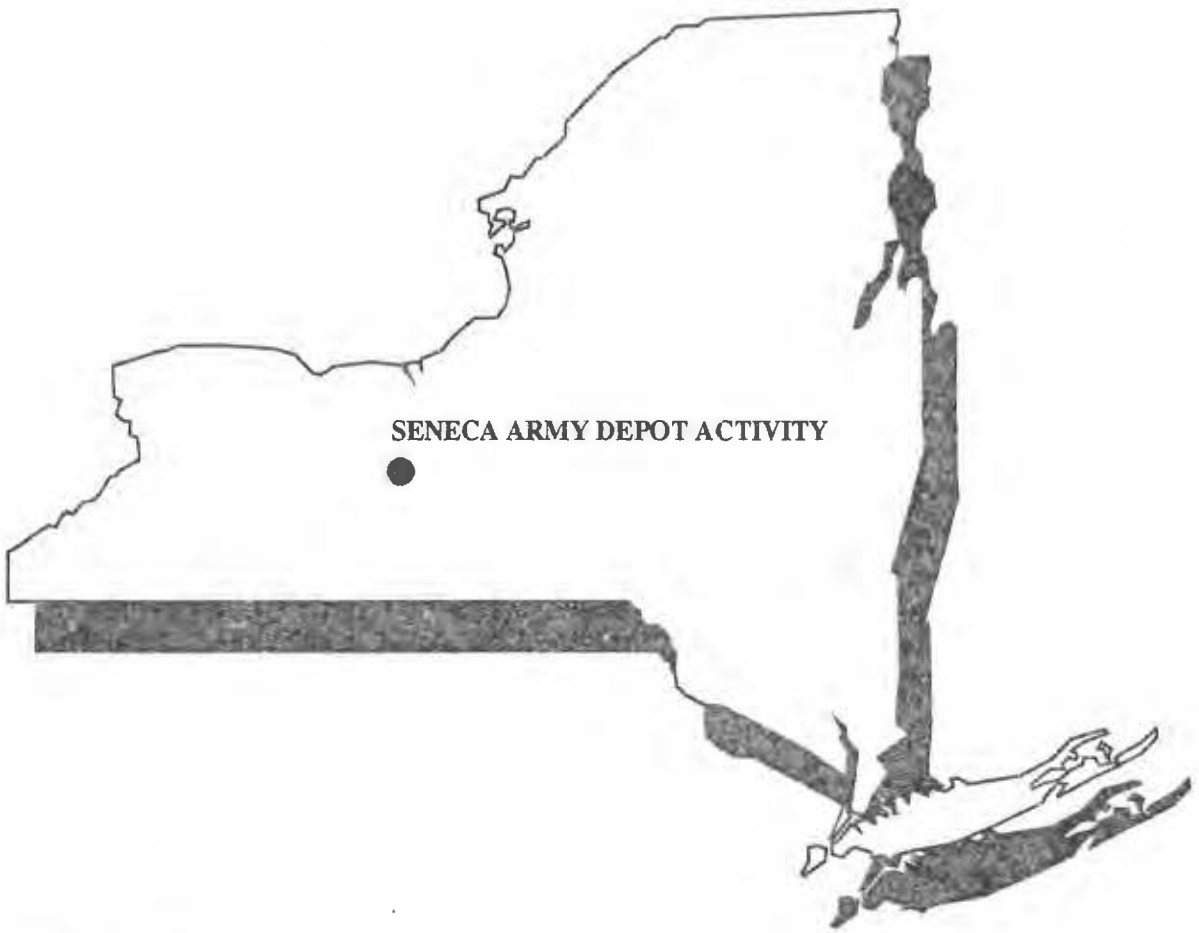
U.S. ARMY ENGINEER DIVISION
HUNTSVILLE, ALABAMA

53-01



DRAFT

ENGINEERING EVALUATION/COST ANALYSIS (EE/CA) APPROVAL MEMORANDUM FILL AREA WEST OF BUILDING 135 (SEAD-59) AND THE ALLEGED PAINT DISPOSAL AREA (SEAD-71)

CONTRACT NO. DACA87-95-D-0031
TASK ORDER R OF DELIVERY ORDER 17

DECEMBER 1998

EE/CA APPROVAL MEMORANDUM
AT SEAD-59/71
SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared For:

Seneca Army Depot Activity
Romulus, New York

Prepared By:

Parsons Engineering Science, Inc.
30 Dan Road
Canton, Massachusetts

734516 **December 1998**

DRAFT APPROVAL MEMORANDUM
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FIGURES

1.0 INTRODUCTION

1.1 PURPOSE AND ORGANIZATION

This Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum has been prepared for SEAD-59 and SEAD-71 (59/71), the Fill Area West of Building 135 and the Alleged Paint Disposal Area at the Seneca Army Depot (SEDA) by Parsons Engineering Science (Parsons ES). Parsons ES has been retained by the United States Army Corps of Engineers (USACE) Huntsville Division as part of USACE's remedial response activities under the Comprehensive Environmental Responsibility, Compensation, and Liability Act (CERCLA), to prepare this Approval Memorandum.

The Approval Memorandum serves the following functions (EPA, 1993):

1. Justifies the need to perform an EE/CA;
2. Outlines how the conditions at SEAD-59 and SEAD-71 meet the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria for initiating a removal action and that the required action is non-time-critical; and
3. Provides site background; threats to public health, welfare, or the environment posed by the site; imminent and substantial endangerment, if present; enforcement activities related to the site; and project costs.

1.2 NON-TIME-CRITICAL REMOVAL ACTION

This section summarizes how EPA views non-time-critical removal actions in the Superfund process, the basis of a non-time-critical removal action at SEAD-59 and SEAD-71, and the steps of the non-time-critical removal action process.

1.2.1 Superfund Accelerated Cleanup Model (SACM)

Non-time critical removal actions are a tool used in the Superfund Accelerated Cleanup Model (SACM) being implemented to make Superfund cleanups more timely and efficient (EPA, 1993). SACM involves:

- A continuous process for assessing site-specific conditions and the need for action.
- Cross-program coordination of response planning.
- Prompt risk reduction through early action.
- Appropriate cleanup of long-term environmental problems.
- Early public notification and participation.
- Early initiation of enforcement activities.

SACM should be considered for all Superfund activities, so long as implementation is consistent with requirements of the NCP and CERCLA (EPA, 1993). The Superfund program priorities

remain the same: (i) address the worst problems first; (ii) aggressively pursue enforcement; and (iii) involve the public during all stages of the work. The goals of SACM are being accomplished by focusing on the front end of the cleanup process and better integrating all Superfund program components.

1.2.2 Basis of Non-Time-Critical Removal Action at SEAD-59 and SEAD-71

CERCLA and the NCP define removal actions to include "the cleanup or removal of released hazardous substances from the environment, such actions as may necessarily be taken in the event of the threat of release of hazardous substances into the environment, such actions as may be necessary to monitor, assess, and evaluate the threat of release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release" (EPA, 1993).

Section 300.415(b)(2) of the NCP specifies that the following factors shall be considered in determining the appropriateness of a removal action:

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;
- Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat or release;
- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;
- Threat of fire or explosion;
- The availability of other appropriate federal or state response mechanisms to respond to the release; and
- Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

Field work for the *Expanded Site Inspection - Seven Low Priority AOCs SEADs 60, 62, 63, 64 (A,B,C, and D), 67, 70, and 71,* and the *Expanded Site Inspection - Seven Moderately Low Priority AOCs SEADs 5, 9, 12 (A and B), 43, 56, 69, 44 (A and B), 50, 58, and 59*, was completed in 1995. Based on the results of these ESIs which are summarized in Sections 2 and 3 of this Approval Memorandum, a release of contaminants occurred at SEAD-59 and SEAD-71 which impacted several media. The extent of contamination at this site was defined in the ESIs and potential exposure pathways and receptors were identified. Based on several factors listed above, this Approval Memorandum demonstrates that a removal action is appropriate at this site. A removal action at the site will decrease and potentially eliminate the threat to public health, welfare, and the environment.

EPA has categorized removal actions in three ways, emergency, time-critical, and non-time-critical, based on the situation, the urgency and threat of the release or potential release, and the subsequent time frame in which the action must be initiated (EPA, 1993). Emergency and time-critical removal actions respond to releases requiring action within 6 months; non-time-critical actions respond to releases requiring action that can start later than 6 months after the determination that a response is necessary.

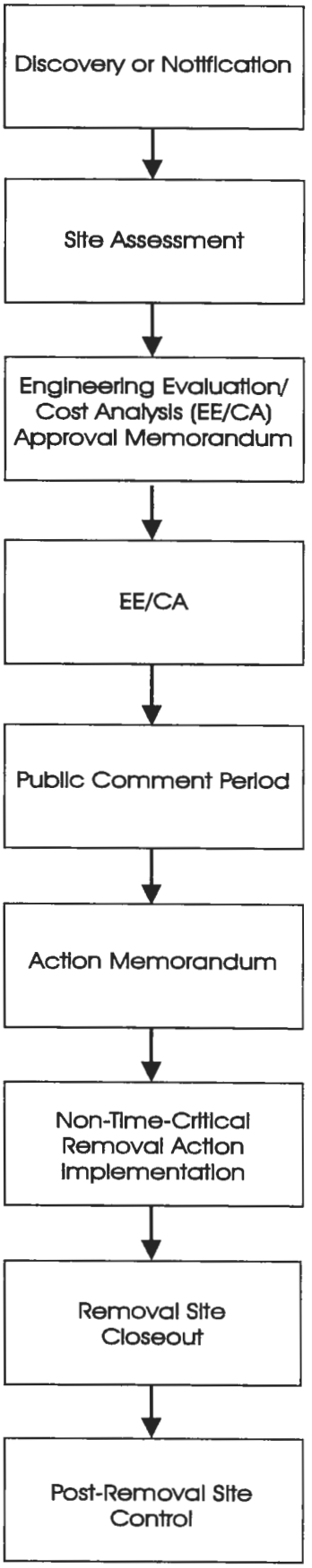
Action at SEAD-59 and SEAD-71 is considered non-time-critical. The nature of conditions does not constitute an emergency and are not time-critical. Site contaminants have been present for many years. Access to the site is currently controlled by SEDA and there are currently no ongoing activities at this site. Therefore, removal actions can start later than 6 months since it was determined that a response was necessary.

This Approval Memorandum provides supporting information on how conditions at SEAD-59 and SEAD-71 meet NCP criteria for initiating a removal action and that the required action is non-time-critical.

1.2.3 Non-Time-Critical Removal Action Process

Figure 1-1 depicts the non-time-critical removal action process. The process steps are summarized below:

- Site Assessment - identifies the source and nature of the release or threatened release and to assess the threat to public health, the magnitude of the threat, and the factors necessary to determine the need for a removal action. The need for additional data is also assessed (i.e. removal site investigation).
- EE/CA Approval Memorandum - performed once the removal site evaluation is complete and the need for non-time-critical removal action is determined. The functions of this memorandum are discussed in Section 1.1.
- EE/CA - identifies the objectives of the removal action and analyzes the various alternatives that may be used to satisfy these objectives for cost, effectiveness, and implementability. An EE/CA is similar to an RI/FS, but is less comprehensive.
- Public comment period - public opportunity to comment on EE/CA.



* Additional removal actions or remedial actions may occur at any time, depending on the exigencies of the site conditions.
Source: EPA, 1993.

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT
EE/CA APPROVAL MEMORANDUM
SEADs - 59 and 71

DEPT. ENVIRONMENTAL ENGINEERING | DWG NO. 734516-01001

FIGURE 1-1

NON-TIME-CRITICAL REMOVAL ACTION PROCESS*

SCALE NA | DATE DECEMBER 1998

H:\ENG\SENECA\EECA1-1.CDR

- EE/CA Action Memorandum - documents the need for a removal action and the decision process leading to a removal action. Summarizes the EE/CA.
- Implement removal action.
- Removal site closeout.
- Post-removal site control.

The site assessment has been performed at SEAD-59 and SEAD-71 and is documented in the Draft Final *Project Scoping Plan for Performing a CERCLA Remedial Investigation / Feasibility Study (RI/FS) at the Fill Area West of Building 135 (SEAD-59), and the Alleged Paint Disposal Area (SEAD-71),* February 1997; the *Expanded Site Inspection - Seven Low Priority AOCs SEADs 60, 62, 63, 64 (A,B,C, and D), 67, 70, and 71,* April 1995, and; the *Expanded Site Inspection - Seven Moderately Low Priority AOCs SEADs 5, 9, 12 (A and B), 43, 56, 69, 44 (A and B), 50, 58, and 59*, December 1995.

1.3 STATUTORY AUTHORITY

Authority for responding to releases or threats of releases from a hazardous waste site is addressed in Section 104 of CERCLA, as amended. The Army has been delegated the response authority for Army sites, whether or not the sites are on the National Priorities List of the U.S. Environmental Protection Agency (EPA). Under CERCLA Section 104(b), the Army is authorized to investigate, survey, test, or gather other data required to identify the existence, extent, and nature of contaminants, including the extent of danger to human health or welfare and the environment. In addition, the Army is authorized to undertake planning, engineering, and other studies or investigations appropriate to directing response actions that prevent, limit, or mitigate the risk to human health or welfare and the environment.

