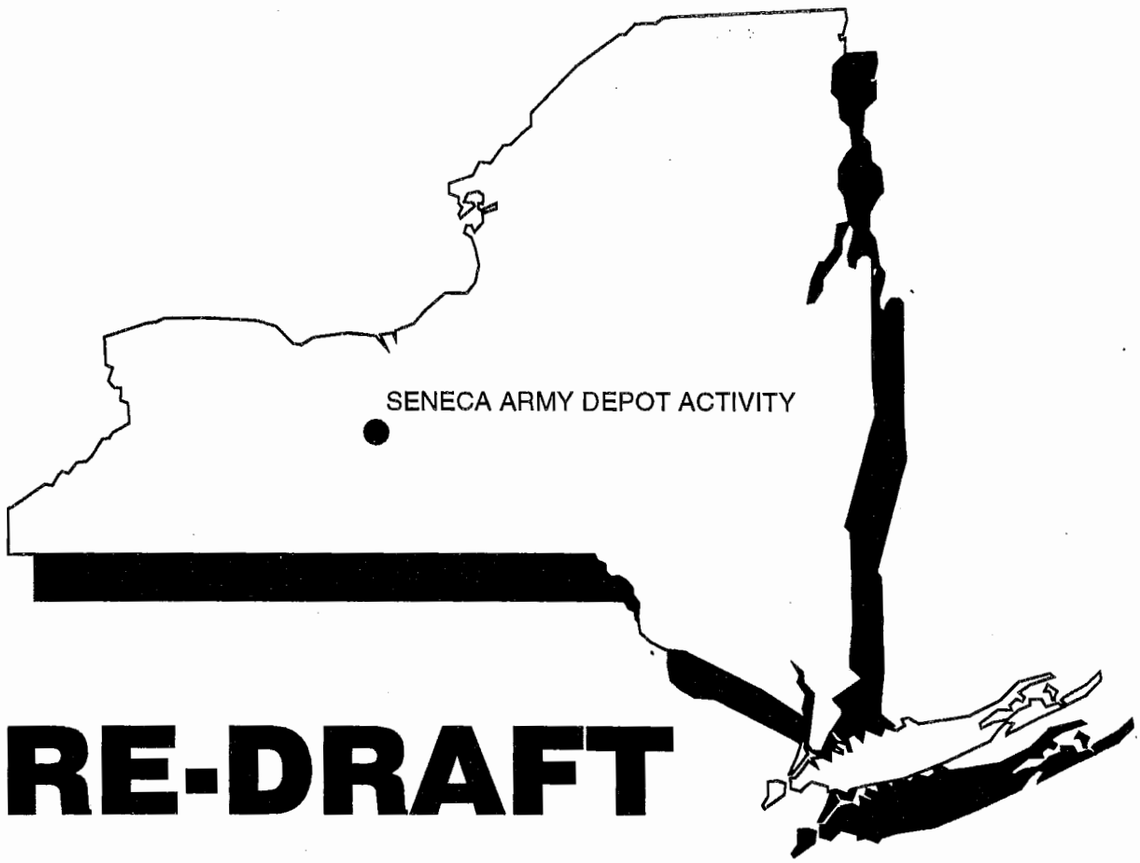
U.S. ARMY ENGINEER DIVISION
HUNTSVILLE, ALABAMA

00059



PRE-DRAFT

SEAD-64D
PROJECT SCOPING PLAN FOR PERFORMING A CERCLA REMEDIAL INVESTIGATION / FEASIBILITY STUDY (RI/FS) AT A GARBAGE DISPOSAL AREA (SEAD-64D)

JULY 1995

PROJECT SCOPING PLAN
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
AT SEAD-64D
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

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONT.)

TABLE OF CONTENTS
(CONT.)

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

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

LIST OF ACRONYMS
(CONT.)

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
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
OB	Open Burning
OD	Open Detonation
OVM	Organic Vapor Meter
Pb	Lead
PAH	Polynuclear Aromatic Hydrocarbon
Parsons ES	Parsons Engineering Science, Inc.
PCB	Polychlorinated biphenyls

LIST OF ACRONYMS
(CONT.)

PID	Photoionization detector
ppm	parts per million
ppmv	parts per million per volume
PSCR	Preliminary Site Characterization Report
QA	Quality Assurance
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 Kjeldah 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

LIST OF ACRONYMS
(CONT.)

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
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
Vs	Volt Second

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This Project Scoping Plan was prepared by Parsons Engineering Science, Inc. (Parsons ES) to outline the work proposed for a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS) at SEAD-64D at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This Plan is based on the results and recommendations presented in a draft report, issued in April 1995, on the Expanded Site Investigation (ESI) conducted at this Area of Concern titled, "Expanded Site Inspection, Seven Low Priority AOCs, SEADs 60, 62, 63, 64 (A,B,C, and D), 67, 70, and 71". The purpose of this project is to determine the nature and extent of environmental impacts, and evaluate and select appropriate remedial actions. 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 (USACE) 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).

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 the results of previous investigations to develop a conceptual site model, identification of potential receptors and exposure scenarios using the conceptual site model, 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.

1.3 BACKGROUND

SEAD-64D is a former garbage disposal area at SEDA in Romulus, NY located on the southwest side of the SEDA facility (Figure 1-1). The site is a large, heavily vegetated area as shown in Figure 1-2.

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 geologic 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 hydrogeology 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 RI/FS

This section describes the conceptual model for SEAD-64D based on the results of the ESI. This information is used to identify the known contaminant sources and receptor pathways. The data quality objectives and potential remedial actions for SEAD-64D are also described. The information in this section is used to develop a list of the data gaps and needs that will be the basis for designing the Remedial Investigation in Section 4.0 and performing the feasibility study and baseline risk assessment.

3.1 CONCEPTUAL SITE MODEL

This section will describe the site history, the results of the ESI, and the environmental fate of the primary contaminants on site to develop a conceptual model of SEAD-64D.

3.1.1 Site History

The area occupied by SEAD-64D was a vineyard before SEDA was constructed in 1941. Since then, the land was allowed to reforest. At some time, SEDA cut fire lanes through the vegetation for firefighting.

SEAD-64D was reportedly used for waste disposal during the period from 1974 to 1979 when the on-site incinerator was inoperable. The SWMU Classification Report states that metal drums and other industrial waste were also reportedly disposed on site.

3.1.2 Physical Site Characterization

3.1.2.1 Physical Site Setting

SEAD-64D covers approximately 90 acres between West Patrol Road and the SEDA railroad tracks along the North-South Baseline Road (Figure 1-2). The site is approximately 2,800 feet long in a north-south direction and is approximately 1,600 feet wide in an east-west direction at the north end and 1,200 feet at the south end. Firebreaks are cut into the vegetation in the area and trend east-west and north-south.

The site is heavily vegetated with low brush, small deciduous trees, and grass. Areas in the southern portion of the site are heavily vegetated with large deciduous trees. Stressed vegetation was observed adjacent to West Patrol Road.

The land on site slopes generally downward to the west. An intermittent stream flows west through the south-central portion of the site, then off SEDA property. There are several wetlands along the east side of the site. There are low areas along the east side of West Patrol Road.

Two disposal areas were observed on site as evidenced by metal or other debris on the ground surface. These two areas are shown on Figure 1-2. At the south end of the site, an elongate east-west trending mound approximately 75 feet long contains trash and debris. Immediately to the north and east of this elongated mound are three 25-foot to 30-foot diameter depressions that are 2 to 4 feet deep. There are two other mounds nearby. In the east-central portion of the site, metal disposed on the ground surface was also observed.

Shallow north-south trending furrows in the ground surface are present over most of the site. These furrows are probably related to the former use of the site as a vineyard prior to the establishment of SEDA.

The site is bordered by the non-combustible fill area, the Ash Landfill, and an inactive incinerator (SEADs-8, 6, and 15, respectively) to the north, a railroad line and undeveloped land to the east, forested land to the south, and the West Patrol Road and the SEDA property boundary to the west.

3.1.2.2 Site Geology

Subsurface soil samples were obtained from ten borings (SB64D-1 to -10) and five borings in which monitoring wells were installed (MW64D-1 to -5) as located on Figure 3-1. The boring logs, presented in Appendix A, were used to define the site geology.

The following strata were observed in the borings with increasing depth: topsoil, glacial till, weathered shale, and shale. All the strata and the bedrock surface parallel the slope of the ground surface.

TABLE 3-1

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF ESI SOIL GAS SURVEY RESULTS

Sample Name	Location		OVM Screen (ppm)	Concentration (ppmV as TCE)
	Line	Station		
Soil Gas Points Based on a Grid System:				
SGL53-1	53	8700	0.0	0.0
SGL53-2	53	8900	0.0	0.0
SGL53-3	53	9100	0.0	0.0
SGL53-4	53	9300	0.0	0.0
SGL53-5	53	9500	0.0	0.0
SGL53-6	53	9700	0.0	0.0
SGL53-7	53	9900	0.0	0.0
SGL49-8	49	10,000	0.0	0.0
SGL49-9	49	9800	0.0	0.0
SGL49-10	49	9600	0.0	0.0
SGL49-11	49	9400	0.0	0.0
SGL49-12	49	9200	0.0	0.0
SGL49-13	49	9000	0.0	0.0
SGL49-14	49	8800	0.0	0.0
SGL49-15	49	8600	0.0	0.0
SGL45-16	45	8700	0.0	0.0
SGL45-17	45	8900	0.0	0.0
SGL45-18	45	9100	0.0	0.0
SGL45-19	45	9300	0.0	0.0
SGL45-20	45	9500	0.0	0.0
SGL45-21	45	9700	0.0	0.0
SGL45-22	45	9900	0.0	0.0
SGL41-23	41	10,000	0.0	0.0
SGL41-24	41	9800	0.0	0.0
SGL41-25	41	9600	0.0	0.0
SGL41-26	41	9400	0.0	0.0
SGL41-27	41	9200	0.0	0.0
SGL41-28	41	9000	0.0	0.0
SGL41-29	41	8800	0.0	0.0
SGL41-30	41	8600	0.0	0.0
SGL37-31	37	8700	0.0	0.0
SGL37-32	37	8900	0.0	0.0
SGL37-33	37	9100	No Sample (R)	No Sample (R)
SGL37-34	37	9300	0.0	0.0
SGL37-35	37	9500	0.0	0.0
SGL37-36	37	9700	0.0	0.0
SGL37-37	37	9900	0.0	0.0

TABLE 3-1

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF ESI SOIL GAS SURVEY RESULTS

Sample Name	Location		OVM Screen (ppm)	Concentration (ppmV as TCE)
	Line	Station		
SGL33-38	33	10,000	0.0	0.0
SGL33-39	33	9800	0.0	0.0
SGL33-40	33	9600	0.0	0.0
SGL33-41	33	9400	0.0	0.0
SGL33-42	33	9200	0.0	0.0
SGL33-43	33	9000	0.0	0.0
SGL33-44	33	8800	0.0	0.0
SGL33-45	33	8600	0.0	0.0
SGL33-46	33	8400	0.0	0.0
SGL33-47	33	8200	0.0	0.0
SGL33-48	33	8000	0.0	0.0
SGL33-49	33	7800	0.0	0.0
SGL33-50	33	7600	0.0	0.0
SGL33-51	33	7400	0.0	0.0
SGL33-52	33	7200	0.0	0.0
SGL29-53	29	7300	0.0	0.0
SGL29-54	29	7500	0.0	0.0
SGL29-55	29	7700	0.0	0.0
SGL29-56	29	7900	0.0	0.0
SGL29-57	29	8100	No Sample (R)	No Sample (R)
SGL29-58	29	8300	0.0	0.0
SGL29-59	29	8500	0.0	0.0
SGL29-60	29	8700	0.0	0.0
SGL29-61	29	8900	0.0	0.0
SGL29-62	29	9100	0.0	0.0
SGL29-63	29	9300	0.0	0.0
SGL29-64	29	9500	0.0	0.0
SGL29-65	29	9700	0.0	0.0
SGL29-66	29	9900	0.0	0.0
SGL25-67	25	10,000	0.0	0.0
SGL25-68	25	9800	0.0	0.0
SGL25-69	25	9600	0.0	0.0
SGL25-70	25	9400	0.0	0.0
SGL25-71	25	9200	0.0	0.0
SGL25-72	25	9000	0.0	0.0
SGL25-73	25	8800	0.0	0.0
SGL25-74	25	8600	0.0	0.0
SGL25-75	25	8400	0.0	0.0
SGL25-76	25	8200	0.0	0.0
SGL25-77	25	8000	0.0	0.0
SGL25-78	25	7800	0.0	0.0
SGL25-79	25	7600	0.0	0.0
SGL25-80	25	7400	No Sample (W)	No Sample (W)
SGL25-81	25	7200	0.0	0.0

TABLE 3-1

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF ESI SOIL GAS SURVEY RESULTS

Sample Name	Location		OVM Screen (ppm)	Concentration (ppmV as TCE)
	Line	Station		
SGL21-82	21	7300	0.0	0.0
SGL21-83	21	7500	0.0	0.0
SGL21-84	21	7700	0.0	0.0
SGL21-85	21	7900	No Sample (W)	No Sample (W)
SGL21-86	21	8100	0.0	0.0
SGL21-87	21	8300	0.0	0.0
SGL21-88	21	8500	0.0	0.0
SGL21-89	21	8700	0.0	0.0
SGL21-90	21	8900	0.0	0.0
SGL21-91	21	9100	0.0	0.0
SGL21-92	21	9300	0.0	0.0
SGL21-93	21	9500	0.0	0.0
SGL21-94	21	9700	0.0	0.0
SGL21-95	21	9900	0.0	0.0
SGL17-96	17	10,000	0.0	0.0
SGL17-97	17	9800	0.0	0.0
SGL17-98	17	9600	0.0	0.0
SGL17-99	17	9400	0.0	0.0
SGL17-100	17	9200	0.0	0.0
SGL17-101	17	9000	0.0	0.0
SGL17-102	17	8800	0.0	0.0
SGL17-103	17	8600	0.0	0.0
SGL17-104	17	8400	0.0	0.0
SGL17-105	17	8200	0.0	0.0
SGL17-106	17	8000	0.0	0.0
SGL17-107	17	7800	0.0	0.0
SGL17-108	17	7600	0.0	0.0
SGL17-109	17	7400	0.0	0.0
SGL13-110	13	7300	0.0	0.0
SGL13-111	13	7500	0.0	0.0
SGL13-112	13	7700	0.0	0.0
SGL13-113	13	7900	0.0	0.0
SGL13-114	13	8100	0.0	0.0
SGL13-115	13	8300	0.0	0.0
SGL13-116	13	8500	0.0	0.0
SGL13-117	13	8700	0.0	0.0
SGL13-118	13	8900	0.0	0.0
SGL13-119	13	9100	0.0	0.0
SGL13-120	13	9300	0.0	0.0
SGL13-121	13	9500	0.0	0.0
SGL13-122	13	9700	0.0	0.0
SGL13-123	13	9900	0.0	0.0

TABLE 3-1

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF ESI SOIL GAS SURVEY RESULTS

Sample Name	Location		OVM Screen (ppm)	Concentration (ppmV as TCE)
	Line	Station		
SGL9-124	9	10,000	0.0	0.0
SGL9-125	9	9800	0.0	0.0
SGL9-126	9	9600	0.0	0.0
SGL9-127	9	9400	0.0	0.0
SGL9-128	9	9200	0.0	0.0
SGL9-129	9	9000	0.0	0.0
SGL9-130	9	8800	0.0	0.0
SGL9-131	9	8600	0.0	0.0
SGL9-132	9	8400	0.0	0.0
SGL9-133	9	8200	0.0	0.0
SGL9-134	9	8000	0.0	0.0
SGL9-135	9	7800	0.0	0.0
SGL9-136	9	7600	0.0	0.0
SGL9-137	9	7400	0.0	0.0
SGL9-138	9	7250	0.0	0.0
SGL5-139	5	7300	0.0	0.0
SGL5-140	5	7500	No Sample (R)	No Sample (R)
SGL5-141	5	7700	0.0	0.0
SGL5-142	5	7900	0.0	0.0
SGL5-143	5	8100	0.0	0.0
SGL5-144	5	8300	0.0	0.0
SGL5-145	5	8500	0.0	0.0
SGL5-146	5	8700	0.0	0.0
SGL5-147	5	8900	0.0	0.0
SGL5-148	5	9100	No Sample (W)	No Sample (W)
SGL5-149	5	9300	No Sample (W)	No Sample (W)
SGL5-150	5	9500	0.0	0.0
SGL5-151	5	9700	No Sample (W)	No Sample (W)
SGL5-152	5	9900	0.0	0.0
Soil Gas Points Based on Geophysical Anomalies:				
SG-A	28	8980	0.0	0.0
SG-B	27	8795	0.0	0.0
SG-C	39	8960	0.0	0.0
SG-D	50	8780	0.0	0.0
SG-E	48	8970	0.0	0.0
SG-F	7	7520	No Sample (R)	No Sample (R)
SG-G	21	7600	0.0	0.0
SG-H	7	9770	0.0	0.0
SG-I	11	9530	0.0	0.0
SG-J	15	9780	0.0	0.0
SG-K	19	9940	0.0	0.0

TABLE 3-1

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF ESI SOIL GAS SURVEY RESULTS

Sample Name	Location		OVM Screen (ppm)	Concentration (ppmV as TCE)
	Line	Station		
SG-L	18	9540	0.0	0.0
SG-M	23	9360	0.0	0.0
SG-N	22	9620	0.0	0.0
SG-O	28	9760	0.0	0.0
SG-P	31	9400	0.0	0.0
SG-Q	42	9770	0.0	0.0
SG-S	44	9310	0.0	0.0
SG-T	15	7230	0.0	0.0

Notes:
1) Rod Blanks and field duplicates were collected daily for Quality Control.
2) "No Sample" indicates that high groundwater was present (W) or refusal was encountered within 2.5 feet (R); therefore no soil gas sample was collected.

conjunction with calibration curve data to calculate concentrations expressed as TCE in parts per million by volume (ppmv). Table 3-1 shows the concentrations of volatiles calculated at each sampling point as well as the maximum OVM readings of the soil gas immediately prior to sampling.

3.1.2.4 Geophysics

Several geophysical survey techniques were used on site. A seismic survey was used to determine the approximate groundwater flow direction on site. An electromagnetic survey was used to locate possible disposal areas. A ground penetrating radar survey was used to detect anomalies in the subsurface conditions, such as filled pits.

Seismic Survey

Four seismic refraction profiles, each 120 feet long, were performed at the locations shown in Figure 3-3 to obtain approximate groundwater depth information. The results of the seismic refraction survey conducted at SEAD-64D are shown in Table 3-2. Saturated overburden was detected only on profiles P1 and P2 at depths of 5.4 and 6.2 feet at P1 and 4.1 feet at P2.

The seismic refraction profiles detected 4 to 15 feet of unconsolidated overburden (1,050 to 4,900 ft./sec.) overlying bedrock (8,200 to 13,000 ft./sec.). In particular, the unconsolidated material included unsaturated overburden (1,050 to 1,370 ft./sec.) and saturated overburden (4,580 to 4,900 ft./sec.).

Seismic velocities typical of weathered shale (8,200 to 8,400 ft./sec.) were detected on profiles P1 and P3. However, on both profiles, the low velocity bedrock layer was detected only over a portion of the seismic transect. At distance 120 feet on profile P1, weathered rock was detected at a depth of 5.7 feet (refer to Table 3-2). On profile P3, weathered rock was detected at a depth of approximately 5.8 feet at distances -5 feet and 57.5 feet. At distance 120 feet of this profile, competent rock (13,000 ft/sec) was detected at a depth of 14.8 feet.

A review of Table 3-2 indicates that the bedrock slopes to the west, generally following the surface topography. Groundwater flow is also expected to be to the west, following the slope of the bedrock.

A

B

C

D

E

F

ST 9500

ST 9000

ST 8550

ST 8500

ST 8000

ST 7500

ST 7200

E 741500

E 741250

E 740250

E 740000

LINE 10

LINE 0

N 993500

N 993000

N 992500

N 992000

N 991750

N 991500

SEDA BOUNDARY

WEST PATROL ROAD

100 0 100 200
(feet)

IN-PHASE
(ppt)

1.74 1.49 1.24 0.99 0.74 0.49 0.24 0.00 -0.24 -0.49 -0.74 -0.99 -1.24 -1.49 -1.74 -1.99

GEOSOFT

N

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- LANDFILL EXTENT
- RAILROAD
- GROUND SURFACE ELEVATION CONTOUR (760)
- SURVEY MONUMENT
- ROAD SIGN
- DECIDUOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- COORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD64D GARBAGE DISPOSAL SITE

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No. 727651-02006

FIGURE 3-6
EM SURVEY,
IN-PHASE RESPONSE

SCALE 1" = 200' | DATE MAY 1995 | REV A

the test pit. Drums, cans, and fencing were present on the ground surface. No buried objects were observed.

Soils excavated from the three test pits were continuously screened for volatile organic compounds and radioactivity with an OVM-580B and a Victoreen-190, respectively. Excluding the 3 ppm OVM reading from the waste material in TP64D-1, no readings above background levels (0 ppm of organic vapors and 10-15 micro Rhems per hour of radiation) were observed during the excavations.

3.1.2.5 Site Hydrology and Hydrogeology

The main hydrologic features on SEAD-64D include an intermittent stream, drainage channels on the east and west sides of the site, and wetlands on the east side as shown in Figure 3-7.

Runoff on the site is controlled by the topography. Over most of the site, surface runoff flows west toward a drainage channel on the east side of the West Patrol Road. Along the eastern side of the site north of the stream, runoff flows primarily south toward wetlands and east into a drainage channel. South of the stream, runoff flows radially toward a low area located on site.

An intermittent unnamed stream flows west across the south central section of the site. Aerial photographs indicate the stream may start in the wetlands located in the southeastern corner of the site. The stream appears to flow west under the West Patrol Road and off SEDA property.

Drainage channels are shown on the topographic map along the eastern and western sides of the site. The eastern drainage channel flows south along the west side of the railroad tracks. This channel does not appear to collect or discharge water to the wetlands on the east side of the site. The drainage channel on the west side of the site appears to flow from the north end and south end of the site parallel to the West Patrol Road into a low area on the east side of the road.

