Gold Book)
- Safe Drinking Water Act, Maximum Contaminant Levels (MCLs) (40 CFR 141.11-.16)

New York State:

- New York State Codes, Rules and Regulations (NYCRR) Title 6, Chapter X
- New York Groundwater Quality Standards (6 NYCRR 703)
- New York Safe Drinking Water Act, Maximum Contaminant Levels (MCLs) (10 NYCRR 5)
- New York Surface Water Quality Standards (6 NYCRR 702)
- New York State Raw Water Quality Standards (10 NYCRR 170.4)
- New York RCRA Groundwater Protection Standards (6 NYCRR 373-2.6 (e))

- New York State Department of Environmental Conservation, Division of Water, Technical and Operational Guidance Series (1.1.1), Ambient Water Quality Standards and Guidance Values, November 15, 1990
- Surface Water and Groundwater Classifications and Standards (6 NYCRR 700-705)
- Declaration of Policy, Article 1 Environmental Conservation Law (ECL)
- General Functions, Powers, Duties and Jurisdiction, Article 3 Environmental Conservation Law, Department of Environmental Conservation
- ECL, Protection of Water, Article 15, Title 5.
- Use and Protection of Waters, (6 NYCRR, Part 608)

3.4.2 Sources Of Location-Specific Arars

Federal:

- Executive Orders on Floodplain Management and Wetlands Protection (CERCLA Floodplain and Wetlands Assessments) #11988 and 11990
- National Historic Preservation Act (16 USC 470) Section 106 et seq. (36 CFR 800) (Requires Federal agencies to identify all affected properties on or eligible for the National Register of Historic Places and consult with the State Historic Preservation Office and Advisory Council on Historic Presentation)
- RCRA Location Requirements for 100-year Floodplains (40 CFR 264.18(b)).
- Clean Water Act, Section 404, and Rivers and Harbor Act, Section 10, Requirements for Dredge and Fill Activities (40 CFR 230)
- Wetlands Construction and Management Procedures (40 CFR 6, Appendix A).
- USDA/SCS - Farmland Protection Policy (7CFR 658)
- USDA Secretary's memorandum No. 1827, Supplement 1, Statement of Prime Farmland, and Forest Land - June 21, 1976.
- EPA Statement of Policy to Protect Environmentally Significant Agricultural Lands - September 8, 178.

- Farmland Protection Policy Act of 1981 (FPPA)(7 USC 4201 et se q).
- Endangered Species Act (16 USC 1531).
- Wilderness Act (16 USC 1131).

New York State:

- New York State Freshwater Wetlands Law (ECL Article 24, 71 in Title 23).
- New York State Freshwater Wetlands Permit Requirements and Classification (6 NYCRR 663 and 664).
- New York State Floodplain Management Act and Regulations (ECL Article 36 and 6 NYCRR 500).
- Endangered and Threatened Species of Fish and Wildlife Requirements (6 NYCRR 182).
- New York State Flood Hazard Area Construction Standards.

3.4.3 Sources Of Action-Specific Arars

Federal:

- RCRA Subtitle C Hazardous Waste Treatment Facility Design and Operating Standards for Treatment and Disposal systems, (i.e., landfill, incinerators, tanks, containers, etc.) (40 CFR 264 and 265); Minimum Technology Requirements.
- RCRA, Subtitle C, Closure and Post-Closure Standards (40 CFR 264, Subpart G).
- RCRA Groundwater Monitoring and Protection Standards (40 CFR, Subpart F).
- RCRA Generator Requirements for Manifesting Waste for Offsite Disposal (40 CFR 262).
- RCRA Transporter Requirements for Off-Site Disposal (40 CFR 263).
- RCRA, Subtitle D, Non-Hazardous Waste Management Standards (40 CFR 257).
- Safe Drinking Water Act, Underground Injection Control Requirements (40 CFR 144 and 146).

- RCRA Land Disposal Restrictions (40 CFR 268) (On and off-site disposal of excavated soil).
- Clean Water Act, - NPDES Permitting Requirements for Discharge of Treatment System Effluent (40 CFR 122-125).
- Effluent Guidelines for Organic Chemicals, Plastics and Resins (Discharge Limits) (40 CFR 414).
- Clean Water Act Discharge to Publicly - Owned Treatment Works (POTW) (40 CFR 403).
- DOT Rules for Hazardous Materials Transport (49 CFR 107, 171.1-171.500).
- Occupational Safety and Health Standards for Hazardous Responses and General Construction Activities (29 CFR 1904, 1910, 1926).
- SARA (42 USC 9601)
- OSHA (29 CFR 1910.120)
- Clean Air Act (40 CFR 50.61)

New York State:

- New York State Pollution Discharge Elimination System (SPDES) Requirements (Standards for Stormwater Runoff, Surfacewater, and Groundwater discharges (6 NYCRR 750-757).
- New York State RCRA Standards for the Design and Operation of Hazardous Waste Treatment Facilities (i.e., landfills, incinerators, tanks, containers, etc.); Minimum Technology Requirements (6 NYCRR 370-373).
- New York State RCRA Closure and Post-Closure Standards (Clean Closure and Waste-in-Place Closures) (6 NYCRR 372).
- New York State Solid Waste Management Requirements and Siting Restrictions (6 NYCRR 360-361), and revisions/enhancements effective October 9, 1993.
- New York State RCRA Generator and Transporter Requirements for Manifesting Waste for Off-Site Disposal (6 NYCRR 364 and 372).

3.5 DATA QUALITY OBJECTIVES (DQOs)

The RI/FS process requires decisions regarding future site remedial actions, including whether or not any actions are required. These decisions will be based upon the data collected during the SEAD-66 RI. Consequently, the collected data must be of sufficient quantity and quality to support this decision-making process. Data Quality Objectives (DQO)s are the portion of the RI/FS which consider issues related to data quality and quantity. As the name implies, DQOs establish objectives and requirements for data collection which, if reasonably met, will assure that the collected data is valid for its intended use.

Since the intended use of the data is to support several decisions for the RI/FS process, the first step in establishing DQOs is to identify these decisions. Once the decisions, which the collected data will support, have been identified, the levels of data quality can be specified. The sampling program and the analytical techniques to be employed must be consistent with the required levels of data quality. For the site described in this Scoping Plan these decisions have been identified and include the following:

- Determining the nature and extent of current environmental impacts;
- Monitoring for health and safety;
- Assessing the risk to human health and the environment;
- Selecting appropriate remedial alternatives;
- Designing remedial actions, if necessary;
- Determining background levels of constituents of concern; and
- Determining regulatory compliance with ARARs.

USEPA has indicated that at a minimum, Level 3 quality data should be collected to support many of the decisions to be made at these sites, such as Risk Assessment. However, in order to meet the requirements of New York State, samples for metals in soils/sediments and surface water/groundwater will be collected and analyzed according to NYSDEC CLP protocols and the data reported as Level 4. Specifying Level 4 quality data will assure that the data collected in this program is of sufficient quality for the intended use.

Level 4 data will be generated by analyses performed in the Contract laboratory Program (CLP). Routine Analytical Services (RAS) will be performed according to methods established by the USEPA and the CLP Statement of Work (SOW). The New York State Department of Environmental Conservation (NYSDEC) has also established CLP Protocols for routine analyses with requirements that are considered equivalent to the USEPA requirements for Level 4 data. Level 4 analyses are characterized by rigorous QA/QC requirements defined in the SOW. The data package submittal from the laboratory contains all the raw data generated in the analyses, including mass spectral identification charts, mass spectral tuning data, spike recoveries laboratory duplicate results, method blank results, instrument calibration, and holding times documentation.

Level 1 data, defined as field screening data, will be collected during soil boring operations. Precision and accuracy for Level 1 data has not been established by USEPA. The intended use of this information is for health and safety monitoring and to assist in the optimization of sampling locations. Data can be generated regarding the presence or absence of certain contaminants (especially volatile organic compounds, VOCs), at sampling locations. For these sites, the soils obtained from the split-spoon sampler will be screened for the presence of volatile organics using a hand-held instrument equipped with a Photoionization Detector (PID). The occurrence of high readings, above normal background levels, from a sampling location will provide a qualitative indication that volatiles are present and, therefore, samples collected from this location should be subjected to more rigorous analytical techniques.

Level 2, which will not be collected during the sampling program at SEAD-66, includes analyses using analytical instruments at the site or at the laboratory, but it does not involve the extensive QA/QC processes that are performed for a higher level of data quality (i.e., Level IV). Depending upon the types of contaminants, sample matrices, and personnel skills, reliable qualitative and quantitative data can be obtained.

Further discussion of the DQOs as they pertain to SEDA is presented in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

3.6 DATA GAPS AND DATA NEEDS

The Limited Sampling Program at SEAD-66 was conducted to gain a preliminary understanding of the nature and extent of pesticide impacts at the site. These data were used to evaluate the potential for risks to human health and the environment. The results of the investigation at SEAD-66 were used to develop a conceptual site model identifying potential source areas, release mechanisms and receptor pathways.

The data needs for SEAD-66 are a result of the need to meet the DQOs identified in the Generic Installation RI/FS Workplan. By media, these needs are:

3.6.1 Groundwater Data

- Install and sample overburden monitoring wells in the till/weathered shale aquifer.
- Determine whether groundwater has been impacted by constituents on-site and establish concentrations in aquifer with collected data.

- In addition to assessing the ground water quality, determine hydrologic properties of the aquifer (such as hydraulic conductivity) to assess contaminant migration and potential remedial actions.
- Establish database to determine compliance with ARARs, to perform baseline risk assessment and to develop remedial action alternatives.

3.6.2 Surface Water/Sediment Data

- Establish potential for contamination of off-site surface water and sediment.
- Compare SEAD-66 sediment data with site-wide sediment background data compiled from the ESIs performed at 25 SEADs and RIs performed at the OB Grounds and the Ash Landfill.
- Assess the sorptive potential of the sediment by performing total organic carbon (TOC) and grain size analysis on sediment samples.
- Establish database to determine compliance with ARARs, to perform baseline risk assessment and to develop remedial action alternatives.

3.6.3 Soil Data

- Verify surface soil sampling results from the Limited Sampling Program.
- Determine the nature and extent of contamination across the site. Collect samples for risk evaluation.
- Compare SEAD-66 soil data to site-wide soil background data that has been compiled from 57 samples obtained from the ESIs performed at 25 SEADs and RIs performed at the OB Grounds and the Ash Landfill.
- Establish potential for soil contamination to infiltrate groundwater.
- Assess the sorptive potential of the soil by performing TOC and grain size analysis on soil samples.
- Establish database to determine compliance with ARARs, to perform baseline risk assessment and to develop remedial action alternatives.

3.6.4 Ecological Data

- Document visual observations discriminating between obviously and potentially impacted and non-impacted areas. This will determine where and if there is a need for further investigation.
- Establish database to determine compliance with ARARs, to perform baseline risk assessment and to develop remedial action alternatives.

4.0 TASK PLAN FOR THE REMEDIAL INVESTIGATION (RI)

This section describes the tasks required for completion of the Remedial Investigation (RI) at SEAD-66. These include the following:

- Pre-field Activities;
- Field Investigations;
- Data Reduction, Interpretation and Assessment;
- Data Reporting; and
- Task Plan Summary.

4.1 PRE-FIELD ACTIVITIES

The pre-field activities include the following:

- A site inspection to familiarize key project personnel with site conditions and finalize direction and scope of field activities;
- A comprehensive review of Health & Safety Plan with field team members to ensure that site hazards and preventive and protective measures are completely understood;
- Inspection and calibration of all equipment necessary for field activities to ensure proper functioning and usage; and
- A comprehensive review of sampling and work procedures with field team members.

4.2 FIELD INVESTIGATIONS AT SEAD-66

The following field investigations will be performed to complete the RI characterization of SEAD-66:

- Geophysical Investigation;
- Soil Investigation;
- Surface Water and Sediment Investigation;
- Groundwater Investigation; and
- Ecological Investigation.

These investigations are described in the following sections.

4.2.1 Geophysical Investigation

4.2.1.1 Seismic Refraction Survey

In order to determine the direction of groundwater flow at the site, up to four seismic refraction spreads will be surveyed. These spreads will be located at each boundary of the AOC and surveyed using a drop weight and 5-foot geophone spacings. The depth to the water table will be determined for each spread. Since the individual spreads will be situated at the AOC boundaries, this horizontal spacing and the water table depth information will be used to determine the direction of groundwater flow. This information will be used to determine whether the proposed locations for the monitoring wells are up and downgradient of the AOC. If the proposed locations are not up and downgradient of the AOC, they will be relocated according to the information from the seismic refraction survey.