2.0 BACKGROUND

SEDA was evaluated in 1994 as part of an Army effort to determine the conditions at several SWMUs that were considered to potentially pose a threat to human health and the environment. A more detailed discussion can be found in the Draft Final *Project Scoping Plan for Performing a CERCLA Remedial Investigation / Feasibility Study (RI/FS) at the Fill Area West of Building 135 (SEAD-59), and the Alleged Paint Disposal Area (SEAD-71)*, February 1997, as well as the *Expanded Site Inspection - Seven Low Priority AOCs SEADs 60, 62, 63, 64 (A,B,C, and D), 67, 70, and 71,* April 1995, and *Expanded Site Inspection - Seven Moderately Low Priority AOCs SEADs 5, 9, 12 (A and B), 43, 56, 69, 44 (A and B), 50, 58, and 59*, December 1995.

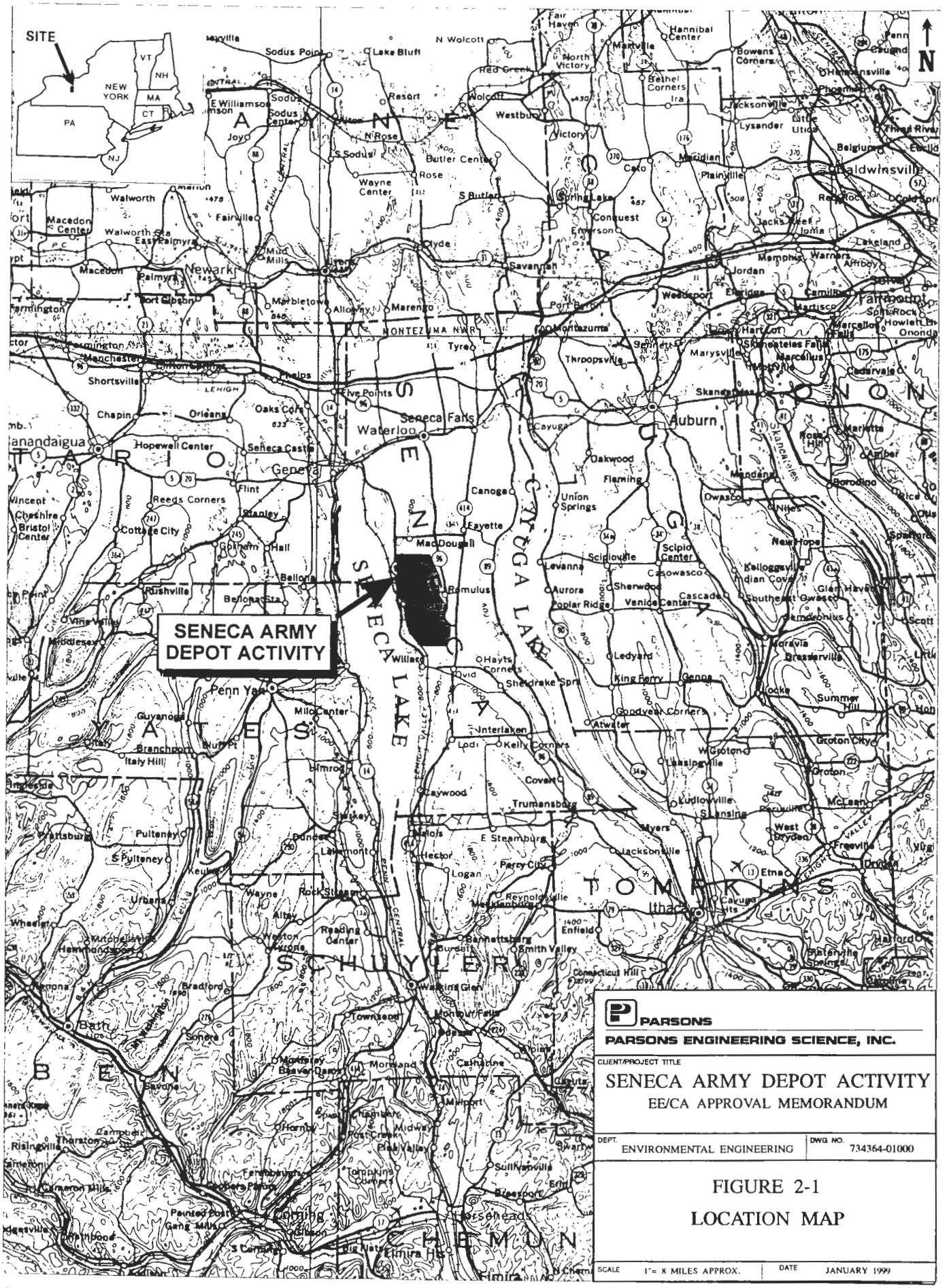
The SEDA facility is situated on the western flank of a topographic high between Cayuga and Seneca lakes in the Finger Lakes region of central New York (**Figure 2-1**). The SEDA was constructed in 1941 and has been owned by the United States Government and operated by the Department of the Army since this time. The post generally consists of an elongated central area for storage of ammunitions and weaponry in Quonset-style buildings, an operations and administration area in the eastern portion, and an army barracks area at the north end of the depot. The base was expanded to encompass a 1,524-meter airstrip, formerly the Sampson Air Force Base.

The mission of the SEDA has been primarily the management of munitions. SEDA is currently used for the following purposes: (1) receiving, storing, and distributing ammunition and explosives, (2) providing receipt, storage, and distribution of items that support special weapons, and (3) performing depot-level maintenance, demilitarization, and surveillance on conventional ammunition and special weapons. The depot formerly employed approximately 1,000 civilian and military personnel. Within the last year, the facility has undergone a downsizing and no longer houses a large contingent of military personnel.

2.1 SITE DESCRIPTION AND HISTORY

2.1.1 SEAD-59

SEAD-59 (Fill Area West of Building 135) is located in the east-central portion of SEDA. The site encompasses an area along both sides of an unnamed dirt road which is the access road to Building 311 and runs perpendicular to the south side of Administration Avenue terminating at Building 311 (**Figure 2-2, Figure 2-3**). SEAD-59 is comprised of two areas, one area located north of the access road to Building 311 and one area located to the south of the road. Each area is characterized by different topography with the area to south of the road being relatively flat and sloping gently to the west and the area to the north of the road containing a fill area with approximately 10 feet of relief.



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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

EE/CA APPROVAL MEMORANDUM

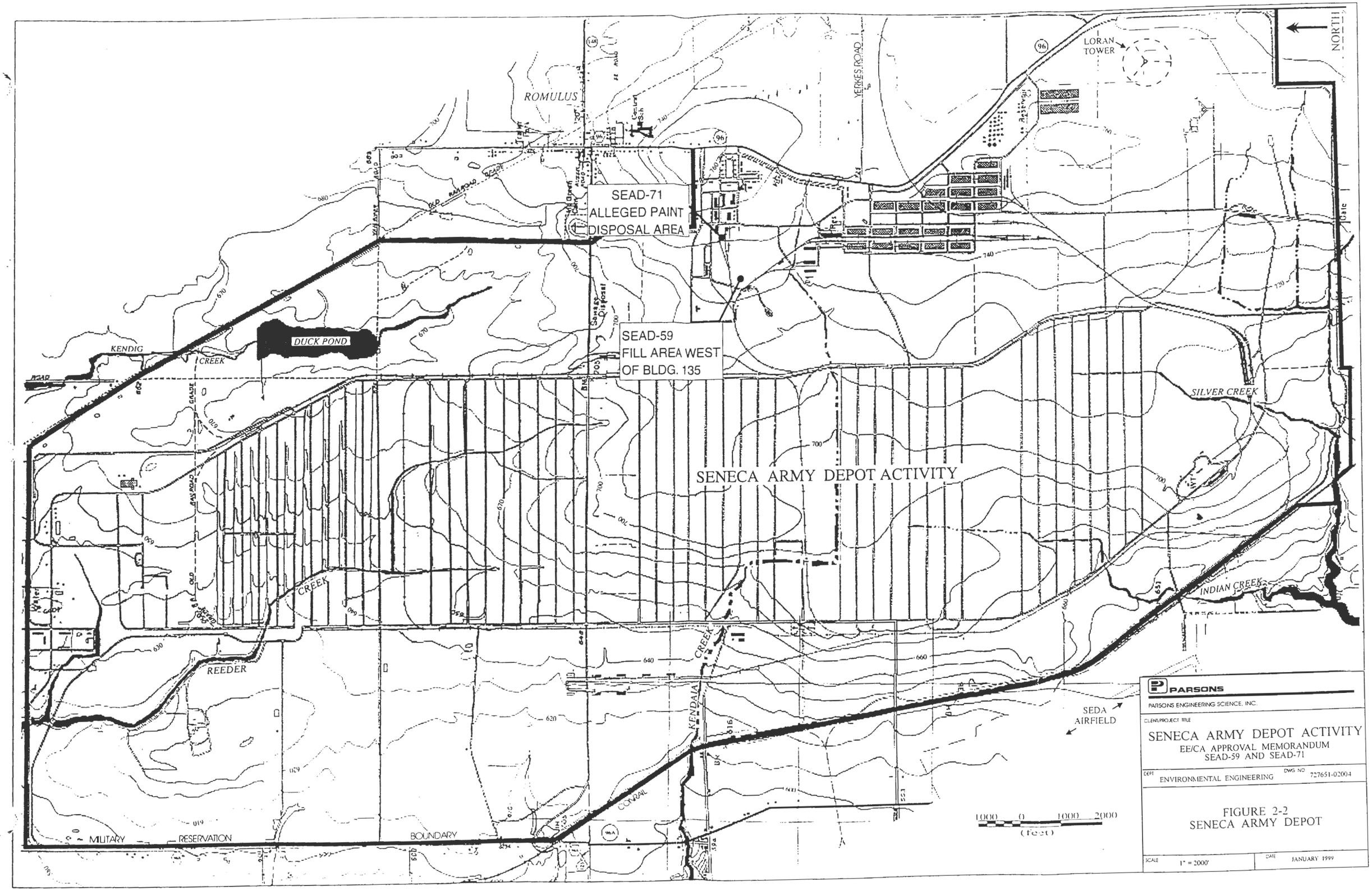
DEPT. ENVIRONMENTAL ENGINEERING | DWG NO. 734364-01000

FIGURE 2-1

LOCATION MAP

SCALE 1" = 8 MILES APPROX. | DATE JANUARY 1999

R:\GRAPHICS\SENECA\LOCMAP.CDR(CVM)



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SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING

DWG NO 727651-02004

FIGURE 2-2
SENECA ARMY DEPOT

SCALE 1" = 2000'

DATE JANUARY 1999

R:\GRAPHICS\SENECA\BASEMAP\MINBASE.CDR (CVM)

LEGEND

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

N

50 0 50 100
(feet)

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING DWG NO 727651-02011

FIGURE 2-3
SEAD-59 SITE PLAN

SCALE 1" = 100' DATE JANUARY 1999

R:\SENECA\RIFS\SD59\SD59SITE.DWG

The entire western border of the site is defined by a north-south trending drainage ditch. A drainage swale which flows east to west, parallels the railroad tracks which form the northern boundary of SEAD-59. At the northwestern corner of the site, the drainage swale turns to the north and flows under the railroad tracks. A north-south trending drainage ditch is located in the western portion of the site. Drainage ditches are also located on each side of the access road to Building 311 and flow from east to west into the drainage ditch in the western portion of the site.

Surface water flow from precipitation events is controlled by local topography. Surface water flow in this area is to the west and it is likely to be captured by the north-south trending drainage swale located in the western portion of the site and by the drainage ditch which parallels the south side of the access road. This ditch also drains SEAD-5, which is located just to the east of SEAD-59. The groundwater flow direction is primarily southwest across SEAD-59.

SEAD-59 was used for the disposal of construction debris and oily sludges. SEDA personnel have indicated that there may be a large quantity of miscellaneous "roads and grounds" waste buried at the site. It is not known when the disposal took place.