MW64D-1
664.36

MW64D-4
655.10

MW64D-3
645.89

MW64D-5
646.96

MW64D-2
630.75

660
650
640

APPROXIMATE LOCATION OF OLD HOUSE FOUNDATION

POTENTIAL RUBBLE PILE

NON-COMBUSTIBLE FILL AREA

UNNAMED STREAM

WEST RAILROAD ROAD

SEDA BOUNDARY

E 741250
E 741000
E 740750
E 740500
E 740250
E 740000

N 994000
N 993750
N 993500
N 993250
N 993000
N 992750
N 992500
N 992250
N 992000
N 991750
N 991500
N 991250

100 0 100 200
(feet)

MW64D-1
664.36
MONITORING WELL WITH WATER TABLE ELEVATION

640
GROUNDWATER ELEVATION CONTOUR (ARROW INDICATES DIRECTION OF FLOW)

GROUNDWATER LEVEL MEASUREMENTS MADE ON 7/6/94

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- LANDFILL EXTENT
- RAILROAD
- 760 GROUND SURFACE ELEVATION CONTOUR
- SURVEY MONUMENT
- ROAD SIGN
- DECIDUOUS TREE
- FIRE HYDRANT
- MANHOLE
- GUIDE POST
- POLE
- UTILITY BOX
- COORDINATE GRID (250' GRID)
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL

ACAD\SENECA\RIFS\SD64D\SD64DGW.DWG

PARSONS
PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD64D GARBAGE DISPOSAL SITE

DEPT. ENVIRONMENTAL ENGINEERING | Dwg. No. 727851-02006

FIGURE 3-7
GROUNDWATER ELEVATION MAP

SCALE 1" = 200' | DATE MAY 1995 | REV A

Five monitoring wells, screened in the till/weathered shale aquifer were installed during the ESI. The monitoring well installation diagrams and development reports are presented in Appendices B and C, respectively. Groundwater in the till/weathered shale aquifer on site flows west based on groundwater elevations measured in the five monitoring wells on July 6, 1994 and July 25, 1994 (Table 3-3 and Figure 3-7). Recharge of water to the monitoring wells during sampling was good.

3.1.2.6 Chemical Analysis Results

Soil and groundwater were sampled as part of the ESI conducted at SEAD-64D in 1994. The results of the investigation were presented in the report titled "Expanded Site Inspection, Seven Low Priority AOCs, SEADs 60, 62, 63, 64(A,B,C, and D), 67, 70, and 71" which was issued in April 1995. A total of 35 surface and subsurface soil samples were collected at SEAD-64D. Groundwater from five monitoring wells was also sampled as part of this investigation. The following sections describe the nature and extent of contamination identified at SEAD-64D in soil and groundwater.

Soil

The analytical results for the 35 soil samples collected as part of the investigation of SEAD-64D are presented in Table 3-4. The following sections describe the nature and extent of contamination in SEAD-64D soils. These data are compared to the criteria in the Technical and Administrative Guidance Memorandum (TAGM): Determination of Soil Cleanup Objectives and Cleanup Levels (NYSDEC, 1992).

Volatile Organic Compounds

Methylene chloride, 2-butanone, and toluene were detected in several samples at concentrations well below their criteria. Methylene chloride was detected in approximately 20 percent of the samples at concentrations up to 3 μg/kg. 2-Butanone and toluene were each detected in one sample at concentrations of 8 and 1 μg/kg, respectively.

Semivolatile Organic Compounds

A total of 17 semivolatile organic compounds (SVOs) were found at varying concentrations in the soil samples obtained at SEAD-64D. Thirteen of the compounds are polynuclear

TABLE 3-3

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
GROUNDWATER ELEVATION SUMMARY FROM ESI

MONITORING WELL NUMBER	TOP OF PVC CASING ELEVATION (MSL)	WELL DEVELOPMENT			SAMPLING			WATER LEVEL MEASUREMENTS		
		DATE	DEPTH TO GROUNDWATER TOC (FT)	GROUNDWATER ELEVATION (MSL)	DATE	DEPTH TO GROUNDWATER TOC (FT)	GROUNDWATER ELEVATION (MSL)	DATE	DEPTH TO GROUNDWATER TOC (FT)	GROUNDWATER ELEVATION (MSL)
MW64D-1	667.79	6/23/94	4.71	663.08	7/8/94	3.82	663.97	7/6/94	3.43	664.36
								7/25/94	4.26	663.53
MW64D-2	635.20	6/28/94	4.05	631.15	7/9/94	4.87	630.33	7/6/94	4.45	630.75
								7/25/94	7.66	627.54
MW64D-3	648.88	6/27/94	3.72	645.16	7/8/94	3.42	645.46	7/6/94	2.99	645.89
								7/25/94	4.48	644.40
MW64D-4	661.33	6/27/94	7.94	653.39	7/8/94	6.54	654.79	7/6/94	6.23	655.10
								7/25/94	9.22	652.11
MW64D-5	652.49	6/27/94	7.34	645.15	7/18/94	7.24	645.25	7/6/94	5.53	646.96
								7/25/94	7.37	645.12

TABLE 3-4

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SOIL ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION DEPTH (FEET) SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	TAGM	NUMBER ABOVE TAGM	SOIL SEAD-64 0-0.2 04/14/94 SS64D-1 217694 43535	SOIL SEAD-64 0-0.2 04/14/94 SS64D-2 217695 43535	SOIL SEAD-64 0-0.2 04/14/94 SS64D-3 217696 43535	SOIL SEAD-64 0-0.2 04/14/94 SS64D-4 217697 43535	SOIL SEAD-64 0-0.2 04/14/94 SS64D-5 217698 43535	SOIL SEAD-64 0-0.2 06/23/94 SB64D-1-00 225467 44799
VOLATILE ORGANICS											
Methylene Chloride	ug/Kg	3	23%	100	0	2 J	3 J	14 U	12 U	2 J	11 U
2-Butanone	ug/Kg	8	3%	300	0	14 U	14 U	14 U	12 U	14 U	11 U
Toluene	ug/Kg	1	3%	1500	0	14 U	14 U	14 U	12 U	14 U	11 U
SEMIVOLATILE ORGANICS											
Phenol	ug/Kg	42	6%	NA	NA	460 U	470 U	440 U	400 U	420 U	370 U
Naphthalene	ug/Kg	31	6%	13000	0	460 U	470 U	29 J	400 U	420 U	370 U
2-Methylnaphthalene	ug/Kg	49	14%	36400	0	30 J	27 J	49 J	400 U	420 U	370 U
Phenanthrene	ug/Kg	100	31%	50000*	0	35 J	36 J	57 J	400 U	24 J	370 U
Di-n-butylphthalate	ug/Kg	77	49%	8100	0	460 U	470 U	440 U	400 U	420 U	370 U
Fluoranthene	ug/Kg	240	43%	50000*	0	47 J	62 J	99 J	21 J	33 J	370 U
Pyrene	ug/Kg	160	40%	50000*	0	38 J	47 J	81 J	20 J	25 J	370 U
Benzo(a)anthracene	ug/Kg	86	20%	220	0	22 J	23 J	41 J	400 U	420 U	370 U
Chrysene	ug/Kg	110	26%	400	0	34 J	36 J	53 J	400 U	22 J	370 U
bis(2-Ethylhexyl)phthalate	ug/Kg	1100	43%	50000*	0	120 J	470 U	440 U	19 J	420 U	370 U
Di-n-octylphthalate	ug/Kg	75	3%	50000*	0	460 U	470 U	440 U	400 U	420 U	370 U
Benzo(b)fluoranthene	ug/Kg	160	23%	1100	0	26 J	28 J	39 J	400 U	420 U	370 U
Benzo(k)fluoranthene	ug/Kg	110	17%	1100	0	27 J	470 U	53 J	400 U	420 U	370 U
Benzo(a)pyrene	ug/Kg	77	23%	61	3	25 J	27 J	43 J	400 U	420 U	370 U
Indeno(1,2,3-cd)pyrene	ug/Kg	61	14%	3200	0	460 U	470 U	26 J	400 U	420 U	370 U
Dibenz(a,h)anthracene	ug/Kg	40	11%	14	4	460 U	470 U	440 U	400 U	420 U	370 U
Benzo(g,h,i)perylene	ug/Kg	68	17%	50000*	0	460 U	470 U	23 J	400 U	420 U	370 U
METALS											
Aluminum	mg/Kg	20800	100%	14593	17	11300	8930	12900	12000	10300	16700
Antimony	mg/Kg	0.49	26%	3.59	0	0.24 UJ	0.16 UJ	0.18 UJ	0.19 J	0.19 UJ	0.23 UJ
Arsenic	mg/Kg	7.8	100%	7.5	1	4.3	3.9	6.4	4.5	3.6	6.1
Barium	mg/Kg	152	100%	300	0	76.4	74.6	89.3	61.8	77.3	87.7
Beryllium	mg/Kg	0.99	100%	1	0	0.53 J	0.43 J	0.65 J	0.56 J	0.45 J	0.76 J
Cadmium	mg/Kg	0.97	100%	1	0	0.38 J	0.35 J	0.42 J	0.42 J	0.27 J	0.76 J
Calcium	mg/Kg	162000	100%	101904	3	88900	129000	34900	84800	84100	10600
Chromium	mg/Kg	29.6	100%	22	14	18.3	13.5	20.4	18.8	15.3	25.2
Cobalt	mg/Kg	18.6	100%	30	0	9.3 J	7.8 J	12.7	8.8	7.3 J	12.8
Copper	mg/Kg	32.7	100%	25	10	18.8	14.5	20.6	19.7	15.5	28.1
Iron	mg/Kg	36600	100%	26627	18	23200	17800	28400	22900	17000	33800
Lead	mg/Kg	60.7	100%	30	2	13.2	11.4	18.7	10	12.2	14.2
Magnesium	mg/Kg	16300	100%	12222	2	7720	9080	7460	13400	11600	6610
Manganese	mg/Kg	1240	100%	669	18	475 J	424 J	750 J	457 J	323 J	606
Mercury	mg/Kg	0.08	69%	0.1	0	0.02 J	0.01 J	0.02 J	0.01 J	0.01 J	0.02 J
Nickel	mg/Kg	41.2	100%	34	8	25.7	20.3	32.4	28.5	20.3	40.3
Potassium	mg/Kg	3240	100%	1762	20	1610	1480	1590	2200	2330	1870 J
Selenium	mg/Kg	2	80%	2	0	0.53 J	0.27 U	0.49 J	0.21 U	0.33 U	1.7
Sodium	mg/Kg	266	89%	104	5	100 J	95.7 J	59.6 J	151 J	30.3 J	43.6 J
Thallium	mg/Kg	0.76	46%	0.28	16	0.39 U	0.25 U	0.28 U	0.2 U	0.31 U	0.33 U
Vanadium	mg/Kg	35.3	100%	150	0	18.2	14.1	21.1	18.5	18.4	24.7
Zinc	mg/Kg	111	100%	83	19	72.6	63.1	87.9	80.4	54.8	102
OTHER ANALYSES											
Total Solids	%W/W					71.4	70.1	74.1	82.2	78.6	90.5

TABLE 3-4

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SOIL ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION DEPTH (FEET) SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	TAGM	NUMBER ABOVE TAGM	SOIL SEAD-64 0.2-1.2 06/23/94 SB64D-1-01 225468 44799	SOIL SEAD-64 2-3 06/23/94 SB64D-1-02 225469 44799	SOIL SEAD-64 0-0.2 06/23/94 SB64D-2-00 225470 44799	SOIL SEAD-64 2-3.5 06/23/94 SB64D-2-02 225471 44799	SOIL SEAD-64 4-6 06/23/94 SB64D-2-03 225472 44799	SOIL SEAD-64 0-0.2 06/24/94 SB64D-3-00 225473 44799
VOLATILE ORGANICS											
Methylene Chloride	ug/Kg	3	23%	100	0	1 J	1 J	12 U	12 U	11 U	13 U
2-Butanone	ug/Kg	8	3%	300	0	12 U	11 U	12 U	12 U	11 U	13 U
Toluene	ug/Kg	1	3%	1500	0	12 U	11 U	12 U	12 U	11 U	13 U
SEMIVOLATILE ORGANICS											
Phenol	ug/Kg	42	6%	NA	NA	380 U	360 U	380 U	410 U	350 U	42 J
Naphthalene	ug/Kg	31	6%	13000	0	380 U	360 U	380 U	410 U	350 U	440 U
2-Methylnaphthalene	ug/Kg	49	14%	36400	0	380 U	360 U	380 U	410 U	350 U	440 U
Phenanthrene	ug/Kg	100	31%	50000*	0	380 U	360 U	380 U	410 U	350 U	98 J
Di-n-butylphthalate	ug/Kg	77	49%	8100	0	380 U	360 U	380 U	410 U	350 U	37 J
Fluoranthene	ug/Kg	240	43%	50000*	0	380 U	360 U	380 U	410 U	350 U	240 J
Pyrene	ug/Kg	160	40%	50000*	0	380 U	360 U	380 U	410 U	350 U	160 J
Benzo(a)anthracene	ug/Kg	86	20%	220	0	380 U	360 U	380 U	410 U	350 U	86 J
Chrysene	ug/Kg	110	26%	400	0	380 U	360 U	380 U	410 U	350 U	110 J
bis(2-Ethylhexyl)phthalate	ug/Kg	1100	43%	50000*	0	32 J	29 J	25 J	410 U	33 J	96 J
Di-n-octylphthalate	ug/Kg	75	3%	50000*	0	380 U	360 U	380 U	410 U	350 U	440 U
Benzo(b)fluoranthene	ug/Kg	160	23%	1100	0	380 U	360 U	380 U	410 U	350 U	86 J
Benzo(k)fluoranthene	ug/Kg	110	17%	1100	0	380 U	360 U	380 U	410 U	350 U	110 J
Benzo(a)pyrene	ug/Kg	77	23%	61	3	380 U	360 U	380 U	410 U	350 U	77 J
Indeno(1,2,3-cd)pyrene	ug/Kg	61	14%	3200	0	380 U	360 U	380 U	410 U	350 U	61 J
Dibenz(a,h)anthracene	ug/Kg	40	11%	14	4	380 U	360 U	380 U	410 U	350 U	34 J
Benzo(g,h,i)perylene	ug/Kg	68	17%	50000*	0	380 U	360 U	380 U	410 U	350 U	54 J
METALS											
Aluminum	mg/Kg	20800	100%	14593	17	14100	7480	14800	17600	11100	14200
Antimony	mg/Kg	0.49	26%	3.59	0	0.17 UJ	0.17 UJ	0.22 UJ	0.28 UJ	0.21 UJ	0.26 UJ
Arsenic	mg/Kg	7.8	100%	7.5	1	6.9	3.8	6.2	6.3	5	5.9
Barium	mg/Kg	152	100%	300	0	81.5	38.5	93.2	115	45.3	103
Beryllium	mg/Kg	0.99	100%	1	0	0.7	0.32 J	0.73 J	0.93 J	0.5 J	0.71 J
Cadmium	mg/Kg	0.97	100%	1	0	0.66 J	0.54 J	0.78 J	0.97 J	0.65 J	0.64 J
Calcium	mg/Kg	162000	100%	101904	3	3830	36900	13800	4250	45600	4900
Chromium	mg/Kg	29.6	100%	22	14	22.1	11.8	21.7	25.3	16.9	18.6
Cobalt	mg/Kg	18.6	100%	30	0	11.5	7.7	11.8	18.6	11.1	8.1 J
Copper	mg/Kg	32.7	100%	25	10	27.5	18.7	24.9	22.1	20.6	21.6
Iron	mg/Kg	36600	100%	26627	18	32000	16800	29800	36600	24200	23200
Lead	mg/Kg	60.7	100%	30	2	15.1	8.8	60.7	15.5	8.2	19.1
Magnesium	mg/Kg	16300	100%	12222	2	5240	11800	5700	5850	9520	3800
Manganese	mg/Kg	1240	100%	669	18	640	415	688	1240	476	549
Mercury	mg/Kg	0.08	69%	0.1	0	0.04 J	0.02 J	0.05 J	0.06 J	0.02 J	0.08 J
Nickel	mg/Kg	41.2	100%	34	8	37.8	20.6	31.4	41.2	28	22.5
Potassium	mg/Kg	3240	100%	1762	20	1380 J	1080 J	1800 J	1470 J	1190 J	1820 J
Selenium	mg/Kg	2	80%	2	0	1.4	0.44 J	1.6	1.6	0.62 J	2
Sodium	mg/Kg	266	89%	104	5	35.7 J	26.4 J	50.4 J	35.9 J	78.9 J	19.7 U
Thallium	mg/Kg	0.76	46%	0.28	16	0.45 J	0.3 J	0.32 U	0.41 U	0.3 U	0.58 J
Vanadium	mg/Kg	35.3	100%	150	0	23.3	13.5	22.1	23.9	15.8	22.4
Zinc	mg/Kg	111	100%	83	19	95.3	63.1	93	98.4	86.1	82.9
OTHER ANALYSES											
Total Solids	%W/W					86.5	91.2	85.9	81.3	93.2	74.7

TABLE 3-4

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SOIL ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION DEPTH (FEET) SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	TAGM	NUMBER ABOVE TAGM	SOIL SEAD-64 0.2-2 06/24/94 SB64D-3-01 225497 45048	SOIL SEAD-64 2-3.2 06/24/94 SB64D-3-02 225498 45048	SOIL SEAD-64 0-0.2 06/24/94 SB64D-4-00 225522 45048	SOIL SEAD-64 0.2-2.0 06/24/94 SB64D-4-01 225523 45048	SOIL SEAD-64 2-4 06/24/94 SB64D-4-02 225524 45048
VOLATILE ORGANICS										
Methylene Chloride	ug/Kg	3	23%	100	0	11 U	12 U	14 U	12 U	11 U
2-Butanone	ug/Kg	8	3%	300	0	11 U	12 U	14 U	12 U	11 U
Toluene	ug/Kg	1	3%	1500	0	11 U	12 U	14 U	12 U	11 U
SEMIVOLATILE ORGANICS										
Phenol	ug/Kg	42	6%	NA	NA	390 U	42 J	460 U	420 U	370 U
Naphthalene	ug/Kg	31	6%	13000	0	390 U	390 U	460 U	420 U	370 U
2-Methylnaphthalene	ug/Kg	49	14%	36400	0	390 U	390 U	460 U	420 U	370 U
Phenanthrene	ug/Kg	100	31%	50000*	0	22 J	390 U	36 J	420 U	370 U
Di-n-butylphthalate	ug/Kg	77	49%	8100	0	390 U	37 J	71 J	420 U	370 U
Fluoranthene	ug/Kg	240	43%	50000*	0	31 J	390 U	61 J	420 U	370 U
Pyrene	ug/Kg	160	40%	50000*	0	20 J	390 U	54 J	420 U	370 U
Benzo(a)anthracene	ug/Kg	86	20%	220	0	390 U	390 U	38 J	420 U	370 U
Chrysene	ug/Kg	110	26%	400	0	390 U	390 U	41 J	420 U	370 U
bis(2-Ethylhexyl)phthalate	ug/Kg	1100	43%	50000*	0	390 U	390 U	39 J	1100	34 J
Di-n-octylphthalate	ug/Kg	75	3%	50000*	0	390 U	390 U	460 U	420 U	370 U
Benzo(b)fluoranthene	ug/Kg	160	23%	1100	0	390 U	390 U	61 J	420 U	370 U
Benzo(k)fluoranthene	ug/Kg	110	17%	1100	0	390 U	390 U	47 J	420 U	370 U
Benzo(a)pyrene	ug/Kg	77	23%	61	3	390 U	390 U	68 J	420 U	370 U
Indeno(1,2,3-cd)pyrene	ug/Kg	61	14%	3200	0	390 U	390 U	53 J	420 U	370 U
Dibenz(a,h)anthracene	ug/Kg	40	11%	14	4	390 U	390 U	40 J	420 U	370 U
Benzo(g,h,i)perylene	ug/Kg	68	17%	50000*	0	390 U	390 U	68 J	420 U	370 U
METALS										
Aluminum	mg/Kg	20800	100%	14593	17	14900	16100	17400	20100	9770
Antimony	mg/Kg	0.49	26%	3.59	0	0.22 J	0.47 J	0.4 J	0.3 UJ	0.21 UJ
Arsenic	mg/Kg	7.8	100%	7.5	1	5.9	6	6.6	6.9	4.3
Barium	mg/Kg	152	100%	300	0	92.1	111	116	114	62.7
Beryllium	mg/Kg	0.99	100%	1	0	0.74	0.73 J	0.78 J	0.81 J	0.46 J
Cadmium	mg/Kg	0.97	100%	1	0	0.36 J	0.51 J	0.43 J	0.4 J	0.41 J
Calcium	mg/Kg	162000	100%	101904	3	3060 J	4940 J	5120 J	11800 J	130000 J
Chromium	mg/Kg	29.6	100%	22	14	20.7	20.5	22.9	27.7	14.3
Cobalt	mg/Kg	18.6	100%	30	0	10.4	8.5 J	11.5 J	13.6	9.7
Copper	mg/Kg	32.7	100%	25	10	20.7	24	20.6	25.2	17.5
Iron	mg/Kg	36600	100%	26627	18	26900	24400	28300	34800	20500
Lead	mg/Kg	60.7	100%	30	2	17 J	19.3 J	21.5 J	15.6 J	7.4 J
Magnesium	mg/Kg	16300	100%	12222	2	3890	4110	3990	5330	9290
Manganese	mg/Kg	1240	100%	669	18	690	564	884	859	751
Mercury	mg/Kg	0.08	69%	0.1	0	0.07 J	0.06 J	0.08	0.06 J	0.02 J
Nickel	mg/Kg	41.2	100%	34	8	25.8	23.6	27.2	35.6	24.8
Potassium	mg/Kg	3240	100%	1762	20	1440 J	2130 J	2280 J	2020 J	1520 J
Selenium	mg/Kg	2	80%	2	0	1.3	1.2	1.7	1.1 J	0.51 J
Sodium	mg/Kg	266	89%	104	5	14.5 U	25.4 J	27.1 U	28.6 J	90.4 J
Thallium	mg/Kg	0.76	46%	0.28	16	0.41 J	0.48 J	0.52 U	0.44 U	0.31 U
Vanadium	mg/Kg	35.3	100%	150	0	23.7	25.4	26.9	30.8	14.4
Zinc	mg/Kg	111	100%	83	19	85.8	89	91	88.3	63.9
OTHER ANALYSES										
Total Solids	%W/W					85.4	84.4	71.2	78.5	89.9