4.2.1.2 EM-31 and Ground Penetrating Radar Survey

To evaluate the potential for buried drums containing pesticides at SEAD-66, EM-31 and ground penetrating radar (GPR) surveys will be performed in the area surrounding Building 6. The electromagnetic data will be collected along profiles spaced at 10-foot intervals with readings spaced at 10 feet along each profile. Where the electromagnetic data indicate anomalies possibly associated with buried metallic objects, a subsequent GPR survey will be performed to characterize the anomaly source. Figure 4-1 shows the area over which the EM-31 and GPR surveys will be performed.

4.2.1.3 Geophysical Anomaly Excavations

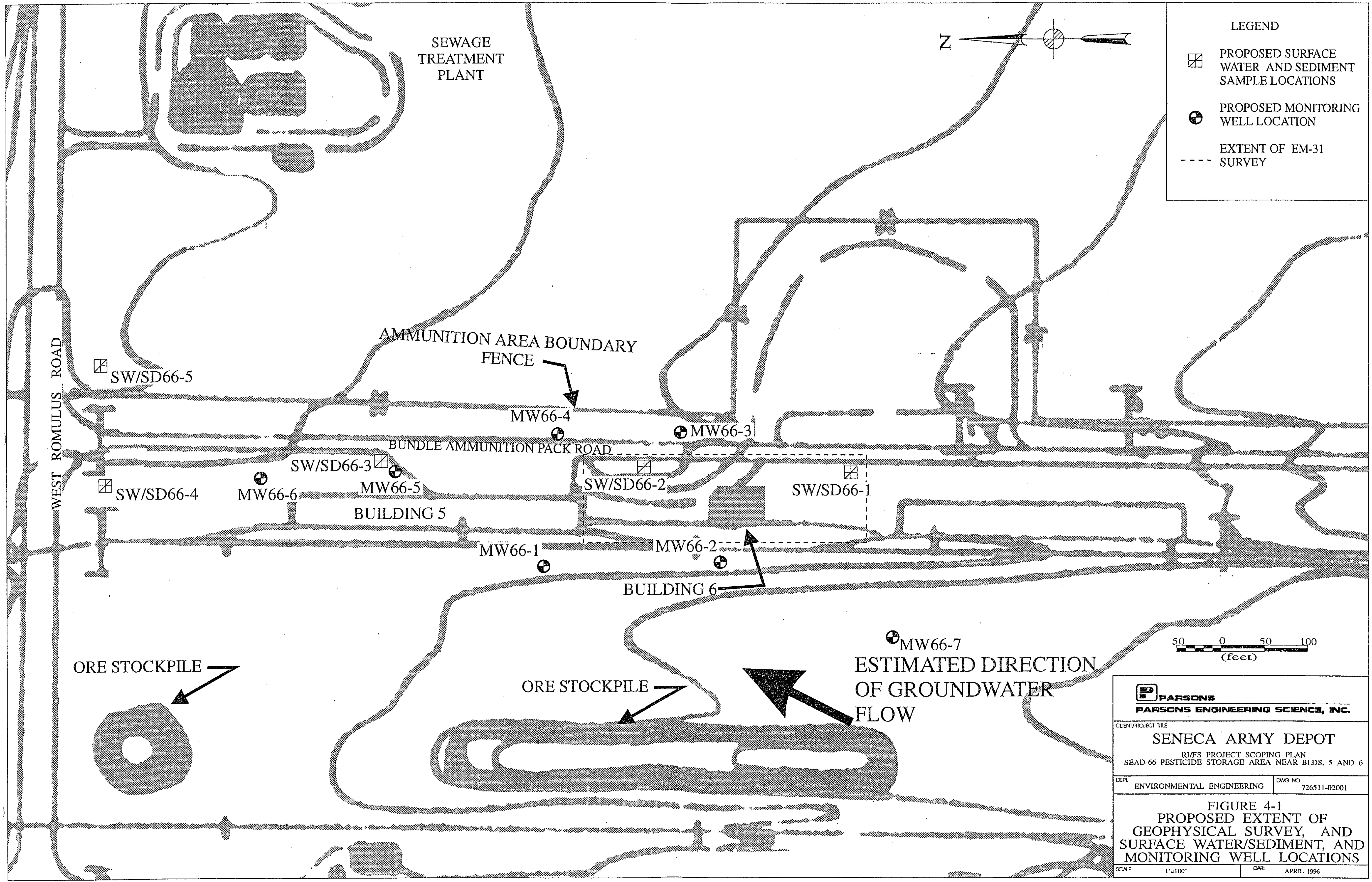
A maximum of 4 test pits will be excavated to observe the types of buried metallic objects present at the anomalies characterized using GPR as described above.

4.2.2 Soil Investigation

The purpose of the soil investigation program at SEAD-66 is to:

- Determine the extent of surface and subsurface soil impacts exceeding TAGM values;
- Locate areas for potential removal actions;
- Provide database for baseline risk assessment; and
- Provide database for feasibility study and scoping of remedial actions.

The sampling program will consist of surface and subsurface soil sampling.



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CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
RI/FS PROJECT SCOPING PLAN
SEAD-66 PESTICIDE STORAGE AREA NEAR BLDS. 5 AND 6

DEPT.	DWG NO.
ENVIRONMENTAL ENGINEERING	726511-02001

FIGURE 4-1
PROPOSED EXTENT OF GEOPHYSICAL SURVEY, AND SURFACE WATER/SEDIMENT, AND MONITORING WELL LOCATIONS

SCALE	DATE
1"=100'	APRIL 1996

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The results of the Limited Sampling Program soil investigation, which was summarized previously in the SWMU Classification Report (Parsons ES, September 1994) and in Section 3.1.3 of this Project Scoping Plan, indicate that the surface soil at SEAD-66 has been impacted by pesticides. Surface soil samples SS66-1 through SS66-9 were previously collected during the ESI (Parsons ES, 1995), so this sampling program continues with this sample numbering scheme.

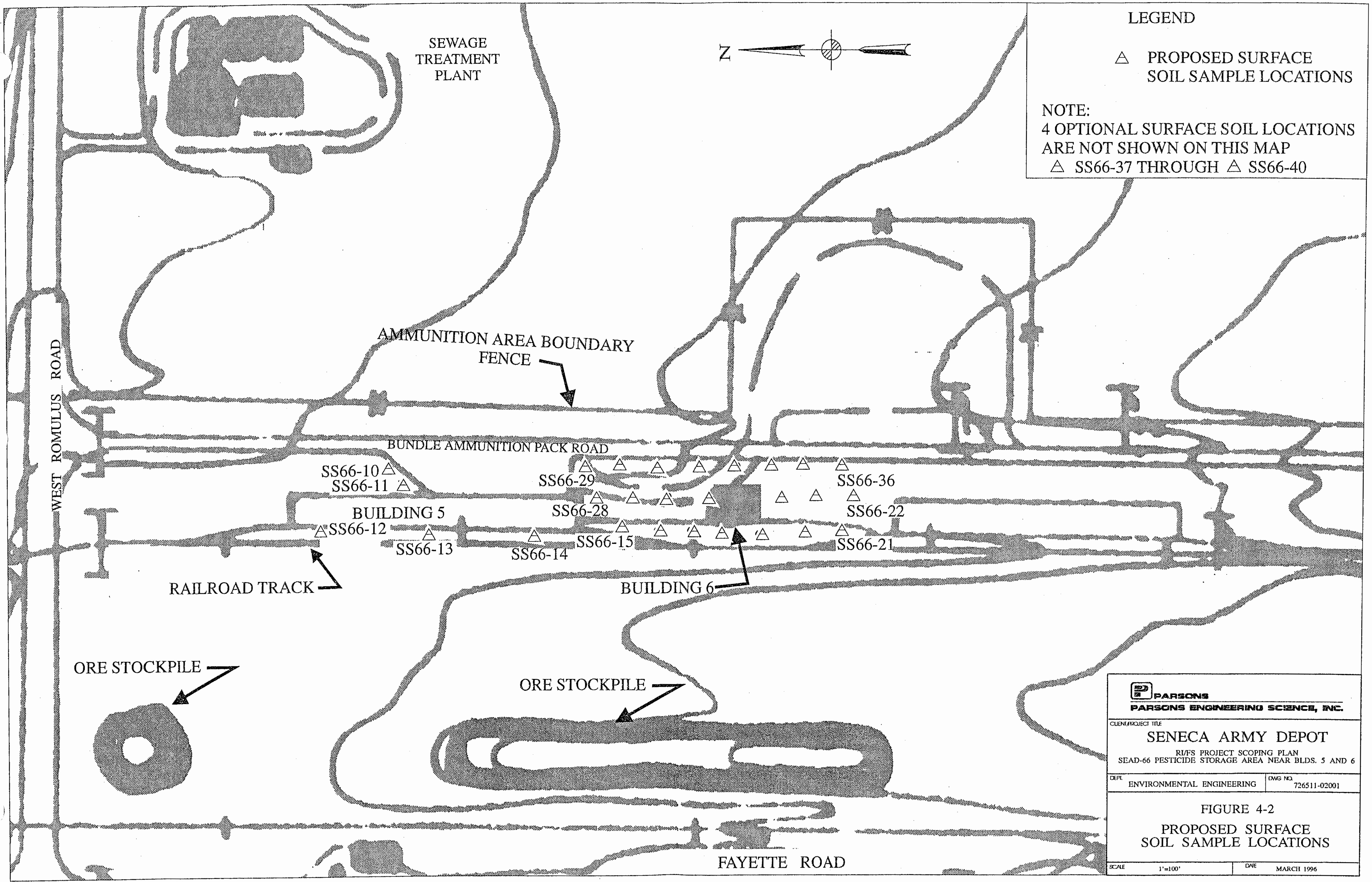
4.2.2.1 Surface Soil Sampling Program

Figure 4-2 shows the proposed locations for surface soil samples (0"-2"). A total of 31 surface soil samples will be collected. These samples are intended to delineate the extent of pesticides in the surface soil around the loading areas of Building 5 and around all of Building 6. These data will provide the information necessary for completion of a baseline risk assessment and development of remedial action alternatives.

The sample locations around the loading areas of Building 5 have been placed where spills would have most likely occurred and where runoff from spills would have most likely accumulated (Figure 4-2). Two (2) samples (SS66-10 and SS66-11), therefore, were placed just off of the paved area on the northeastern side of the building where precipitation may have washed spills that may have occurred on the east side of the building. Three (3) samples (SS66-12 through SS66-14) were placed between Building 5 and the railroad tracks on the west side of the building at the loading areas where pesticides may have been handled.

The 22 sample locations around Building 6 (SS66-15 through SS66-36) were selected using a random-start equilateral triangular grid method ("Statistical Methods For Evaluating the Attainment of Cleanup Standards, Volume 3: Referenced-Based Standards for Soils and Soil Media," EPA, Policy, Planning and Evaluation, EPA 230-R-94-004). This method provides uniform coverage of the area to be sampled, whereas random sampling can leave subareas that are not sampled. Using the method, a rectangular area encompassing the site was established and a random point within this area was located using equations that utilize data from the size of the area to be sampled and random numbers. The random numbers in this instance, were generated on a hand calculator. This location was the random starting point for the grid. Next, using the equations specified in the method, a distance of 45 feet between sampling points was determined. The distance between grid lines was determined to be 40 feet. The resulting sampling grid contained 22 points as shown in Figure 4-2.

Four (4) optional sample locations (SS66-37 through SS66-40) are not shown on Figure 4-2. Field team members, after a site inspection, will identify any areas where there is evidence that pesticide spills may have occurred (such as areas of stressed vegetation) and the identified areas will be sampled. If no suspected spill areas are identified, then 2 samples will be placed between Building 5 and the railroad tracks near the loading areas and 2 samples will be placed off of the paved area to the northeast of Building 5.



LEGEND

△ PROPOSED SURFACE SOIL SAMPLE LOCATIONS

NOTE:
4 OPTIONAL SURFACE SOIL LOCATIONS ARE NOT SHOWN ON THIS MAP
△ SS66-37 THROUGH △ SS66-40

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CLIENT/PROJECT TITLE
SENECA ARMY DEPOT
RI/FS PROJECT SCOPING PLAN
SEAD-66 PESTICIDE STORAGE AREA NEAR BLDS. 5 AND 6

DEPT. ENVIRONMENTAL ENGINEERING
DWG NO. 726511-02001

FIGURE 4-2
PROPOSED SURFACE SOIL SAMPLE LOCATIONS

SCALE 1'=100'
DATE MARCH 1996

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Surface soil sampling procedures are described in Appendix A, Field Sampling and Analysis Plan. The samples will be tested according to the analyses specified in Section 4.2.7 Analytical Program.