2.1.2 SEAD-71

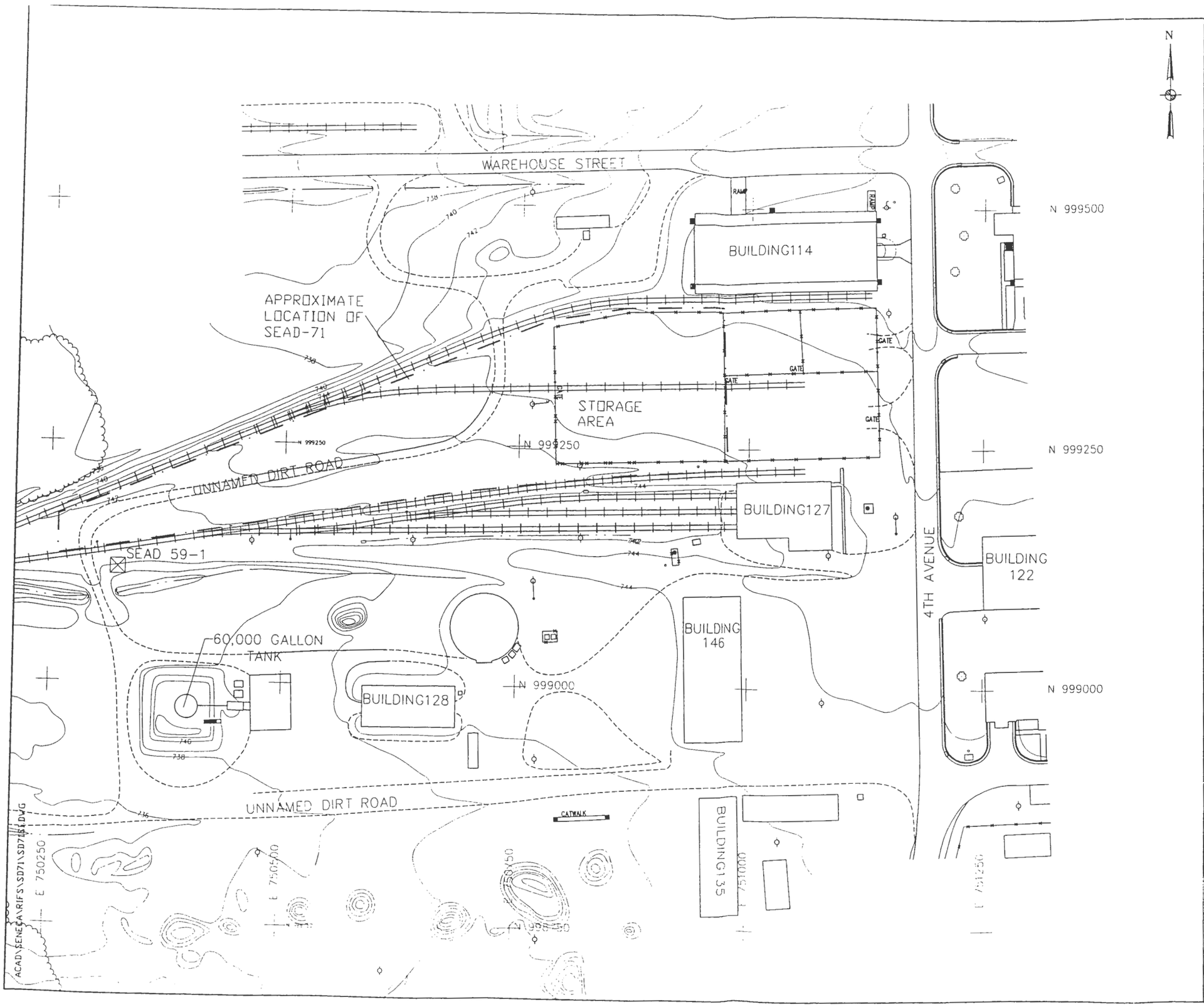
SEAD-71 (Alleged Paint Disposal Area) is located in the east-central portion of SEDA. The site is located approximately 200 feet west of 4th Avenue near Buildings 127 and 114 (**Figure 2-2, Figure 2-4**). The entire site is approximately 350 feet by 100 feet and bounded on the north and south by railroad tracks serving Buildings 114 and 127. A chain-link fence borders the east side of the site.

Surface water flow from precipitation events is controlled by local topography, although the topography is relatively flat, gently sloping to the southwest. There are no sustained surface water bodies on-site. In the fenced storage area located in the eastern half of the site, the area is covered with asphalt, which provides an impermeable surface resulting in an increased amount of surface water runoff from the site. The groundwater flow direction in the till/weathered shale aquifer on the site is to the west-southwest.

It is rumored that paints and/or solvents were disposed of in burial pits at SEAD-71. It is not known what other activities occurred here. No dates of disposal are available nor is there any information on the number of suspected disposal pits.

2.2 REGIONAL GEOLOGICAL AND HYDROGEOLOGICAL SETTING

A discussion of regional geology and hydrogeology may be found in the ESIs previously mentioned (Parsons ES, 1995).



N

LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- LANDFILL EXTENTS
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- ROAD SIGN
- DECIDOUS TREE
- GUIDE POST
- FIRE HYDRANT
- MANHOLE
- CORDINATE GRID (250' GRID)
- POLE
- UTILITY BOX
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- APPROXIMATE EXTENT OF AOC

50 0 50 100
(feet)

ACAD\SENECA\RIFS\SD71\SD71S1.DWG

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CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING DWG NO 727651-02011

FIGURE 2-4
SEAD-71 SITE PLAN

SCALE 1" = 100' DATE JANUARY 1999

2.3 SITE- SPECIFIC GEOLOGY

2.3.1 SEAD-59

Determination of the site geology was based on the drilling program conducted for the ESI at SEAD-59. This program included 5 soil borings and 3 monitoring wells which were drilled to a maximum depth of 20 feet below ground surface. Based on the results of the drilling program, fill material, till, weathered dark gray shale, and competent gray-black shale are the four major geologic units present on-site. At most of the boring locations very little topsoil was present. Several of the borings were drilled on a gravel surface, and no topsoil was encountered at these locations.

Fill material was encountered in the seven borings located within the fill area north of the access road. The borings in which fill was not encountered were the two downgradient monitoring well locations, MW59-1 and MW59-2. The fill was lithologically similar to the till in that it was characterized as silt with minor components of sand and shale fragments, but was different from the till in color, which tended to be gray brown or tan, and by the presence of gravel, asphalt, wood and other organic material. The fill was fond up to a depth of 10.5 feet.

The till was characterized as light brown in color and composed of silt, very fine sand, and clay, with minor components of gray-black shale fragments. Larger shale fragments (rip-up clasts) were observed at some locations at the top of the weathered shale. The thickness of the till ranged from 3.1 to 8.6 feet.

The weathered shale that forms the transition between till and competent shale was encountered at five of the nine boring locations. At boring locations MW59-3 and SB59-2, the contact between till and weathered shale was distinct. At the remaining three boring locations the weathered shale interval was comprised of weathered shale interbedded with till. Competent gray-black shale was observed at MW59-3 and SB59-1 at 8.0 and 10.5 feet below grade, respectively. At the remainder of the boring locations (SB59-3A and SB59-5 excepted), bedrock was inferred from the point of auger or spoon refusal at depths ranging from 9.5 to 20.5 feet below grade.

2.3.2 SEAD-71

Determination of the site geology was based on the results of the subsurface exploration program conducted for the ESI at SEAD-71. This program included three soil borings, which were completed as monitoring wells, and two test pits. The soil borings were drilled to a maximum depth of 9.4 feet below ground surface and the test pits were excavated to a maximum depth of 5.7 feet.

Based on the results of the subsurface exploration program, till, calcareous weathered shale, and competent shale are the three major types of geologic materials present on-site. The till in the storage area was characterized as olive gray clay with little silt, very fine sand, and shale fragments (up to 1 inch in diameter) and ranged in thickness between 4.7 and 7.8 feet. In the southern section of the storage area, the till consisted of light brown silt with little clay and trace amounts of shale fragments (up to 1 inch in diameter). Large shale fragments (rip-up clasts) were observed at or near the till/weathered shale contact at all soil boring locations. In the western half of the site, the till consisted of olive gray silt and was found to be approximately 4 feet thick.

The weathered shale that forms the transition between the till and competent shale was encountered at all soil boring and test pit locations. The depth of the weathered shale ranged from 4.7 to 8.3 feet below ground surface. Competent, calcareous gray shale was encountered at depths between 5.2 and 9.4 feet below ground surface.

2.4 ESI CONTAMINATION ASSESSMENT

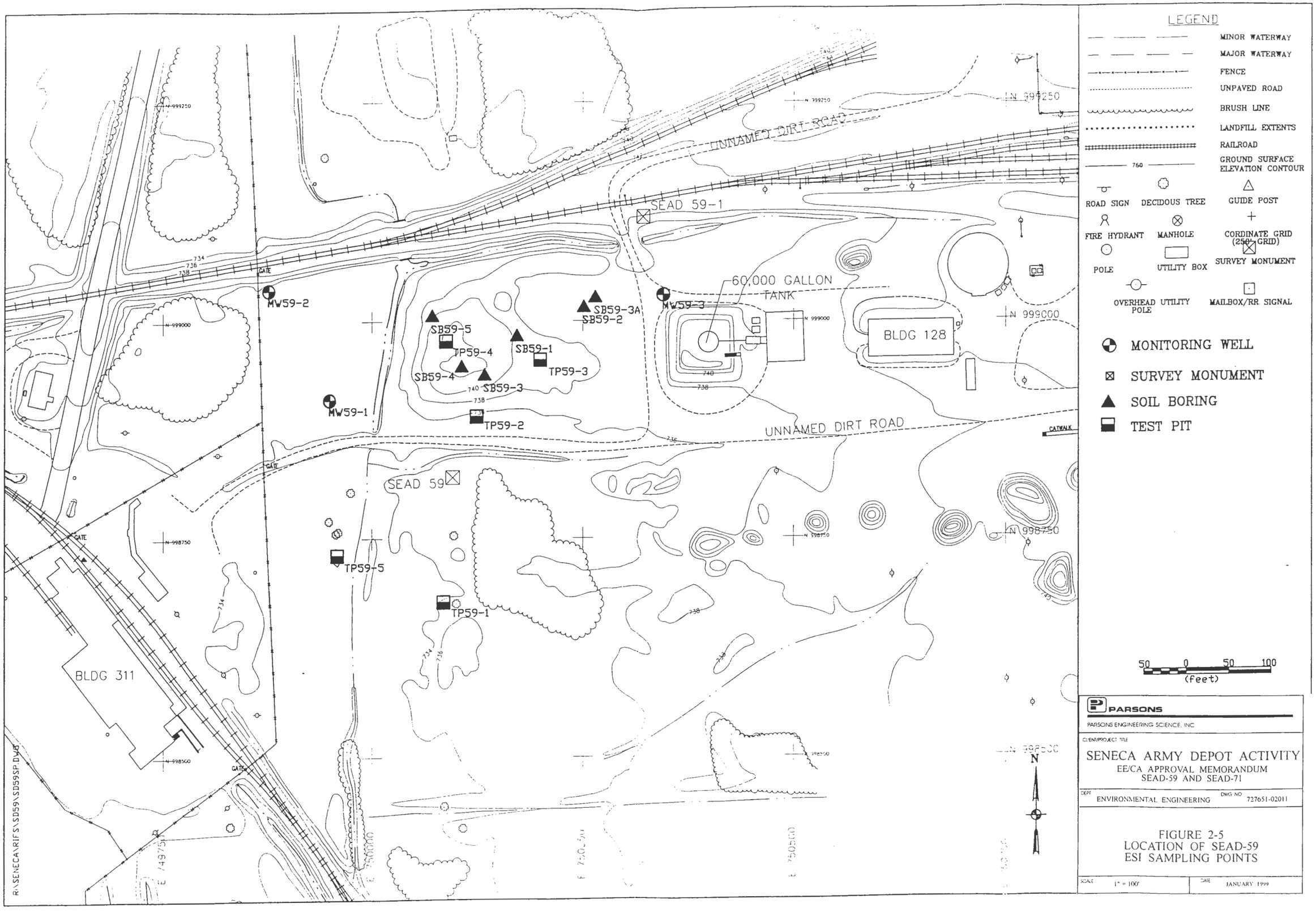
The results of the ESI investigation activities are summarized below. These activities include geophysical surveys (including EM-31 and GPR); soil sampling from the surface, borings and test pits; and groundwater, surface water, and sediment sampling. A full discussion of the investigation conducted in the Expanded Site Inspection Reports (Parsons ES, 1995). All the samples were analyzed for the following: TCL VOCs, SVOCs, and Pesticides/PCBs and TAL Metals and Cyanide according to the NYSDEC CLP SOW, and radioactivity (Gross Alpha and Gross Beta only). A summary is provided below. The locations of the borings, test pits, and monitoring wells for SEAD-59 and SEAD-71 are shown in **Figure 2-5** and **Figure 2-6**, respectively.

2.4.1 Geophysical Survey and Test Pitting Program

2.4.1.1 SEAD-59

Seismic refraction surveys, electromagnetic (EM-31) surveys, and GPR surveys were performed at SEAD-59 as part of the geophysical investigations for the ESI. Four seismic refraction profiles were performed on 4 lines positioned along each boundary line of SEAD-59. The seismic refraction profiles detected 5 to 10 feet of unconsolidated overburden (1,050 to 1,730 ft/sec) overlying bedrock (10,500 to 15,500 ft/sec). Saturated overburden was not detected by the seismic survey due to limited thickness of the saturated overburden. The elevations of the bedrock surface indicated that the bedrock sloped to the west, generally following the surface topography. Based upon the results of the seismic survey, the groundwater flow direction was also expected to be to the west, following the slope of the bedrock surface.

An electromagnetic (EM-31) survey was performed for the ESI at SEAD-59 to delineate the limits of the landfill and to identify locations where metallic objects were buried. **Figure 2-7** shows the EM-31 quadrature response, which is proportional to the apparent ground conductivity.