TABLE 3-4

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SOIL ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION DEPTH (FEET) SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	TAGM	NUMBER ABOVE TAGM	SOIL SEAD-64 0-0.2 06/25/94 SB64D-5.00 225570 45058	SOIL SEAD-64 2-4 06/25/94 SB64D-5.02 225571 45058	SOIL SEAD-64 4-6 06/25/94 SB64D-5.03 225572 45058	SOIL SEAD-64 0-0.2 06/25/94 SB64D-6.00 225573 45058	SOIL SEAD-64 0.2-2 06/25/94 SB64D-6.01 225574 45058	SOIL SEAD-64 2-4 06/25/94 SB64D-6.02 225575 45058
VOLATILE ORGANICS											
Methylene Chloride	ug/Kg	3	23%	100	0	13 U	1 J	12 U	13 U	12 U	1 J
2-Butanone	ug/Kg	8	3%	300	0	13 U	12 U	12 U	13 U	12 U	11 U
Toluene	ug/Kg	1	3%	1500	0	13 U	1 J	12 U	13 U	12 U	11 U
SEMIVOLATILE ORGANICS											
Phenol	ug/Kg	42	6%	NA	NA	450 U	380 U	370 U	440 U	380 U	370 U
Naphthalene	ug/Kg	31	6%	13000	0	31 J	380 U	370 U	440 U	380 U	370 U
2-Methylnaphthalene	ug/Kg	49	14%	36400	0	46 J	22 J	370 U	440 U	380 U	370 U
Phenanthrene	ug/Kg	100	31%	50000*	0	100 J	29 J	370 U	34 J	380 U	370 U
Di-n-butylphthalate	ug/Kg	77	49%	8100	0	77 J	46 J	75 J	76 J	32 J	74 J
Fluoranthene	ug/Kg	240	43%	50000*	0	140 J	25 J	370 U	52 J	380 U	370 U
Pyrene	ug/Kg	160	40%	50000*	0	100 J	380 U	370 U	41 J	380 U	370 U
Benzo(a)anthracene	ug/Kg	86	20%	220	0	66 J	380 U	370 U	43 J	380 U	370 U
Chrysene	ug/Kg	110	26%	400	0	97 J	28 J	370 U	47 J	380 U	370 U
bis(2-Ethylhexyl)phthalate	ug/Kg	1100	43%	50000*	0	450 U	380 U	370 U	440 U	380 U	370 U
Di-n-octylphthalate	ug/Kg	75	3%	50000*	0	450 U	380 U	370 U	75 J	380 U	370 U
Benzo(b)fluoranthene	ug/Kg	160	23%	1100	0	160 J	22 J	370 U	48 J	380 U	370 U
Benzo(k)fluoranthene	ug/Kg	110	17%	1100	0	450 UJ	21 J	370 U	47 J	380 U	370 U
Benzo(a)pyrene	ug/Kg	77	23%	61	3	64 J	23 J	370 U	47 J	380 U	370 U
Indeno(1,2,3-cd)pyrene	ug/Kg	61	14%	3200	0	53 J	380 U	370 U	43 J	380 U	370 U
Dibenz(a,h)anthracene	ug/Kg	40	11%	14	4	34 J	380 U	370 U	33 J	380 U	370 U
Benzo(g,h,i)perylene	ug/Kg	68	17%	50000*	0	41 J	22 J	370 U	46 J	380 U	370 U
METALS											
Aluminum	mg/Kg	20800	100%	14593	17	16400	16900	20800	14500	18900	12200
Antimony	mg/Kg	0.49	26%	3.59	0	0.49 J	0.24 UJ	0.28 UJ	0.22 J	0.23 UJ	0.22 UJ
Arsenic	mg/Kg	7.8	100%	7.5	1	5.8 J	6 J	6 J	5.6 J	5.5 J	3.4 J
Barium	mg/Kg	152	100%	300	0	116	123	110	113	152	59.1
Beryllium	mg/Kg	0.99	100%	1	0	0.88 J	0.8 J	0.87 J	0.72 J	0.88 J	0.56 J
Cadmium	mg/Kg	0.97	100%	1	0	0.75 J	0.43 J	0.4 J	0.48 J	0.45 J	0.35 J
Calcium	mg/Kg	162000	100%	101904	3	4770	3260	2760	3700	3630	30500
Chromium	mg/Kg	29.6	100%	22	14	22.4	23.3	29.6	20	24	19.5
Cobalt	mg/Kg	18.6	100%	30	0	10.5 J	11.4	12.9	10.1	10.7	11.1
Copper	mg/Kg	32.7	100%	25	10	22.7	21.6	23.7	27.2	24.9	17
Iron	mg/Kg	36600	100%	26627	18	25600	29000	34600	24300	28200	25300
Lead	mg/Kg	60.7	100%	30	2	29.9	13.5	13.4	16.4	13.1	6.1
Magnesium	mg/Kg	16300	100%	12222	2	3970	4540	6030	3980	4650	7390
Manganese	mg/Kg	1240	100%	669	18	698	851	638	627	851	645
Mercury	mg/Kg	0.08	69%	0.1	0	0.14 R	0.07 J R	0.04 J R	0.06 J R	0.06 J R	0.01 U
Nickel	mg/Kg	41.2	100%	34	8	25.7	28.2	39.5	24.7	26.1	30.8
Potassium	mg/Kg	3240	100%	1762	20	3240 J	2470 J	3090 J	2170 J	2340 J	1220 J
Selenium	mg/Kg	2	80%	2	0	1.6	1.1	1.2	0.94	1.2	0.46 U
Sodium	mg/Kg	266	89%	104	5	71.2 J	90 J	99.7 J	75 J	94.9 J	170 J
Thallium	mg/Kg	0.76	46%	0.28	16	0.65 J	0.5 J	0.53 J	0.74 J	0.34 U	0.33 U
Vanadium	mg/Kg	35.3	100%	150	0	26.6	26.4	32	24.9	31.9	16.6
Zinc	mg/Kg	111	100%	83	19	111 J	83.3 J	101 J	70.3 J	77 J	60.7 J
OTHER ANALYSES											
Total Solids	%W/W					73.6	85.9	88.2	75.2	85.8	88

TABLE 3-4

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SOIL ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION DEPTH (FEET) SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	TAGM	NUMBER ABOVE TAGM	SOIL SEAD-64 0-0.2 06/24/94 SB64D-7-00 225525 45048	SOIL SEAD-64 0.2-2.0 06/24/94 SB64D-7-01 225526 45048	SOIL SEAD-64 2-4 06/24/94 SB64D-7-02 225527 45048	SOIL SEAD-64 0-0.2 06/24/94 SB64D-8-00 225528 45048	SOIL SEAD-64 0.2-2.0 06/24/94 SB64D-8-01 225529 45048	SOIL SEAD-64 2-4 06/24/94 SB64D-8-02 225530 45048
VOLATILE ORGANICS											
Methylene Chloride	ug/Kg	3	23%	100	0	14 U	12 U	11 U	13 UJ	12 U	11 U
2-Butanone	ug/Kg	8	3%	300	0	14 U	12 U	11 U	13 UJ	8 J	11 U
Toluene	ug/Kg	1	3%	1500	0	14 U	12 U	11 U	13 UJ	12 U	11 U
SEMIVOLATILE ORGANICS											
Phenol	ug/Kg	42	6%	NA	NA	460 U	390 U	360 U	450 U	380 U	370 U
Naphthalene	ug/Kg	31	6%	13000	0	460 U	390 U	360 U	450 U	380 U	370 U
2-Methylnaphthalene	ug/Kg	49	14%	36400	0	460 U	390 U	360 U	450 U	380 U	370 U
Phenanthrene	ug/Kg	100	31%	50000*	0	460 U	390 U	360 U	24 J	380 U	370 U
Di-n-butylphthalate	ug/Kg	77	49%	8100	0	54 J	390 U	360 U	56 J	44 J	370 U
Fluoranthene	ug/Kg	240	43%	50000*	0	39 J	390 U	360 U	48 J	380 U	370 U
Pyrene	ug/Kg	160	40%	50000*	0	41 J	390 U	360 U	54 J	380 U	370 U
Benzo(a)anthracene	ug/Kg	86	20%	220	0	460 U	390 U	360 U	450 U	380 U	370 U
Chrysene	ug/Kg	110	26%	400	0	460 U	390 U	360 U	450 U	380 U	370 U
bis(2-Ethylhexyl)phthalate	ug/Kg	1100	43%	50000*	0	66 J	58 J	46 J	48 J	380 U	32 J
Di-n-octylphthalate	ug/Kg	75	3%	50000*	0	460 U	390 U	360 U	450 U	380 U	370 U
Benzo(b)fluoranthene	ug/Kg	160	23%	1100	0	460 U	390 U	360 U	450 U	380 U	370 U
Benzo(k)fluoranthene	ug/Kg	110	17%	1100	0	460 U	390 U	360 U	450 U	380 U	370 U
Benzo(a)pyrene	ug/Kg	77	23%	61	3	460 U	390 U	360 U	450 U	380 U	370 U
Indeno(1,2,3-cd)pyrene	ug/Kg	61	14%	3200	0	460 U	390 U	360 U	450 U	380 U	370 U
Dibenz(a,h)anthracene	ug/Kg	40	11%	14	4	460 U	390 U	360 U	450 U	380 U	370 U
Benzo(g,h,i)perylene	ug/Kg	68	17%	50000*	0	460 U	390 U	360 U	450 U	380 U	370 U
METALS											
Aluminum	mg/Kg	20800	100%	14593	17	17700	17500	13000	16100	15500	12400
Antimony	mg/Kg	0.49	26%	3.59	0	0.25 UJ	0.25 UJ	0.24 UJ	0.28 UJ	0.22 UJ	0.27 UJ
Arsenic	mg/Kg	7.8	100%	7.5	1	5.7	5.7	3.7	5.8	4.5	5.3
Barium	mg/Kg	152	100%	300	0	127	124	59.3	116	85	65.6
Beryllium	mg/Kg	0.99	100%	1	0	0.82 J	0.85 J	0.6 J	0.81 J	0.68 J	0.56 J
Cadmium	mg/Kg	0.97	100%	1	0	0.49 J	0.42 J	0.46 J	0.61 J	0.49 J	0.44 J
Calcium	mg/Kg	162000	100%	101904	3	5980 J	3690 J	80900 J	10900 J	29700 J	64000 J
Chromium	mg/Kg	29.6	100%	22	14	23.9	24.1	19	23.3	21.3	19.3
Cobalt	mg/Kg	18.6	100%	30	0	11.5	12.2	11.7	13.9	10.8	12.7
Copper	mg/Kg	32.7	100%	25	10	32.7	28.5	17.2	28	21.2	22.4
Iron	mg/Kg	36600	100%	26627	18	30100	34400	26600	32500	28200	28600
Lead	mg/Kg	60.7	100%	30	2	18.9 J	15.8 J	13.8 J	32.5 J	9.9 J	9 J
Magnesium	mg/Kg	16300	100%	12222	2	4350	4980	5810	5740	6010	8170
Manganese	mg/Kg	1240	100%	669	18	776	830	642	1040	659	748
Mercury	mg/Kg	0.08	69%	0.1	0	0.07 J	0.05	0.04 J	0.06 J	0.04 J	0.02 J
Nickel	mg/Kg	41.2	100%	34	8	28	30.5	29.5	34.4	29.4	34.7
Potassium	mg/Kg	3240	100%	1752	20	2550 J	1670 J	1790 J	2030 J	1840 J	1390 J
Selenium	mg/Kg	2	80%	2	0	1.2	1.7	0.62 J	1.9	1.3	0.55 U
Sodium	mg/Kg	266	89%	104	5	27.5 J	22.6 J	90.6 J	21.3 U	37.3 J	94.7 J
Thallium	mg/Kg	0.76	46%	0.28	16	0.47 J	0.37 U	0.57 J	0.57 J	0.32 U	0.39 U
Vanadium	mg/Kg	35.3	100%	150	0	28.3	27.2	16.7	23.9	22.3	16.7
Zinc	mg/Kg	111	100%	83	19	90.8	86	69.8	106	85.2	85.9
OTHER ANALYSES											
Total Solids	%W/W					71.2	83.8	92.3	73.6	86	89.5

TABLE 3-4

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SOIL ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION DEPTH (FEET) SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	TAGM	NUMBER ABOVE TAGM	SOIL SEAD-64 0-0.2 06/25/94 SB64D-9.00 225576 45058	SOIL SEAD-64 0.2-2 06/25/94 SB64D-9.01 225577 45058	SOIL SEAD-64 2-4 06/25/94 SB64D-9.02 225578 45058	SOIL SEAD-64 0-0.2 06/25/94 SB64D-10.00 225579 45058	SOIL SEAD-64 0.2-2 06/25/94 SB64D-10.01 225580 45058	SOIL SEAD-64 4-5.1 06/25/94 SB64D-10.03 225581 45058
VOLATILE ORGANICS											
Methylene Chloride	ug/Kg	3	23%	100	0	13 U	12 U	1 J	14 U	12 U	12 U
2-Butanone	ug/Kg	8	3%	300	0	13 U	12 U	11 U	14 U	12 U	12 U
Toluene	ug/Kg	1	3%	1500	0	13 U	12 U	11 U	14 U	12 U	12 U
SEMIVOLATILE ORGANICS											
Phenol	ug/Kg	42	6%	NA	NA	450 U	400 U	360 U	460 U	400 U	370 U
Naphthalene	ug/Kg	31	6%	13000	0	450 U	400 U	360 U	460 U	400 U	370 U
2-Methylnaphthalene	ug/Kg	49	14%	36400	0	450 U	400 U	360 U	460 U	400 U	370 U
Phenanthrene	ug/Kg	100	31%	50000*	0	450 U	400 U	360 U	460 U	400 U	370 U
Di-n-butylphthalate	ug/Kg	77	49%	8100	0	53 J	34 J	360 U	70 J	45 J	24 J
Fluoranthene	ug/Kg	240	43%	50000*	0	33 J	400 U	360 U	38 J	400 U	370 U
Pyrene	ug/Kg	160	40%	50000*	0	24 J	400 U	360 U	33 J	400 U	370 U
Benzo(a)anthracene	ug/Kg	86	20%	220	0	450 U	400 U	360 U	460 U	400 U	370 U
Chrysene	ug/Kg	110	26%	400	0	450 U	400 U	360 U	460 U	400 U	370 U
bis(2-Ethylhexyl)phthalate	ug/Kg	1100	43%	50000*	0	450 U	400 U	360 U	460 U	400 U	370 U
Di-n-octylphthalate	ug/Kg	75	3%	50000*	0	450 U	400 U	360 U	460 U	400 U	370 U
Benzo(b)fluoranthene	ug/Kg	160	23%	1100	0	450 U	400 U	360 U	460 U	400 U	370 U
Benzo(k)fluoranthene	ug/Kg	110	17%	1100	0	450 U	400 U	360 U	460 U	400 U	370 U
Benzo(a)pyrene	ug/Kg	77	23%	61	3	450 U	400 U	360 U	460 U	400 U	370 U
Indeno(1,2,3-cd)pyrene	ug/Kg	61	14%	3200	0	450 U	400 U	360 U	460 U	400 U	370 U
Dibenz(a,h)anthracene	ug/Kg	40	11%	14	4	450 U	400 U	360 U	460 U	400 U	370 U
Benzo(g,h,i)perylene	ug/Kg	68	17%	50000*	0	450 U	400 U	360 U	460 U	400 U	370 U
METALS											
Aluminum	mg/Kg	20800	100%	14593	17	13800	15800	12600	12100	19900	9180
Antimony	mg/Kg	0.49	26%	3.59	0	0.31 UJ	0.25 J	0.33 J	0.28 UJ	0.26 UJ	0.35 J
Arsenic	mg/Kg	7.8	100%	7.5	1	6 J	6.7 J	5.2 J	4.6 J	7.8 J	4.4 J
Barium	mg/Kg	152	100%	300	0	110	107	62.5	100	147	97.7
Beryllium	mg/Kg	0.99	100%	1	0	0.82 J	0.84 J	0.61 J	0.66 J	0.99 J	0.47 J
Cadmium	mg/Kg	0.97	100%	1	0	0.53 J	0.51 J	0.38 J	0.43 J	0.56 J	0.4 J
Calcium	mg/Kg	162000	100%	101904	3	3090	16300	47700	4750	5810	162000
Chromium	mg/Kg	29.6	100%	22	14	20.2	23.7	19.9	16.7	27.5	14.5
Cobalt	mg/Kg	18.6	100%	30	0	11.2 J	12.8	9.8 J	8.5 J	11.9	6.7 J
Copper	mg/Kg	32.7	100%	25	10	30.4	28.3	23.5	25	26.8	15.7
Iron	mg/Kg	36600	100%	26627	18	25500	32500	26000	21000	36200	17000
Lead	mg/Kg	60.7	100%	30	2	19.1	12.6	9.7	17.5	13.6	8
Magnesium	mg/Kg	16300	100%	12222	2	3620	4850	5700	3140	5180	16300
Manganese	mg/Kg	1240	100%	669	18	973	971	539	684	776	352
Mercury	mg/Kg	0.08	69%	0.1	0	0.06 J R	0.47 R	0.09 J R	0.11 J R	0.06 J R	0.03 J
Nickel	mg/Kg	41.2	100%	34	8	25.1	34	31.5	18.1	35.3	19
Potassium	mg/Kg	3240	100%	1762	20	1970 J	1530 J	1540 J	1670 J	2300 J	2040 J
Selenium	mg/Kg	2	80%	2	0	1 J	1.2	0.54 U	1.3	1.3	0.5 U
Sodium	mg/Kg	266	89%	104	5	103 J	101 J	148 J	97.3 J	108 J	266 J
Thallium	mg/Kg	0.76	46%	0.28	16	0.66 J	0.76 J	0.38 U	0.49 J	0.62 J	0.35 U
Vanadium	mg/Kg	35.3	100%	150	0	23.7	23.9	19.1	21.4	35.3	17.3
Zinc	mg/Kg	111	100%	83	19	72.9 J	81.8 J	75.7 J	61.8 J	89.4 J	40.6 J
OTHER ANALYSES											
Total Solids	%W/W					73.9	82.4	91	71.1	82.2	87.7

NOTES:
b) * = As per proposed TAGM, total VOCs < 10 ppm, total SVOs < 500 ppm, and individual SVOs < 50 ppm.
c) NA = Not Available.
d) U = The compound was not detected below this concentration.
e) J = The reported value is an estimated concentration.
f) UJ = The compound may have been present above this concentration, but was not detected due to problems with the analysis.
g) R = The data was rejected during the data validation process.

aromatic hydrocarbons (PAHs). These PAHs were detected primarily in the soil samples from the 0- to 0.2-foot range. Other compounds included three phthalates and phenol.

Only two SVOs, benzo(a)pyrene and dibenz(a,h)anthracene, were detected at concentrations above their criteria. These exceedances occurred in the surface soil samples obtained from four borings: SB64D-3, 4, 5, and 6.

Pesticides and PCBs

No pesticides or PCBs were found in the soil samples collected at SEAD-64D.

Metals

A variety of samples were found to contain metals at concentrations just slightly above their criteria. Of the 22 metals analyzed, 13 were found in one or more samples at concentrations above their criteria. The majority of those exceedances appear to reflect natural variations in site soils. The exceptions to this are lead, thallium and sodium which were reported in some samples at concentrations at least two times their criteria.

Groundwater

Five monitoring wells were installed on site. One well, MW64D-1, was installed as a background well. The other four, MW64D-2, 3, 4, and 5, were installed downgradient of electromagnetic anomalies. The summary of chemical analysis results is presented in Table 3-5. The following sections describe the nature and extent of groundwater contamination identified at SEAD-64D.

Volatile Organic Compounds

No volatile organic compounds were detected in the groundwater samples collected at SEAD-64D.

Semivolatile Organic Compounds

No semivolatile organic compounds were detected in the groundwater samples collected at SEAD-64D.

TABLE 3-5

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
GROUNDWATER ANALYSIS RESULTS FROM ESI

COMPOUND	MATRIX LOCATION SAMPLE DATE ES ID LAB ID SDG NUMBER UNITS	MAXIMUM	FREQUENCY OF DETECTION	NY AWQS CLASS GA (a)	FEDERAL DRINKING WATER MCL (h)	NUMBER ABOVE LOWEST CRITERIA	WATER SEAD-64 07/08/94 MW64D-1 226385 45257	WATER SEAD-64 07/09/94 MW64D-2 226386 45257	WATER SEAD-64 07/08/94 MW64D-3 226387 45257	WATER SEAD-64 07/08/94 MW64D-4 226388 45257	WATER SEAD-64 07/18/94 MW64D-5 227269 45332
METALS											
Aluminum	ug/L	30100	100%	NA	50-200 *	5	177 J	1390	453	494	30100 J
Antimony	ug/L	1.5	20%	3	6	0	1.3 U	1.3 U	1.5 J	1.3 U	1.3 U
Arsenic	ug/L	10	20%	25	NA	NA	2 U	2 U	2 U	2 U	10
Barium	ug/L	693	100%	1000	2000	0	88.6 J	62.8 J	75.9 J	63 J	693
Beryllium	ug/L	3.1	20%	NA	4	0	0.1 U	0.1 U	0.1 U	0.1 U	3.1 J
Cadmium	ug/L	1.3	40%	10	5	0	0.2 U	0.2 U	1.3 J	0.2 U	1 J
Calcium	ug/L	902000	100%	NA	NA	NA	142000	122000	120000	140000	902000
Chromium	ug/L	47.1	80%	50	100	0	0.4 U	1.5 J	0.63 J	0.42 J	47.1
Cobalt	ug/L	82.3	100%	NA	NA	NA	0.69 J	2.8 J	1.5 J	1.4 J	82.3
Copper	ug/L	41.3	80%	200	1000 *	0	0.5 U	3.9 J	2 J	0.68 J	41.3
Iron	ug/L	65800	100%	300	300 *	5	440	1730	538	552	65800
Lead	ug/L	71.6	40%	25	15 **	1	0.9 U	1.2 J	0.89 U	0.89 U	71.6
Magnesium	ug/L	35900	100%	NA	NA	NA	14800	13000	14800	13200	35900
Manganese	ug/L	8250	100%	300	50 *	5	223	456	86.6	106	8250
Mercury	ug/L	0.05	40%	2	2	0	0.04 U	0.04 U	0.04 U	0.04 J	0.05 J
Nickel	ug/L	108	100%	NA	100	1	1.4 J	4.1 J	1.1 J	1.5 J	108
Potassium	ug/L	7080	100%	NA	NA	NA	3340 J	3240 J	1770 J	1280 J	7080 J
Sodium	ug/L	12300	100%	20000	NA	NA	12300	4490 J	6520	3350 J	4390 J
Thallium	ug/L	3.2	60%	NA	2	3	2.2 J	1.9 U	3.2 J	1.9 U	2.1 J
Vanadium	ug/L	42.9	100%	NA	NA	NA	0.69 J	2.1 J	0.9 J	0.69 J	42.9 J
Zinc	ug/L	305	100%	300	5000 *	1	3.8 J	12.4 J	14.4 J	6.5 J	305
OTHER ANALYSES											
pH	Standard Units						7.2	7.9	7.5	7.3	7.8
Conductivity	umhos/cm						725	490	550	595	550
Temperature	°C						22	15.6	16.9	15.2	15.3
Turbidity	NTU						1.5	181	127	141	>200

NOTES:
a) NY State Class GA Groundwater Regulations
b) NA = Not Available
d) U = The compound was not detected below this concentration.
e) J = The reported value is an estimated concentration.
f) UJ = The compound may have been present above this concentration, but was not detected due to problems with the analysis.
g) R = The data was rejected during the data validation process.
h) Federal Primary and Secondary(*) Drinking Water Maximum Contaminant Levels (40 CFR 141.61-62 and 40 CFR 143.3)
i) ** the value is an action level, reported in Drinking Water Regulations and Health Advisories, USEPA, May 1994

Pesticides and PCBs

No pesticides or PCBs were detected in the groundwater samples collected at SEAD-64D.