4.2.2.2 Soil Boring Program

Six (6) soil borings will be performed at monitoring well locations MW66-1 through MW66-6 to determine the vertical extent of soil impacts. This data will also be used to assess the potential for infiltration to groundwater as part of the groundwater receptor pathway.

Three (3) soil samples will be collected from each soil boring; the samples will be selected and sampled according to the criteria in Appendix A, Field Sampling and Analysis Plan. Each sample collected will be tested according to the analyses specified in Section 4.2.7 Analytical Program.

At each boring location, the soil sampling will be performed until split-spoon refusal is encountered. The soil boring will continue until auger refusal is reached, preferably at competant shale. Auger refusal for this project is defined in Appendix A Field Sampling and Analysis Plan.

In addition, at 2 monitoring well locations (the background location, MW66-7, and one other location), 3 subsurface soil samples will be collected (from 0-2 inches, from below the water table, and at an intermediate location) for physical and limited chemical testing. These 6 samples will be tested as described in Section 4.2.7, Analytical Testing Program. These data will be used to evaluate fate and transport characteristics of the soil.

4.2.3 Surface Water and Sediment Investigation

Surface water and sediment sampling will be conducted in the roadside drainage ditches that have the potential to act as exposure pathways or for off-site transport of site contaminants.

There is little topographic relief at SEAD-66 and no standing water bodies are known to exist at the site. The north-south drainage ditches are believed to direct surface flow from precipitation events to the north. Five (5) sediment samples will be collected at the locations shown on Figure 4-1. One (1) sample will be collected to the south of SEAD-66 as a background sample, 2 will be collected from the drainage ditch adjacent to the site, and 2 will be collected from the drainage ditch adjacent to West Romulus Road. Surface water samples will be collected at the same locations as the sediment samples if there is any water present. These data will be used to determine if there is a surface water or sediment exposure pathway at SEAD-66. If concentrations exceeding applicable guidelines are present, the data will be used to perform a baseline risk assessment for this exposure pathway.

The surface water and sediment sampling procedures are described in Appendix A, Field Sample and Analysis.

The surface water and sediment will be tested according to the analyses described in section 4.2.7, Analytical Program.

4.2.4 Groundwater Investigation

The goals of the groundwater investigation are to determine whether groundwater has been impacted by constituents used on-site, to determine the extent of these potential impacts, and to characterize the till/weathered shale aquifer by gathering chemical, potentiometric and hydraulic conductivity data.

4.2.4.1 Monitoring Well Installation and Groundwater Sampling

To accomplish the goals of the groundwater investigation, 6 monitoring wells will be installed at the approximate locations shown in Figure 4-1. All wells are will be screened in the saturated overburden (till/weathered shale) overlying the shale bedrock.

Two (2) wells (MW66-1 and MW66-2) will be installed immediately west of the railroad tracks to determine if a release has occurred along the tracks, possibly during past railcar loading or unloading activities.

Because the location where pesticides were stored is unknown, 4 monitoring wells are proposed in locations downgradient of four potential pesticide storage or handling areas on the east side of buildings 5 and 6 (MW66-3 through MW66-6). Groundwater flow is estimated to be to the north-northeast based on local topography, so all downgradient wells are placed to the north-northeast of potential pesticide storage or handling areas.

One monitoring well (MW66-7) will be installed in an upgradient location and will serve as a background well for the site.

The groundwater samples will be tested according to the analyses described in section 4.2.7, Analytical Program.

Monitoring well installation and development procedures for overburden wells are described in Appendix A, Field Sampling and Analysis Plan. All wells will be properly developed prior to sampling. Groundwater Sampling procedures are described in Appendix A, Field Sampling and Analysis Plan.

4.2.4.2 Aquifer Characterization

Three rounds of water levels will be measured at each of the monitoring wells at SEAD-66 to define the groundwater flow direction at the site. The first found of groundwater levels will be measured at the time that the monitoring wells are developed and the measurement will be used for well develpment calculations. The remaining two rounds of measurements will be performed before both rounds of groundwater sampling and will be used to construct a groundwater elelvation contour map and evaluated seasonal changes in the groundwater flow direction.

Aquifer testing will be performed at the 7 monitoring wells. In-site hydraulic conductivity tests will be performed on the 7 monitoring wells using a rising head slug test.

Procedures for in-site conductivity tests and water level measurements are outlined in Appendix A, Field Sampling and Analysis Plan.

4.2.5 Ecological Investigation

The following procedure for the ecological investigation was developed from the New York State Department of Environmental Conservation (NYSDEC) Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (1994). The purpose of the ecological investigation is to determine if aquatic and terrestrial resources have been affected by a release of contaminants from the site. The investigation will be completed in two parts. The first part will be the site description, which will involve the accumulation of data describing the physical characteristics of the site, as well as the identification of aquatic and terrestrial resources present or expected to be present at the site. The second part will be the contaminant-specific impact analysis, which involves the determination of whether the identified aquatic and terrestrial resources have been impacted by contaminants that have been released at the site. The second part of the ecological investigation is dependent upon the chemical analyses of the samples collected for the RI, described in Sections 4.2.1 through 4.2.4.

4.2.4.1 Site Description

The purpose of the site description is to determine whether aquatic and terrestrial resources are present at the site, and if they were present at the site prior to contaminant introduction. And, if they were present prior to contaminant introduction, the appropriate information to design a remedial investigation of the resources will be provided. The information to be gathered includes site maps, descriptions of aquatic and terrestrial resources at the site, the assessment of the value of the aquatic and terrestrial resources, and the appropriate contaminant-specific and site-specific regulatory criteria applicable to the remediation of the identified aquatic and terrestrial resources.

A topographic map showing the site and documented aquatic and terrestrial resources within a two mile radius from the site will be obtained. The aquatic and terrestrial resources of concern are Significant Habitats as defined by the New York State Natural Heritage Program; sources of this information are indicated in parentheses. These include the following: habitats supporting endangered, threatened or rare species or species of concern (letter from the United States Dept. of Interior Fish and Wildlife Service dated June 21, 1994); regulated wetlands (National Wetlands Inventory (NWI) maps of the Dresden, Geneva Smith, Ovid and Romulus quadrangles, and New York State Regulated Wetland maps for the same quadrangles); wild and scenic rivers; significant coastal zones (Federal Emergency Management Agency Flood Insurance Rate Maps (FIRM), Town of Varick, New York Seneca County Community-Panel Number 3607580010B, December 17, 1987); streams (United States Geological Survey Romulus, Ovid, Dresden and Geneva South 7.5 minute quadrangles); lakes (United States Geological Survey Qqadrangles Romulus, Ovid, Dresden and Geneva South 7.5 minute quadrangles); and other major resources. Two additional sources of information are 1) NYSDEC Region 8 at 6274 Past Avalon-Lima Road in Avon, NY (716)225-2466 and 2) NYSDEC Wildlife Resources Center - Information Service, New York Heritage Program at 700 Troy-Schenectady Road in Latham, NY (518)783-3932.

A map showing the major vegetative communities within a one half-mile radius of the site will be developed. The major vegetative communities will include wetlands, aquatic habitats, NYSDEC Significant Habitats, and areas of special concern. These covertypes will be identified using the NYSDEC Natural Heritage Program descriptions and classifications of natural communities.

To describe the covertypes at the site, the abundance, distribution, and density of the typical vegetative species will be identified. To describe the aquatic habitats at the site, the abundance and distribution of aquatic vegetation will be identified. The physical characteristics of the aquatic habitats will also be described and will include parameters such as the water chemistry, water temperature, dissolved oxygen content, depth, sediment chemistry, discharge, flow rate, gradient, stream-bed morphology, and stream classification.

The aquatic and terrestrial species that are expected to be associated with each covertype and aquatic habitat will be determined. In particular, endangered, threatened and rare species, as well as species of concern, will be identified. Alterations in biota, such as reduced vegetation growth or quality will be described. Alterations in, or absence of, the expected distribution or assemblages of wildlife will be described.

A qualitative assessment will be conducted evaluating the ability of the area within a half mile of the site to provide a habitat for aquatic and terrestrial species. The factors that will be considered will include the species' food requirements and the seasonal cover, bedding sites, breeding sites and roosting sites that the habitats provide.

The current and potential use of the aquatic and terrestrial resources of the site by humans will be assessed. Included with the assessment of the site, the area within a half mile of the site, documented resources within two miles of the site, and documented resources downstream of the site that are potentially affected by contaminants will also be assessed. Human use of the resources that will be considered will be activities such as hunting, fishing, wildlife observation, scientific studies, agriculture, forestry, and other recreational and economic activities.

The appropriate regulatory criteria will be identified for the remediation of aquatic and terrestrial resources and will include both site-specific and contaminant-specific criteria.

4.2.4.2 Contaminant-Specific Impact Analysis

Information from the site description developed in Section 4.2.4.1 and from the characterization of the contaminants at the site developed from the results of the RI will be used to assess the impacts of contaminants on aquatic and terrestrial resources. The impact analysis will involve three steps, each using progressively more specific information and fewer conservative assumptions and will depend upon the conclusion reached at the previous step regarding the degree of impact. If minimal impact can be demonstrated at a specific step, additional steps will not be conducted.

Pathway Analysis

A pathway analysis will be performed identifying aquatic and terrestrial resources, contaminants of concern and potential pathways of contaminant migration and exposure. After performing the pathway analysis, if no significant resources or potential pathways are present, or if results from field studies show that contaminants have not migrated to a resource along a potential pathway, the impact on aquatic and terrestrial resources will be considered to be minimal and additional impact analyses will not be performed.

Criteria-Specific Analysis

Presuming that the presence of contaminated resources and pathways of migration of site-related contaminants has been established, the contaminant levels identified in the field investigation will be compared with available numerical criteria or criteria developed according to methods established as part of the criteria. If contaminant levels are below criteria, the impact on resources will be considered to be minimal and additional impact analyses will not be performed. If numerical criteria are exceeded or if they do not exist and cannot be developed, an analysis of the toxicological effects will be performed.

Analysis of Toxicological Effects

The analysis of toxicological effects is based on the assumption that the presence of contaminated resources and pathways of migration of site-related contaminants has been established. The purpose of the analysis of toxicological effects is to assess the degree to which contaminants have affected the productivity of a population, a community, or an ecosystem and the diversity of species assemblages, species communities or an entire ecosystem through direct toxicological and indirect ecological effects.

A number of approaches are available to conduct an analysis of toxicological effects. One or more of the four following approaches will be used to assess the toxicological effects.

Indicator Species Analysis–A toxicological analysis for a indicator species will be used if the ecology of the resource and the exposure scenarios are simple. This approach assumes that exposure to contaminants is continuous throughout the entire life cycle and does not vary among individuals.

Population Analysis–A population level analysis is relevant to and will be used for the evaluation of chronic toxicological effects of contaminants to an entire population or to the acute toxicological effect of contaminant exposure limited to specific classes of organisms within a population.

Community Analysis– A community with highly interdependent species including highly specialized predators, highly competitive species, or communities whose composition and diversity is dependent on a key-stone species, will be analyzed for alternations in diversity due to contaminant exposure.

Ecosystem Analysis–If contaminants are expected to uniformly affect physiological processes that are associated with energy transformation within a specific trophic level, an analysis of the effects of contaminant exposure on trophic structure and trophic function within an ecosystem will be performed. Bioconcentration, bioaccumulation, biomagnification, etc., are concepts that may be used to evaluate the potential effects of contaminant transfer on trophic dynamics.

4.2.6 Analytical Program

A total of 52 soil samples, 7 groundwater samples, 5 surface water and sediment samples will be collected from SEAD-66 for testing. All of these samples (except 6 of the soil samples from 2 borings) will be analyzed for the following: Target Compound List (TCL) volatile organic compounds (EPA Method 524.2 on groundwater), semivolatile organic compounds, pesticides/PCBs and Target Analyte List (TAL) metals and cyanide according to the NYSDEC Contract Laboratory Program (CLP) Statement of Work (SOW). Additional analyses to be performed on specific media are provided below.

Six (6) of the soil samples from the 2 borings will only be analyzed for total organic carbon (TOC) content by EPA Method 415.1, cation exchange capacity (CEC) by EPA Method 9081, and grain size distribution (including the distribution within the silt and clay size fraction) by ASTM Method D:422-63.

The 7 groundwater samples will be analyzed for volatile organic compounds by EPA Method 524.2.

The 5 surface water samples will also be analyzed for pH by EPA Method 150.1, hardness by EPA Method 352.1, and TOC by EPA Method 415.1.

The 5 sediment samples will also be analyzed for TOC by EPA Method 415.1, and grain size distribution (including the distribution within the silt and clay size fractions) by ASTM Method 422:63.