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- LANDFILL EXTENTS
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- ROAD SIGN
- DECIDOUS TREE
- GUIDE POST
- FIRE HYDRANT
- MANHOLE
- CORDINATE GRID (250' GRID)
- POLE
- UTILITY BOX
- SURVEY MONUMENT
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MONITORING WELL
- SURVEY MONUMENT
- SOIL BORING
- TEST PIT

50 0 50 100
(feet)

R:\SENECA\RIFS\SD59\SD59SP.DWG

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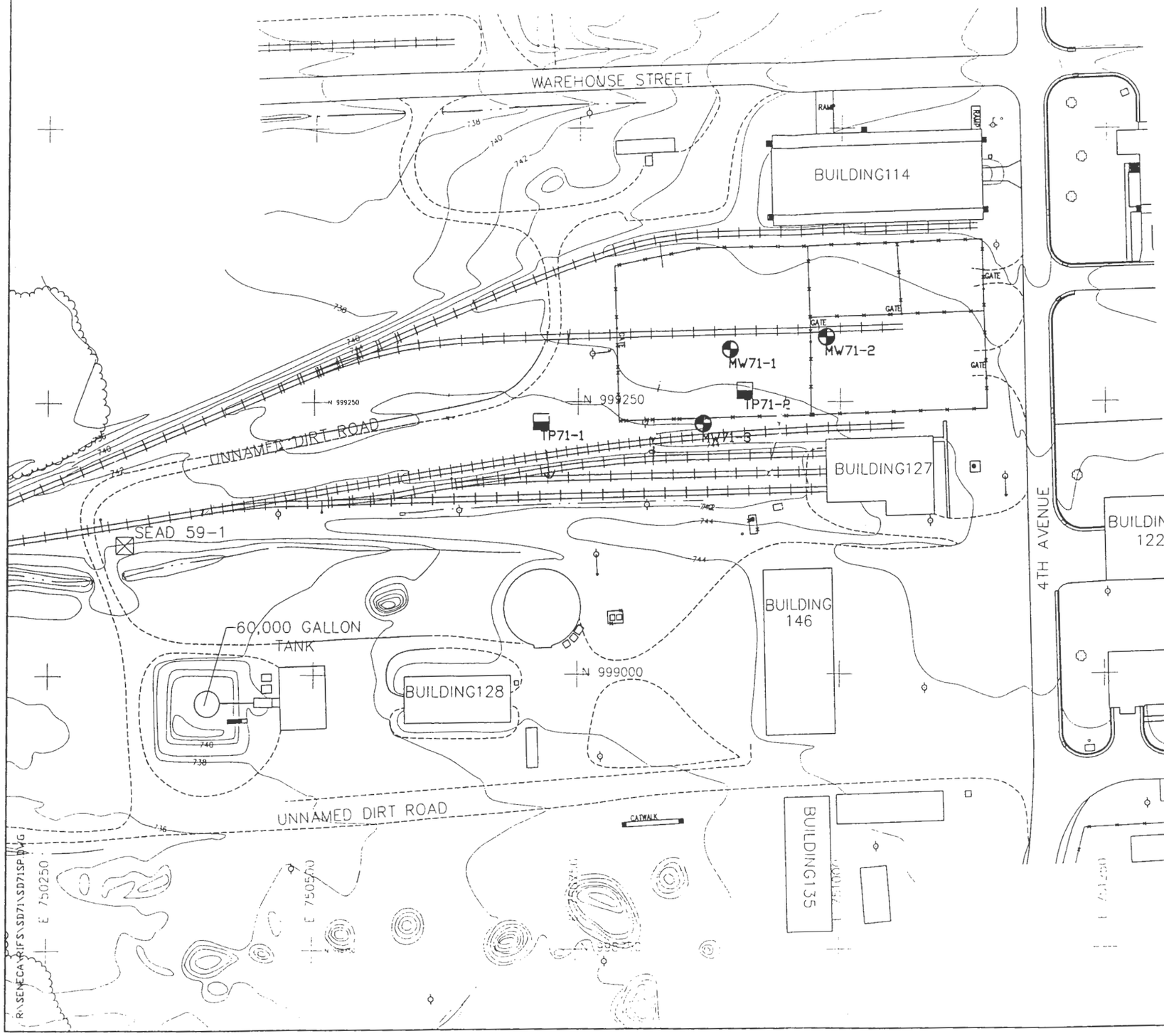
CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING
DWG NO 727651-02011

FIGURE 2-5
LOCATION OF SEAD-59
ESI SAMPLING POINTS

SCALE 1" = 100'
DATE JANUARY 1999



LEGEND

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
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- LANDFILL EXTENTS
- RAILROAD
- 760 — GROUND SURFACE ELEVATION CONTOUR
- ROAD SIGN
- DECIDOUS TREE
- GUIDE POST
- FIRE HYDRANT
- MANHOLE
- CORDINATE GRID (250' GRID)
- POLE
- UTILITY BOX
- OVERHEAD UTILITY POLE
- MAILBOX/RR SIGNAL
- MONITORING WELL
- SURVEY MONUMENT
- TEST PIT

50 0 50 100
(feet)

N

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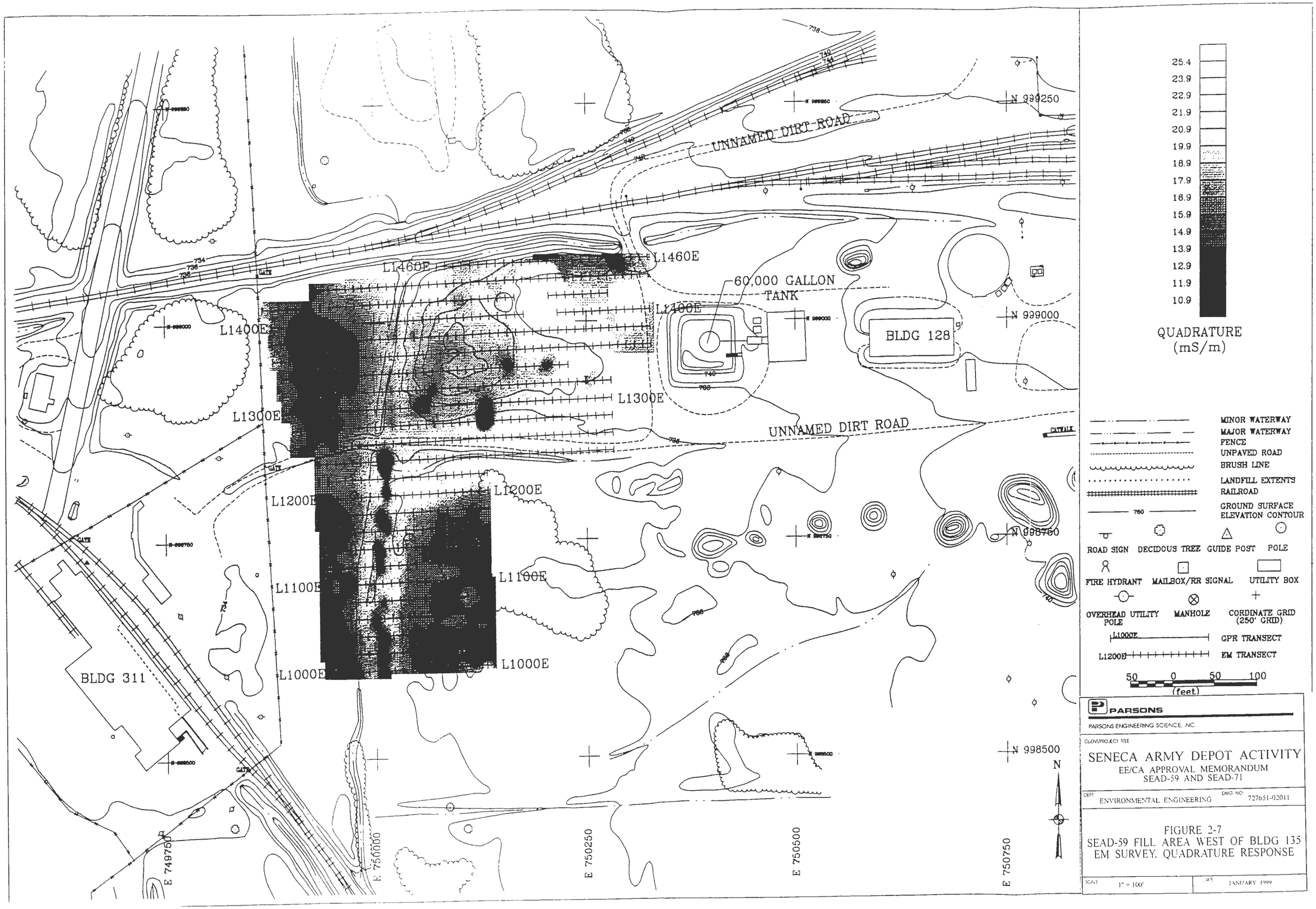
SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING, DWG NO 727651-02011

FIGURE 2-6
LOCATION OF SEAD-71
ESI SAMPLING POINTS

SCALE 1" = 100' | DATE JANUARY 1999



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SENECA ARMY DEPOT ACTIVITY

EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

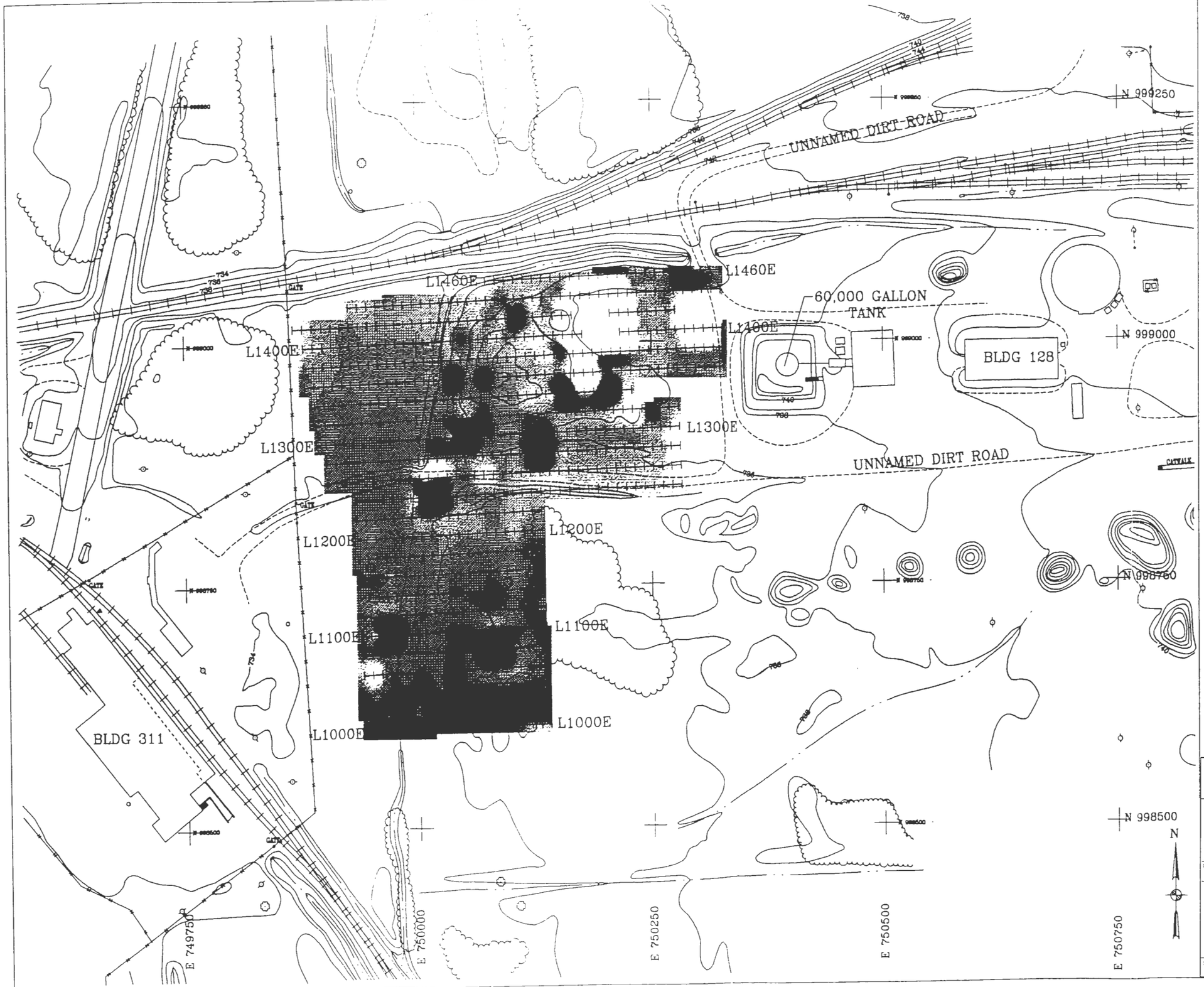
DEPT: ENVIRONMENTAL ENGINEERING

DWG NO: 727651-02011

FIGURE 2-7
SEAD-59 FILL AREA WEST OF BLDG 135
EM SURVEY, QUADRATURE RESPONSE

SCALE: 1" = 100'