Metals

All of the inorganics on the Target Analyte List (TAL), except selenium, silver, and cyanide, were detected in one or more of the five groundwater samples. Seven metals were detected in the groundwater samples at concentrations above the lowest criteria for NY AWQS Class GA criteria or the Federal primary and secondary drinking water MCLs: aluminum, iron, lead, manganese, nickel, thallium, and zinc. Aluminum, iron, and manganese concentrations exceeded the criteria in the background and all the downgradient locations. Lead, nickel, thallium, and zinc concentrations exceeded the criteria in one or two of the downgradient samples.

When the data for each downgradient groundwater sample are compared to the background groundwater data, many of the metals concentrations are higher than the background concentrations, especially at MW64D-5. All the downgradient samples also had higher turbidities (127 to > 200 NTUs) than the background sample (1.5 NTU). Groundwater from MW64D-5 had a turbidity greater than 200 NTU and looked silty. The higher turbidity in the downgradient wells may influence the reported metals concentrations..

3.1.3 Environmental Fate of Constituents

The potential contaminants of concern at SEAD-64D (The Generic Installation RI/FS Workplan addresses all potential contaminants of concern site-wide as "constituents of concern") are semivolatile organic compounds, primarily polynuclear aromatic hydrocarbons (PAHs), and metals.

The following discussion is meant to present general information on the fate of these potential contaminants of concern, and where possible, site-specific characteristics are presented. Further discussion of these potential contaminants of concern, and all contaminants of concern at SEDA, is provided in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

3.1.3.1 Semivolatile Organic Compounds

The following information was obtained from the document, "Management and Manufactured Gas Plant Sites, Volume III, Risk Assessment," Gas Research Institute (GRI), May 1988,

GRI-87/0260.3. A summary of fate and transport parameters for semivolatile organic compounds is presented in Table 3-6.

PAH compounds have a high affinity for organic matter and low water solubility. Water solubility tends to decrease and affinity for organic matter tends to increase with increasing molecular weight. Therefore, naphthalene (molecular weight 128.16) is much more soluble in water than is benzo(a)pyrene (molecular weight 252.3). When present in soil or sediments, PAHs tend to remain bound to the soil particles and dissolve slowly into the groundwater or the water between the soil particles in the vadose zone. Because of the high affinity for organic matter, the physical fate of the chemicals is usually controlled by the transport of particulates. Thus, soil, sediment, and air represent important media for the transport of PAHs.

Because of their high affinity for organic matter, PAH compounds are readily taken up (bioaccumulated) by living organisms. However, organisms have the ability to metabolize the chemicals and to excrete the polar metabolites. This ability varies among organisms. Fish appear to have well-developed systems for metabolizing PAHs and excreting them. Shellfish (bi-valves) appear to be less able to metabolize the compounds. As a result, PAH concentrations are usually low in fish tissue and higher in shellfish tissue.

Natural processes can alter PAH concentrations in the environment. Biodegradation due to microorganisms, is an important process affecting the concentration of PAHs in soil, sediment, and water. Volatilization is another important process which occurs more readily for the lighter molecular weight PAHs than the higher molecular weight PAHs.

3.1.3.2 Heavy Metals

Fate and Transport Factors

In general, metals tend to be persistent and relatively insoluble in the environment. The behavior of heavy metals in soil is unlike that of organic compounds. For example, volatilization of metals from soil is not considered a realistic mechanism for contaminant migration and is not considered here. However, leaching and sorption will be considered.

Leaching of heavy metals from soil is controlled by numerous factors. The most important consideration for leaching of heavy metals is the chemical form (base metal or cation) present in the soil. The leaching of metals from soil is substantial if the metal exists as a soluble salt. Metallic salts have been identified as a component of such items as tracer ammunition, ignitor compositions, incendiary ammunition, flares, colored smoke, and primer explosive

TABLE 3-6

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF FATE AND TRANSPORT PARAMETERS FOR SELECTED ORGANIC COMPOUNDS

COMPOUND	SOLUBILITY (mg/l)	VAPOR PRESSURE (mmHg)	HENRY'S LAW CONSTANT (atm-m³/mol)	Koc (ml/g)	Kow	HALF - LIFE (days)	BCF
Semivolatile Organic Compounds							
Phenol	93000	0.341	4.54E-07	1.42E+01	2.88E+01	3-5	1.4-2
2-Methylphenol	25000	0.24	1.50E-06	2.74E+02	8.91E+01	1-3	
4-Methylphenol		0.11	4.43E-07	2.67E+02	8.51E+01	1-3	
2,4-Dimethylphenol	4200	0.0573	2.38E-06	2.22E+02	2.63E+02	1-3	9.5-150
Benzoic Acid	2700			2.48E+02	7.41E+01		
Naphthalene	31.7	0.23	1.15E-03	1.30E+03	2.76E+03	1-110	44-95
2-Methylnaphthalene	25.4	0.0083	5.80E-05	8.50E+03	1.30E+04	1-3	
2-Chloronaphthalene	6.74	0.017	4.27E-04	4.16E+03	1.32E+04		
2,6-Dinitrotoluene	1320	0.018	3.27E-06	9.20E+01	1.00E+02	4	4.6
Acenaphthene	3.42	0.00155	9.20E-05	4.60E+03	1.00E+04		
Dibenzofuran				4.16E+03	1.32E+04		
2,4-Dinitrotoluene	240	0.0051	5.09E-06	4.50E+01	1.00E+02	5	
Diethylphthalate	896	0.0035	1.14E-06	1.42E+02	3.16E+02	1-3	14-117
Fluorene	1.69	0.00071	6.42E-05	7.30E+03	1.58E+04		
N-Nitrosodiphenylamine	113		1.40E-06	6.50E+02	1.35E+03	4	65-217
Hexachlorobenzene	0.006	0.000019	6.81E-04	3.90E+03	1.70E+05		
Phenanthrene	1	0.00021	1.59E-04	1.40E+04	2.88E+04	1-200	
Anthracene	0.045	0.000195	1.02E-03	1.40E+04	2.82E+04		
Di-n-butylphthalate	13	0.00001	2.82E-07	1.70E+05	3.98E+05	1-3	89-1800
Fluoranthene	0.206	0.0177	6.46E-06	3.80E+04	7.94E+04	140-440	
Pyrene	0.132	2.50E-06	5.04E-06	3.80E+04	7.59E+04	9-1900	
Butylbenzylphthalate	2.9	8.60E-06	1.20E-06	2.84E+04	5.89E+04		663
Benzo(a)anthracene	0.0057	1.50E-07	1.16E-06	1.38E+06	3.98E+05	240-680	
Chrysene	0.0018	6.30E-09	1.05E-06	2.00E+05	4.07E+05	160-1900	
Bis(2-Ethylhexyl)phthalate	0.285	2.00E-07	3.61E-07	5.90E+03	9.50E+03	Neg. Deg.	
Di-ni-octylphthalate	3			2.40E+06	1.58E+09		
Benzo(b)fluoranthene	0.014	5.00E-07	1.19E-05	5.50E+05	1.15E+06	360-610	
Benzo(k)fluoranthene	0.0043	5.10E-07	3.94E-05	5.50E+05	1.15E+06	910-1400	
Benzo(a)pyrene	0.0012	0.000568	1.55E-06	5.50E+06	1.15E+06	220-530	
Indeno(1,2,3-cd)pyrene	0.00053	1.00E-10	6.86E-08	1.60E+06	3.16E+06	600-730	
Dibenz(a,h)anthracene	0.0005	5.20E-11	7.33E-08	3.30E+06	6.31E+06	750-940	
Benzo(g,h,i)perylene	0.0007	1.03E-10	5.34E-08	1.60E+06	3.24E+06	590-650	

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).

compositions. In particular, barium nitrate, lead stearate, lead carbonate, and mercury fulminate are potential heavy metal salts or complexes which are components of ammunition that may have been tested or disposed of at SEDA. During the burning of these materials, a portion of these salts oxidize to their metallic oxide forms. In general, metal oxides are considered less likely to leach metallic ions than metallic salts. Upon contact with surface water or precipitation, the heavy metal salts may be dissolved, increasing their mobility and increasing the potential for leaching to the groundwater.

Heavy metals may also exist in the base metallic form as a component of the projectiles tested or disposed of at SEDA. Bullets are composed mainly of lead, which may contain trace amounts of cadmium and selenium. Objects composed of these metals, such as bullets or projectiles, will dissolve slowly.

Oxidation and reduction, another mechanism, involves valence state changes to the metal ions and has a large influence on fate mechanisms. An example of the variation in contaminant fate and transport due to oxidation and reduction changes is iron. Iron (Fe) normally exists in one of two valence states, +2 and +3 [Fe(II) and Fe(III)]. Fe(II) is more soluble than Fe(III); therefore, it has a greater mobility. The valence can also affect the toxicity of a compound. For example, chromium +6 is more toxic than chromium +3.

Soil pH can also affect metal migration. If the soil pH is greater than 6.5, most metals are fairly immobile, particularly those normally present as cations. At higher pH values, metals form insoluble carbonate and hydroxide complexes. In acidic soils (pH less than 5), metals are more mobile. For example, the surface soil at the OB Grounds which has undergone an RI/FS, has pH values ranging from 5 to 8.4 (SCS, 1972). The subsurface soil is more alkaline with measured pH values ranging from 7 to 9. Therefore, metals at the OB Grounds would be expected to be present primarily in insoluble forms.

Fate and Transport of Selected Metals

More specific information regarding the fate and transport of lead, which was detected at concentrations greater than two times its criteria, is presented below.

Lead is extremely persistent in both water and soil. Environmental fate processes may transform one lead compound to another; however, lead is generally present in the +2 oxidation state, and will form lead oxides. It is largely associated with suspended solids and

sediment in aquatic systems, and it occurs in relatively immobile forms in soil. Lead, which has been released to soil, may become airborne as a result of fugitive dust generation.

3.1.4 Data Summary and Conclusions

The results of the ESI conducted at SEAD-64D identified a large debris pile at the south end of SEAD-64D that may be impacting the soils and groundwater locally due to municipal waste. Two other debris piles were observed in this area; the contents of which were not investigated. An area of disposed metallic debris was identified on the ground surface in the east-central section of SEAD-64D. Criteria for PAHs were exceeded in several surface soil samples across the site which may have been caused by the formerly active incinerator located approximately 500 feet north of the site. Most soil samples also had at least one exceedance of the criteria for a heavy metal. The groundwater sample collected from MW64D-5 had a high concentration of heavy metals, several of which were orders of magnitude above their respective criteria, though the sample's high turbidity may have affected these results.

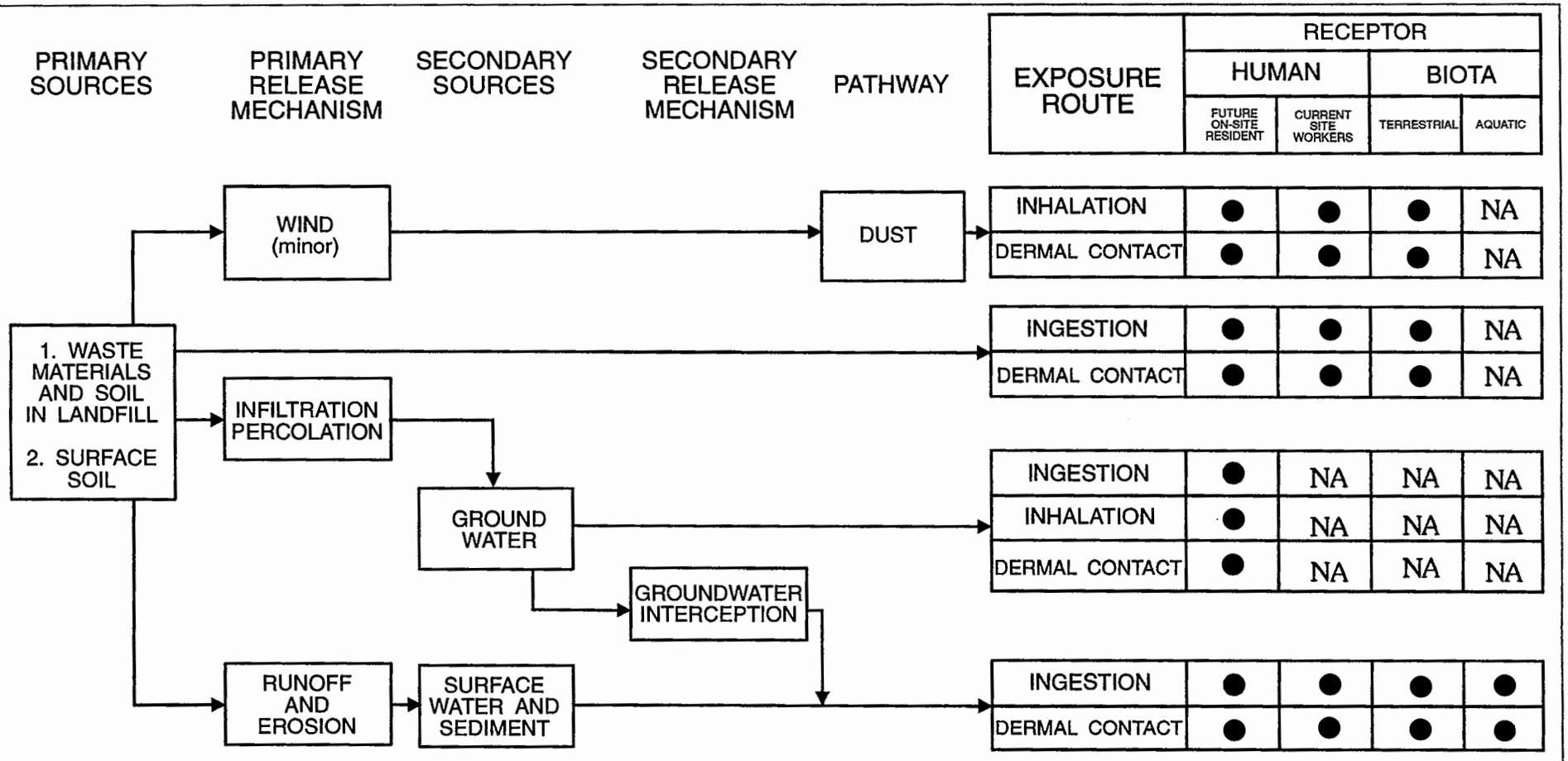
This information suggests that there have been localized impacts to the soil and possibly to the groundwater at SEAD-64D which may pose a risk to receptors. In addition, emissions from the former incinerator may have impacted the surface soils across much of SEAD-64D.

3.2 PRELIMINARY IDENTIFICATION OF POTENTIAL RECEPTORS AND EXPOSURE SCENARIOS

This section will identify the source areas, release mechanisms, potential exposure pathways, and likely human and environmental receptors at SEAD-64D using the conceptual site model. The potential exposure pathways are presented in Figure 3-8.

This section also discusses the current understanding of site risk for SEAD-64D based upon the data gathered for the ESI. This information is used to assess whether sources of contamination, release mechanisms, exposure routes, and receptor pathways developed based on the conceptual site model are valid, or if they may be eliminated from further consideration prior to conducting the risk assessment.

This is a generic discussion. The future use scenario and the required degree of cleanup will be proposed on a site-by-site basis as part of each feasibility study. The future plans for each



PARSONS
PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD-64D GARBAGE DISPOSAL AREA

DEPT. ENVIRONMENTAL ENGINEERING | DWG NO. 727651-02006

FIGURE 3-8
EXPOSURE PATHWAY SUMMARY

SCALE NA | DATE MAY 1995

H:\ENG\SENECA\SCOPING\SEAD64D\64DEXP.CDR

site will be taken into account at that time. Currently, the Army has no plans to change the use of this facility or to transfer the ownership.

3.2.1 Potential Source Areas and Release Mechanisms

The primary source areas identified during the ESI are the waste material located in the east-central area and at the south end of SEAD-64D and the surface soils across the site. The constituents of concern for these sources are SVOs and heavy metals.

The primary release mechanisms from the waste material and the surface soils are surface water runoff, infiltration of precipitation, and wind erosion. Wind erosion is expected to be a minor mechanism since the site is vegetated. Groundwater, surface water, and sediment are secondary sources. Groundwater discharge to surface water is a secondary release mechanism.

3.2.2 Potential Exposure Pathways and Receptors - Current Uses

The potential exposure pathways from sources to receptors are shown schematically in Figure 3-8. At SEDA, human and vehicular access to the site is restricted to SEDA on-site workers by a chain-link fence around the SEDA facility.

There are two primary receptor populations for potential releases of contaminants from SEAD-64D:

1. SEDA personnel and other people may visit the site. This is not an active site; therefore, these receptors would be exposed only on an intermittent or occasional basis.
2. Terrestrial and aquatic biota near the site.

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

The numerical assumptions that will be used in the baseline risk assessment for the current usage 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

Human receptors of impacted surface water and sediment include on-site workers who may

incidentally ingest or come in contact with the surface water and sediment. Terrestrial biota that drink from and come in contact with impacted surface waters may be affected. Aquatic biota in the surface water and sediment may also be affected.

3.2.2.2 Soil Ingestion and Dermal Contact

Incidental ingestion of the waste material and soil is a potential exposure pathway for on-site workers and terrestrial biota. Dermal contact with the waste material and soil is a potential pathway for on-site workers and terrestrial biota.

3.2.2.3 Groundwater Ingestion, Inhalation, and Dermal Contact

Ingestion of, inhalation of, and dermal contact with groundwater are not potential exposure pathways for on-site workers or terrestrial biota. The groundwater beneath the site is not used currently as a drinking water source and connection to other potable groundwater aquifers has not been demonstrated. It is not anticipated that there would be direct exposure of on-site workers or terrestrial biota to the groundwater from the site.

3.2.2.4 Dust Inhalation and Dermal Contact

Inhalation and dermal contact with impacted dust is a potential exposure pathway for on-site workers and terrestrial biota.

3.2.3 Potential Exposure Pathways and Receptors - Future Use

For future uses of SEAD-64D, on-site residents would be added to the above mentioned receptors. For the ingestion of soil, surface water, and sediment, the most susceptible receptor would be children. Dermal contact with soil is a potential exposure pathway for future residents. Ingestion of groundwater is a potential route of exposure to all future on-site residents assuming on-site groundwater is used as their water supply. Inhalation and dermal contact of fugitive dust is also a potential route of exposure for all on-site future residents.

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

3.3 SCOPING OF POTENTIAL REMEDIAL ACTION ALTERNATIVES

Based upon data gathered during the ESI, the media and contaminants of concern at SEAD-64D for selecting potential remedial action alternatives are the following:

a. subsurface and surficial soils containing semivolatiles;
b. groundwater containing heavy metals; and
c. surface water and sediment in the stream, drainage channels, and wetlands that may contain semivolatiles and heavy metals.

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 within the SEAD-64D RI/FS Report.

A comprehensive list of ARARs 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.

3.5 DATA QUALITY OBJECTIVES (DQOs)

The RI investigation at SEAD-64D will conform with all the stated DQOs. Chemical analysis of soil and groundwater samples will generally require Level IV quality data.

The DQOs as they pertain to SEDA are discussed 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

3.6.1 Rationale for the Remedial Investigation

A conceptual site model was developed for the ESI Work Plan identifying potential source area release mechanisms and receptor pathways at SEAD-64D. The ESI results were used to refine the conceptual site model and determine additional data requirements for an evaluation of risks to human health and the environment, compliance with the DQOs and ARARs, and the development of preliminary remedial action alternatives.

The ESI data indicate there are two waste disposal sites at SEAD-64D that could affect soil, groundwater, surface water, and sediment. One is located in the east central section of the site. The other is located at, and south of, the south end of SEAD-64D. These two sites will require further investigation. Test pits will be excavated at geophysical anomalies, mounds, and topographically unusual features identified on the site plan to evaluate whether there are any other disposal sites at SEAD-64D. PAHs and heavy metals were present in some of the surface soil samples across the site at concentrations greater than the TAGMs. They may be due to prior emissions from the incinerator located north of the site. Surface soil samples will be collected in a systematic pattern over the site and analyzed to evaluate whether the PAHs and heavy metals are due to the incinerator. Surface water and sediment samples will be obtained to evaluate whether the PAHs and metals in surface soils affect these media through surface water runoff.

3.6.2 Soil Data

- Extend the topographic map of SEAD-64D 400 feet south to obtain information on the site conditions in the area of disposed material.

- Obtain additional geophysical data to locate the eastern extent of the waste material in the east central area of the site.

- Obtain soil samples from the disposal area in the east central area of the site to evaluate whether the waste has impacted the soil quality.

- Determine if waste material is present at potential clear areas south of SB64D-1, at a potential rubble pile, at a geophysical anomaly, and any other berms located 100 to 300 feet south and west of the waste material at the south end of SEAD-64D.

- Obtain samples of the waste material and the soils below the potential rubble pile at the south end of SEAD-64D.

- Obtain surface soil samples systematically over the site to evaluate whether the incinerator north of the site is the source of the PAHs and heavy metals detected in the surface soil.

- Collect and analyze soil samples for a baseline risk assessment and to develop remedial action alternatives.

- Compare SEAD-64D data to sitewide soil background data that has been compiled from 57 samples obtained from the ESIs performed at 25 SEADs and Remedial Investigations at the OB Grounds and Ash Landfill.

- Analyze soil samples for general chemical and physical parameters. This information would be used during the selection of remedial action alternatives.

- Establish database to determine compliance with ARARs, to perform a baseline risk assessment, and to develop remedial action alternatives.

3.6.3 Groundwater Data

- Determine whether contaminants are present in the groundwater downgradient of the two identified waste disposal areas.

- Determine the hydraulic conductivity of the aquifer to assess the potential for contaminant migration and to select potential remedial action alternatives.

- Analyze groundwater samples for general chemical parameters. This information would be used during the selection of remedial action alternatives.

- Analyze an additional sample of the background groundwater at SEAD-64D to allow comparison with other SEAD-64D groundwater data.

- Establish database to determine compliance with ARARs, to perform a baseline risk assessment, and to develop remedial action alternatives.

3.6.4 Surface Water/Sediment Data

- Define the hydrology of the site by determining flow rates, if possible, and flow directions in the drainage channels and streams.

- Evaluate whether surface water runoff transports PAHs and heavy metals present in the surface soil to the drainage channel, stream, and wetland sediments.

- Analyze surface water and sediment samples for general chemical parameters. This information will be used during the selection of potential remedial action alternatives and determine whether the surface water quality meets the state criteria.

- Determine the background surface water/sediment quality by obtaining samples of surface water and sediment from the head of the stream and where the drainage channels enter the site.

- Establish a database to determine compliance with ARARs, to perform a baseline risk assessment, and to develop remedial action alternatives.

3.6.5 Ecological Data

- Perform an ecological investigation to systematically document visual observations between obvious and potentially impacted and non-impacted areas.

- Analyze flora, fauna, and endangered species on, and in the vicinity of, the site.