Quality Assurance/Quality Control (QA/QC) sampling requirements are described in Section 5.3 of Appendix C of the Generic Installation RI/FS Workplan. Analyses for all of the media to be sampled are summarized in Table 4-1. A detailed description of these methods, as well as lists of each compound included in each of the categories is presented in Appendix C, Chemical Data Acquisition Plan.

4.2.8 Surveying

Surveying will be performed at SEAD-66 to provide accurate site base maps which will be used for the following purposes:

Table 4-1

Summary of Sampling and Analyses

SEAD-66 Remedial Investigation
Seneca Army Depot Activity

	VOCs		SVOCs	Pesticides/PCBs	Metals	Grain Size*	pH	Hardness	TOC	Cat Ex Cap.
	NYSDEC	EPA	NYSDEC	NYSDEC	NYSDEC	ASTM	EPA	EPA	EPA	EPA
MEDIA	TCL NYSDEC CLP	Method 524.2	TCL NYSDEC CLP	TCL NYSDEC CLP	TAL NYSDEC CLP	ASTM D 422:63	Method 150.1	Method 130.2	Method 415.1	Method 9081
Soil **Surface**	31	0	31	31	31	0	0	0	0	0
Subsurface	15	0	15	15	15	6	0	0	6	6
Groundwater	0	6	6	6	6	0	0	0	0	0
Surface water	5	0	5	5	5	0	5	5	5	0
Sediment	5	0	5	5	5	5	0	0	5	0

Notes:
1) * Grain size analysis includes determination of the grain size distribution within the silt and clay size fraction.
2) QA/QC sampling requirements are described in Section 5.3 of Appendix C of the Generic Installation RI/FS Workplan.
3) ASTM = American Society of Testing and Materials

- Map the direction and compute the velocity of groundwater movement;
- Locate all the environmental sampling points;
- Serve as the basis for volume estimates of impacted soil and sediment that may require a remedial action; and
- Map the extent of any impacted groundwater above established ARAR limits.

The survey will involve photogrammetric mapping, followed by a field survey. Based on the mapping and the survey, a topographic map of the site with 2-foot contour intervals will be generated. This map will serve as the basis for the site plan and other figures in the RI/FS report. Also, the location, identification, coordinates and elevations of all the control points recovered and/or established at the site and all of the geophysical survey areas, the locations of monitoring wells, surface soil samples and all surface water/sediment sampling points will be plotted on a topographic map to show their location with respect to surface features within the project area.

Site surveys will be performed in accordance with good land surveying practices and will conform to all pertinent state laws and regulations governing land surveying. The surveyor shall be licensed and registered in New York.

A detailed discussion of the site field survey requirements is presented in Appendix A, Field Sampling and Analysis Plan.

4.3 DATA REDUCTION, ASSESSMENT AND INTERPRETATION

Data reduction, assessment, and interpretation is discussed in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

4.4 BASELINE RISK ASSESSMENT

The baseline risk assessment is discussed in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

Because SEDA has been placed on the BRAC list, future receptors will be evaluated and made to be consistent with the Local Redevelopment Authority proposed land use for the Seneca Army Depot Activity. The human receptors considered for the risk assessment will include: future industrial worker, future construction worker, future trespasser, and current site worker. The risk assessment for biota will include terrestrial and aquatic receptors.

4.5 DATA REPORTING

Data reporting is discussed in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

4.6 TASK PLAN SUMMARY FOR THE RI

General information about the Task Plan Summary is given in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

A detailed Task Plan Summary that indicates the number and type of samples to be collected at SEAD-66 is provided in Table 4-1.

5.0 TASK PLAN FOR THE FEASIBILITY STUDY (FS)

The task plan for the Feasibility Study is given in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

5.1 DEVELOPMENT OF OBJECTIVES

A discussion of the development of remedial action objectives for the FS is given in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

5.2 SCREENING OF ALTERNATIVES

A discussion of the development of remedial action objectives for the FS is given in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

Additionally, as part of the FS process, at least one innovative technology will be evaluated for SEAD-66.

5.3 DETAILED ANALYSIS OF REMEDIAL ACTION ALTERNATIVES

A discussion of the detailed analysis of remedial action alternatives for the FS is given in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

Additionally, as part of the FS process, at least one innovative technology will be evaluated for SEAD-65.

5.4 TASK PLAN SUMMARY FOR THE FS

The task plan summary for the FS is given in the Generic Installation RI/FS workplan that serves as a supplement to this RI/FS Project Scoping Plan.

The remedial action cost estimate for the RI/FS will be prepared in accordance with ER1110-3-1301. Additionally, the estimate for the selected plan will be prepared using MCASES Gold Software, and structured using the Remedial Action Work Breakdown Structure (RA-WBS).

6.0 PLANS AND MANAGEMENT

The purpose of this Work Plan is to present and describe the activities that will be required for the site remedial investigation/feasibility study at SEAD-66. The Field Sampling and Analyses Plan (Appendix A), details procedures which will be used during the field activities. Included in this plan are procedures for sampling soil, sediments, surface water, fish, shellfish and groundwater. Also included in this plan are procedures for developing and installing monitoring wells, measuring water levels and packaging and shipment of samples.

The Health and Safety Plan (Appendix B) details procedures to be followed during field activities to protect personnel involved in the field program.

The Chemical Data Acquisition Plan (Appendix C) describes the procedures to be implemented to assure the collection of valid data. It also describes the laboratory and field analytical procedures which will be utilized during the RI.

6.1 SCHEDULING

The proposed schedule for performing the RI/FS at SEAD-66 is presented in Figures 6-1 and 6-2. Because the start date was unknown at the time of the preparation of this Scoping Plan, the time periods shown are relative to an arbitrary start date.

6.2 STAFFING

The project team organization for performing the RI/FS is presented in Figure 6-3.

Figure 6-1
SEAD-66 RI Field Investigation Schedule (schedule relative-no start date)
Seneca Army Depot Activity

Page 1 of 1

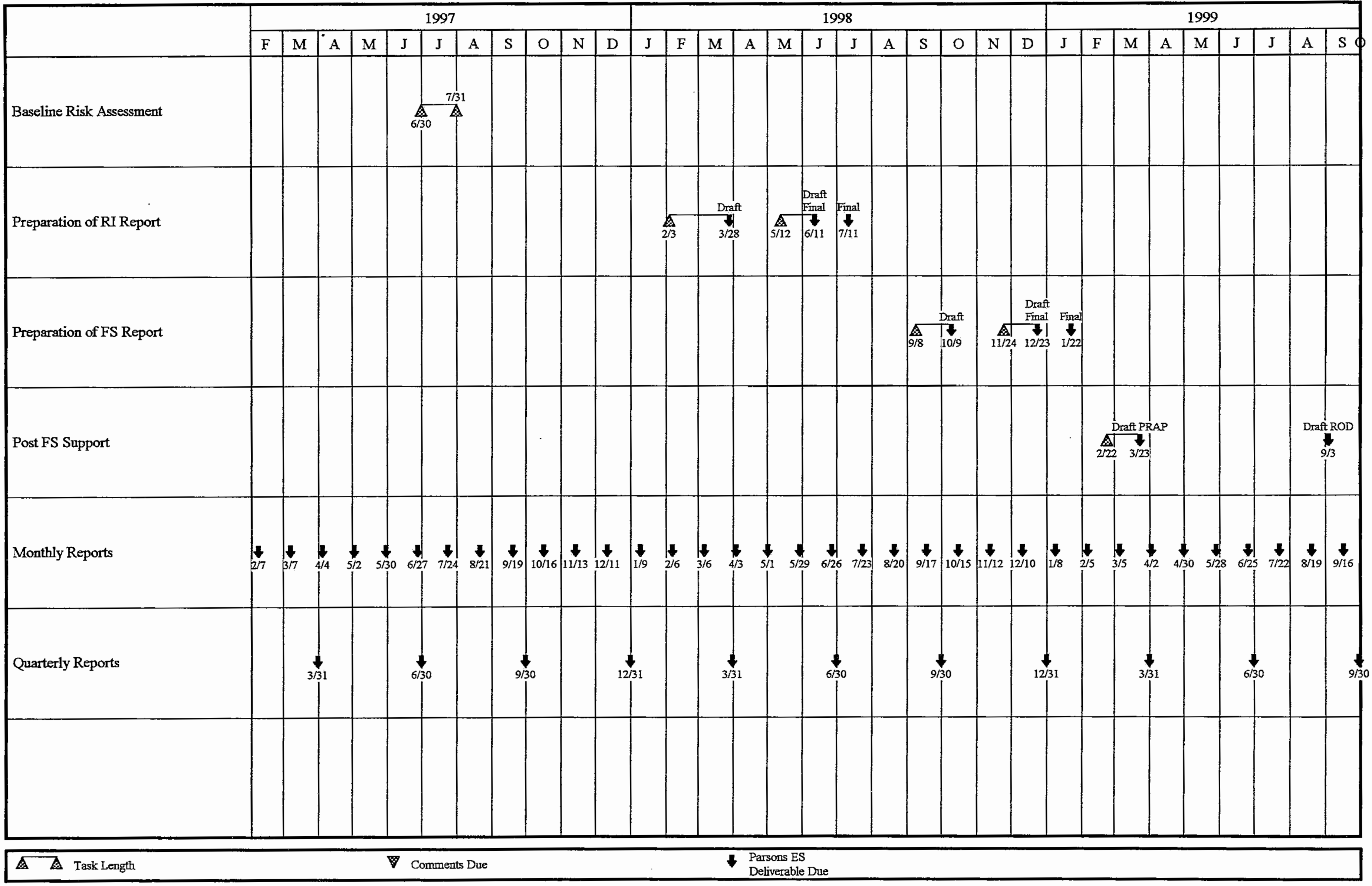
3/8/1996

	1997							
	February	March	April	May	June	July	August	September
Mark Sample Locations	2/3 ▲–▲ 2/4							
Geophysical Investigation	2/3 ▲–▲ 2/7							
Surface Water/Sediment Sampling and Runoff Delineation	2/5 ▲–▲ 2/6							
Ecological Investigation	2/17 ▲–	–▲ 3/4 3/31 ▲–	–▲ 4/5					
Surface Soil Sampling	2/7 ▲–▲ 2/10							
Monitoring Well Installation and Development: 1 crew	2/11 ▲–▲ 2/21	3/3 ▲–▲ 3/6						
Groundwater Sampling		3/20 ▲–▲ 3/23					8/18 ▲–▲ 8/22	
Water Level Measurements		▲ 3/3 ▲ 3/20					▲ 8/18	
Aquifer Testing		3/24 ▲–▲ 3/26						
Sample Analysis	2/6 ▲–	–▲ 3/31					8/19 ▲–▲ 8/29	
Data Validation			4/28 ▲–	–▲ 5/3				9/26 ▲–▲ 9/28
Surveying		3/10 ▲–▲ 3/14						
Field Activity Reports	⬇ 2/7	⬇ 3/7	⬇ 4/4				⬇ 8/21	⬇ 9/18
Field Sampling Letter Report								⬇ 9/30