DATE: JANUARY 1999



1.74
1.49
1.24
0.99
0.74
0.49
0.24
0.00
-0.12
-0.37
-0.62
-0.74
-0.99
-1.24
-1.49
-1.74
-1.99

IN-PHASE (ppt)

MINOR WATERWAY
MAJOR WATERWAY
FENCE
UNPAVED ROAD
BRUSH LINE
LANDFILL EXTENTS
RAILROAD
760 GROUND SURFACE ELEVATION CONTOUR
ROAD SIGN
DECIDOUS TREE
GUIDE POST
POLE
FIRE HYDRANT
MAILBOX/RR SIGNAL
UTILITY BOX
OVERHEAD UTILITY POLE
MANHOLE
CORDINATE GRID (250' GRID)
L1000E GPR TRANSECT
L1200E EM TRANSECT

50 0 50 100
(feet)

N

PARSONS
PARSONS ENGINEERING SCIENCE, INC

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT ACTIVITY

EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING
DWG NO 727651-02011

FIGURE 2-8
SEAD-59 FILL AREA WEST OF BLDG 135
EM SURVEY, IN-PHASE RESPONSE

SCALE 1" = 100'
DATE JANUARY 1999

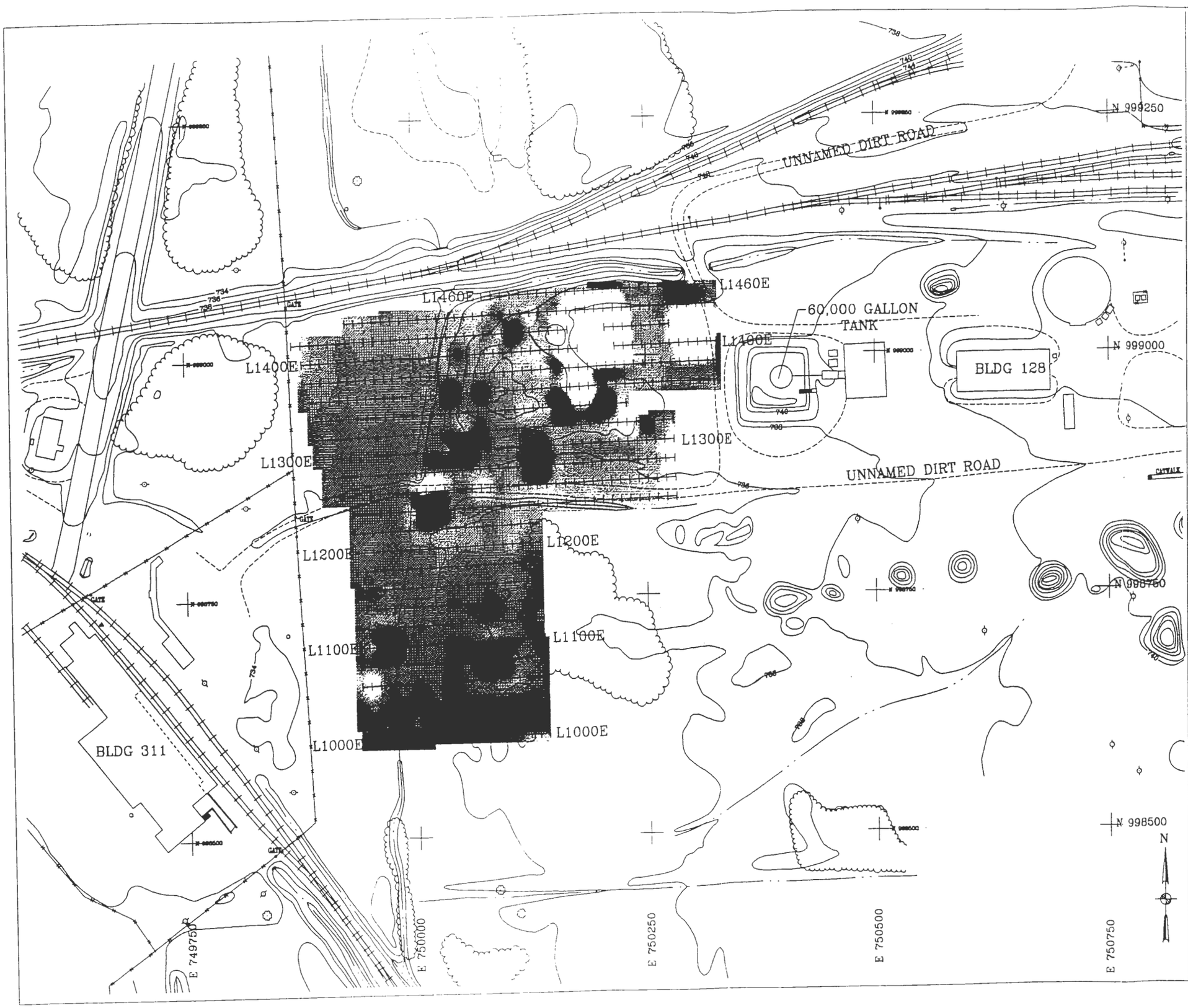
Several apparent ground conductivity anomalies were observed in the northeastern portion of the EM grid which coincided with areas used for site access and equipment storage. A large area of elevated ground conductivity, also located in the northeastern portion of the EM grid, could be attributed to an increase in the clay content of the fill material, to the presence of dissolved solids in the groundwater, or soil moisture. A north-south trending lineament was detected near the western boundary of the EM grid and was correlated to a drainage swale having a large quantity of clay sediment along its length.

Ten localized anomalies were identified as a result of the EM-31 survey completed at SEAD-59. Two of the 10 localized anomalies were correlated to surface features: one was attributed to a drainage culvert located under the railroad track along the northern boundary of the EM grid, and the second was correlated to an area of surface debris located in the southwestern portion of the EM grid. The sources of the remaining 8 localized anomalies could not be attributed to surface features.

The results of the in-phase response, which reflect the presence of buried ferrous objects, are shown in **Figure 2-8**. Eight of the localized in-phase response anomalies are associated with the eight apparent ground conductivity anomalies of unknown origin previously mentioned. Several larger anomalies were identified in the northeastern quadrant of the EM grid and were associated to cultural features. Although many anomalies were observed in both the apparent ground conductivity and in-phase data, no clearly defined boundaries of the large fill area in the northeastern portion of the EM grid could be determined based upon the geophysical results.

Ground penetrating radar (GPR) data were acquired for the ESI at SEAD-59 along profiles spaced at 50-foot intervals. In addition, GPR data from two profiles were also collected over distinct EM-31 anomalies to provide better characterization of the suspected metallic sources. The GPR profiles revealed 17 locations where buried metallic objects were suspected. A small disposal pit was also detected in the southeastern portion of the area investigated. Twelve of the buried metallic object locations were situated within the suspected disposal area in the northeastern quadrant of SEAD-59. Ten of the GPR anomaly locations were either situated over a localized EM anomaly or within 15 feet of a localized EM anomaly.

Five test pits were excavated for the ESI at SEAD-59 (**Figure 2-5**). A layer of petroleum hydrocarbon stained silt (having a distinct diesel odor) was further investigated in one of the three test pits. A large quantity of filled 2 gallon paint cans were found at another, approximately 1 foot below the ground surface. Several zones of paint-stained soil were observed and screened accordingly. A thin layer of construction debris had been disposed over the paint cans. Three 55-gallon drums were also found at one of the test pits. The excavation was halted when these drums were unearthed; therefore, the existence of additional drums at greater depths is unknown. With the exception of the readings from the petroleum- and paint-stained soil layers, no other readings above background levels (0 ppm of organic vapors and 10-15 microrems per hour of radiation) were observed during the excavations.



1.74
1.49
1.24
0.99
0.74
0.49
0.24
0.00
-0.12
-0.37
-0.62
-0.74
-0.99
-1.24
-1.49
-1.74
-1.99

IN-PHASE (ppt)

MINOR WATERWAY
MAJOR WATERWAY
FENCE
UNPAVED ROAD
BRUSH LINE
LANDFILL EXTENTS
RAILROAD
760 GROUND SURFACE ELEVATION CONTOUR
ROAD SIGN
DECIDUOUS TREE
GUIDE POST
POLE
FIRE HYDRANT
MAILBOX/RR SIGNAL
UTILITY BOX
OVERHEAD UTILITY POLE
MANHOLE
CORDINATE GRID (250' GRID)
L1000E GPR TRANSECT
L1200E EM TRANSECT

50 0 50 100
(feet)

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CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT ENVIRONMENTAL ENGINEERING
DWG NO 727651-02011

FIGURE 2-8
SEAD-59 FILL AREA WEST OF BLDG 135
EM SURVEY, IN-PHASE RESPONSE

SCALE 1" = 100'
DATE JANUARY 1999

2.4.1.2 SEAD-71

Seismic refraction surveys, EM-31 surveys, and GPR surveys were also performed at SEAD-71 as part of the geophysical investigations for the ESI. Four seismic refraction profiles were performed on four lines positioned along each boundary line of the storage area in the eastern half of SEAD-71. The seismic refraction profiles detected 6 to 9 feet of unconsolidated overburden (1,125 to 1,500 ft./sec.) overlying bedrock (12,800 to 16,200 ft./sec.). Saturated overburden was not detected by the seismic survey due to limited thickness of the saturated overburden. The elevations of the bedrock surface indicated that the bedrock slopes to the west, generally following the surface topography. Based on the results of the seismic survey, the groundwater flow direction is also expected to be to the west, following the slope of the bedrock surface.

The EM-31 survey was performed for the ESI at SEAD-71 in the western half of the site to help locate the burial pits. **Figure 2-9** shows the EM-31 quadrature response, which is proportional to the apparent ground conductivity survey. **Figure 2-10** shows the results of the in-phase response, which reflects the presence of buried ferrous objects.

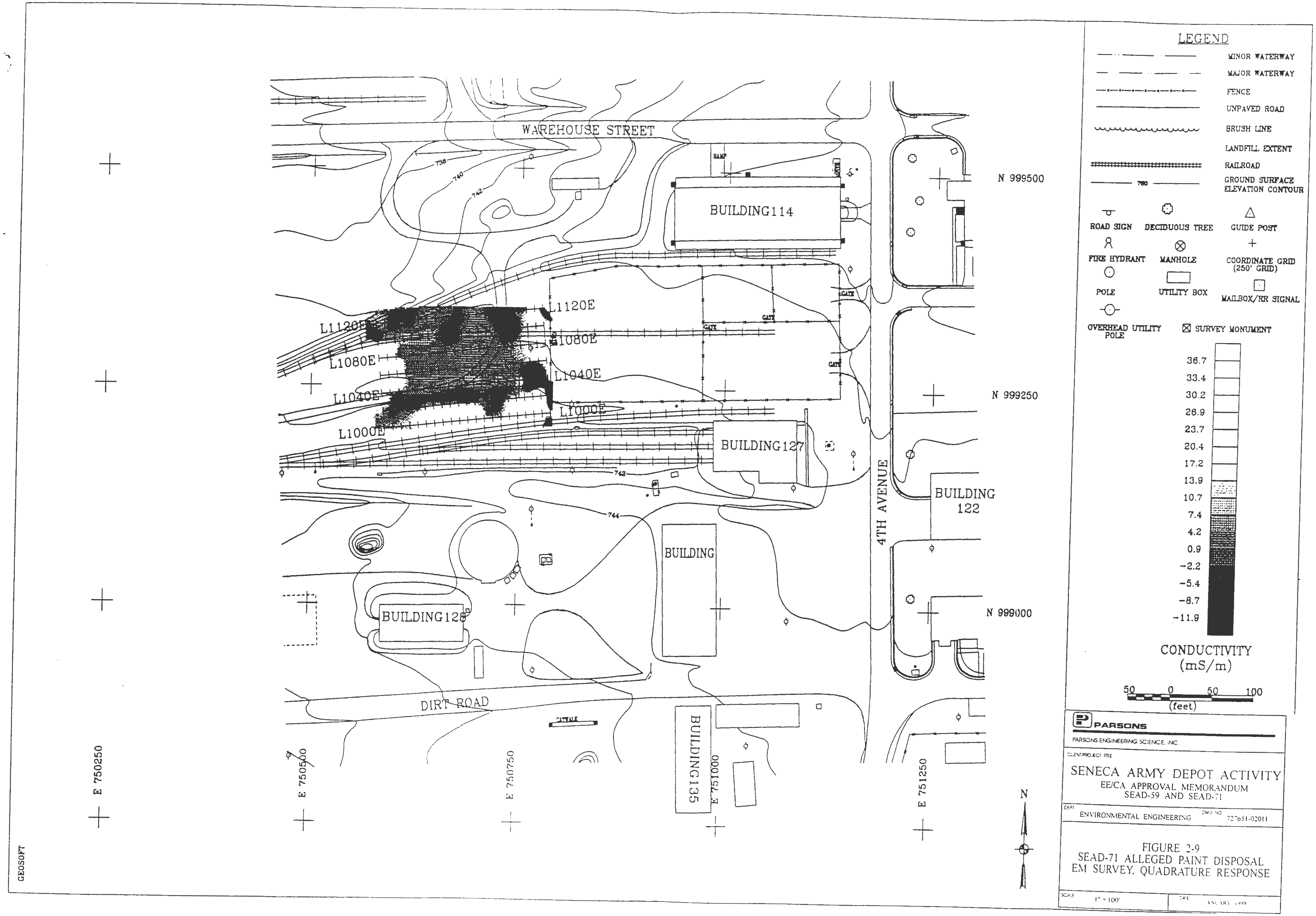
Interferences from many cultural effects along the perimeter of the surveyed area complicated the interpretation of the data. A review of the EM-31 data from SEAD-71 revealed one area, in the south central portion of the grid, where both the apparent conductivity and the in-phase response decreased noticeably. One other area of increased apparent ground conductivity measurements was detected along the west-central portion of the grid, however, an associated in-phase response was not observed.