- Establish a database to determine compliance with ARARs, to perform a baseline risk assessment, and to develop remedial action alternatives.

3.6.6 Archaeologic Data

- Perform an archaeologic investigation of the house foundation located on the south side of the stream.

4.0 TASK PLAN FOR THE RI

This section describes the tasks required for completion of the Remedial Investigation (RI) at SEAD-64D. These include the following:

1. Pre-field Activities
2. Field Investigations
3. Data Reduction, Interpretation, and Assessment
4. Data Reporting
5. Task Plan Summary

4.1 PRE-FIELD ACTIVITIES

Pre-field activities include the following:

1. A site inspection to familiarize key project personnel with site conditions and finalize direction and scope of field activities.
2. A comprehensive review of the Health and Safety Plan with field team members to insure that the hazards that might occur and preventative and protective measures for those are completely understood.
3. An inspection of all equipment necessary for field activities to insure proper functioning and usage.
4. A comprehensive review of sampling and work procedures with field team members.
5. Site clearance, if required.

4.2 FIELD INVESTIGATIONS

The following field investigations will be performed for the RI characterization of SEAD-64D:

1. Geophysical investigation,
2. Soil investigation (surface soil samples, test pits, and soil borings),
3. Groundwater investigation (overburden wells),
4. Ecological investigation,
5. Archeological investigation, and
6. Surveying.

4.2.1 Geophysical Survey

An electromagnetic survey will be performed in a 150- by 250-foot area that was not surveyed during the ESI. This area is located in the east central portion of the site immediately east of the geophysical anomaly as shown in Figure 4-1. The survey will be used to locate the eastern extent of the geophysical anomaly identified in the ESI of this site. Geophysical survey procedures are discussed in Appendix D, Field Sampling and Analysis Plan.

4.2.2 Soil Investigation

4.2.2.1 Soil Boring Program

Soil borings will be performed where waste material was found at the south end of the site and at the east-central area of the site. The borings will be located as shown in Figures 4-1 and 4-2.

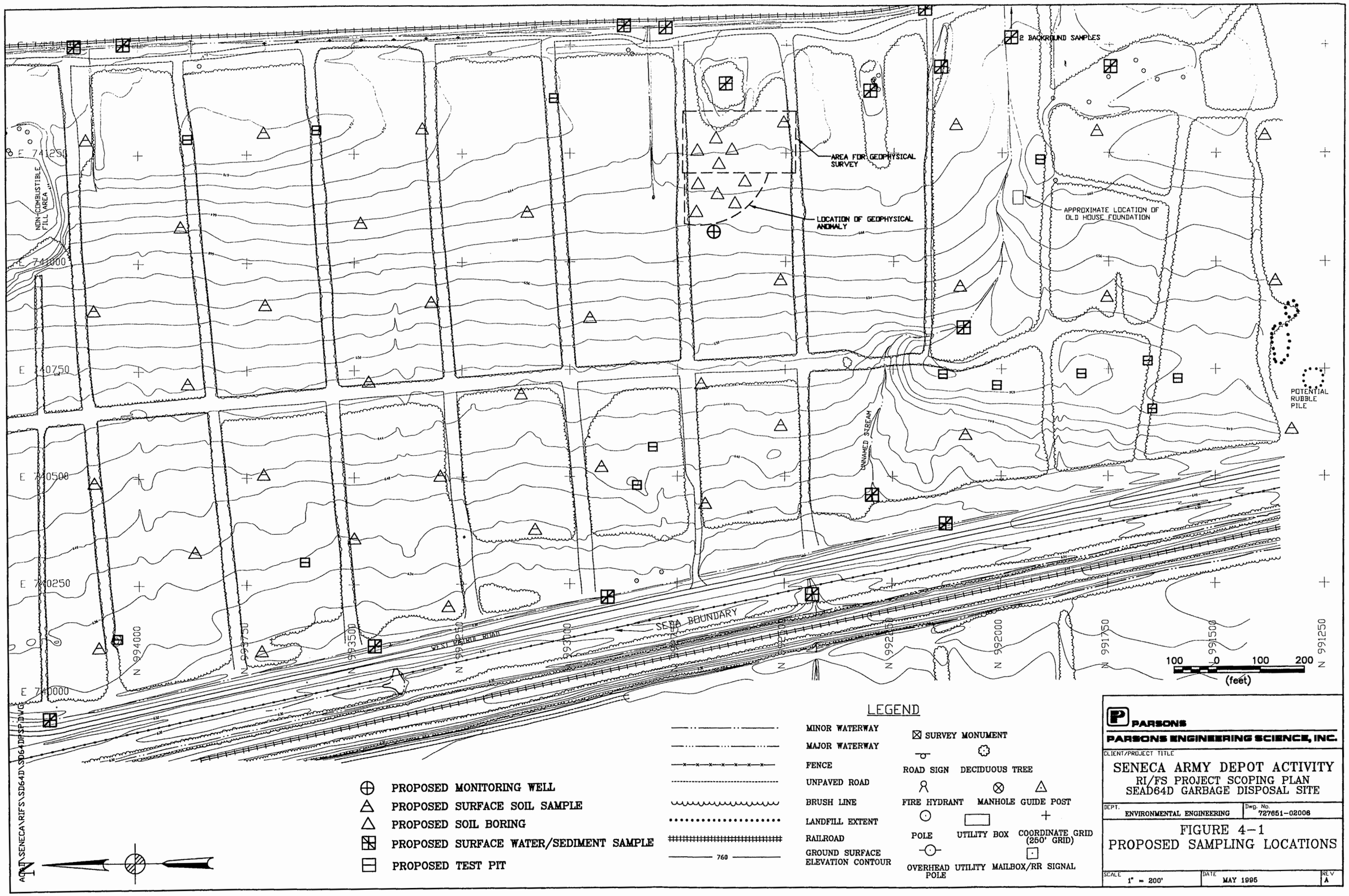
Nine soil borings will be performed within the area of the geophysical anomaly in the east-central area of the site. The ESI data indicate that the depth to bedrock is approximately 4 feet; therefore, soil samples from each boring location will be obtained for chemical analysis from the following depths: 0 to 0.2 feet, 0.2 to 2 feet, and 2 to 4 feet.

One boring will be performed on a potential rubble pile at the south end of the site as shown in Figure 4-2. Samples for chemical analysis will be obtained as follows: a composite sample of the waste material, soil immediately below the waste material, soil at the water table, and an intermediate soil sample.

Soil boring procedures and subsurface soil sampling criteria from borings are discussed in Appendix D, Field Sampling and Analysis Plan. These samples will be analyzed for the parameters listed in Section 4.2.7.

4.2.2.2 Test Pit Program

Test pits will be excavated at 19 locations across the site as shown in Figures 4-1 and 4-2 to evaluate whether there are other disposal sites on SEAD-64D. The test pits will be excavated at geophysical anomalies, mounds, and topographically unusual features identified on the site



PARSONS

PARSONS ENGINEERING SCIENCE, INC.

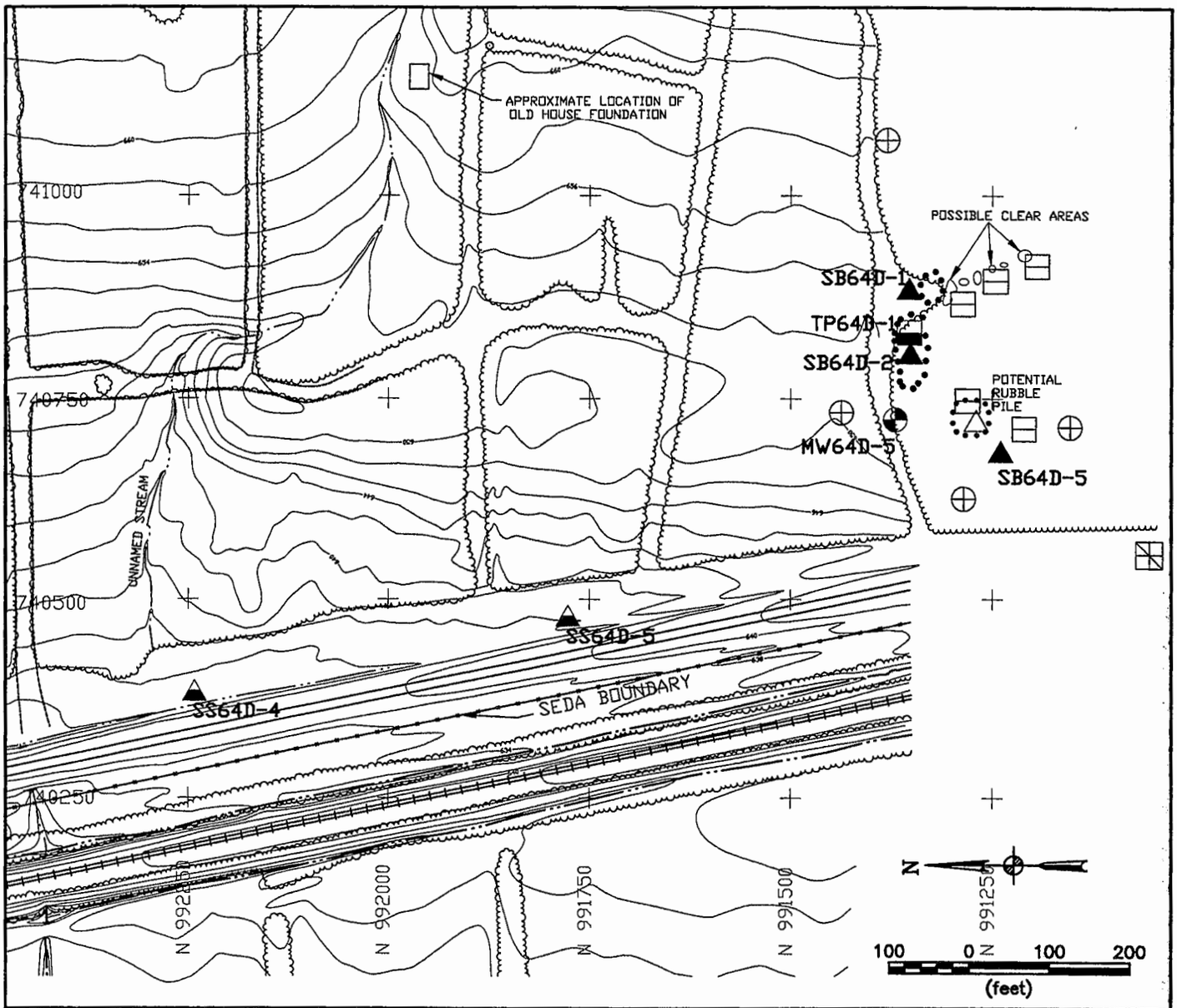
CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD64D GARBAGE DISPOSAL SITE

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	727651-02006

FIGURE 4-1
PROPOSED SAMPLING LOCATIONS

SCALE	DATE	REV
1" = 200'	MAY 1995	A



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- LANDFILL EXTENT
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- ROAD SIGN
- DECIDUOUS TREE
- GUIDE POST
- FIRE HYDRANT
- MANHOLE
- COORDINATE GRID (250' GRID)
- POLE
- UTILITY BOX
- MAILBOX/RR SIGNAL
- OVERHEAD UTILITY POLE
- SURVEY MONUMENT

- PROPOSED MONITORING WELL
- PROPOSED SURFACE SOIL SAMPLE
- PROPOSED SOIL BORING
- PROPOSED SURFACE WATER/SEDIMENT SAMPLE
- PROPOSED TEST PIT
- EXISTING TEST PIT
- EXISTING MONITORING WELL
- EXISTING SOIL BORING
- EXISTING SURFACE SOIL SAMPLE

ACAD\SENECA\RIFS\SD64D\SD64DSE.DWG

PARSONS

PARSONS ENGINEERING SCIENCE, INC.

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
RI/FS PROJECT SCOPING PLAN
SEAD64D GARBAGE DISPOSAL SITE

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	727651-02006

FIGURE 4-2
PROPOSED SAMPLING LOCATIONS
SOUTH END

SCALE	DATE	REV
1" = 200'	MAY 1995	A

plan and in aerial photographs. Additional test pits will be excavated at the south end of the site if other berms, piles, or depressions are observed in this area. No soil samples will be obtained from these test pits for chemical analysis.

The test pit excavation procedure is discussed in Appendix D, Field Sampling and Analysis Plan.

4.2.2.3 Surface Soil Sampling Program

An abandoned incinerator, formerly used to burn municipal waste, is located approximately 500 feet north of the site. PAHs and heavy metals present in the surface soils on site may be due to particulate deposition from the incinerator. Therefore, 36 surface soil samples will be obtained in a systematic pattern across the site as shown in Figure 4-1.

The surface soil sampling procedure is discussed in Appendix D, Field Sampling and Analysis Plan. These samples will be analyzed for the parameters listed in Section 4.2.7.

4.2.2.4 Soil Sampling Summary

Surface soil samples will be obtained at 36 locations across the site and at nine boring locations. One waste sample will be obtained from a boring. Twenty-one subsurface soil samples will be obtained for chemical analysis from ten borings. No samples will be obtained from the 19 test pits. These soil samples will be analyzed for the parameters listed in Section 4.2.7.

4.2.3 Groundwater Investigation

4.2.3.1 Monitoring Well Installation and Sampling

The purpose of the groundwater investigation is to determine whether the groundwater quality is being impacted at the two locations where waste material is located on site.

A total of five new overburden monitoring wells will be installed at SEAD-64D at the locations shown in Figures 4-1 and 4-2. The borings for these wells will be continuously sampled to competent rock. A monitoring well will then be installed in the boring and screened over the entire length of the overburden aquifer. These wells and the existing well MW64D-5 will be developed before they are sampled.

Water level measurements will be made in all the existing and proposed monitoring wells to obtain updated groundwater flow direction information.

The following wells will be sampled twice for chemical analysis: the background well MW64D-1, the proposed well immediately west of the waste material in the east-central area of the site, the existing well MW64D-5, and three proposed wells west of the waste identified during the ESI at the south end of the site.

Installation, development, sampling, and groundwater level measurement procedures for overburden wells are provided in Appendix D, Field Sampling and Analysis Plan. Groundwater samples from the six monitoring wells identified above will be analyzed for the parameters listed in Section 4.2.7.

4.2.3.2 Aquifer Testing

Slug tests will be performed at the five monitoring wells installed during the ESI (MW64D-1 to -5) to determine hydraulic conductivities at various locations on site. The procedures for slug testing (hydraulic conductivity determination) are provided in Appendix D, Field Sampling and Analysis Plan.

4.2.4 Surface Water/Sediment Sampling Program

Surface water and sediment samples will be obtained from 19 locations on site to evaluate the transport of PAHs and heavy metals in, and the general quality of, the surface water and sediment. The surface water flow rate and direction will also be measured at each location. The 19 locations are shown on Figures 4-1 and 4-2.

Surface water/sediment sampling and surface water flow rate measurement procedures are provided in Appendix D, Field Sampling and Analysis Plan. These samples will be analyzed for the parameters listed in Section 4.2.7.

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 analysis data obtained for the RI.

4.2.5.1 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. If they were present prior to contaminant introduction, the appropriate information will be provided to design a remedial investigation of the resources. 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; habitats supporting endangered, threatened or rare species or species of concern; regulated wetlands; wild and scenic rivers; significant coastal zones; streams; lakes; and other major resources.

A map showing the major vegetative communities within a 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 human use of the aquatic and terrestrial resources of the site and the area within a half mile of the site will be assessed. In addition to assessing this area, documented resources within two miles of the site and 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.

4.2.5.2 Contaminant-Specific Impact Analysis

Information from the site description developed in Section 4.2.5.1 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 Archeological Investigation

The results of the archeological survey performed on SEDA, titled "An Archeological Overview and Management Plan for Seneca Army Depot" (Final Report No. 16, September 1986), were reviewed to determine whether any known or potential archeological resources were present at SEAD-64D. The only archeological resources identified at or near SEAD-64D were three potential resources numbered 105, 108, and 109 in the survey. All three are identified as former farmsteads.

The remains of only one foundation were observed on SEAD-64D located on the south side of the stream that flows west through the site. A preliminary archeological assessment of the foundation and nearby land will be performed. The foundation and any nearby areas that contain remains will be located, described, photographed, surveyed, and shown on a topographic map. One or two shallow (less than one foot deep) pits will be dug with a shovel in each area containing remains to obtain preliminary information on the depth of the remains. Any remains in the pits will be documented. The pit locations will be surveyed and shown on a topographic map. Each pit will be backfilled with the material that was removed from it.

4.2.7 Analytical Program

A total of one waste sample, 66 soil samples, 6 groundwater samples, 19 surface water samples, and 19 sediment samples will be collected for chemical testing.

All the samples, except for the 36 surface soil samples obtained from across the site, will be analyzed for the following: TCL volatile organic compounds (EPA Method 524.2 for groundwater samples only), TCL semivolatile organic compounds, TCL pesticides/PCBs, and TAL metals and cyanide according to the NYSDEC Contract Laboratory Program (CLP) Statement of Work (SOW).

A second round of groundwater samples will be obtained approximately two months after the

first round. These samples will be chemically analyzed for the same parameters as listed in the previous paragraph except the volatile organic compounds will be analyzed using EPA Method 524.2.

The 36 surface soil samples obtained from across the site will be analyzed for the TCL semivolatile organic compounds and the TAL metals and cyanide according to the NYSDEC CLP SOW.

All the surface soil, waste, and subsurface soil samples from the 10 borings (31 samples) will be analyzed for total recoverable petroleum hydrocarbons (TRPH) by EPA Method 418.1.

The four samples from the boring at the south end of the site and both subsurface samples from three of the nine borings in the east central section of the site will be analyzed for grain size (including the distribution in the silt and clay fractions), Total Organic Carbon (TOC), Cationic Exchange Capacity (CEC), pH, leachability, and density.

The six groundwater samples from both rounds will be analyzed in the field for pH, temperature, specific conductivity, dissolved oxygen, turbidity, and oxidation-reduction potential. The following analyses will be performed by the laboratory: TRPH, alkalinity, ferrous iron, sulfate, sulfide, nitrate, TOC, biological oxygen demand (BOD), hardness, total dissolved solids (TDS), and chemical oxygen demand (COD).

The 19 surface water samples will be analyzed in the field for pH, temperature, specific conductivity, and dissolved oxygen. The following analyses will be performed by the laboratory: total suspended solids (TSS), TDS, alkalinity, hardness, ammonia, nitrate/nitrite, phosphate, TOC, and turbidity.

The 19 sediment samples will be analyzed for grain size, TOC, CEC, and pH. The western-most sample from the unnamed stream and the sample furthest downstream in the drainage channel along the eastern border of SEAD-64D will also be analyzed for density.

A summary of the analyses to be performed at SEAD-64D is provided in Table 4-1.

TABLE 4-1

SENECA ARMY DEPOT ACTIVITY
SEAD-64D PROJECT SCOPING PLAN
SUMMARY OF SAMPLING AND ANALYSES

MEDIA	VOCs		SVOs	Pesticides/PCBs	Metals	TPH	General Chem. and Physical Parameters(1)	Density
	TCL NYSDEC CLP	Method 524.2	TCL NYSDEC CLP	TCL NYSDEC CLP	TAL NYSDEC CLP	Method 418.1		
Soil Surface	0	0	36	0	36	0	0	0
Subsurface	31	0	31	31	31	31	10	10
Groundwater	6	6	12	12	12	12	12	0
Surface Water	19	0	19	19	19	0	19	0
Sediment	19	0	19	19	19	0	19	2

Notes:
1) The general chemistry and physical parameters that will be analyzed for each medium are listed in Section 4.2.7.
2) QA/QC sampling requirements are described in Appendix C, Section 5.3 of the Generic Installation RI/FS Workplan.

4.2.8 Surveying

Surveying will be performed at SEAD-64D for the following purposes:

1. Extend the topographic map approximately 400 feet south of the mapped area.
2. Mapping the direction and computing the velocity of groundwater movements;
3. Locating the environmental sampling points;
4. Estimating the volume of impacted soils and sediments which may require a remedial action; and
5. Mapping the extent of any impacted groundwater above established ARAR limits.

The location, identification, coordinates, and elevations of all the control points recovered and/or established at the site and all of the geophysical lines, soil borings, monitoring wells (new and existing), surface soil sampling points, and surface water/sediment sampling points will be surveyed and plotted on the topographic map to show their location with respect to surface features within the project area. The extent of the waste materials will also be surveyed and plotted on the topographic map.

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 will be licensed and registered in New York.

The site field survey requirements are presented in Appendix D, Field Sampling and Analysis Plan.

4.3 DATA REDUCTION, ASSESSMENT, AND INTERPRETATION

Data reduction, assessment, and interpretation are 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.

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

Detailed task plan summaries that indicate the number and type of samples to be collected at SEAD-64D are provided in Table 4-1.

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

5.0 TASK PLAN FOR THE FS

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

5.1 DEVELOPMENT OF REMEDIAL ACTION OBJECTIVES

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

5.2 DEVELOPMENT OF REMEDIAL RESPONSE ALTERNATIVES

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

5.3 SCREENING OF REMEDIAL ACTION ALTERNATIVES

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

5.4 DETAILED ANALYSIS OF REMEDIAL ACTION ALTERNATIVES

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

5.5 TASK PLAN SUMMARY FOR THE FS

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

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-64D. The Field Sampling and Analysis Plan (Appendix D) details procedures that 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 shipping samples.

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

The Chemical Data Acquisition Plan (Appendix F) 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 used during the RI.

6.1 SCHEDULING

A discussion of the scheduling for the RI/FS to be conducted at SEAD-64D is presented in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

6.2 STAFFING

A discussion of the staffing for the RI/FS to be conducted at SEAD-64D is presented in the Generic Installation RI/FS Workplan that serves as a supplement to this RI/FS Project Scoping Plan.