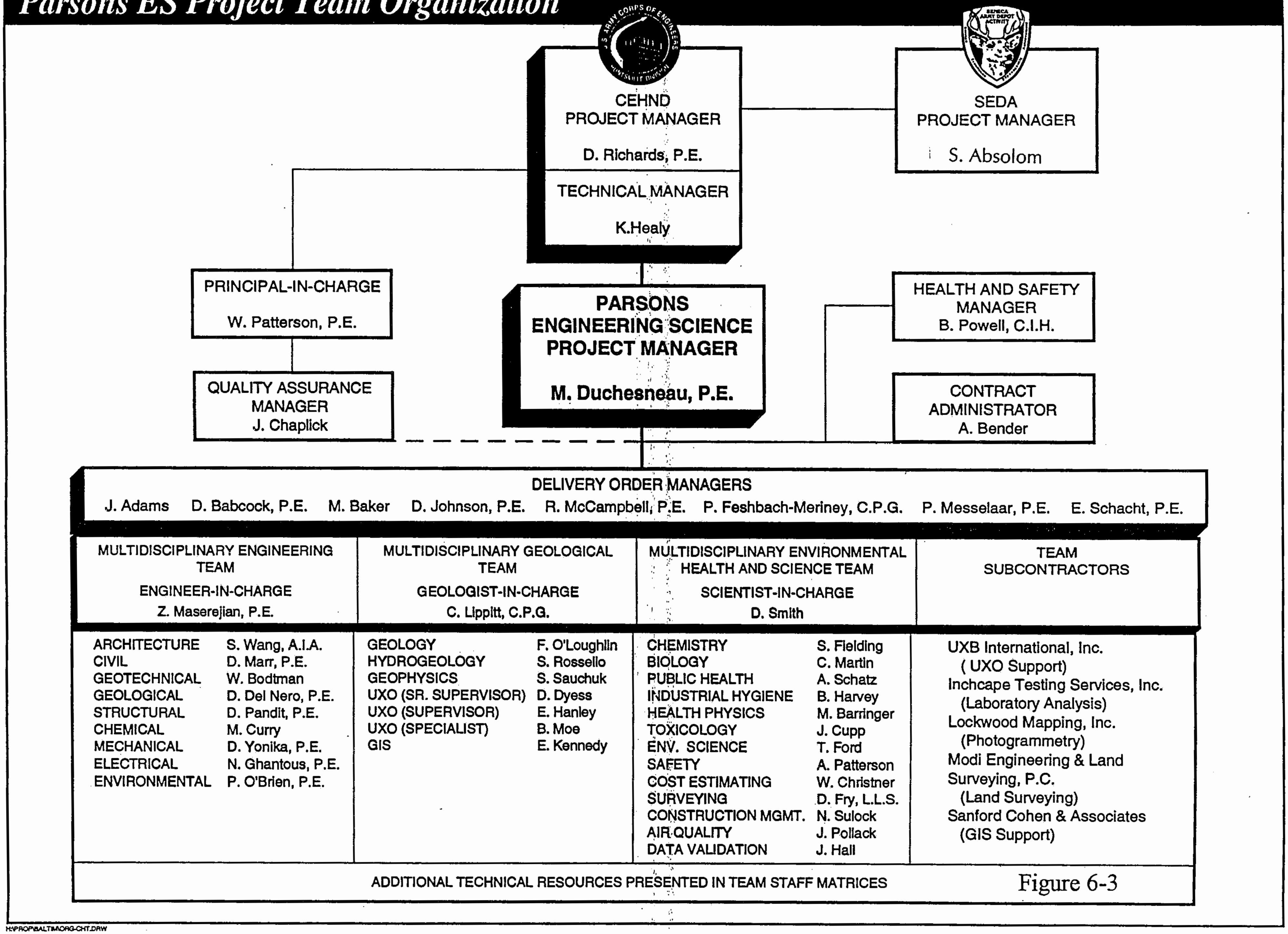
▲–▲ Task Length ▼ Comments Due ⬇ Parsons ES Deliverable Due

Figure 6-2
SEAD-66 RI/FS Schedule: Risk Assessment and Reports
Seneca Army Depot Activity

3/8/1996



Parsons ES Project Team Organization



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(Laboratory Analysis)
Lockwood Mapping, Inc.
(Photogrammetry)
Modi Engineering & Land Surveying, P.C.
(Land Surveying)
Sanford Cohen & Associates
(GIS Support)

ADDITIONAL TECHNICAL RESOURCES PRESENTED IN TEAM STAFF MATRICES

Figure 6-3

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7.0 REFERENCES

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PARSONS ENGINEERING SCIENCE, INC.

PARSONS

CLIENT ____________________ JOB. NO. __________ SHEET _____ OF _____

SUBJECT ____________________ BY __________ DATE __________

____________________ CKD. __________ REVISION __________

APPENDIX A

FIELD SAMPLING AND ANALYSIS PLAN

Appendix A information is contained in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan

APPENDIX B

HEALTH AND SAFETY PLAN

Appendix B information is contained in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan

APPENDIX C

CHEMICAL DATA AQUISITION PLAN

Appendix C information is contained in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan

APPENDIX D

UNITED STATES DEPARTMENT OF INTERIOR FISH AND WILDLIFE SERVICES ENDAGERED AND THREATENED SPECIES LETTER

Appendix D information is contained in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan

APPENDIX E

RESPONSE TO REVIEW COMMENTS

COMMENTS AND RECOMMENDATIONS
PRE-DRAFT PROJECT SCOPING PLAN
REMEDIAL INVESTIGATION FEASIBILITY STUDY
PESTICIDE STORAGE AREA NEAR BUILDING 5 AND 6 (SEAD-66)
SENECA ARMY DEPOT
ROMULUS, NEW YORK
FEBRUARY 1995

COMMENTS BY HODDINOTT, ALDEN, BUTORYAK

Comment #1 Page 3-8, Section 3.2.3, Potential Exposure Pathways and Receptors.

This discussion should include the numerical assumptions of the exposure scenarios. This comment also applies to Section 3.2.3.

Recommendation: Include a table or discussion outlining the numerical assumptions associated with the current and future exposure scenarios.

Response #1 Agree. Table 4-1 in the Generic Installation RI/FS Workplan, which includes the numerical assumptions for exposure scenarios, has been referenced in Sections 3.2.2 and 3.2.3.

Comment #2 Page 3-9, Section 3.2.2.2, S. Alden, Dust Inhalation and Dermal Contact.

It is stated that contaminated fugitive dust maybe released due to high winds, traffic in the area, or disturbance of the soil during site use. It is also stated that the fugitive dust would not be expected to be transported in significant quantities beyond the SEDA facility boundaries. What is the basis for this conclusion? What modeling techniques were utilized? Were any meteorological studies conducted that support this statement?

Recommendation: Include the technique(s) used in making this determination.

Response #2 Agree. No modeling techniques were used in making this determination, so the statement "Fugitive dust would not be expected to be transported in significant quantities beyond the SEDA Facility boundaries" has been removed. Fugitive dust modeling will be performed as part of the risk assessment to evaluate dust inhalation as an exposure pathway. The techniques to be used are described in Section 4.4.2 of the Generic Installation RI/FS Workplan.

Comment #3 Page 3-11, Section 3.6, Data Gaps and Data Needs.

The data needs for the soil and sediment must include an adequate determination of the background concentrations, with a statistical comparison with the site data.

Recommendation: Include an adequate determination of the background levels of chemicals in the soil and sediments.

Response #3

Agree. Sitewide soil and sediment background data has been compiled from the ESIs performed at 25 SEADs, and Remedial Investigations at the OB Grounds and the Ash Landfill. These data were used to evaluate whether contaminants were present at the 25 SEADs where ESIs were performed and will be used to evaluate the RI data from SEAD-66. This information has been added to the soil and sediment data needs in Section 3.6.

Comment #4

Page 4-2, Figure 4-1, Proposed Sample Locations.

One of the proposed monitoring well sites appears to be located in the center of the Pesticide Storage Area, as illustrated in Figure 1-2. If the borehole for this well is drilled through soil that contains pesticides, the potential exists for contamination of ground water by constructing a conduit through which contaminants can migrate.

Recommendation: Install this monitoring well at a site that is estimated to be downgradient of the source of contamination.

Response #4

Agree. The figure needs clarification. The arrow in Figure 1-2 was pointing to the general area "near Buildings 5 and 6" that comprises SEAD-66, not a specific source of contamination. However, to clarify the location of the AOC, Figure 1-2 has been changed so that the arrow has been deleted and a dashed line has been drawn around the approximate boundaries of the AOC. Three of the monitoring well locations have also been moved to more downgradient locations.

Comment #5

Page 4-6, Section 4.2.2, Soil Investigation.

It is noted that two surface samples will be tested for particle size distribution which will be used for modeling fugitive dust releases, however, there is no mention of air sampling for Chlordane. Chlordane is a liquid phase contaminant, and release into the atmosphere should be in the vapor phase as stated in Section 3.1.2.

Recommendation: Indicate what sampling or modeling techniques will be used to measure for volatile, and semivolatile organic compounds that may be emitted to the atmosphere, or discuss why Chlordane would not be considered an issue for air monitoring.

Response #5

Agree. An explanation for why chlordane is not an issue for air monitoring is provided below. Chlordane has a Henry's Law constant of 9.63×10^{-6} atm m^3/mole. Henry's Law constant expresses the tendency of a compound to volatilize from an aqueous phase when the concentration of a compound is very low, which is applicable to most constituents found at hazardous waste sites. In general, volatilization will not be a major pathway for release for compounds with a Henry's Law constant less than 5×10^{-3} atm m^3/mole. If chlordane were present at SEAD-66 in the liquid phase, then volatilization would not be significant enough to justify air monitoring, as shown by its Henry's Law constant which is very low. Liquid chlordane has not been identified during either the preliminary assessment or the limited sampling program performed at SEAD-66, so there is no justification for air monitoring for chlordane.

Chlordane was detected in 2 of the 8 surface soil samples collected during the limited sampling program at estimated concentrations of 1.3 μg/Kg and 16 μg/Kg. The New York State TAGM value for chlordane is 540 μg/Kg, so the concentrations at which chlordane is present are relatively low. Because it is present, however, it is considered an issue for the release of chlordane in fugitive dust.

Chordane's organic carbon petition coefficient, 1.40×10^5 ml/g, indicates that the compound tends to sorb to be organic fraction of the soil to such an extent that it is immobile. Any release of chlordane into the atmosphere would therefore tend to be the result of fugitive dust releases of soil. Fugitive dust modeling will be performed as part of the risk assessment to evaluate dust inhalation and dermal contact as exposure pathways. The techniques to be used are described in Section 4.4.2 of the Generic Installation RI/FS Workplan. No change was made to the Scoping Plan text.

Comment #6 Page 4-7, Section 4.2.4, Ground-Water Investigation.

Although the approximate locations for the proposed monitoring wells are given in Figure 4-1, no justification for these locations is given in the text. Were the locations based on an estimated direction of ground-water flow?

Recommendation: Provide justification for selection of proposed monitoring well locations.

Response #6 Agree. The selection of the proposed locations for the monitoring wells has been explained in Section 4.2.4 as follows:

"Because the location where pesticides were stored is unknown, 4 monitoring wells have been placed downgradient of four potential pesticide storage or handling areas on the east side of buildings 5 and 6 (MW66-3 through MW66-6). Groundwater flow is estimated to be to the north-northeast based on local topography, so all downgradient wells are placed to the north-northeast of potential pesticide storage or handling areas."

COMMENTS BY S. WHITE

Comment #1 Section 1.1

This paragraph gives the impression that the goals for risk assessment have not been carefully thought out as part of the sampling program. After reading subsequent sections, this is clearly not the case. This paragraph should be modified to reflect the process that is in the later sections.

Response #1 Agree. Section 1.1 has been changed as follows:

The purpose of this Project Scoping Plan is to outline the work proposed for a Remedial Investigation/Feasibility Study (RI/FS) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at SEAD-66, the Pesticide Storage Area near Buildings 5 and 6, at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This RI/FS Scoping Plan outlines work to be conducted at SEAD-66 based upon recommendations specified in the SWMU Classification Report (Parsons ES, 1994); limited sampling of surface soils on the site was performed as part of this report. This plan is based upon a conceptual site model that identified potential source areas, release mechanisms, and receptor pathways; determined data requirements for an evaluation of risks to human health and the environment; and developed a task plan to address the data requirements that have been identified. The primary objective of the RI/FS is to gather hydrogeological, chemical, and geotechnical data to characterize the nature and extent of impact to the media, and the nature and extent of risks to human health and the environment. This information will be used to support the remedial options evaluated in the FS. These actions will comply with applicable or relevant and appropriate requirements (ARARs) and take into account the risks to human health and the environment.

This work will be performed as part of the United States Army Corps of Engineers (USACOE) remedial response activities under CERCLA. It will follow the requirements of the New York State Department of Environmental Conservation (NYSDEC), the U.S. Environmental Protection Agency, Region II (EPA), and the Interagency Agreement (IAG). The site is referred to as a SWMU because the Army elected in the Federal Facilities Agreement to combine RCRA and CERCLA obligations and the Army uses RCRA terms to describe the units.

This Project Scoping Plan provides site-specific information for the RI/FS project at SEAD-66. The Generic Installation RI/FS Workplan (Parsons ES, August 1995) is designed to serve as a foundation for this document and provides generic information that is applicable to all RI/FS site activities at SEDA.

Comment #2 Section 3.2.2.4

There has been no investigation of the ground water on the site so there is no basis to demonstrate any contamination on site let alone connection to other aquifers. This discussion seems premature.

Response #2 Agree. The statement has been removed from the Scoping Plan text.

Comment #3 Section 3.6

The necessity of wells is unclear at this site. Bullet one assumes there is contamination, however, that seems very unlikely given the nature of the unconsolidated materials present and the immobility of the potential contaminants that are present as contaminants in the soil. I would suggest that a simpler objective would be to collect soil samples from 1-3 and 4-5 feet using a hand auger. If these soils are clean then the combination of lack of contaminants at depth, impermeability of the soils and the immobility of the contaminants at the surface would be adequate to show that there is no likelihood of ground water contamination. This type of investigation would be much less costly also. In the unlikely event that soil contamination is vertically extensive, a second optional phase of groundwater investigations could still be implemented.