GPR data was acquired for the ESI at SEAD-71. The data from these surveys revealed an underground utility line or conduit running northwest - southeast across the northeastern corner of the storage compound. One area of anomalous subsurface reflections, typical of reflections from metallic objects, was detected in the south-central portion of the storage compound. The GPR survey conducted in the area west of the storage compound revealed five localized anomalies and three zones with multiple anomalies. The source of these EM-31 and the GPR anomalies was identified during test pit excavations as construction debris composed of chain link fencing, sheet metal, asphalt, and a crushed, yellow, twenty gallon drum. Weathered shale, encountered at a depth of 5.5 feet, limited any further advancement of the excavation. There were no readings above background levels (0 ppm of organic vapors and 10-15 micro rems per hour of radiation) during the excavations.

2.4.2 Summary of Affected Media

2.4.2.1 SEAD-59

The ESI conducted at SEAD-59 identified several areas which have been impacted by releases of volatile organic compounds, semivolatile organic compounds, total petroleum hydrocarbons, and



LEGEND
MINOR WATERWAY
MAJOR WATERWAY
FENCE
UNPAVED ROAD
BRUSH LINE
LANDFILL EXTENT
RAILROAD
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
36.7
33.4
30.2
26.9
23.7
20.4
17.2
13.9
10.7
7.4
4.2
0.9
-2.2
-5.4
-8.7
-11.9
CONDUCTIVITY (mS/m)
50 0 50 100
(feet)
WAREHOUSE STREET
BUILDING114
BUILDING127
BUILDING 122
BUILDING
BUILDING128
BUILDING135
4TH AVENUE
DIRT ROAD
L1120E
L1080E
L1040E
L1000E
N 999500
N 999250
N 999000
E 750250
E 750500
E 750750
E 751000
E 751250
N
GEOSOFT
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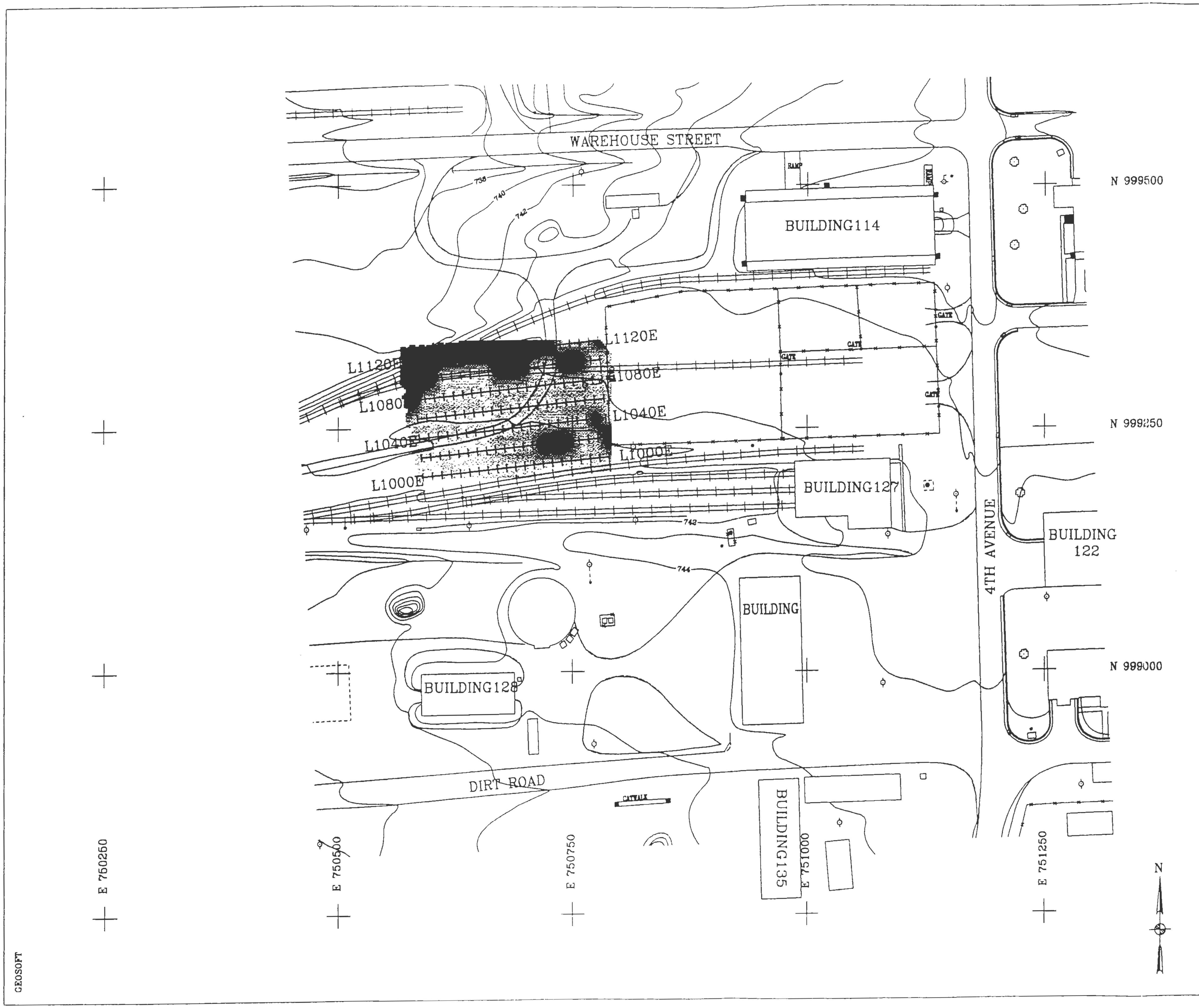
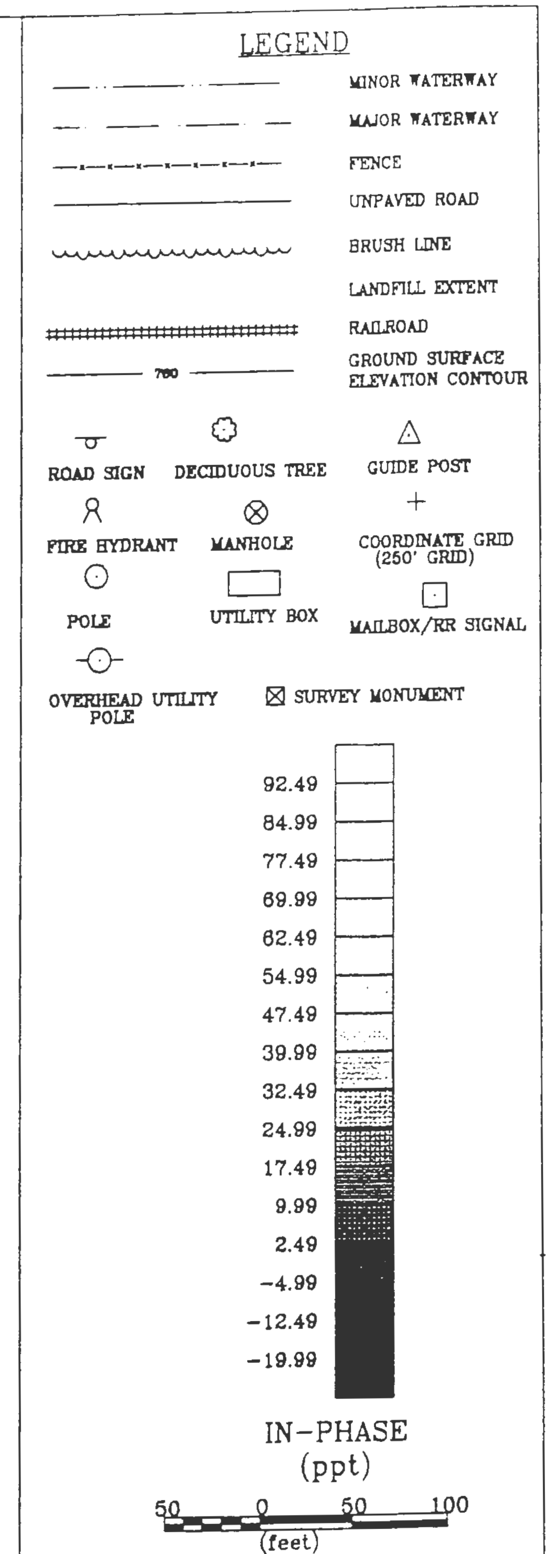
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71
ENVIRONMENTAL ENGINEERING
FIGURE 2-9
SEAD-71 ALLEGED PAINT DISPOSAL
EM SURVEY, QUADRATURE RESPONSE
1" = 100'





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SENECA ARMY DEPOT ACTIVITY
EE/CA APPROVAL MEMORANDUM
SEAD-59 AND SEAD-71

DEPT: ENVIRONMENTAL ENGINEERING | DWG NO: 727651-02011

FIGURE 2-10
SEAD-71 ALLEGED PAINT DISPOSAL
EM SURVEY, IN-PHASE RESPONSE

SCALE: 1" = 100' | DATE: JANUARY 1999

to a lesser extent, heavy metals.

Soil

Sampling conducted in SEAD-59 indicated impacts to soils from volatile organic compounds, semivolatile organic compounds, total petroleum hydrocarbons, and to a lesser extent, metals. A total of 20 soil samples were collected from soil borings and test pits as part of the ESI for SEAD-59.

VOCs (BTEX) were detected at concentrations exceeding the associated Technical and Administrative Guidance Memorandum (TAGM) criteria for soil. Polyaromatic hydrocarbon (PAH) compounds were found in 5 surface soil and 7 subsurface soil samples at concentrations which exceeded the TAGM by at least one order of magnitude. Total petroleum hydrocarbons were detected in all but 2 of the soil samples collected from the fill area. The reported concentrations of TPH ranged from 40 to 7,870 mg/kg. A total of 22 metals were detected in the 20 soil samples collected at SEAD-59, and exceedances were reported for all. A total of 14 pesticides and 1 PCB compound were also detected at varying concentrations in 15 of the 20 soil samples collected at SEAD-59.

Groundwater

The analytical results of the groundwater analyses indicated that the groundwater at SEAD-59 has been moderately impacted by total petroleum hydrocarbons and, to a lesser extent, by metals and semivolatile organic compounds. Total petroleum hydrocarbons were detected at low concentrations in each of the downgradient groundwater samples, and were undetected in the upgradient groundwater samples. Iron, aluminum, manganese, and sodium were detected at concentrations above their associated groundwater criteria in both the upgradient and the downgradient groundwater samples. Thallium was found in the upgradient and one downgradient groundwater sample at concentrations above the federal MCL. One SVOC was reported at estimated concentrations above groundwater TAGM.

The results of this ESI have identified significant releases of BTEX and PAH compounds in the materials comprising the fill area and disposal pits at SEAD-59. It is important to note that trace quantities of total petroleum hydrocarbons detected in the fill materials are presumably being leached into the groundwater beneath the site. Therefore, the data suggest that affected media at SEAD-59 may have the potential to impact the modeled receptors.

2.4.2.2 SEAD-71

Soil and groundwater were sampled as part of the ESI conducted at SEAD-71 in 1994. Sampling and analyses were based upon historical usage of the area for the disposal of paint and solvents. The results of this investigation were detailed in the draft ESI report (Parsons ES, April 1995). To

evaluate whether each media (soil and groundwater) is being impacted, the chemical analysis data were compared to available New York State and Federal standards, guidelines, and criteria. Only those state standards which are more stringent than federal requirements were used as criteria.

Soil

A total of eight subsurface soil samples were obtained from two test pits as part of the ESI for SEAD-71. The results suggest that soils at SEAD-71 have been impacted by former activities on site. Ten PAH compounds were found at concentrations exceeding the associated TAGM criteria and at least one PAH exceedance was noted in 7 of the 8 soil samples. Thirteen metals were detected in one or more samples at concentrations above the associated TAGM criteria. Lead was detected in soil samples from one location at concentrations at least two times the criteria. VOCs and pesticides were also detected in soil samples, but were at concentrations significantly below the associated TAGM criteria.