APPENDIX A

ESI BORING AND TEST PIT LOGS

LOG OF BORING NO. SB64D-1

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
ASSOCIATED UNIT/AREA: SEAD-64D
PROJECT NO: 720518-01000
DATE STARTED: 06/23/94
DATE COMPLETED: 06/23/94
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 3" SPLIT SPOONS

DEPTH TO WATER (ft): NA
BORING LOCATION (N/E): 991352.4 740881.4
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): NA
DATUM: NAD 1983
INSPECTOR: KK, LR
CHECKED BY: FO

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	4 7 6 6	2.00	1.7	0	BGD	0.5 1 1.2 1.7		Dark gray-brown SILT + CLAY, trace(+) very fine Sand, trace very fine to fine gray Shale fragments and Gravel, very stiff, iron staining.	ML
								Light brown CLAY + SILT, little very fine Sand, trace fine gray Shale fragments and Gravel, trace coarse gray Shale fragments, some iron staining, grading from medium stiff to soft, moist.	ML
								Grading from light brown SILT + very fine SAND to very fine to fine SAND, little Silt, trace fine gray Shale fragments soft to very soft, saturated.	SM
						2.0		No Recovery	-
.02	18 30 32 40	2.00	2.0	0	BGD	2 2.1 2.7 3		AA (1.2-1.7'), saturated.	SM
								Light brown very fine SAND + SILT, trace coarse Gravel, trace iron-stained Clay, trace gray very fine gray Shale fragments, medium stiff, wet.	ML
								Light brown very fine to fine SAND, trace Silt, little coarse gray Shale fragments, trace fine to medium gray Shale fragments, Coarse Shale Gravel, loose, wet to saturated.	SM
.03	40 62 72 92	2.00	2.0	0	BGD	4 4.0 4.9 5		Brown very fine to fine SAND, trace(+) Silt, trace fine gray Shale fragments, little coarse Shale fragments, loose, wet to saturated.	SM
						5.0		Tan siltstone GRAVEL, trace iron staining.	GM
								AA, (4-4.9').	SM
.04	78 100/.3	0.80	0.8	0	BGD	6 6.4 6.7 6.8		Gray-brown very fine SAND, little Silt, little gray coarse Shale fragments, trace Clay, trace fine gray Shale fragments, medium stiff, wet.	ML
						7		Gray fractured SHALE, saturated.	-
								No Recovery	
								BORING TERMINATED AT 7.8'	

NOTES: Bottom of overburden at 6.7'. The following samples were collected for chemical analysis: SB64D-1.00(0-2"), SB64D-1.01(2"-2'), SB64D-1.02(2'-4').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-1

LOG OF BORING NO. SB64D-2

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/23/94**
DATE COMPLETED: **06/23/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **6.7**
BORING LOCATION (N/E): **991351.4 740802.4**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **NA**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
.01	3 4 5 5	2.00	1.3	0	BGD	1.0		Brown, very fine SAND + SILT, little fine gray Shale fragments, trace medium Gravel, trace iron-stained Clay, trace organics, medium stiff, dry to moist.	ML
						1.3		Brown SILT, trace organics, soft, moist.	ML
						2.0		No Recovery	-
.02	3 4 4 4	2.00	1.6	0	BGD	2.3		AA, (0-1'), soft, moist.	ML
						3.0		AA, (1-1.3'), trace roots, trace fine Gravel.	ML
						3.6		Light brown, iron-stained SILT + very fine SAND, little Clay, trace organics, trace very fine, weathered gray Shale fragments, medium stiff, moist.	ML
						4.0		No Recovery	-
.03	12 18 20 18	2.00	2.0	0	BGD	4.3		AA, (3-3.6'), little very fine to fine gray Shale fragments.	ML
						5.4		Gray, fine to coarse, fractured + weathered SHALE fragments + very fine to fine SAND, trace Silt and Clay, medium dense, moist.	GM
						6.0		AA, (4-4.3').	ML
.04	18 20 26 16	2.00	1.3	0	BGD	6.5		Light brown very fine to fine SAND, some gray, very fine to medium weathered Shale fragments, trace Silt, medium stiff, wet.	SW
						6.7		AA, saturated.	SW
						7.1		Gray fractured + weathered, SHALE, saturated (6.7-6.8'), moist to wet (6.8-7.1'), iron stained.	-
						7.3		AA, (6.5-6.7').	SW
						8.0		No Recovery	-
.05	41 100/.3	0.80	0.5	0	BGD	8.5		Gray highly fractured, medium weathered SHALE, trace iron-stained, 0.1 lenses of olive gray Silt and very fine Sand, moist.	-
						10.0		No Recovery	-

NOTES: Bottom of overburden at 6.7'. The following samples were collected for chemical analysis: SB64D-2.00(0-2"), SB64D-2.01(2"-1.3'), SB64D-2.02(2.3'-3.6'), SB64D-2.03(4'-6').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-2

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT NO: **720518-01000**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**

GROUND SURFACE ELEVATION: **NA**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.06	100/.2	0.20	0.0	0	BGD			Gray SHALE	-
								BORING TERMINATED AT 10.2'	

NOTES: Bottom of overburden at 6.7'. The following samples were collected for chemical analysis: SB64D-2.00(0-2"), SB64D-2.01(2"-1.3'), SB64D-2.02(2.3'-3.6'), SB64D-2.03(4'-6').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-2

LOG OF BORING NO. SB64D-3

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
ASSOCIATED UNIT/AREA: SEAD-64D
PROJECT NO: 720518-01000
DATE STARTED: 06/24/94
DATE COMPLETED: 06/24/94
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 3" SPLIT SPOONS

DEPTH TO WATER (ft): 3.2
BORING LOCATION (N/E): 992695.3 741196.0
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): NA
DATUM: NAD 1983
INSPECTOR: KK, LR
CHECKED BY: FO

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	4 6 10 8	2.00	2.0	0	BGD	1		Dark brown SILT, some very fine Sand, little organics, grading from soft to medium stiff, slightly moist to moist.	ML
						1.2		Light brown-orange SILT + very fine SAND, trace very fine Gravel and gray Shale fragments, little orange Clay, trace organics, stiff, dry to slightly moist.	ML
.02	6 12 10 5	2.00	0.4	0	BGD	2		Light brown SILT and very fine SAND, trace very fine Gravel and gray Shale fragments, little orange Clay, stiff, moist.	ML
						2.0		Light brown SILT + very fine to fine SAND, little medium Sand, trace fine Gravel and gray Shale fragments, trace Gravel Cobble, wet.	ML
						2.7		Fine SAND, little very fine Sand and Silt, trace fine Gravel and gray Shale fragments, saturated.	SW
						3		No Recovery	-
.03	10 38 25 17	2.00	0.9	0	BGD	3.2		Brown CLAY + SILT, trace fine to medium gray Shale fragments, saturated.	ML
						3.4		Gray highly fractured, medium to coarse SHALE fragments, saturated, iron stained.	GW
						4		No Recovery	-
						4.0			
.04	65 12 10 14	2.00	1.3	0	BGD	4.4		Gray highly fractured, medium to coarse SHALE fragments, trace olive gray Silt, iron-stained fragments, saturated.	GM
						4.9		Very fine to coarse gray SHALE fragments + gray, iron-stained CLAY, stiff, saturated.	GC
						5		Light brown, iron-stained SILT + very fine SAND + fine to medium gray SHALE fragments, stiff, saturated.	GM
						6		No Recovery	-
						6.0			
.05	100/.4	0.40	0.4	0	BGD	6.4		Light gray, iron-stained CLAY + fine gray SHALE fragments, stiff, wet.	GC
						7		AA, (6-6.4'), dry to moist.	GC
						7.0		No Recovery	-
						7.3			
						8			
						8.0			
						8.2			
						8.4			
						9			
						10			
						10.0			

NOTES: Bottom of overburden at 8.4'. The following samples were collected for chemical analysis: SB64D-3.00(0-2"), SB64D-3.01 (0.2-2.0'), SB64D-3.02 (2'-3.2'), SB64D-3.01 MRD (0.2-2.0'), and SB64D-3.20 (duplicate of .01)

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-3

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT NO: **720518-01000**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**

GROUND SURFACE ELEVATION: **NA**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.06	100/.2	0.20	0.2	0	BGD		— — -	Gray highly weathered, finely laminated SHALE, dry.	-
								BORING TERMINATED AT 10.2'	

NOTES: Bottom of overburden at 8.4'. The following samples were collected for chemical analysis: SB64D-3.00(0-2"), SB64D-3.01 (0.2-2.0'), SB64D-3.02 (2'-3.2'), SB64D-3.01 MRD (0.2-2.0'), and SB64D-3.20 (duplicate of .01)

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-3

LOG OF BORING NO. SB64D-4

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
ASSOCIATED UNIT/AREA: SEAD-64D
PROJECT NO: 720518-01000
DATE STARTED: 06/24/94
DATE COMPLETED: 06/24/94
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 3" SPLIT SPOONS

DEPTH TO WATER (ft): 4.0
BORING LOCATION (N/E): 992588.8 741199.6
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): NA
DATUM: NAD 1983
INSPECTOR: KK, LR
CHECKED BY: FO

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	4 8 10 14	2.00	1.7	0	BGD	0.4		Brown SILT, little very fine Sand, little organic material, moist.	ML
						0.9		Light brown CLAY, trace Silt, trace(-) organic material, stiff, moist.	CL
						1		Light gray CLAY + SILT, little weathered Siltstone, trace Shale fragments, trace organic material, loose, moist.	ML
						1.7			
						2.0		No Recovery	-
.02	32 50 41 25	2.00	1.7	0	BGD	2		Light gray-olive brown CLAY, little Silt, trace weathered Shale fragments, loose, dry.	CL
						2.7			
						2.9		Gray fractured SHALE, wet.	-
						3		Light brown, very fine SAND, some Silt, little weathered, fractured Shale, loose, moist, saturated at (3.6-3.7').	SM
						3.7			
						4.0		No Recovery	-
.03	11 9 2 5	2.00	0.9	0	BGD	4		Light brown very fine SAND, trace(+) Silt, trace Shale fragments.	SP
						4.4		Light brown-tan SILT, little very fine Sand, saturated.	ML
						4.9			
						5		No Recovery	-
						6.0			
.04	25 100/.5	1.00	1.0	0	BGD	6		AA, (4.4-4.9').	ML
						6.4		Dark gray, highly weathered SHALE, wet.	-
						7.0			
						7		No Recovery	-
						8.0			
.05	100/.4	0.40	0.4	0	BGD	8		Gray, highly weathered SHALE, dry to damp.	-
								BORING TERMINATED AT 8.4'	

NOTES: Bottom of overburden at 6.5'. The following samples were collected for chemical analysis: (SB64D-4.00), (SB64D-4.01), (SB64D-4.02).

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-4

LOG OF BORING NO. SB64D-5

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
ASSOCIATED UNIT/AREA: SEAD-64D
PROJECT NO: 720518-01000
DATE STARTED: 06/25/94
DATE COMPLETED: 06/25/94
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 3" SPLIT SPOONS

DEPTH TO WATER (ft): 6.0
BORING LOCATION (N/E): 991240.7 740681.3
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): NA
DATUM: NAD 1983
INSPECTOR: KK, LR
CHECKED BY: FO

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
						0.3		This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	4 6 7 8	2.00	1.7	0	BGD	1		Brown SILT, little very fine Sand, little organic material, trace fine Shale fragments, loose, moist.	ML
						1.7		Light brown SILT, some very fine Sand trace(-) fine Gravel, trace(-) organic material, loose, damp.	ML
						2.0		No Recovery	-
.02	11 11 14 16	2.00	1.6	0	BGD	2 3		Light brown very fine SAND + SILT, trace(+) very fine to fine Shale fragments, trace(-) organic material, medium stiff, dry.	ML
						3.6		No Recovery	-
						4.0			
.03	13 13 24 77	2.00	1.9	0	BGD	4 5		Light brown SAND + SILT, trace(+) very fine to fine Shale fragments, trace Clay, medium stiff, dry.	ML
						5.2		Light brown alternating lenses of very fine SAND, little(+) Silt, trace Clay and weathered/fractured Shale, wet.	ML
						5.9			
.04	74 48 100/.1	1.10	1.0	0	BGD	6 7		No Recovery	
						6.0		Weathered + fractured SHALE w/little lense of light brown very fine Sand and Silt, saturated.	-
						6.7		Gray weathered/fractured SHALE, saturated.	-
						7.0		No Recovery	-
						8.0			
.05	100/.2	0.20	0.1	0	BGD	8		Gray fractured SHALE.	-
								BORING TERMINATED AT 8.2'	

NOTES: Bottom of overburden at 5.5'. The following samples were collected for chemical analysis: SB64D-5.00(0-2"), SB64D-5.01(2"-2'), SB64D-5.02(2'-4').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-5

LOG OF BORING NO. SB64D-6

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/25/94**
DATE COMPLETED: **06/25/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **NA**
BORING LOCATION (N/E): **993876.2 740349.0**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **NA**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
.01	3 8 16 15	2.00	1.3	0	BGD	0.6		Brown SILT, little very fine Sand, little organic material, trace(-) fine Shale, loose, moist.	ML
						1.3		Light brown SILT + very fine SAND, trace(+) very fine Shale fragments, trace(-) organic material, medium stiff, organic.	ML
						2.0		No Recovery	-
.02	24 18 35 57	2.00	1.8	0	BGD	2.3		Light brown CLAY, trace(-) Silt + very fine Sand.	CL
						2.8		Gray-brown SILT + very fine SAND, little very fine to fine Gravel (Shale), trace Clay, trace medium to coarse Shale fragments, medium stiff, moist to wet.	ML
						3.4		Olive gray-gray weathered SHALE + CLAY w/little Silt, trace organic material, dry.	GC
						3.8		Olive gray to gray highly weathered SHALE, dry.	-
						4.0		No Recovery	-
.03	25 100/.4	0.90	0.5	0	BGD	4.5		AA, (3.4-3.8'), moist to wet.	-
						6.0		No Recovery	-
.04	100/.2	0.20	0.1	0	BGD			Dark gray fractured SHALE, dry.	-
								BORING TERMINATED AT 6.2'	

NOTES: Bottom of overburden at 4.5'. The following samples were collected for chemical analysis: SB64D-6.00(0-2"), SB64D-6.01(2"-2'), SB64D-6.02(2'-4').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-6

LOG OF BORING NO. SB64D-7

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/24/94**
DATE COMPLETED: **06/24/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **4.2**
BORING LOCATION (N/E): **993532.9 740778.6**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **NA**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	USCS
								DESCRIPTION	
.01	5 6 8 10	2.00	1.7	0	BGD	0.5 1 1.5 1.7		Brown SILT, little(-) very fine Sand, trace(+) organic material, loose, moist to wet.	ML
								Light brown SILT, some very fine Sand, trace weathered fine Shale fragments, trace(-) organic material, medium stiff, moist.	ML
								Light brown tan SILT + very fine SAND, loose, wet.	ML
						2.0		No Recovery	-
.02	18 18 24 40	2.00	1.6	0	BGD	2 3 3.6		Light brown-gray SILT, some very fine Sand, little(-) Clay, trace(+) Shale fragments, moist.	ML
						4.0		No Recovery	-
.03	42 100/.4	0.90	0.9	0	BGD	4		Gray highly weathered SHALE, wet to saturated (4.2-4.6'), damp to moist (4.6-4.9').	-
								BORING TERMINATED AT 4.9'	

NOTES: Bottom of overburden at 4'. Samples taken for chemical analysis were: SB64D-7.00(0-2"), SB64D-7.01(2"-2'), SB64D-7.02(2'-4').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-7

LOG OF BORING NO. SB64D-8

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/24/94**
DATE COMPLETED: **06/24/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **4**
BORING LOCATION (N/E): **993098.6 740816.8**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **NA**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	4 5 9 10	2.00	1.9	0	BGD	0.6		Dark brown SILT, some very fine Sand, little organics, trace very fine gray Shale fragments.	ML
						1		Grading from light brown to olive gray SILT, little very fine Sand, trace organics, trace very fine to fine gray Shale fragments, little iron-stained Clay, medium stiff to stiff, slightly moist.	ML-GC
						1.9			
.02	12 14 18 16	2.00	1.8	0	BGD	2		No Recovery	
						2.0		Olive-gray SILT, some very fine Sand, little heavily iron-stained Clay, little very fine to coarse gray Shale fragments, trace coarse Gravel, trace coarse gray fine fragments, fractured Shale from (3.5-3.8), stiff, slightly moist.	ML
						3			
						3.8			
						4.0		No Recovery	-
.03	29 65 71 100/.3	1.70	1.7	0	BGD	4		Gray very fine to medium SHALE fragments, some light gray Clay and Silt, saturated.	GC-GM
						4.3			
						4.5		Highly fractured, slightly weathered SHALE, trace light gray Clay, saturated.	-
						4.8		Highly fractured, highly weathered SHALE, moist.	-
						5		AA, iron-stained medium Shale fragments from (4.5-5.7'), dry to moist.	-
						5.7			
								No Recovery	
								BORING TERMINATED AT 5.8'	

NOTES: Bottom of overburden at 4.3'. The following samples were collected for chemical analysis: SB64D-8.00 (0-2"), SB64D-8.01 (0.2-2.0'), SB64D-8.02 (2.0-4.0').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-8

LOG OF BORING NO. SB64D-9

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/25/94**
DATE COMPLETED: **06/25/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **4.5**
BORING LOCATION (N/E): **993140.6 741264.7**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **NA**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
.01	4 6 14 8	2.00	2.0	0	BGD	0.2		Dark brown SILT, little Clay, little very fine Sand, little organics, loose, moist.	ML
						0.8		Light brown to brown SILT and very fine SAND, trace very fine Gravel, trace organics, medium stiff to soft, slightly moist.	ML
						1.2		Brown SILT, little iron-stained Clay, trace very fine Sand, trace very fine to fine gray Shale fragments, trace organics, medium stiff.	ML
						2.0		Gray-brown CLAY and + highly fractured, weathered, iron-stained SHALE, little Silt, medium soft to soft, moist.	GC
.02	6 14 15 12	2.00	1.9	0	BGD			AA(.8-1.2')	GC
						2.8		AA, little very fine Sand.	CL
						3.2		Light brown very fine to fine SAND, trace fine to medium gray Shale fragments, little coarse sand-sized gray Shale fragments, little Silt, iron-stained, wet.	SW
						3.5		Fractured, weathered, iron-stained SHALE fragments and light brown, iron-stained Silt and very fine Sand, wet to moist.	GM
						3.9		No Recovery	ML
.03	6 4 7 10	2.00	1.9	0	BGD	4.0		Brown SILT + very fine SAND, little fine to coarse gray Shale fragments, iron-stained, soft, moist to wet.	ML
						4.5		AA, saturated.	SW
						4.9		Light brown very fine to medium SAND, trace very fine to fine gray SHALE fragments, loose, saturated.	CL
						5.4		Light gray, iron-stained CLAY and very fine to coarse, weathered gray SHALE fragments, trace very fine Sand, soft, wet.	CL
						5.9		No Recovery	-
.04	6 100/.2	0.70	0.7	0	BGD	6.0		Olive gray SILT and CLAY, very fine to coarse gray Shale fragments, loose, saturated.	
						6.4		Gray, fractured, weathered, iron-stained, coarse gray Shale fragments, saturated.	
						6.7		No Recovery	
								BORING TERMINATED AT 6.8'	

NOTES: Bottom of overburden at 6.4'. The following samples were collected for chemical analysis: SB64D-9.00(0-2"), SB64D-9.01(2"-2'), SB64D-9.02(2'-4').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-9

LOG OF BORING NO. SB64D-10

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
ASSOCIATED UNIT/AREA: SEAD-64D
PROJECT NO: 720518-01000
DATE STARTED: 06/25/94
DATE COMPLETED: 06/25/94
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
SAMPLING METHOD: 3" SPLIT SPOONS

DEPTH TO WATER (ft): 5.0
BORING LOCATION (N/E): 992967.4 741344.7
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): NA
DATUM: NAD 1983
INSPECTOR: KK, LR
CHECKED BY: FO

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	3 4 5 5	2.00	1.6	0	BGD	0.7		Dark brown SILT, little organics, moist.	ML
						1		Little brown, iron-stained SILT and CLAY, trace very fine Sand, trace organic, trace(-) very fine gray Shale fragments, medium stiff, moist.	ML
						1.4 1.6		Brown SILT, trace iron-stained Clay, little very fine to fine gray Shale fragments, soft to medium stiff, moist.	ML
						2.0		No Recovery	-
.02	9 15 18 18	2.00	2.0	0	BGD	2		AA (1.4-1.6'), medium stiff.	ML
						2.5		Light iron stained CLAY, trace very fine to fine gray Shale fragments, stiff, slightly moist.	CL
						3			
						3.3		Olive gray SILT, little very fine Sand, trace Clay, little very fine to fine gray Shale fragments, stiff to medium stiff, slightly moist	ML
.03	8 12 19 10	2.00	1.1	0	BGD	4			
						4.3		AA, (2.5-3.3'), trace decayed organics.	CL
						5.0			
						5		Light brown very fine SAND and SILT, little weathered fine gray Shale fragments, soft, saturated.	ML
						5.2		No Recovery	-
						6.0			
.04	19 24 27 30	2.00	1.0	0	BGD	6		Slightly weathered, highly fractured, coarse gray SHALE fragments, iron-stained, saturated.	GW
						6.7		Olive gray CLAY and very fine to coarse gray SHALE fragments, saturated.	GC
						7.0		No Recovery	-
						7			
						8.0			
.05	85 55 50 100/.1	1.60	0.7	0	BGD	8		Gray fractured SHALE, trace iron staining, saturated.	-
						8.7		No Recovery	-
						9			
								BORING TERMINATED AT 9.6'	

NOTES: Bottom of overburden at 6.0'. The following samples were collected for chemical analysis: SB64D-10.00(0-2"), SB64D-10.01(2"-2'), SB64D-10.03(4'-5.1').

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING SB64D-10

LOG OF BORING NO. MW64D-1

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **03/28/94**
DATE COMPLETED: **03/28/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **3.0**
BORING LOCATION (N/E): **993059.7 741523.1**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **666.6**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	1 2 6 8	2.00	1.5	0	BGD	1 1.2		Dark brown SILT, little organic, trace fine to medium Shale fragments and Gravel, soft, moist.	ML
						1.5		Light green-gray CLAY, iron staining, medium stiff, moist.	CL
						2.0		No Recovery	-
.02	9 18 40 40	2.00	1.7	0	BGD	2		Light olive gray CLAY, little fine to medium Shale fragments, trace Silt, soft, wet, iron staining.	CL
						2.7		Olive gray CLAY, some fine to medium Shale fragments, trace very fine Sand, trace Silt, very soft, wet to saturated.	CL
						3 3.0		Gray fractured, slightly weathered, SHALE, trace Silt, loose, saturated.	GM
						3.7		No Recovery	-
.03	30 39 100/.3	1.30	1.3	0	BGD	4 4.0		Gray fractured + weathered SHALE fragments and olive gray CLAY, trace very fine Sand, loose, saturated.	GC
						4.4		Gray fractured, SHALE, trace olive gray Clay, loose, saturated.	GC
						5 5.0		Light gray CLAY, iron staining, stiff, moist	CL
						5.2		Gray SHALE.	-
								BORING TERMINATED AT 5.3' AUGER REFUSAL	

NOTES: Bottom of overburden at 3.0'. No samples were collected for chemical analysis.