Response #3 Disagree. The 1986 Superfund Amendments and Reauthorization Act (SARA) adopted and expanded a provision of the 1985 National Contingency Plan (NCP) that remedial actions must at least attain compliance with applicable or relevant and appropriate requirements (ARARs) of other environmental and public health statutes when conducting remedial actions. To demonstrate compliance with the various federal and New York State groundwater ARARs (listed in Table 3-7 in the Generic Workplan), groundwater monitoring wells must be installed and sampled. Because the location where pesticides were stored is unknown, four downgradient wells have been proposed. No changed was made to the Scoping Plan text.

Comment #4 Section 4.2.1

Again the seismic data for groundwater depth and flow direction seem premature until the vertical extent of soil contamination can be found.

Response #4 See Response #3.

Comment #5 Section 4.2.4

See previous two comments.

Response #5 See Response #3.

Comment #6 Section 4.2.2

A selected number of the sampling locations closest to potential sources should be selected for deeper samples also. Alternatively the deeper samples could be held by the lab until the results from the surface samples are available. USACE and the A-E can then decide which of the deeper samples should be analyzed.

Response #6 Agree. Five locations have been proposed for soil borings. Three of the locations were selected based upon the previous sampling performed at SEAD-66, and 2 of the locations were selected based upon potential storage or handling areas identified in the conceptual site model.

COMMENTS BY FORGET

Comment #1 Risk Assessment

Due to limited time, I was not able to review this document. However, please reference and incorporate all applicable comments made on the scoping plan for SEAD-46 scoping plan (small arms range).

Response #1 Agree. Comments made by C. Forget for the SEAD-46 RI/FS Project Scoping Plan were reviewed, and where appropriate, were incorporated into the SEAD-66 RI/FS Project Scoping Plan. The applicable comments are listed below.

The following SEAD-46 Scoping Plan comments by Forget were applicable to the SEAD-66 Scoping Plan as well.

Comment #1 This document would be much better if it would integrate the Generic Installation RI/FS Work Plan that is often referenced.

Response #1 Agree. The Generic Workplan is integrated into the individual scoping plan as much as possible. The preparation of RI/FS workplans at SEDA has been formulated so that the Project Scoping Plan contains specific information about the site and additional information that is not specific to the site is contained in the Generic RI/FS Installation Workplan. This was done to avoid repeating large sections of generic text for the individual scoping plans.

Comment #2 Parsons Engineering Science, Inc. has done a very good job in the development of the conceptual site model, and identification of data needs. If all of the work plans include this type of analysis, I look forward to working with them in the future.

Response #2 Acknowledged.

Comment #3 Last sentence of the paragraph. This introduces doubt regarding the adequacy of your DQO process for this investigation. If the DQO process has been accurately completed, no Phase II should be required unless there are unforeseen changes in circumstances.

Response #3 Agreed. The text in Section 1.1 has been clarified to reflect a new approach to completing the RIs.

Comment #5 Once again, it is good that the contractor has developed this CSM, however, there are several clarifications required represented by the following comments.

First, clarify the use of future residents as a receptor. To avoid wasting federal money, the contractor must justify this is a likely scenario, and not a hypothetical "worst case" scenario. A more thorough justification of what is a more likely future use scenario is required.

Response #5 Agreed. The question of matching future land use to risk assessment has become more defined now that the BRAC process has progressed. Previously future residential was considered for every site as the Army could not provide assurances to EPA that land use would never be residential. As a worst case, residential exposure was considered. However, even though residential exposure was evaluated, clean-up was to be based upon other more realistic exposure scenarios. With the recent release of the Local Redevelopment Authority proposed land use for the depot, there is now a basis to decide what exposure scenarios will be considered. SEAD-66 is located within the area designated as industrial and our exposure scenarios will be focused upon evaluating scenarios consistent with such land use. This will include future industrial worker, future construction worker, and future trespasser. The text in sections 3.2 and 4.4 has been modified to reflect this new information regarding proposed future land use and exposure.

Comment #7 Current workers are said to be exposed by direct contact with soil. Therefore, incidental ingestion must also be assumed while they are in contact with the soil.

Response #7 Agreed. Figure 3-2 (formerly Figure 3-1) has been modified to include ingestion of soil by workers.

Comment #8 If the contractor can justify the assessment of future residential use, also justify the use of groundwater as a potable water supply since it is not currently being used as such.

Response #8 See the response for comment #5.

Comment #12 This text states visitors are potential receptors at this site, but they are not included in the CSM.

Response #12 Agreed. Visitors have been added to the CSM Figure 3-2 (formerly Figure 3-1).

Comment #14 The text here is not consistent with the CSM.

Response #14 Agreed. The text has been made to be consistent with the CSM.

Comment #15 The first sentence is apparently in error. The evaluation of DQOs is not fulfilled by a list of remedial action alternatives.

Response #15 Agreed. Section 3.5 has been clarified and expanded.

Comment #16 With no previous data at this site to indicate it is a real hazard, the proposed biological sampling is not warranted. The contractor should sample the surface water and sediment downstream from the to determine if biological sampling is warranted.

Response #16 Agreed. The text in Section 4.2.5 has been clarified.

Comment #17 Based on the results of the risk assessment in the RI, a determination should be made if further action is warranted at this site before proceeding to the FS.

Response #17 Agreed. Upon completion of the risk assessment a determination will be made to determine if further action is warranted at the site. Not completing any further work on the site would be equivalent to supporting a "no action" outcome based on the data available in the RI, which would have to show that the risk was acceptable and that no ARARs have been exceeded. It is noteworthy that the RI/FS process is based on Army, EPA, and NYSDEC cooperation and approval, therefore, any "no action" outcome would have to be jointly approved. In our experience, much of the supporting information is developed during the FS process (i.e., soil leaching studies, groundwater modeling), and by not performing these FS tasks it greatly reduces the Army's ability to convince the regulators that "no action" is appropriate. Also, our experience has shown that even though acceptable human health risk has been demonstrated in the risk assessment, other considerations often factor into the agency's decision to grant a "no action" outcome. These include: NYSDEC TAGM values, leaching of constituents (e.g., metals) from soil into groundwater, ecological risks, etc.

Comment #18 These comments were written by Cathy Forget. If there are any questions or if clarification is needed, please call me at 402-697-2588.

Response #18 Acknowledged.

COMMENTS BY K. PETERSON

Comment #1 EST

The feasibility estimates for the various remedial action alternatives that will be included in the RI/FS will be developed using ER 1100-1-1300, Cost Engineering Policy and General Requirements - 26 Mar 93, ER 1110-3-1301, Cost Engineering Policy and General Requirements for HTRW Remedial Action Cost Estimates - 15 Apr 94. Also recently distributed the draft TM 5-800-2, Cost Estimates, can be used for guidance. Please contact the HTRW-MCX, Kate Paterson, 402/697-2610 for any further instructions and/or guidance.

Response #1 Agreed. The feasibility estimates for the various remedial action alternatives that will be included in the RI/FS will be developed using ER 1100-1-1300, Cost Engineering Policy and General Requirements - 26 Mar 93, ER 1100-3-1301, Cost Engineering Policy and General Requirements for HTRW Remedial Action Cost Estimates - 15 Apr 94. MCASES Gold software will be used to estimate the cost for the selected plan. Also, we will contact Kate Peterson for any needed instructions or guidance.

Response #1 Agree. We have added text to Section 5.4, Task Summary Plan for the (see SEAD-4) that describes the use of MCASES for the remedial action cost estimate and conformance with ER-1110-3-1301.

COMMENTS BY K. HEALY

Comment #1 Page 1-4.

Please delete "Although the SMWU... has decided to conduct a RI/FS at this AOC." In order to maintain a priority for this project, a euphemism has been developed. This is actually an SI in all respects but the name.

Response #1 Agree. The sentence has been deleted.

Comment #2 Figure 4-1.

Without a lot of prior information concerning the direction of groundwater flow, it is difficult to understand the rationale behind the lineal placement of proposed wells. Please clarify.

Response #2 Agree. The rational behind the placement of the wells is provided below. The groundwater flow direction was estimated to be north-northeast based upon the local topography. Because the location where pesticides were stored is unknown, 4 potential storage or handling areas were selected and a monitoring well was proposed to be located to the north-northeast of each of these locations. To avoid any problems with using a triangulation method to develop a groundwater flow map, 3 of the monitoring wells have been re-located.

Comment #3 Section 4.2.2, Page 4-6.

In the final paragraph of this section, subsurface soil sampling is discussed. Question whether "below the water table" should be the usual "within a one foot horizon immediately above the water table". Also, would question why more extensive chemical analysis is not being performed on these subsurface samples. Please clarify.

Response #3 Agree. Clarification of this is provided below. The subsurface soil samples originally proposed were to be analyzed for total organic carbon (TOC) and grain size distribution. Two of these samples were to be collected below the water table to characterize the grain size of saturated soil. In this revision of the workplan, 5 soil borings have been added that will have more extensive chemical analyses performed.

Comment #4 Table 4-1.

Recommend including references (Table and associated text) to the number and type of QA/QC samples envisioned.

Response #4 Agree. The frequency at which QA/QC samples will be collected is described in Section 5.3 of Appendix C within the Generic Installation RI/FS Workplan. These samples will be collected in accordance with NYSDEC/EPA and USACE guidance. A footnote has been added to Table 4-1, and a statement has been added to Section 4.2.6 indicating this.

COMMENTS BY S. BRADLEY

Comment #1 Section 1.1, Page 1-1.

The initial statement referencing the Generic Workplan is not correct for this document. Please define the purpose of <u>this</u> document as it is not the same as the RI/FS workplan. Additionally, even if it is somewhat repetitive, citing another document to introduce the purpose of this report exacerbates the challenges of utilizing multiple separate plans tied to a generic workplan. The purpose statement should define how this scoping document ties into the overall program.

Response #1 Agree. Section 1.1 has been changed. See the Response #1 for S. White.

Comment #2 Section 1.2, Page 1-1.

Please replace the reference to the generic WP with a brief overview of the report organization.

Response #2 Agree. Section 1.2 has been changed as follows:

"The remaining sections of this report are organized to describe the overall site conditions, provide a scoping of the RI/FS and to provide task plans for the RI and FS. Section 2.0 (Site Conditions) presents a description of regional geologic site conditions and discusses the results of previous investigations. Section 3.0 discusses scoping of the RI/FS including the conceptual site model identification of potential receptors and exposure scenarios, scoping of potential remedial action technologies, preliminary identification of ARARS, data quality objectives, and gaps and needs. The task plans for the RI and FS are discussed in Sections 4.0 and 5.0, respectively. Section 6.0 (Plans and Management) discusses scheduling and staffing. Appendices A through F are included with this report."

Comment #3 Section 3.1.2, pg. 3-2.

Part 1: In first sentence, please use term "Potential Contaminants of Concern" and indicate in parenthesis that the generic WP addresses all PCOC's, site-wide, as "constituents of concern".

Part 2: This entire section on fate of constituents is too detailed for a scoping document and should be summarized. The details should go in the RI/FS report itself.

Response #3 Part 1: Agree. The paragraph has been changed as follows:

"The potential contaminants of concern (PCOC) at SEAD-66 are pesticides and their environmental fate is discussed below. The Generic Installation RI/FS Workplan addresses all PCOCs, site-wide, as constituents of concern. The discussion is meant to provide wide range of fate and transport characteristics that will be further defined in the RI/FS report. A summary of the fate and transport parameters of selected organic compounds is presented in Table 3-2."

Part 2: Disagree. The section on environmental fate of constituents has not been summarized because it is meant to provide a wide range of fate and transport characteristics that will be further defined in the RI/FS report. This information, along with relevant environmental fate information on any constituents of concern identified during the RI, will be included in the RI/FS report.

Comment #4 Section 3.2, Page 3-35.

Retitle as "Preliminary Identification of Potential Receptors and Exposure Scenarios". This section is too detailed for scoping purposes and should be summarized.

Response #4 Agree. The section has been retitled and summarized.

Comment #5 Section 4.2, Page 4-1.

Under each discussion of field investigation specifics (like number of samples or wells), please rephrase if possible to support a position that the identified quantities are sufficient to characterize the sites.

Response #5 Agree. Where appropriate, the information requested above has been incorporated.

Comment #6 Figures 4-1 and 4-2.

Drawing quality is insufficient to delineate details.

Response #6 Agree. Because no base map has been developed for this AOC, general site maps supplied by SEDA were used to develop the base maps used in this workplan. A surveying program has been included in the RI/FS characterization, and new base maps will be produced for the RI/FS report. The maps included in this revision of the workplan have been improved.