Groundwater

Groundwater at the site has not been significantly impacted. Metals were the only constituents detected, with a total 20 for SEAD-71. Out of the 20 metals found, five (aluminum, iron, lead, manganese, and thallium) were detected at concentrations above the lowest associated state or federal criteria.

3.0 THREAT TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT

The Approval Memorandum provides information for EPA to determine that a threat or potential threat to public health, welfare, and the environment could exist (EPA, 1993). This section identifies source areas, release mechanisms, and the likely threat to public health, welfare, and the environment at SEADs-59 and -71.

3.1 POTENTIAL SOURCE AREAS AND RELEASE MECHANISMS

Primary source areas were identified during the ESI and the *Project Scoping Plan for Performing a CERCLA Remedial Investigation / Feasibility Study (RI/FS) at the Fill Area West of Building 135 (SEAD-59), and the Alleged Paint Disposal Area (SEAD-71)*, February 1997. The suspected source area for SEAD-59 (Fill Area West of Building 135) is waste material buried in a small fill area and in small disposal pits. The primary release mechanisms from the buried waste and soil that comprise the fill area and pits are infiltration and percolation of precipitation, and surface water runoff and erosion. Wind is also a release mechanism from impacted soil, although this is not expected to be significant because the site is vegetated. Groundwater, surface water, and sediment are secondary sources. Groundwater interception of surface water is a secondary release mechanism.

The suspected source area for SEAD-71 (Alleged Paint Disposal Area) is waste material buried in disposal pits. The primary release mechanisms from the buried waste and soil that comprise the pits are infiltration and percolation of precipitation, and surface water runoff and erosion. Wind is also a release mechanism from impacted soil, although this is not expected to be significant because the site is vegetated. Groundwater, surface water, and sediment are secondary sources. Groundwater interception of surface water is a secondary release mechanism.

3.2 THREATS TO PUBLIC HEALTH, WELFARE AND THE ENVIRONMENT

SEDA has been placed on the 1995 Base Realignment and Closure List (BRAC List). The President and the Congress have approved the list and it has become public law. As BRAC applies to SEDA, future use of the sites will be determined by the Army. The future use of the land at Seneca Army Depot Activity is defined in the Reuse Plan and Implementation Strategy for the Seneca Army Depot (December 1996). The proposed future use of the area that encompasses SEAD-59 and SEAD-71 is as Planned Office/Industrial Development. At the time when the SEDA facility is relinquished by the Army, the Army will ensure that SEAD-59 and SEAD-71 can be used for the intended purpose. Restrictions will be put in place to ensure that additional investigations and/or remedial actions are taken should the future use of this site change.

3.2.1 SEAD-59

The complete potential exposure pathways from sources to receptors at SEAD-59 are shown schematically in **Figure 3-1**. The potential for human exposure is directly affected by the accessibility to the site. Within SEDA, human and vehicular access to the site is restricted since the facility is located within the confines of the ammunition storage area.

3.2.1.1 Potential Exposure Pathways and Receptors - Current Uses

There are two primary receptor populations that could be affected by potential releases of contaminants from SEAD-59 and they are as follows:

1. Current site workers
2. Terrestrial biota and aquatic organisms on or near the site

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

Ingestion and Dermal Exposure Due to Surface Water Runoff and Erosion

Surface water run-off on-site is controlled by the variable land surface topography and a well developed drainage ditch system. At the fill area, which is located in the northern portion of the site, overland flow is likely to be radial toward drainage ditches that surround the fill area. These ditches eventually flow beyond the site boundary.

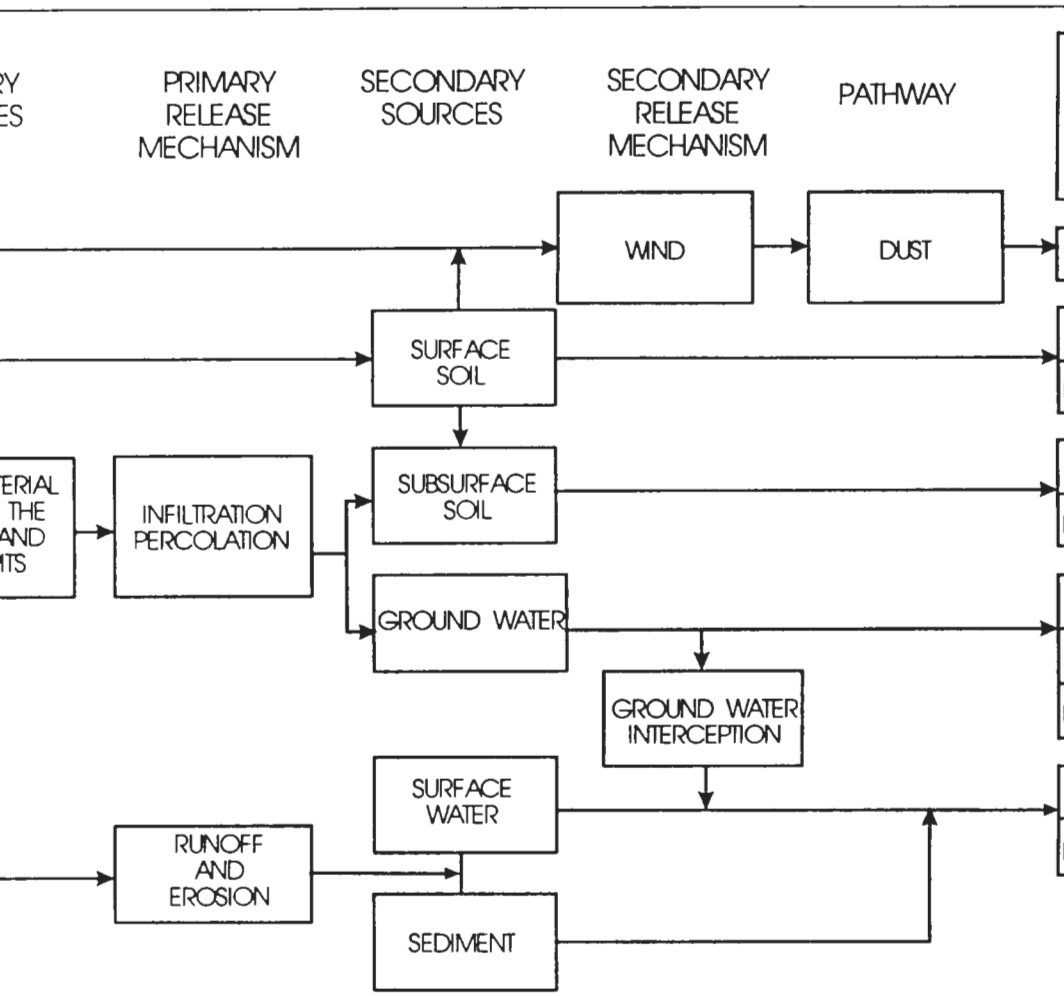
Human receptors of impacted surface water and sediment include current site workers, who may incidentally ingest or come in contact with the surface water and sediment. Terrestrial biota and aquatic organisms that ingest and come in contact with impacted surface waters and sediment may also be affected.

Incidental Soil Ingestion and Dermal Contact

Incidental ingestion of, and dermal contact with surface soil are potential exposure pathways for current site workers. Ingestion of, and dermal contact with surface and subsurface soil are potential pathways for terrestrial biota.

Ingestion of Groundwater and Dermal Contact

Ingestion of, inhalation of, and dermal contact with groundwater are not potential exposure pathways for current site workers or terrestrial biota. The groundwater beneath SEAD-59 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 will be direct exposure to the groundwater from the site to current site workers or terrestrial biota.



EXPOSURE ROUTE	RECEPTOR: HUMAN: FUTURE CONSTRUCTION WORKER	HUMAN: FUTURE TRESPASSER	HUMAN: CURRENT SITE WORKERS	BIOTA: TERRESTRIAL	BIOTA: AQU
INHALATION	●	●	●	●	N
INGESTION	●	●	●	●	N
DERMAL CONTACT	●	●	●	●	N
INGESTION	●	NA	NA	●	N
DERMAL CONTACT	●	NA	NA	●	N
INHALATION	NA	NA	NA	NA	N
INGESTION	NA	NA	NA	NA	N
DERMAL CONTACT	NA	NA	NA	NA	N
INGESTION	NA	●	●	●	●
DERMAL CONTACT	NA	●	●	●	●

● PATHWAY CONSIDERED TO POSE POTENTIAL RISK

NA NOT APPLICABLE RECEPTOR

PARSONS

PARSONS ENGINEERING SCIEN

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT A
EE/CA APPROVAL MEMORA
SEAD-59 FILL AREA
WEST OF BUILDING 135

DEPT ENVIRONMENTAL ENGINEERING | DWG NO

FIGURE 3-1
EXPOSURE PATHWAY SUM
FOR SEAD-59

SCALE NA | DATE JANUA

SD59EXPR.CDR

Dust Inhalation and Dermal Contact

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

3.2.1.2 Potential Exposure Pathways and Receptors - Future Uses

The proposed future use of the area that encompasses SEAD-59 is as Planned Office/Industrial Development. The potential for human exposure is directly affected by the accessibility to the site and related facilities under this land use.

There are three primary receptor populations for potential releases of chemicals from SEAD-59 and they are as follows:

1. Future construction worker,
2. Future trespasser, and
3. Terrestrial biota and aquatic organisms on or near the site.

For the future construction worker, dermal contact with and ingestion of soils, along with inhalation of particulates in ambient air are considered. For the future child trespasser, the following pathways will be quantified: ingestion and dermal contact with site surface soils; ingestion and dermal contact with on-site surface water and sediment while wading; and inhalation of particulates in ambient air.

3.2.2 SEAD-71

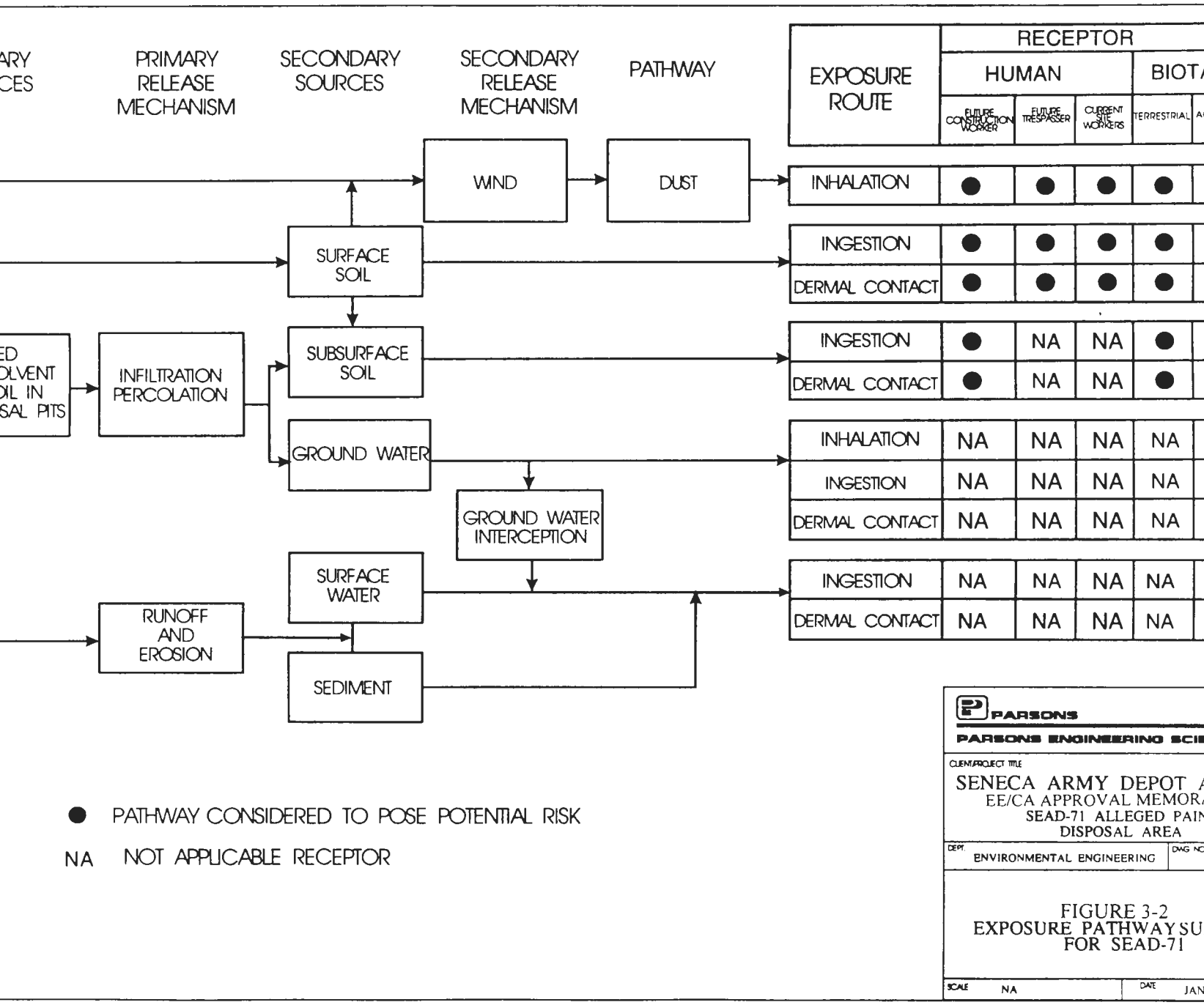
The potential exposure pathways from sources to receptors are shown schematically in **Figure 3-2**. The potential for human exposure is directly affected by the accessibility to the site. Within SEDA, human and vehicular access to the site is restricted since the facility is located within the confines of the ammunition storage area.