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING MW64D-1

LOG OF BORING NO. MW64D-2

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/21/94**
DATE COMPLETED: **06/21/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **3" SPLIT SPOONS**

DEPTH TO WATER (ft): **3.6**
BORING LOCATION (N/E): **993638.6 740197.6**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **633.7**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	3 2 3 4	2.00	1.2	0	BGD	0.3		Dark brown SILT + very fine SAND, trace fine Gravel, some organics, soft, moist.	ML
						0.9		Brown SILT + CLAY, trace organics, very soft, moist to wet.	ML
						1 1.2		Tan-pink CLAY, little(-) brown Silt, trace fine Gravel, medium stiff, moist.	CL
						2.0		No Recovery	-
.02	3 5 5 6	2.00	2.0	0	BGD	2		AA (0.9-1.2'), yellow, red, pink, gray, light brown Clay, trace fine Gravel, trace medium Sand, medium stiff, moist.	CL
						3 3.3			
						3.4		Red + pink fine SAND, wet to saturated.	SP
						4.0		Brown-gray SILT + very fine SAND, little fine gray Shale fragments, little coarse Sand-sized gray Shale fragments, wet to saturated.	ML
.03	5 8 9 15	2.00	2.0	0	BGD	4		Gray fine to medium SHALE fragments + brown-gray very fine SAND, little Silt, loose, saturated.	GM
						4.7		Light gray CLAY + SILT, little fine gray Shale fragments, little coarse gray Shale fragments, soft, saturated.	ML
						5 5.1		Gray fine to coarse SHALE fragments + brown-gray, iron-stained SILT, loose, saturated.	GM
						6.0			
.04	21 38 45 59	2.00	1.3	0	BGD	6 6.4		Gray fine to medium SHALE fragments + gray SILT, saturated.	GM
						6.9		Gray highly fractured SHALE, trace gray Silt, saturated.	-
						7 7.3		AA, (6-6.4').	GM
						8.0		No Recovery	-
.05	100/.5	0.50	0.5	0	BGD	8 8.5		Gray coarse SHALE fragments + gray-brown CLAY + SILT, soft, saturated.	GM-GC
.06	100/.1	0.10	0	NA	NA			No Recovery	-
						9		BORING TERMINATED AT 9'	

NOTES: Bottom of overburden at 8.0'. No samples were collected for chemical analysis.

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING MW64D-2

LOG OF BORING NO. MW64D-3

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/20/94**
DATE COMPLETED: **06/20/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **2" SPLIT SPOONS**

DEPTH TO WATER (ft): **6.4**
BORING LOCATION (N/E): **993017.4 740735.8**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **647.3**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
.01	2 3 4 5	2.00	1.3	0	BGD	0.1		Dark brown SILT, some organics, soft, moist.	ML
								Grading from SILT + some Clay, to CLAY + some Silt, dark brown to tan, trace organics, trace(-) fine Gravel, soft, moist.	ML
						1			
						1.3		No Recovery	-
						2.0			
.02	8 10 15 17	2.00	1.6	0	BGD	2		AA (1.0-1.3'), tan Clay, some Silt, soft, iron-stained.	CL
						2.3		Tan-gray, heavily iron-stained CLAY, little Silt, trace organics, trace fine gray Shale fragments, stiff, dry.	CL
						2.9			
						3		Limestone Cobble.	-
						3.1		AA, (2.3-2.9'), some fine Sand, wet (3.2-3.4'), dry (3.4-3.6'), medium Shale fragments (3.6').	CL
						3.6		No Recovery	-
						4.0			
.03	16 20 20 20	2.00	2.0	0	BGD	4		Brown SILT + very fine SAND, some fine to medium gray Shale fragments, trace coarse Sand-sized gray Shale fragments, moist to wet.	ML
						5			
						5.7			
						6.0		AA, trace fine Shale fragments, loose, wet.	ML
.04	27 55 100/.4	1.40	1.4	0	BGD	6		Brown SILT + CLAY + gray fine to medium weathered SHALE fragments, stiff, moist, iron-stained.	GM-GC
						6.4		Gray weathered SHALE, trace Silt, loose, saturated.	-
						6.8		AA, (6.0-6.4').	ML
						7.0		Gray highly weathered SHALE, dry.	-
						7		No Recovery	-
						7.4			
								BORING TERMINATED AT 7.8'	

NOTES: Bottom of overburden at 7'. No samples were collected for chemical analysis.

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING MW64D-3

LOG OF BORING NO. MW64D-4

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/20/94**
DATE COMPLETED: **06/20/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **2" SPLIT SPOONS**

DEPTH TO WATER (ft): **3.5**
BORING LOCATION (N/E): **992533.5 741082.2**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **659.7**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	DESCRIPTION	USCS
.01	4 7 9 12	2.00	1.5	0	BGD	0.4	Brown SILT + very fine SAND, little organics, trace(-) fine gray Shale fragments, soft, moist.	ML
						0.5	Gray fractured SHALE fragments, trace brown Silt, dry.	CL
						1.0	Red CLAY, little(-) brown Silt, trace organics, soft, moist.	
						1.3	Gray fractured SHALE fragments, dry.	-
						1.5	Fine to medium gray SHALE fragments + brown SILT + CLAY, trace very fine Sand, soft, moist.	GM-GC
						2.0	No Recovery	-
.02	40 38 15 12	2.00	1.9	0	BGD	2.5	AA, (1.3-1.5').	ML
						3.5	Gray highly weathered SHALE, dry. Also, .01 lense of light brown, moist Clay at (2.6'), (2.9'), and (3.2').	-
						3.9	Brown SILT, and very fine to fine Sand, little fine gray Shale fragments, soft, saturated.	ML
.03	6 7 9 8	2.00	1.7	0	BGD	4.0	No Recovery	
						4.3	Brown SILT, fine Sand and very fine Sand, little coarse Sand-sized gray Shale fragments, trace fine gray Shale fragments, soft, saturated.	ML
						4.6		SM
						4.8	Fine to coarse SAND, trace Shale fragments, trace Silt, loose, saturated.	GM
						5.2	SILT, very fine SAND + coarse SHALE fragments, loose, saturated.	GM
							AA, (4.3-4.6'), saturated.	GM
						5.7	AA, (5.2-5.7'), 4-4.3'), saturated.	
						6.0	No Recovery	-
.04	9 14 12 18	2.00	2.0	0	BGD	6.2	AA, (4.3-4.6), saturated.	GM
						6.4	Gray CLAY + fine to medium gray SHALE fragments, medium stiff, moist.	GC
						6.7	AA, (4.6-4.8'), wet to saturated.	GC
						6.9	Gray weathered + fractured SHALE, moist iron-stained.	-
						7.1	AA, (6.2-6.4'), iron-stained, moist.	CL
						7.5	Gray fractured SHALE, trace Silt, saturated.	-
							Gray highly weathered SHALE, dry to moist, trace iron staining.	-
.05	100/.3	0.30	0.3	0	BGD	8.3	No Recovery	-
							BORING TERMINATED AT 9.9'	

NOTES: Bottom of overburden at 7.5'. No samples were collected for chemical analysis.

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING MW64D-4

LOG OF BORING NO. MW64D-5

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
ASSOCIATED UNIT/AREA: **SEAD-64D**
PROJECT NO: **720518-01000**
DATE STARTED: **06/22/94**
DATE COMPLETED: **06/22/94**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
SAMPLING METHOD: **2" SPLIT SPOONS**

DEPTH TO WATER (ft): **6.2**
BORING LOCATION (N/E): **991371.4 740724.3**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **651.0**
DATUM: **NAD 1983**
INSPECTOR: **KK, LR**
CHECKED BY: **FO**

Sample Number	Blow Counts (# Blows per 6")	Sample Advance (ft)	Sample Recovery (ft)	VOC Screen-PID (ppm)	Rad Screen (cps)	Depth (ft)	Macro Lithology	DESCRIPTION	USCS
								This log is part of the report prepared by Engineering-Science, Inc. for the named project and should be read together with that report for complete interpretation. This summary applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations.	
.01	2 2 4 7	2.00	1.3	0	BGD	0.4		Dark brown SILT, little organics, soft, moist.	ML
						1.0		Light brown SILT, little Clay, trace(-) fine gray Shale fragments, trace organics, soft, moist.	ML
						1			
						1.3		Gray brown SILT, soft, moist.	ML
						1.4		Gray limestone Cobble.	
								No Recovery	-
						2.0			
.02	12 18 15 14	2.00	2.0	0	BGD	2		Gray fine to medium SHALE fragments, medium to highly weathered, some light gray to light brown Silt + Clay, slightly moist.	GM-GC
						2.6		Light brown very fine SAND + SILT, little fine gray Shale fragments, little coarse gray Shale fragments, medium dense, moist to wet.	ML
						3			
						3.1		Light brown SILT + fine to medium weathered gray Shale fragments, trace fine Sand, medium stiff, moist to wet.	ML
						4.0			
.03	7 8 49 64	2.00	1.7	0	BGD	4		Light brown very fine SAND + fine to medium gray Shale fragments, medium to highly weathered, little coarse gray Shale fragments, saturated to wet.	GM
						4.9		Gray highly weathered SHALE, dry.	-
						5			
						5.5			
						5.7		Light brown SILT + very fine SAND, some fine to medium gray weathered Shale fragments, wet to moist.	SM
						6.0			-
.04	58 100/.2	0.70	0.7	0	BGD	6		No Recovery	-
						6.2		Highly weathered SHALE, dry to moist.	GM
						6.7		Gray fine to medium SHALE fragments, little light brown Silt, saturated.	
								No Recovery	-
						7			
								BORING TERMINATED AT 7.2'	

NOTES: Bottom of overburden at 6.7'. No samples were collected for chemical analysis.

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

LOG OF BORING MW64D-5

TEST PIT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	TEST PIT #: TP64D-1
PROJECT: 15 SWMU ESI		JOB NUMBER: 720518
LOCATION: ROMULUS, NY		EST. GROUND ELEV.
		INSPECTOR: JWC/AGS
		CONTRACTOR: ES/ESI
		START DATE: 6/13/94
		COMPLETION DATE: 6/13/94
		CHECKED BY:
		DATE CHECKED:

TEST PIT DATA

LENGTH	WIDTH	DEPTH	EXCAVATION/SHORING METHOD
20'	3'	8'	BACKHOE

MONITORING DATA

INSTRUMENT	DETECTOR	BACKGROUND	TIME/DATE
OVM-580B	10.0 eV	0 PPM	0930 Am / 6/13/94
VICTOREEN-190	pancake	10-15 µR/Hr	0930 Am / 6/13/94

QA/QC DUPLICATE SAMPLE: YES or (NO)
Duplicate Sample Number:
MRD Sample Number:
QA/QC Rinsate Sample Number:
COMMENTS:

SCALE (FT)	VOC/ RAD.	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA SCHEMATIC	DESCRIPTION OF MATERIALS (BURMEISTER METHODOLOGY)	REMARKS
	0 PPM				Top Soil	
1	0 PPM BKGD				1" Light Brown SILT (Fill) with Domestic waste	
2						
3	3.7 PPM BKGD				2' Little Light Brown SILT (Fill) in Domestic waste	Found: metal cans, Glass, Trash Bags (Full) Lamp Carpet Paint Can
4						
5	0 PPM BKGD				4' Light Gray SILT with Shale Clasts	

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

TEST PIT #: 64D-1

TEST PIT REPORT

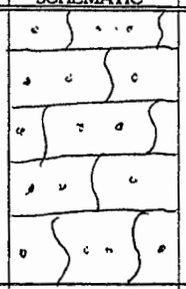
ENGINEERING–SCIENCE, INC.	CLIENT:	TEST PIT #: TP64D-1

MONITORING DATA

INSTRUMENT	DETECTOR	BACKGROUND	TIME/DATE

DATE START: 6/13/94
DATE FINISH: 6/13/94

INSPECTOR: JWC/ABS
CONTRACTOR: ES/ESI

SCALE (FT)	VOC/ RAD.	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA SCHEMATIC	DESCRIPTION OF MATERIALS (BURMEISTER METHODOLOGY)	REMARKS
					▽ = 6'2" Wet Light Gray Silt with Shale Clasts	
					8' Bottom of Pit Same as Above (6'2"-8')	

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

TEST PIT #: TP64D-1

TEST PIT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	TEST PIT #: TP64D-2

PROJECT: 15 SWMU ESI
LOCATION: ROMULUS, NY

JOB NUMBER: 720518
EST. GROUND ELEV.:
INSPECTOR: JWC/AGS
CONTRACTOR: ES/ESI
START DATE: 6/13/94
COMPLETION DATE: 6/13/94
CHECKED BY:
DATE CHECKED:

TEST PIT DATA

LENGTH	WIDTH	DEPTH	EXCAVATION/SHORING METHOD
32'	2'3"	4'	BACKHOE

MONITORING DATA

INSTRUMENT	DETECTOR	BACKGROUND	TIME/DATE
OVM-580B	10.0 eV	Ø PPM	1030 hrs / 6/13/94
VICTOREEN-190	pancake	10-15 μR/Hr	1030 hrs / 6/13/94

QA/QC DUPLICATE SAMPLE: YES or (NO)
Duplicate Sample Number:
MRD Sample Number:
QA/QC Rinsate Sample Number:
COMMENTS:

SCALE (FT)	VOC/ RAD.	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA SCHEMATIC	DESCRIPTION OF MATERIALS (BURMEISTER METHODOLOGY)	REMARKS
1	Øppm BKGD				Topsoil One 15' Long Section of 8 gauge wire found at 2"	
2	Øppm BKGD				1'1" Light Brown Silt	
3	Øppm BKGD				2'1" Olive Gray Silt w/ Shale Clasts 3" ID; 4" ID Red Clay Pipe at 2'3" -- pipe runs E-W, was dry and not Back Filled.	
4					▽	
5					4'2" Bottom of Pit Weathered Shale with Some Olive Gray Silt	

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

TEST PIT #: TP640-2

TEST PIT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	TEST PIT #: TP64D-3

PROJECT: 15 SWMU ESI
LOCATION: Romulus NY

JOB NUMBER: 720518
EST. GROUND ELEV.:
INSPECTOR: JWC/ABS
CONTRACTOR: ES/ESI
START DATE: 6/13/94
COMPLETION DATE: 6/13/94
CHECKED BY:
DATE CHECKED:

TEST PIT DATA

LENGTH	WIDTH	DEPTH	EXCAVATION/SHORING METHOD
13'	3'	4'	BACKHOE

MONITORING DATA

INSTRUMENT	DETECTOR	BACKGROUND	TIME/DATE
OVM-580B	10.0eV	0 ppm	1145 hrs / 6/13/94
Victoreen 190	PANCAKE	10-15 µR/Hr	1145 hrs / 6/13/94

QA/QC DUPLICATE SAMPLE: YES or (NO)
Duplicate Sample Number:
MRD Sample Number:

QA/QC Rinsate Sample Number:

COMMENTS:

SCALE (FT)	VOC./ RAD.	SAMPLE NUMBER	SAMPLE DEPTH RANGE	STRATA SCHEMATIC	DESCRIPTION OF MATERIALS (BURMEISTER METHODOLOGY)	REMARKS
1	0 ppm/ BKGD				Topsoil, Root Systems - Debris on Surface: 6" ID clay pipes, metal fencing, Drums, Cans.	
2	0 ppm/ BKGD				1'3" Light Brown Silt	
3						
4	0 ppm/ BKGD				3'0" Olive gray silt with some shale clasts	
5					Bottom of Pit: 4'0" Weathered Shale with some Olive gray silt	

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

TEST PIT #: TP64D-3

APPENDIX B

ESI MONITORING WELL INSTALLATION DIAGRAMS

COMPLETION REPORT OF WELL No. MW64D-1

PROJECT: **SEVEN LOW PRIORITY AOCs**
PROJECT LOCATION: **SENECA ARMY DEPOT, ROMULUS NY**
DRILLING CONTRACTOR: **EMPIRE SOILS INVESTIGATIONS**
DRILLING METHOD: **HOLLOW STEM AUGER**
WELL INSTALLATION STARTED: **03/28/94**
WELL INSTALLATION COMPLETED: **03/28/94**

WELL LOCATION (N/E): **993059.7 741523.1**
REFERENCE COORDINATE SYSTEM: **New York State Plane**
GROUND SURFACE ELEVATION (ft): **666.6**
DATUM: **NAD 1983**
GEOLOGIST: **K.KELLY**
CHECKED BY: **FO**

STRATA MICRO DESCRIPTION (from boring log)	DEPTH (ft)	SYMBOL	WELL DETAILS	DEPTH (ft)		ELEVATION (ft)
					TPC	
					TR	
					TC	
	0			0.0	GS	666.6
ML						
CL				1.5	TBS	665.1
CL				2.5	TSP	664.1
CL						
GM				3.6	TSC	663.1
GC				4.4	BSC	662.3
GC						
CL	5.3			5.3	POW	661.4
	5					

WELL CONSTRUCTION DETAILS

PROTECTIVE COVER
Diameter: 4
Type: RISER
Interval: 3.5

RISER
Diameter: 2
Type: SCH. 40-PVC
Interval: 4.2

SCREEN
Diameter: 2
Type: SCH. 40-PVC/0.010
Interval: .8

SURFACE SEAL
Type: CEMENT
Interval: 1.5

GROUT
Type: N/A
Interval: N/A

SEAL
Type: BENTONITE PELLETS
Interval: 1

SANDPACK
Type: #1, #3
Interval: 2.75

WELL DEVELOPMENT DATA
Date: 6/25/94
Method: BAIL/PUMP
Duration: 3 DAYS
Rate: .232 L/MIN
Final Measurements:

pH	Temperature (degrees C)	Conductivity (micromhos/cm)	Turbidity (NTU)
7.45	15.9	700	2.5

WATER LEVELS

Date	Time	Depth,TR
6/23	1430	4.71
6/25	1315	5.5

LEGEND

SURFACE SEAL, GROUT, SEAL, SANDPACK, GRAVEL, SAND, SILT, CLAY, NO RECOVERY

TPC	TOP OF PROTECTIVE CASING
TR	TOP OF WELL RISER
GS	GROUND SURFACE
TBS	TOP BENTONITE SEAL
TSP	TOP OF SANDPACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
POW	POINT OF WELL

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

COMPLETION REPORT OF WELL No. MW64D-1

COMPLETION REPORT OF WELL No. MW64D-2

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
WELL INSTALLATION STARTED: 06/21/94
WELL INSTALLATION COMPLETED: 06/21/94

WELL LOCATION (N/E): 993638.6 740197.6
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): 633.7
DATUM: NAD 1983
GEOLOGIST: K.KELLY
CHECKED BY: FO

STRATA MICRO DESCRIPTION (from boring log)	DEPTH (ft)	SYMBOL	WELL DETAILS	DEPTH (ft)		ELEVATION (ft)
					TPC	
					TR	
					TC	
				0.0	GS	633.7
	0					
ML ML CL -				1.5	TBS	632.2
CL				2.8	TSP	630.9
SP ML GM				4.0	TSC	629.8
ML GM	5					
GM -						
GM -				7.9	BSC	625.8
GM-GC -	9.0			9.0	POW	624.7

WELL CONSTRUCTION DETAILS

PROTECTIVE COVER
Diameter: 4
Type: RISER
Interval: 3.5

RISER
Diameter: 2
Type: SCH. 40-PVC
Interval: 5

SCREEN
Diameter: 2
Type: SCH. 40-PVC/0.010
Interval: 3.95

SURFACE SEAL
Type: CEMENT
Interval: 1.5

GROUT
Type: N/A
Interval: N/A

SEAL
Type: BENTONITE PELLETS
Interval: 1.3

SANDPACK
Type: #1, #3
Interval: 6.3

WELL DEVELOPMENT DATA
Date: 6/28/94
Method: BAIL
Duration: 170 MIN
Rate: .720 L/MIN
Final Measurements:

pH	Temperature (degrees C)	Conductivity (micromhos/cm)	Turbidity (NTU)
7.2	14	450	2.54

WATER LEVELS

Date	Time	Depth,TR
6/28	0955	4.05
6/28	1240	4.48

LEGEND
SURFACE SEAL
GROUT
SEAL
SANDPACK
GRAVEL
SAND
SILT
CLAY
NO RECOVERY

TPC TOP OF PROTECTIVE CASING
TR TOP OF WELL RISER
GS GROUND SURFACE
TBS TOP BENTONITE SEAL
TSP TOP OF SANDPACK
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH
POW POINT OF WELL

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

COMPLETION REPORT OF WELL No. MW64D-2

COMPLETION REPORT OF WELL No. MW64D-3

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
WELL INSTALLATION STARTED: 06/20/94
WELL INSTALLATION COMPLETED: 06/20/94

WELL LOCATION (N/E): 993017.4 740735.8
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): 647.3
DATUM: NAD 1983
GEOLOGIST: K.KELLY
CHECKED BY: FO

STRATA MICRO DESCRIPTION (from boring log)	DEPTH (ft)	SYMBOL	WELL DETAILS	DEPTH (ft)		ELEVATION (ft)
					TPC	
					TR	
					TC	
	0			0.0	GS	647.3
ML ML				1.5	TBS	645.8
CL CL						
CL				3.9	TSP	643.4
ML				4.9	TSC	642.4
	5					
ML GM-GC				6.9	BSC	640.4
ML				7.6	POW	639.7
	7.8					

WELL CONSTRUCTION DETAILS

PROTECTIVE COVER
Diameter: 4
Type: RISER
Interval: 3.5

RISER
Diameter: 2
Type: SCH. 40-PVC
Interval: 6.15

SCREEN
Diameter: 2
Type: SCH. 40-PVC/0.010
Interval: 1.95

SURFACE SEAL
Type: CEMENT
Interval: 1.5

GROUT
Type: N/A
Interval: N/A

SEAL
Type: BENTONITE PELLETS
Interval: 2.4

SANDPACK
Type: #1, #3
Interval: 4.2

WELL DEVELOPMENT DATA
Date: 6/27/94
Method: BAIL/PUMP
Duration: 110 MIN
Rate: VARIABLE
Final Measurements:

pH	Temperature (degrees C)	Conductivity (micromhos/cm)	Turbidity (NTU)
7.30	13.5	500	12

WATER LEVELS

Date	Time	Depth,TR
6/27	1445	3.72
6/27	1435	4.90

LEGEND
SURFACE SEAL
GROUT
SEAL
SANDPACK
GRAVEL
SAND
SILT
CLAY
NO RECOVERY

TPC TOP OF PROTECTIVE CASING
TR TOP OF WELL RISER
GS GROUND SURFACE
TBS TOP BENTONITE SEAL
TSP TOP OF SANDPACK
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH
POW POINT OF WELL

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

COMPLETION REPORT OF WELL No. MW64D-3

COMPLETION REPORT OF WELL No. MW64D-4

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
WELL INSTALLATION STARTED: 06/20/94
WELL INSTALLATION COMPLETED: 06/20/94

WELL LOCATION (N/E): 992533.5 741082.2
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): 659.7
DATUM: NAD 1983
GEOLOGIST: K.KELLY
CHECKED BY: FO

STRATA MICRO DESCRIPTION (from boring log)	DEPTH (ft)
ML - CL - GM-GC - ML -	0
ML -	1.5
ML -	3.3
ML -	4.6
ML SM GM GM GM - GM GC GC - CL - - -	5
	8.5
	9.6
	9.9

SYMBOL / WELL DETAILS

	DEPTH (ft)		ELEVATION (ft)
		TPC	
		TR	
		TC	
	0.0	GS	659.7
	1.5	TBS	658.2
	3.3	TSP	656.5
	4.6	TSC	655.2
	8.5	BSC	651.2
	9.6	POW	650.1