APPENDIX F

SCOPE OF WORK

Del. Order 36 726510 02001 43169

APPENDIX A
ANNEX AM
PREPARATION OF WORK PLANS FOR CERCLA SITE INVESTIGATIONS
AT
LOW PRIORITY AOC's
AT
SENECA ARMY DEPOT
ROMULUS, NEW YORK

1.0 GENERAL STATEMENT OF SERVICES.

1.1 Background. As mandated by the EPA, Region II, and by the New York State Department of Environmental Conservation (NYSDEC), the Army has performed a Solid Waste Management Unit Classification Study at Seneca Army Depot Activity (SEDA). This work was performed to evaluate the effects of past solid waste management practices at identified solid waste management units (SWMU's) on the facility and to classify each as areas where "No Action is Required" or as "Areas of Concern" (AOC's). Areas of Concern include both (a) SWMU's where releases of hazardous substances may have occurred and (b) locations where there has been a release or threat of a release into the environment of a hazardous substance, pollutant or contaminant (including radionuclides) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). AOC's may include but need not be limited to former spill areas, landfills, surface impoundments, waste piles, land treatment units, transfer stations, wastewater treatment units, incinerators, container storage areas, scrapyards, cesspools and tanks with associated piping which are known to have caused a release into the environment or whose integrity has not been verified. The universe of SWMU's classified as part of the SWMU Classification Study is presented in Table 1.

TABLE 1

Universe of SWMUs at Seneca Army Depot Activity

ITEM	DESIG.		TITLE
1	SEAD-1		Bldg 307 - Hazardous Waste Container Storage Facility
2	SEAD-2		Bldg 301 - PCB Transformer Storage
3	SEAD-3	*	Incinerator Cooling Water Pond
4	SEAD-4	+	Munitions Washout Facility Leach Field
5	SEAD-5		Sewage Sludge Waste Pile
6	SEAD-6	*	Abandoned Ash Landfill
7	SEAD-7		Shale Pit
8	SEAD-8	*	Non-Combustible Fill Area
9	SEAD-9		Old Scrap Wood Site
10	SEAD-10		Present Scrap Wood Site
11	SEAD-11	+	Old Construction Debris Landfill
12	SEAD-12		Radioactive Waste Burial Sites (3)
13	SEAD-13	+	IRFNA Disposal Site
14	SEAD-14	*	Refuse Burning Pits
15	SEAD-15	*	Abandoned Incinerator Building
16	SEAD-16	+	Bld. S-311 - Abandoned Deactivation Furnace
17	SEAD-17	+	Bld. 367 - Existing Deactivation Furnace
18	SEAD-18		Bld. 709 - Classified Document Incinerator
19	SEAD-19		Bld. 801 - Classified Document Incinerator
20	SEAD-20		Sewage Treatment Plant No. 4
21	SEAD-21		Sewage Treatment Plant No. 715
22	SEAD-22		Sewage Treatment Plant No. 314
23	SEAD-23	*	Open Burning Ground
24	SEAD-24	+	Abandoned Powder Burning Pit
25	SEAD-25	+	Fire Training and Demonstration Pad
26	SEAD-26	+	Fire Training Pit
27	SEAD-27		Bld. 360 - Steam Cleaning Waste Tank
28	SEAD-28		Bld. 360 - Underground Waste Oil Tanks (2)
29	SEAD-29		Bld. 732 - Underground Waste Oil Tank
30	SEAD-30		Bld. 118 - Underground Waste Oil Tank
31	SEAD-31		Bld. 117 - Underground Waste Oil Tank
32	SEAD-32		Bld. 718 - Underground Waste Oil Tanks (2)
33	SEAD-33		Bld. 121 - Underground Waste Oil Tank
34	SEAD-34		Bld. 319 - Underground Waste Oil Tanks (2)
35	SEAD-35		Bld. 718 - Waste Oil-Burning Boilers (3)
36	SEAD-36		Bld. 121 - Waste Oil-Burning Boilers (2)
37	SEAD-37		Bld. 319 - Waste Oil-Burning Boilers (s)
38	SEAD-38		Bld. 2079 - Boiler Blowdown Leach Pit
39	SEAD-39		Bld. 121 - Boiler Blowdown Leach Pit

Table 1 (Con't)

40	SEAD-40		Bld. 319 - Boiler Blowdown Leach Pit
41	SEAD-41		Bld. 718 - Boiler Blowdown Leach Pit
42	SEAD-42		Preventive Medicine Lab
43	SEAD-43		Old Missile Propellant Test Lab (Building 606)
44	SEAD-44		Quality Assurance Test Lab
45	SEAD-45	+	Demolition Area (Refer to SEAD-23)
46	SEAD-46		Small Arms Range
47	SEAD-47		Radiation Calibration Source Storage (Buildings 321 and 806)
48	SEAD-48		Pitchblend Storage Bunkers
49	SEAD-49		Columbite Ore Storage (Bld. 356)
50	SEAD-50		Tank Farm
51	SEAD-51		Herbicide Usage - perimeter of high security area
52	SEAD-52		Ammunition Breakdown Area (Blds. 608 and 612)
53	SEAD-53		Munitions Storage Igloos
54	SEAD-54		Asbestos Storage Igloos
55	SEAD-55		Tannin Storage Igloos
56	SEAD-56		Herbicide and Pesticide Storage
57	SEAD-57	+	Explosive Ordnance Disposal Area
58	SEAD-58		Booster Station (Building 2131)
59	SEAD-59		Fill Area (West of Building 135)
60	SEAD-60		Oil Discharge (Building 609)
61	SEAD-61		Underground Waste Oil Tank (Building 718)
62	SEAD-62		Nicotine Sulfate Disposal Area (South side of Road, between Buildings 606 and 612)
63	SEAD-63		Miscellaneous Components Burial Site
64	SEAD-64		Garbage Disposal Areas (Debris Landfill South of Storage Pad)
65	SEAD-65		Acid Storage Pad
66	SEAD-66		Pesticide Storage Area (Near Buildings 5 & 6)
67	SEAD-67		Dump Site (East of Sewage Treatment Plant No. 4)
68	SEAD-68		Pest Control Shop (Building S-335)
69	SEAD-69		Disposal Area (Building 606)
70	SEAD-70		Building 803
71	SEAD-71		Fill Area Adjacent to building T-2110
72	SEAD-72		Rumored Paint and Solvent Burial Area

Note: The items marked by an asterisk have already been identified as AOC's and RI/FS activities have been initiated at these sites. Those marked with a + have been identified as AOC's and SI activities are being initiated under a separate contract.

1.2 Location. Seneca Army Depot Activity is a US Army facility located in Seneca County, New York. SEDA occupies approximately 10,600 acres. It is bounded on the west by State Route 96A and on the east by State Route 96. The cities of Geneva and Rochester are located to the northwest (14 and 50 miles, respectively); Syracuse is 53 miles to the northeast and Ithaca is 31 miles to the south. The surrounding area is generally used for farming.

1.3 Regulatory Status. Seneca Army Depot Activity has applied for a Part B Permit to operate a hazardous waste storage facility (SWMU designation, SEAD-1), a polychlorinated biphenyl storage facility (SEAD-2) and a deactivation furnace (SEAD-17). The OB/OD grounds (SEAD-23) are currently under interim status. Under the Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Amendments of 1984 (HSWA), Part B Permits issued after 8 November 1984 shall require identification and corrective action at any SWMU located on the installation which is releasing hazardous constituents or hazardous wastes to the environment. This requirement applies to all SWMU's regardless of when the wastes were placed therein. However, the format of any required future investigations is being based on CERCLA guidelines, as agreed to by the USEPA Region II and NYSDEC, in an effort to facilitate overall coordination of investigations mandated at SEAD in response to SEAD's inclusion on the Federal Facilities National Priorities List. In addition to SWMU Site Investigations to be performed under this contract, additional investigations which are currently being undertaken include: a RI/FS at the Incinerator Ash Landfill (SEAD-3, 6, 8, 14 and SEAD- 15) and a RI/FS at the OB grounds (SEAD-23).

1.4 Sites To be Investigated under this Contract. The three sites to be investigated under this contract are listed in Table 2.

TABLE 2

ITEM	DESIGNATION	TITLE
1	SEAD-46	Small Arms Range
2	SEAD-66	Pesticide Storage Area
~~3~~	~~Building 804~~	
3	SEAD-68 AAM-4	
4	SEAD-28	

2.0 OBJECTIVE.

The purpose of this contract is to prepare Work Plans for the conduct of CERCLA Site Investigations at the areas of concern at SEDA identified in Table 2. The work shall be performed according to the requirements of the State of New York and the USEPA and according to the Federal Facilities Agreement in effect for Seneca Army Depot Activity. In addition, all comments provided for the initial SWMU Investigation Work Plan (Reference 8.4) shall be taken into account in the preparation of this plan. The format of work shall be based on the requirements presented in the EPA Guidance. No submittal shall be considered "Final" until it adequately satisfies all EPA and NYSDEC review comments and is approved by the regulatory authorities.

3.0 DETAILED DESCRIPTION OF SERVICES.

The AE shall be responsible for performance of the work described below:

3.1 (Task 1) Site Inspection and Records Review. The general purpose of this task is to evaluate available information about each site and its surrounding environment. The AE shall perform a visual inspection of each site, and shall review records and reports provided by the Government or made available to the AE as published data from other sources. Most of the information will come from existing reports. In addition, the AE shall interview, where appropriate, past and present employees with knowledge of site practices. The following categorical guidelines shall be used in the review of information:

3.1.1 Operational and disposal history including past and present practices.

3.1.2 Design and/or construction details, if applicable.

3.1.3 Waste profiles, including types and amounts of wastes.

3.1.4 Appropriate monitoring information, including contaminants, with sampling dates and locations (including depths) found near the unit.

3.1.5 Environmental concerns, targets and pathways.

3.1.6 Corrective measures instituted.

3.1.7 Detailed maps, where available; target populations and environments.

3.1.8 Releases to the environment.

3.2 (Task 2) Preparation of Work Plans. The AE shall prepare a work plan describing specific details of the site investigations to be performed at each site. Procedures, equipment and organizational structure, as well as investigation objectives and rationale, shall be discussed at appropriate locations within the plan. No field work may be performed until the plan is reviewed and approved and all work shall be performed according to the approved plan. The work plan shall include, as a minimum, the following sub-plans.

3.2.1 Health and Safety Sub-Plan. Requirements shall, in general, follow those presented in the Health and Safety Sub-Plans of References 8.2, 8.3 and 8.4.

3.2.2 Sampling and Analysis Sub-Plan.

3.2.2.1 Field Sampling Sub-Plan. General requirements shall follow those presented in the corresponding sub-plans of References 8.2, 8.3 and 8.4. The AE shall provide required site-specific sampling objectives and rationale.

3.2.2.2 Quality Assurance Project Sub-Plan. General requirements shall follow those presented in the corresponding sub-plans of References 8.2, 8.3 and 8.4. Site-specific information shall be added, as required.

3.3 (Task 3) Project Management. The A-E shall, during the life of the Delivery Order (DO), manage the DO in accordance with Appendix A of the basic contract SOW. The A-E shall perform all project management associated with this DO as part of this task including, but not limited to, preparing and submitting a master network schedule, monthly progress reports, and cost/schedule variance reports, and work task proposals in accordance with Section 4.5 of Appendix A to the basic contract SOW.

4.0 SUBMITTALS AND PRESENTATIONS

4.1 Work Plan Format and Content. The Work Plan shall present all procedures and investigation objectives. All site drawings shall be of engineering quality with sufficient detail to show interrelations of major features on the installation site map. When drawings are required, data may be combined to reduce the number of drawings. The report shall consist of 8-1/2" x 11" pages with drawings folded, if necessary, to this size. A decimal paragraphing system shall be used. The report covers shall consist of durable three-ring binders which shall hold pages firmly while allowing easy removal, addition, or deletion of pages. A report title page shall identify the AE, the Corps of Engineers, Huntsville Division, and the date. The AE identification shall not dominate the title page. This Statement of Work shall be incorporated in the draft report only. Submittals shall include incorporation of all previous review comments as well as the disposition of each comment. Disposition of comments submitted with the final report shall be separate from the report document.

4.2 Minutes of Meeting. Following any meeting attended by the AE, the AE shall prepare and submit minutes of the meeting within 5 days to the Contracting Officer.

4.3 Correspondence. The AE shall keep a record of each phone conversation and written correspondence where information related to the performance of this contract is made. A summary of the phone conversations and written correspondence shall be submitted to the Contracting Officer monthly.