WELL CONSTRUCTION DETAILS

PROTECTIVE COVER
Diameter: 4
Type: RISER
Interval: 3.5

RISER
Diameter: 2
Type: SCH. 40-PVC
Interval: 5.55

SCREEN
Diameter: 2
Type: SCH. 40-PVC/0.010
Interval: 3.95

SURFACE SEAL
Type: CEMENT
Interval: 1.5

GROUT
Type: N/A
Interval: N/A

SEAL
Type: BENTONITE PELLETS
Interval: 1.75

SANDPACK
Type: #1, #3
Interval: 6.6

WELL DEVELOPMENT DATA
Date: 6/27/94
Method: BAIL
Duration: 124 MIN
Rate: .540 L/MIN
Final Measurements:

pH	Temperature (degrees C)	Conductivity (micromhos/cm)	Turbidity (NTU)
7.09	12	500	1.41

WATER LEVELS

Date	Time	Depth,TR
6/27	0900	7.94
6/27	1100	8.42

LEGEND
SURFACE SEAL, GROUT, SEAL, SANDPACK, GRAVEL, SAND, SILT, CLAY, NO RECOVERY

TPC	TOP OF PROTECTIVE CASING
TR	TOP OF WELL RISER
GS	GROUND SURFACE
TBS	TOP BENTONITE SEAL
TSP	TOP OF SANDPACK
TSC	TOP OF SCREEN
BSC	BOTTOM OF SCREEN
TD	TOTAL DEPTH
POW	POINT OF WELL

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

COMPLETION REPORT OF WELL No. MW64D-4

COMPLETION REPORT OF WELL No. MW64D-5

PROJECT: SEVEN LOW PRIORITY AOCs
PROJECT LOCATION: SENECA ARMY DEPOT, ROMULUS NY
DRILLING CONTRACTOR: EMPIRE SOILS INVESTIGATIONS
DRILLING METHOD: HOLLOW STEM AUGER
WELL INSTALLATION STARTED: 06/22/94
WELL INSTALLATION COMPLETED: 06/22/94

WELL LOCATION (N/E): 991371.4 740724.3
REFERENCE COORDINATE SYSTEM: New York State Plane
GROUND SURFACE ELEVATION (ft): 651.0
DATUM: NAD 1983
GEOLOGIST: K.KELLY
CHECKED BY: FO

STRATA MICRO DESCRIPTION (from boring log)	DEPTH (ft)	SYMBOL	WELL DETAILS	DEPTH (ft)		ELEVATION (ft)
					TPC	
					TR	
					TC	
	0			0.0	GS	651.0
ML						
ML						
ML				1.5	TBS	649.5
GM-GC						
ML				3.3	TSP	647.8
ML				3.8	TSC	647.3
GM	5					
SM				6.3	BSC	644.7
GM	7.2			7.2	POW	643.9

WELL CONSTRUCTION DETAILS

PROTECTIVE COVER
Diameter: 4
Type: RISER
Interval: 3.5

RISER
Diameter: 2
Type: SCH. 40-PVC
Interval: 5.9

SCREEN
Diameter: 2
Type: SCH. 40-PVC/0.010
Interval: 1.95

SURFACE SEAL
Type: CEMENT
Interval: 1.5

GROUT
Type: N/A
Interval: N/A

SEAL
Type: BENTONITE PELLETS
Interval: 1.75

SANDPACK
Type: #1, #3
Interval: 3.85

WELL DEVELOPMENT DATA
Date: 7/10/94
Method: BAIL/PUMP
Duration: 10 DAYS
Rate: .411 L/MIN
Final Measurements:

pH	Temperature (degrees C)	Conductivity (micromhos/cm)	Turbidity (NTU)
7.00	13.3	470	15

WATER LEVELS

Date	Time	Depth,TR
6/28	1330	7.26
7/10	1535	6.06
7/10	1635	6.64

LEGEND

SURFACE SEAL, GROUT, SEAL, SANDPACK, GRAVEL, SAND, SILT, CLAY, NO RECOVERY

TPC TOP OF PROTECTIVE CASING
TR TOP OF WELL RISER
GS GROUND SURFACE
TBS TOP BENTONITE SEAL
TSP TOP OF SANDPACK
TSC TOP OF SCREEN
BSC BOTTOM OF SCREEN
TD TOTAL DEPTH
POW POINT OF WELL

PARSONS
ENGINEERING-SCIENCE, INC.

UNITED STATES ARMY
CORPS OF ENGINEERS
Seneca Army Depot
Romulus, New York

COMPLETION REPORT OF WELL No. MW64D-5

APPENDIX C

ESI MONITORING WELL DEVELOPMENT REPORTS

WELL DEVELOPMENT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	WELL #: MW64D-1
PROJECT: 15 SWMU ESI (SEAD–64D)		DATE: 6/23/94
LOCATION: SENECA ARMY DEPOT, ROMULUS, NY		PROJECT NO.:

DRILLING METHOD (s): HSA
PUMP METHOD (s): Peristaltic
SURGE METHOD (s): Teflon Bailer
INSTALLATION DATE: 3/28/94

INSPECTOR: KKS
CONTRACTOR:
CREW:
START DEVELOPMENT DATE: 6/23
END DEVELOPMENT DATE: 6/25
Stickup = 1.0'

WATER DEPTH (TOC): 4.71 ft
WELL DIA. (ID CASING): 2.0 " ft
BORING DIAMETER: 8.5 " ft

INSTALLED POW DEPTH(~~TOC~~) G.S.: 5.25 ft
MEASURED POW DEPTH(TOC): 6.24 ft
SILT THICKNESS: ft
POW AFTER DEVELOPMENT: ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	(2)	3	4	5	6	7	8	8.5	9	10	11	12
GALLONS/FT:	(0.163)	0.367	0.654	1.02	1.47	2.00	2.61	2.85	3.30	4.08	4.93	5.87

1.53 x .163

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = .25 GAL. = A

STANDING WATER IN ANNULAR SPACE = $1.53 \times (2.95 - .163) \times .3$
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR – WELL DIAM. FACTOR) X 0.3 = 1.28 GAL. = B

SINGLE STANDING WATER VOLUME = A + B = ... 1.53 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... 7.65 GALS.

3x = 4.6

1" 6/24 inods of rain emy at times

DATE	ACTIVITY	STARTING H20 DEPTH	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	Turbidity (NTU)	Ending Water Depth
6/23	surge	4.71 ~~6.24~~	1430	1450	20	1 gal				Dark Brown	1000+	6.1 DRY
6/25	surge	3.88	1107	1122	15	1.5 gal				Light Brown	1000+	6.0 Dry
6/25	pump 1st (B) 160 ml/min	4.30	1200	1220	20	1.5	7.43	700	16.0	Brown	clear 23.0	6.3 Dry
6/25	pump 2nd 185 ml/min	5.30 ~~4.30~~	1230	1305	35	1.5	7.42	675	15.8	clear	14.0	6.0
6/25	pump 3rd 150 ml/min	5.5	1315	1345	30	1.5	7.45	700	15.9	clear	2.5	5.6
						Complete						
	TOTALS/FINAL					7						

RECOVERY
GOOD (FAIR) (POOR)

INVESTIGATION DERIVED WASTE (IDW)					
DATE	6/23	6/25			
VOLUME	1 gal	6 ss/s			
DRUM #	640-3	63-~~4~~2			

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS WELL #: MW64D-1

6/25 Recovers 0.1' / 20 sec
0.3 / 1 min @ 5.5,
.1 / 2 min @ 4.9

Note: needs Stamp

H:\ENG\SENECA\15SWMU\FIELDFMS\WELLDEV.WK3

WELL DEVELOPMENT REPORT

ENGINEERING-SCIENCE, INC.	CLIENT: USACOE	WELL #: MW640-2
PROJECT: 15 SWMU BSI (SEAD- 64D		DATE: 6/28/94
LOCATION: SENECA ARMY DEPOT, ROMULUS, NY		PROJECT NO.: 720518

DRILLING METHOD (s): HSA
PUMP METHOD (s): peristaltic
SURGE METHOD (s): teflon baler
INSTALLATION DATE: 6/22/94

INSPECTOR: ES
CONTRACTOR:
CREW:
START DEVELOPMENT DATE: 6/28/94
END DEVELOPMENT DATE: 6/28/94
Stickup = 1.34 ft

(measured 6/28 after rain)

WATER DEPTH (TOC): (4.05) 5.58 ft
WELL DIA. (ID CASING): 2" ft
BORING DIAMETER: 8.5" ft

INSTALLED POW DEPTH(TOC): GS 9.0 ft
MEASURED POW DEPTH(TOC): 10.34 ft
SILT THICKNESS: ft
POW AFTER DEVELOPMENT: 10.36 ft

4.14 TSC
5.58 WL
10.34 POW

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	8.5	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	2.95	3.30	4.08	4.93	5.87

values in parentheses are for ∇ at 4.05. Using TSC at 4.14

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR =
(10.34 - 5.58) = 4.76 4.76 x .163
0.8 (1.0) GAL. = A (using 4.05' ∇ (10.34 - 4.14 = 6.29) 6.29 x .163)

STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR - WELL DIAM. FACTOR) X 0.3 =
4.76 (2.95 - .163) .3
4 (5.2) GAL. = B 6.29 x 2.787 x .3

SINGLE STANDING WATER VOLUME = A + B = ... 4.8 (6.0) GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... 24 (30) GALS.

DATE	ACTIVITY	STARTING H2O DEPTH	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	Turbidity (NTU)	Ending Water Depth
6/28	surging	4.05	9:55	10:15	20 min	3						4.26
	1st vol cont.	4.10	10:30	10:50	20min.	3	7.23	475	15°C	H.brn.	1000+	4.44
	2nd vol.	4.44	10:50	11:20	30min.	6	7.24	475	14.5°C	cloudy	9.1	4.46
	3rd vol	4.46	11:20	11:25	5 min	1						
~~4th vol~~	Surge #2	4.14	11:30	11:50	20 min	6						4.16
4th	4th vol.	4.48	11:50	12:15	25min	6	7.24	475	15°C	cloudy	212	4.46
5th	5th vol.	4.46	12:15	12:40	25min	6	7.23	450	14°C	clear	6.85	4.48
	6th vol.	4.48	12:40	13:05	25min	6	7.20	450	14°C	clear	2.54	4.46
	TOTALS/FINAL					37						

Flow Rate
.720
720

RECOVERY
(GOOD) FAIR POOR
after rain

INVESTIGATION DERIVED WASTE (IDW)

DATE	6/28				
VOLUME	37				
DRUM #	640-9W				

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS WELL #: MW640-2

WELL DEVELOPMENT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: ACOE	WELL #: MW64D-3
PROJECT: SEAD - 15 SWMU		DATE: 6-27-94
LOCATION: SEAD - 64D		PROJECT NO.: 720518

DRILLING METHOD (s): HSA
PUMP METHOD (s): Peristaltic
SURGE METHOD (s): Teflon Bailer
INSTALLATION DATE:

INSPECTOR: KKS
CONTRACTOR: —
CREW: —
START DEVELOPMENT DATE: 6-27-94
END DEVELOPMENT DATE: 6-27-94

WATER DEPTH (TOC): 3.72 ft
WELL DIA. (ID CASING): 2.0" ft
BORING DIAMETER: 8.5" ft

INSTALLED POW DEPTH(TOC): ft
MEASURED POW DEPTH(TOC): 9.22 ft
SILT THICKNESS: 0 ft
POW AFTER DEVELOPMENT: ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	8.5	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	2.95	3.30	4.08	4.93	5.87

5.5 - .163
STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = .9 GAL. = A

4.0 x 2.787 x .3
STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR – WELL DIAM. FACTOR) X 0.3 = 3.34 GAL. = B

SINGLE STANDING WATER VOLUME = A + B = ... 4.25 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... 21.25 GALS.

ACTIVITY	Start Depth	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	NTU OTHER	Stop Depth
Surge	~~3.72~~ 4.20	1445	1505	20	5				Dark Brown	1000+	5.5
Pump	4.20	1515	1535	20	5	7.20	500	14.1	Silty	100+	5.0
Pump	4.50	1540	1550	10	5	7.37	500	14.5		6.0	4.5
Surge		1556	1605	10	5				Dark Brown	1000+	4.7
Pump	4.7	1605	1625	20	5	7.49	500	13.9	silty	100+	4.8
Pump	4.8	1625	1435	10	5	7.38	490	13.6	clear	23	4.9
Pump	4.9	1435	1455	20	5	7.30	500	13.5	clear	12	4.7
							Complete				
TOTALS/FINAL					35						

COMMENTS:

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS WELL #: MW64D-3

Waste
Date 6/27
Volume 35
Drum # 64D-3

Note - no pressure cap

Needs well caps!

WELL DEVELOPMENT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	WELL #: MW64D-4
PROJECT: 15 SWMU BSI (SEAD- 64D)		DATE: 6/27/94
LOCATION: SENECA ARMY DEPOT, ROMULUS, NY		PROJECT NO.: 720518

DRILLING METHOD (s): HSA
PUMP METHOD (s): peristaltic
SURGE METHOD (s): teflon bailer
INSTALLATION DATE: 6/20/94

INSPECTOR: ES
CONTRACTOR:
CREW:
START DEVELOPMENT DATE: 6/27/94
END DEVELOPMENT DATE: 6/27/94
stickup = 1.62

WATER DEPTH (TOC): 7.94 ft
WELL DIA. (ID CASING): 2" ft
BORING DIAMETER: 8.5" ft

INSTALLED POW DEPTH(TOC): 9.6 ft
MEASURED POW DEPTH(TOC): 11.22 ft
SILT THICKNESS: ft
POW AFTER DEVELOPMENT: 11.22 ft

4.87 – 7.94 TSP
2.12 – .22 BSC POW

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8 8.5	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61 2.89	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = .5 GAL. = A
(11.22 – 7.94) .163
STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR – WELL DIAM. FACTOR) X 0.3 = 2.7 GAL. = B
11.22 – 7.94 = 3.28 3.28 (2.95 – .163).3 =
SINGLE STANDING WATER VOLUME = A + B = ... 3.2 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... 16 GALS.

Flow Rate 540 ml/m

DATE	ACTIVITY	STARTING H2O DEPTH	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	Turbidity (NTU)	Ending Water Depth
6/27	surging	7.94	9:00	9:25		5					1000+	8.36
	2nd vol,	7.97	9:30	10:05		3.2	7.14	500	13°C	clear	3.02	8.30
	3rd vol,	8.30	10:05	10:25		3.2	7.14	500	13°C	clear	5.46	8.32
	surge	8.32	10:30	10:40		4					1000+ *	8.52
	4th vol	8.38	10:41	11:00		3.2	7.09	500	13°C	clear	4.44	8.42
	5th vol.	8.42	11:00	11:15		3.2	7.09	500	12°C	clear	1.41	8.36
	TOTALS/FINAL					21.8						

RECOVERY
(GOOD) FAIR POOR

* Turbidity reading

begin of pumping after surge #2 130.0
after 1 gal pumped 20.9
after 1 vol. (3.2 gal) 4.44

INVESTIGATION DERIVED WASTE (IDW)

DATE	6/27				
VOLUME	21.8				
DRUM #	~~64D-MW~~ 64D-	13 W			

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS WELL #: MW64D-4

WELL DEVELOPMENT REPORT

ENGINEERING-SCIENCE, INC. | CLIENT: USACOE | WELL #: MW64D-5

PROJECT: 15 SWMU ESI (SEAD- 64D) | DATE: 6/27/94

LOCATION: SENECA ARMY DEPOT, ROMULUS, NY | PROJECT NO.: 720518

DRILLING METHOD (s): HSA
PUMP METHOD (s): peristaltic
SURGE METHOD (s): teflon bailer
INSTALLATION DATE: 6/22/94

INSPECTOR: ES
CONTRACTOR:
CREW:
START DEVELOPMENT DATE: 6/27/94
END DEVELOPMENT DATE: 7/6/94
Stickup = 1.31

WATER DEPTH (TOC): 7.34 ft
WELL DIA. (ID CASING): 2" ft
BORING DIAMETER: 8.5" ft

INSTALLED POW DEPTH(TOC): ~~GS~~ 7.15 ft
MEASURED POW DEPTH(TOC): 8.46 ft
SILT THICKNESS: ft
POW AFTER DEVELOPMENT: ft

4.56 TSP
7.34 WL
8.46 POW

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	8.5	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	2.95	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = .18 GAL. = A
(8.46 - 7.34) = 1.12 1.12 x .163 =

STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR - WELL DIAM. FACTOR) X 0.3 = .94 GAL. = B
(8.46 - 7.34) = 1.12 1.12 x (2.95 - .163) .3 =

SINGLE STANDING WATER VOLUME = A + B = ... 1.12 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... 5.6 GALS.

DATE	ACTIVITY	STARTING HOD DEPTH	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	Turbidity (NTU)	Ending Water Depth
6/27	Surge	~~7.34~~ 7.26 GS										Dry
6/28	Surge	7.26		Not	enough	standing water		to surge				
6/28	Pump (45 ml/min)	~~7.26~~ ~~13.5~~	1330	1340	10	.3	7.80	825	see note		100+	Dry
6/28	"	6.88										
7/6	Surge	5.61	1650	1940	20	.3				muddy	1000+	5.66
	TOTALS/FINAL											

RECOVERY
GOOD FAIR (POOR)

INVESTIGATION DERIVED WASTE (IDW)

DATE	6/28	7/6			
VOLUME	.3	.3			
DRUM #	#64D-7	"			

Note: rate too slow for repeatable readings

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS WELL #:

WELL DEVELOPMENT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	WELL #: MW640-5
PROJECT: 15 SWMU ESI (SEAD- 40)		DATE: 7-10-94
LOCATION: SENECA ARMY DEPOT, ROMULUS, NY		PROJECT NO.: 720518-01000

DRILLING METHOD (s): _____
PUMP METHOD (s): _____
SURGE METHOD (s): _____
INSTALLATION DATE: _____

INSPECTOR: KLK
CONTRACTOR: —
CREW: —
START DEVELOPMENT DATE: _____
END DEVELOPMENT DATE: _____

WATER DEPTH (TOC): 6.06 ft
WELL DIA. (ID CASING): _____ ft
BORING DIAMETER: _____ ft

INSTALLED POW DEPTH(TOC): _____ ft
MEASURED POW DEPTH(TOC): 6.47 ft
SILT THICKNESS: _____ ft
POW AFTER DEVELOPMENT: _____ ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	8.5	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	2.95	3.30	4.08	4.93	5.87

4.75 → 8.65

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = 2.41 · 4 GAL. = A

STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR – WELL DIAM. FACTOR) X 0.3 = 2.79 2.02 GAL. = B

SINGLE STANDING WATER VOLUME = A + B = ... 2.42 GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... 12 GALS.

Pump rate ~ml/min

DATE	ACTIVITY	STARTING H2O DEPTH	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	Turbidity (NTU)	Ending Water Depth
7/10	pump	6.06	1535		300	1.5	7.36	510	15.2	murky		6.28
					300	1.75	7.40	490	14.8	very cloudy (1000+)		6.28
					300	.75	7.42	500	14.8	cloudy		6.28
					300	.75	7.36	500	14.4	slightly cloudy		6.28
					300	.5	7.42	506	14.6	clear		6.28
					500	.75	7.43	500	14.1	murky	1000+	6.40
					500	.75	7.33	500	14.1	cloudy	NTU 130	6.46
7/10	↓			1645	500	.75	7.42	500	14.2	cloudy		6.52
										complete		
TOTALS/FINAL						6.5						

RECOVERY by 1653 water level → 6.09
GOOD FAIR POOR

INVESTIGATION DERIVED WASTE (IDW)					
DATE	7-9-94				
VOLUME	7 gal				
DRUM #	# 640-7-W				

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS WELL #: MW640-5

p 3

WELL DEVELOPMENT REPORT

ENGINEERING–SCIENCE, INC.	CLIENT: USACOE	WELL #: MW64D-5
PROJECT: 15 SWMU ESI (SEAD- 64D)		DATE: 7-10-94
LOCATION: SENECA ARMY DEPOT, ROMULUS, NY		PROJECT NO.:

DRILLING METHOD (s): _____
PUMP METHOD (s): _____
SURGE METHOD (s): _____
INSTALLATION DATE: _____

INSPECTOR: KLK, KKS
CONTRACTOR: _____
CREW: _____
START DEVELOPMENT DATE: _____
END DEVELOPMENT DATE: _____

WATER DEPTH (TOC): 6.23 ft
WELL DIA. (ID CASING): _____ ft
BORING DIAMETER: _____ ft

INSTALLED POW DEPTH(TOC): _____ ft
MEASURED POW DEPTH(TOC): _____ ft
SILT THICKNESS: _____ ft
POW AFTER DEVELOPMENT: _____ ft

DIAMETER FACTORS (GAL/FT):

DIAMETER (IN):	2	3	4	5	6	7	8	9	10	11	12
GALLONS/FT:	0.163	0.367	0.654	1.02	1.47	2.00	2.61	3.30	4.08	4.93	5.87

STANDING VOLUME INSIDE WELL = WATER COLUMN X WELL DIAMETER FACTOR = _____ GAL. = A

STANDING WATER IN ANNULAR SPACE =
WATER COL. BELOW SEAL(ft) X (BORING DIAM. FACTOR – WELL DIAM. FACTOR) X 0.3 = _____ GAL. = B

SINGLE STANDING WATER VOLUME = A + B = ... _____ GAL. = C

MINIMUM VOLUME TO BE REMOVED = 5 X C ..... _____ GALS.

DATE	ACTIVITY	STARTING H20 DEPTH	START TIME	END TIME	ELAPSED TIME	GALLONS REMOVED	pH	CONDUCTIVITY	TEMP	COLOR	Turbidity (NTU)	Ending Water Depth
7/10	Surge	6.23	1600	1611	11	.25				brown		
7/10	pump		1610	1635	25	2.5	6.84	475	13.6	cloudy		6.64
7/10	pump	6.64	1635	1655	20	2.5	7.12	470	13.3	sl. cloudy	clear (15.0)	6.66
7/10	pump	6.66				3.0				sl. Cloudy		7.1
	TOTALS/FINAL											

20 ml/min → 600 ml
600 ml/min → 600 ml/min

RECOVERY
GOOD FAIR POOR

INVESTIGATION DERIVED WASTE (IDW)					
DATE	7-10-94				
VOLUME	0.25				
DRUM #	64D-7-W				

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

WELL #: MW64D-5

APPENDIX D

FIELD SAMPLING AND ANALYSIS PLAN

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

HEALTH AND SAFETY PLAN

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

APPENDIX F

CHEMICAL DATA AQUISITION PLAN

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

APPENDIX G

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

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

APPENDIX H

RESPONSE TO REVIEW COMMENTS

APPENDIX I

SCOPE OF WORK

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