4.4 Monthly Progress Report. The AE shall prepare and submit a monthly progress letter report describing the work performed since the previous report, work currently underway and work anticipated. The report shall state whether current work is on schedule, and, if not, what actions are anticipated in order to get back on schedule. The report shall be submitted not later than the 15th day of each calendar month and shall discuss the previous calendar month's activities.

4.5 Presentations and Meetings. The AE shall attend meetings/presentations of work performed according to the schedule in paragraph 4.7. The meetings/presentations will consist of a summary of the work accomplished and anticipated followed by open discussion among those present. For the purposes of negotiation, the AE shall assume that meetings/presentations shall last no more than one day each and shall be attended by two representatives of the AE firm. Also assume that two trips will be required, one to Seneca Army Depot Activity, Romulus, NY and one to EPA Region II offices in New York City.

4.6 Submittals.

4.4.1 General Submittal Requirements.

4.6.1.1 Distribution. The AE is responsible for reproduction and distribution of all documents. The AE shall furnish copies of submittals to each addressee listed in paragraph 4.6.3 in the quantities listed in the document submittal list. Submittals are due at each of the addressees not later than the close of business on the dates shown in paragraph 4.7.

4.6.1.2 Partial Submittals. Partial submittals will not be accepted unless prior approval is given by the Contracting Officer.

4.6.1.3 Cover Letters. A cover letter shall accompany each document and indicate the project, project phase, the date comments are due, to whom comments are submitted, the date and location of the review conference, etc., as appropriate. (Note that, depending on the recipient, not all letters will contain the same information.) The contents of the cover letters should be coordinated with CEHND-PM-ED prior to the submittal date. The cover letter shall not be bound into the document.

4.6.1.4 Supporting Data and Calculations. The tabulation of criteria, data, calculations, and etc., which are performed but not included in detail in the report shall be assembled as appendices. Criteria information provided by CEHND need not be reiterated, although it should be referenced as appropriate. A copy of the final scope of services shall be included in the draft Work Plan only.

4.6.1.5 Reproducibles. One camera-ready, unbound copy of each submittal shall be provided to the Contracting Officer in addition to the submittals required in the document and submittal list. All final submittals shall also be provided to the Contracting Officer and SEDA on 3.5 inch floppy disks compatible with the Intel 310/80286 computer in WordPerfect 5.1/5.2 format.

4.6.2 Specific Submittal Requirements.

a. Work Plan: Preliminary Draft, Draft, Draft-Final, and Final

b. Monthly Progress Reports: Final only.

4.6.3 Addresses.

Commander
U.S. Army Corps of Engineers
Huntsville Division
ATTN: CEHND-PM-ED ~~(Mr. Suever)~~
106 Wynn Drive
Huntsville, AL 35805 Ms. Richards

Commander
U.S. Army Depot Systems
Command(DESCOM)
ATTN: AMSDS-EN-FD
(Mr. Biernacki)
Chambersburg, PA 17201

Commander
U.S. Army Environmental
Hygiene Agency (USAEHA)
ATTN:HSHB-ME-SR (Mr. Hoddinott)
Aberdeen Proving Ground, Md
21010-5422

Commander
U.S. Army Material Command (USAMC)
ATTN: AMCEN-A (Mr. Bob King)
5001 Eisenhower Ave.
Alexandria, Virginia 22333-0001

Commander
U.S. Army Corps of Engineers
Toxic and Hazardous Materials
Agency
ATTN: ~~CETHA-IR-D~~ SFIM-AEC-IRP (Dr. Buchi)
Aberdeen Proving Ground, MD 21010-5401
BuilDING 4480

Commander
US Army Corps of Engineers,
Missouri River Division
ATTN: CEMRD-ED-EA (Mr Plack)
PO Box 103
Downtown Station,
Omaha, NE 68101-0103

Commander
Seneca Army Depot Activity
ATTN: SDSSE-HE (Mr. Battaglia)
Romulus, New York 14541

Commander
U.S. Army Corps of Engineers
New York District
ATTN: CENAN-PP-E (Mr. Naughton)
26 Federal Plaza
New York, NY 10278-0090

4.6.4 Document and Submittal List.

Work Plan

	Preliminary Draft	Draft	Draft-Final	Final	Monthly Reports
CEHND	2	2	2	2	2
USAMC	1	1	1	1	0
DESCOM	1	1	1	1	0
CETHA	1	1	1	1	0
CEMRD	~~8~~ 3	~~8~~ 3	3	3	0
SDSSE	5	23	~~5~~ 23	~~5~~ 23	0
USAEHA	7	7	7	7	0
CENAN	2	2	2	2	1
TOTAL	~~27~~	~~45~~	~~22~~	~~22~~	3
	22	40	40	40	

4.7 Schedule.

	Date Due
Submit Preliminary Draft Work Plan (to DoD only)	30 Jan 95
Comments Provided	2 Mar 95
Submit Draft Work Plan (to All)	2 Apr 95
Regulatory Comments Due	2 May 95
Submit Draft-Final Work Plan (to All)	2 Jun 95
Final Work Plan (No Disputes)	2 Jul 95
Meetings/Presentations (3)	TBD

The overall completion date for this delivery order shall be 1 September 1995.

5.0 HEALTH AND SAFETY REQUIREMENTS

Health and Safety requirements are contained in Reference 8.2, 8.3 and 8.4.

6.0 SECURITY REQUIREMENTS

6.1 General. The following requirements must be followed by the AE at Seneca Army Depot Activity to facilitate the entry and exit of AE employees and to maintain security.

6.1.1 Personnel Registration:

6.1.1.1 A list of all AE employees, sub-contractors and suppliers indicating firm name and furnished through POC/COR to the Counterintelligence Division, Building 7 prior to commencement of work.

6.1.1.2 A confirmation of employment SDSSE-SC Form 268 will be executed by the AE concerning each employee, to include all sub-contractors and their personnel. No forms will be transferred to another file if the AE has other on-going contracts at SEDA. The AE will provide a list of personnel who are authorized to sign Form 268 for the firm. A sample of each signature is required. Counterintelligence Division must be notified, in writing, of any changes to this list.

All completed forms will be provided through COR/POC to the Counterintelligence Division 72 hours prior to commencement of work. Failure to complete Form 268 will result in employee's denial of access to SEDA. The Counterintelligence Division must be notified, in writing through POC/COR to Counterintelligence, at least 72 hours prior to requesting any action. The chain of command for all AE actions will be through POC/COR to Counterintelligence Division. There will be no exceptions.

6.1.1.3 Camera permits require written notice from the POC/COR prior to access. Open camera permits will not be issued. The following information is required:

(a) Camera make, model and serial number.

(b) Contract name and name of individual responsible for the camera.

(c) Dates camera will be used.

(d) Where it will be used.

(e) What will be photographed and why.

6.1.1.4 If a rental, leased or privately owned vehicle is required in place of a company vehicle, the following information is needed.

(a) Name of individual driving.

(b) Year, make, model, color and license plate of the vehicle.

(c) Typed letter on company letterhead indicating that the company assumes responsibility for rental, leased or privately owned vehicles.

6.1.1.5 All access media will be destroyed upon expiration date of contract. If an extension is required a list of employee names and new expiration date must be furnished to the Counterintelligence Division. Contract extensions must be made prior to the contract expiration date or new Form 268s will be required for each individual that requires an extension.

6.1.2 <u>Traffic Regulations:</u>

6.1.2.1 Traffic Laws, State of New York, apply with emphasis on the following regulations.

6.1.2.2 Speed Limit:

Controlled Area	- as posted
Ammo Area	- 5 mph
Limited/Exclusion Area	- 25 mph

6.1.2.3 All of the above are subject to change with road conditions or as otherwise posted.

6.1.3 Parking: AE vehicles (trucks, rigs, etc.) will be parked in areas designated by the Director of Law Enforcement and Security. Usually parking will be permitted within close proximity to the work site. Do not park within 30 feet of a depot fence, as these are clear zones.

6.1.4 Gates:

6.1.4.1 Post 1, Main Gate - NY Highway 96, Romulus, New York is open for personnel entrance and exit 24 hours daily, 7 days a week.

6.1.4.2 Post 3, entrance to North Depot Troop Area, located at end of access road from Route 96-A is open 7 days a week for personnel and vehicle entrance and exit.

6.1.5 Security Regulations:

6.1.5.1 Prohibited Property:

6.1.5.1.1 Cameras, binoculars, weapons and intoxicating beverages will not be introduced to the installation, except by written permission of the Director/Deputy Director of Law Enforcement and Security.

6.1.5.1.2 Matches or other spark producing devices will not be introduced into the Limited/Exclusion or Ammo Area's except when the possessor of such items is covered by a properly validated match or flame producing device permit.

6.1.5.1.3 All vehicles and personal parcels, lunch pails, etc. are subject to routine security inspections at any time while on depot property.

6.1.5.1.4 All building materials, equipment and machinery must be cleared by the Director of Public Works who will issue a property pass for outgoing equipment and materials.

6.1.6 AE Employee Circulation:

6.1.6.1 AE employees are cleared for entrance to the location of contract work only. Sight-seeing tours or wandering from work site is NOT AUTHORIZED.

6.1.6.2 Written notification will be provided to the Counterintelligence Division (Ext. 30202) at least 72 hours prior to overtime work or prior to working on non-operating days.

6.1.6.3 Security Police (Ext. 30448/30366) will be notified at least two hours in advance of any installation or movement of slow moving heavy equipment that may interfere with normal flow of traffic, parking or security.

6.1.7 Unions: Representatives will be referred to the Depot Industrial Labor Relations Officer (Ext. 41317).

6.1.8 Offenses: (Violations of law or regulations)

6.1.8.1 Minor: Offenses committed by AE personnel which are minor in nature will be reported by the Director of Law Enforcement and Security to the Contracting Officer who in turn will report such incidents to the AE for appropriate disciplinary action.

6.1.8.2 Major: Serious offenses committed while on the installation will be reported to the FBI. Violators may be subject to trial in Federal Court.

6.1.9 Explosive Laden Vehicles:

6.1.9.1 Vehicles such as vans, cargo trucks, etc. carrying explosives will display placards or signs stating "EXPLOSIVES".

6.1.9.2 Explosive ladened vehicles will not be passed.

6.1.9.3 When an explosive laden vehicle is approaching, pull over to the side and stop.

6.1.9.4 When catching up with an explosive laden vehicle, slow down and allow that vehicle to remain at least 100 feet ahead.

6.1.9.5 When approaching an intersection where an explosive laden vehicle is crossing - STOP - do not enter the intersection until such time as the explosive carrier has passed thru, and cleared the intersection.

6.1.9.6 When passing a vehicle that is parked, and displaying "Explosive" signs, slow down to 10 miles per hour, and take every precaution to allow more than ample clearance.

6.1.10 Clearing Post: All AE employees are required to return all identification badges, and passes on the last day of employment on the depot. The AE is responsible for the completion of all turn-ins by his employees, and informing the Counterintelligence Division and the depot organization administering the contract, for termination of any employee's access to the depot.

6.1.11 Security (Access) Requirements:

6.1.11.1 In general, the AE shall note that special access/administration requirements, in addition to those listed here, apply to those wishing to enter the Exclusion Area at SEDA. The AE shall coordinate with the SEDA Security Office to ascertain what special requirements exist prior to considering the performance of any work within this area.

6.1.11.2 Any vehicle wishing to enter either the limited/Exclusion Area must have a fire extinguisher within.

7.0 PUBLIC AFFAIRS

The AE shall not make available to the news media or publicly disclose, in general, any data generated or reviewed under this contract. The AE shall refer all requests for site information to Seneca Army Depot Activity for comment. All requests for contract information shall be directed to the Contracting Officer, Huntsville Division. Reports and data generated under this contract shall become the property of the Department of Defense and distribution to any other source by the AE, unless authorized by the Contracting Officer, is prohibited. The AE shall notify the Contracting Officer and Installation Public Affairs Office prior to any contacts with regulatory agencies.

8.0 REFERENCE DOCUMENTS

8.1 "Solid Waste Management Unit Classification Study at Seneca Army

Depot, Romulus, New York," ERC Environmental and Energy Services Co., Inc., January 1991 (Draft)

8.2 "Work Plan Remedial Investigation/Feasibility Study at the Ash Landfill, Seneca Army Depot, Romulus, New York," Environmental Science and Engineering, Inc., 1990 (Draft-Final).

8.3 "Work Plan of Architect-Engineer Services for Performing a Remedial Investigation/Feasibility Study (RI/FS) at the Open Burning (OB) Grounds, Seneca Army Depot, Romulus, New York," C.T. Main, Inc., February 1991 (Draft).

8.4 "Work Plan For CERCLA Investigation of Eleven Solid Waste Management Units at Seneca Army Depot, Romulus, New York."; 27 January 1992, C.T. Main, Inc.