3.2.2.1 Potential Exposure Pathways and Receptors - Current Uses

There are two primary receptor populations for potential releases of contaminants from SEAD-71:

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

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



● PATHWAY CONSIDERED TO POSE POTENTIAL RISK

NA NOT APPLICABLE RECEPTOR

PARSONS

PARSONS ENGINEERING SCI

CLIENT/PROJECT TITLE

SENECA ARMY DEPOT A
EE/CA APPROVAL MEMORA
SEAD-71 ALLEGED PAIN
DISPOSAL AREA

DEPT. ENVIRONMENTAL ENGINEERING | DWG NO.

FIGURE 3-2
EXPOSURE PATHWAY SU
FOR SEAD-71

SCALE NA | DATE JAN

CA\SD59EXPR.CDR

Ingestion and Dermal Exposure Due to Surface Water Runoff and Erosion

The likelihood of ingestion and dermal exposure to surface water and sediment is low as these media are not well defined on-site. Any surface water run-off from the site is controlled by the gently southwest-sloping topography. Based on the topographic expression on the site, overland flow would likely be directed toward the low area immediately south of the site and occupied by railroad tracks. There are no well defined drainage ditches on the site.

Incidental Soil Ingestion and Dermal Contact

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

Ingestion of Groundwater and Dermal Contact

Ingestion of, inhalation of, and dermal contact with groundwater are not potential exposure pathways for current site workers or terrestrial biota. The groundwater beneath SEAD-71 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 will be direct exposure to the groundwater from the site to current site workers or terrestrial biota.

Dust Inhalation and Dermal Contact

Inhalation and dermal contact with impacted dust is a potential exposure pathway for current site workers, visitors, and terrestrial biota.

3.2.2.2 Potential Exposure Pathways and Receptors - Future Use

The proposed future use of the area that encompasses SEAD-71 is as Planned Office/Industrial Development. The potential for human exposure is directly affected by the accessibility to the site and related facilities under this land use.

There are three primary receptor populations for potential releases of chemicals from SEAD-71 and they are as follows:

1. Future construction worker,
2. Future trespasser, and
3. Terrestrial biota and aquatic organisms on or near the site.

For the future construction worker, dermal contact with and ingestion of soils, along with inhalation of particulates in ambient air are considered. For the future child trespasser, the

following pathways will be quantified: ingestion and dermal contact with site soils; ingestion and dermal contact with on-site surface water and sediment while wading; and inhalation of particulates in ambient air.

3.3 JUSTIFICATION FOR REMOVAL ACTION

Investigations of SEAD-59 and SEAD-71 indicate that buried wastes and soils at this site may pose a potential threat to human health and the environment through soil ingestion or dermal contact, through surface water run-off and through continued leaching to the groundwater which passes through the site. Potential for exposure indicates likelihood of meeting NCP criteria for pursuing a removal action and in turn, an EE/CA (EPA, 1993).

4.0 IMMINENT AND SUBSTANTIAL ENDANGERMENT

Actual or threatened releases of pollutants and contaminants from this site may present an endangerment to public health, welfare, or the environment. It is recommended that an EE/CA be conducted to verify that such a threat exists and to select the appropriate removal action.

5.0 ENFORCEMENT ACTIONS

This section is not applicable to this removal action since the lead agency, the Army, is the Principle Responsible Party to this site, and is taking responsibility for the removal action.

6.0 PROPOSED PROJECT AND COST

6.1 PROPOSED PROJECT

The EE/CA process is depicted in **Figure 1-1**. After acceptance of the Approval Memorandum, an EE/CA is conducted as described in Section 1, Introduction. This is presented to the public for comment. Once public comments are addressed, an Action Memorandum is prepared which provides a written record of the decision to select an appropriate removal action. Work plans are then developed to implement the removal action, the removal action is conducted, and a removal report is written to document the action taken.

The lead agency, the Army, is the Principle Responsible Party to this site and is taking responsibility for conducting an EE/CA and any resulting removal action. Both USEPA and NYSDEC, however, will have the opportunity to review and comment on this Approval Memorandum, the EE/CA, and the Action Memorandum. In addition, they may elect to provide oversight during the selected removal action.

6.2 COST

The Army is taking responsibility for conducting an EE/CA and any resulting removal action. Costs for the removal action will be developed as part of the EE/CA.

7.0 RECOMMENDATION FOR APPROVAL TO CONDUCT AN EE/CA

The Approval Memorandum serves the following functions (EPA, 1993):

1. Justifies the need to perform an EE/CA;
2. Outlines how the conditions at SEADs-59 and -71 meet the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria for initiating a removal action and that the required action is non-time-critical; and
3. Provides site background; threats to public health, welfare, or the environment posed by the site; imminent and substantial endangerment, if present; enforcement activities related to the site; and project costs.

Previous sections in this memorandum addressed the issues outlined in item 3 above. This section summarizes the basis for approval to proceed with a non-time-critical removal action and conduct an EE/CA.

7.1 REMOVAL ACTIONS

CERCLA and the NCP define removal actions to include "the cleanup or removal of released hazardous substances from the environment, such actions as may necessarily be taken in the event of the threat of release of hazardous substances into the environment, such actions as may be necessary to monitor, assess, and evaluate the threat of release of hazardous substances, the disposal of removed material, or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release"(EPA, 1993).

Section 300.415(b)(2) of the NCP specifies that the following factors shall be considered in determining the appropriateness of a removal action:

- Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants;
- Actual or potential contamination of drinking water supplies or sensitive ecosystems;
- Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers, that may pose a threat or release;

- High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate;
- Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released;
- Threat of fire or explosion;
- The availability of other appropriate federal or state response mechanisms to respond to the release; and
- Other situations or factors that may pose threats to public health or welfare of the United States or the environment.

Field work for an Expanded Site Inspection (ESI) for Seven Low Priority AOCs was conducted at SEAD-71 in 1995 (Parsons ES, 1995a) and an ESI for Seven Moderately Low Priority AOCs was conducted at SEAD-59 in 1995 (Parsons ES, 1995b). Based on the results of this ESI which are summarized in Sections 2 and 3 of this Approval Memorandum, a release of hazardous substances occurred at SEADs-59 and -71 which impacted several media including soil and sediment. A removal action is appropriate at this site for the following reasons:

1. The source and extent of contamination at SEAD -59 has been identified. Geophysical surveys identified the location of the disposal areas at SEAD-59. The analytical program identified contaminants present and confirmed the extent of the contamination within the soil. The ESI conducted at SEAD-71 did not uncover a burial pit for paint and solvents, although it did indicate the soils at SEAD-71 have been impacted by the waste materials which have been disposed of in at least on disposal pit on site.
2. Potential exposure pathways and receptors have been identified for current and future land use scenarios. The potential for exposure indicates the likelihood of meeting NCP criteria for taking a removal action (EPA, 1993).
3. A removal action at these sites will decrease and potentially eliminate the threat to public health, welfare and the environment.

7.2 NON-TIME-CRITICAL REMOVAL ACTION PROCESS

EPA has categorized removal actions in three ways, emergency, time-critical, and non-time-critical, based on the situation, the urgency and threat of the release or potential release, and the subsequent time frame in which the action must be initiated (EPA, 1993). Emergency and time-critical

removal actions respond to releases requiring action within 6 months; non-time-critical actions respond to releases requiring action that can start later than 6 months after the determination that a response is necessary.

Removal action at SEADs-59 and-71 is considered non-time-critical for the following reasons:

1. The contamination present has been there for a significant time period although the exact dates of disposal at these sites is unknown.
2. The releases at SEADs-59 and -71 do not constitute an emergency. Access to the site is currently controlled by SEDA and there are currently no ongoing activities at this site.

Non-time-critical removal actions at SEADs-59 and -71 are consistent with the objectives of the SACM in achieving prompt risk reduction through early action. For the reasons summarized above, it is recommended that a non-time-critical removal action proceed and an EE/CA be conducted.

8.0 REFERENCES

EPA, 1988c. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. EPA/540/G-89/004. Washington, D.C. U.S. Environmental Protection Agency.

EPA, 1993. Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, EPA/540/R/93/057. Washington, D.C. U.S. Environmental Protection Agency.

Parsons ES, 1995a. Draft Expanded Site Inspection Report - Seven Low Priority AOCs, SEADs 60, 62, 63, 64 (A,B,C, and D), 67, 70 and 71.

Parsons ES, 1995b. Draft Expanded Site Inspection Report - Seven Moderately Low Priority AOCs, SEADs 5, 9, 12 (A and B), (43, 56, 69), 44 (A and B), 50, 58, and 59.

Parsons ES, 1997. Draft Final Project Scoping Plan for Performing a CERCLA Remedial Investigation/Feasibility Study (RI/FS) at the Fill Area West of Building 135 (SEAD-59), and the Alleged Paint Disposal Area (SEAD-71). Seneca Army Depot Activity.

Parsons ES, 1998. Draft Phase I Remedial Investigation (RI) at the Fill Area West of Building 135 (SEAD-59), and the Alleged Paint Disposal Area (SEAD-71), Seneca Army Depot Activity.

You will be receiving the validated site characterization report and anticipate you will be taking an active role in the decision process determining the appropriateness of an IRM.

The second site, SEAD 4, Munitions Washout Facility, that you mention, will also be done in a phased approach. Upon receipt of funds for work at this site, you will receive correspondence including a schedule of the work being initiated. You will have an opportunity to comment on the effort at that time.

I believe the confusion at this site occurred during the transition of the project managers in your department. The current stabilization of personnel at EPA, NYSDEC and the Army, will insure your concern will be eliminated in the future and a cooperative and interactive atmosphere we currently have will continue.

Should you have any comments, please feel free to contact Stephen M. Absolom, BRAC Environmental Coordinator, at (607) 869-1309.

/S/

Donald C. Olson
LTC, U.S. Army
Commanding Officer

Eng/Env

D/IM

March 30, 1998

Engineering and
Environmental Division

SUBJECT: Remedial Investigation (RI) Schedule at Fill Area West of Bldg 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD 71)

Mr. James A. Quinn
NYS Department of Environmental Conservation
Division of Hazardous Waste Remediation
Bureau of Eastern Remedial Action
50 Wolf Road, Room 237
Albany, New York 12233-7010

Dear Mr. Quinn:

Your letter dated March 9, 1998, erroneously chastises Seneca for not properly notifying NYSDEC of work initiation.

On October 9, 1997, Mr. Chen was notified via datafax and follow-up hard copy of our intention to begin field sampling for the subject project (copy attached). This notification indicated that the use of field screening techniques would be used to enhance the decisions as to where specifically boring and test pits would be accomplished. This additional activity is the only deviation to the approved work plan. The use of field screening results, an army initiative as a result of peer review, to enhance decisions was not expected to create a controversy regarding approval. The fieldwork is still being accomplished as originally planned.

This site, from the early data, appeared to be a candidate for an interim removal action. Phasing of fieldwork was appropriate with this concept. We expected to be able to fully characterize this site with the work performed. The remaining work identified in the work plan would be scheduled after the IRM to complete the RI/FS process. This effort appears to be consistent with the NY State position to follow through the entire process to come to a decision.

D. Olson

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233-7010

March 9, 1998

John P. Cahill
Commissioner

Mr. Stephen Absolom
Chief, Engineering and Environmental Division
Seneca Army Depot Activity (SEADA)
5786 State Route 96
Romulus, NY 14541-5001

Dear Mr. Absolom:

Re: SEAD-4 and SEAD-59 and 71
Work Plans and Schedules
Seneca Army Depot, Site ID No. 850006

The New York State Department of Environmental Conservation (NYSDEC) has received a letter from Donald Olson of the U.S. Army regarding the schedules for the submission of the Draft Remedial Investigation reports for SEAD-4 and SEAD-59 and 71. While we have no objection to the extension, the NYSDEC along with the New York State Department of Health (NYSDOH) take this opportunity to raise a concern regarding each project's progression through the remedial investigation.

We are aware that an internal peer review has caused the Army to re-think its approach to various remedial investigations at the Seneca Army Depot Activity (SEADA). Specifically, the Army will approach the implementation of each project in a phased manner. This approach is designed so that retrospectively unnecessary and/or superfluous field work is avoided where possible. We concur with the logic of this approach.

However, work plans have already been approved by the NYSDEC and the NYSDOH for these investigations. These work plans were developed before the phased approach was fully enacted at SEADA and may therefore detail different field activity requirements and/or schedules than what SEADA now wishes to implement. While the NYSDEC and NYSDOH encourage any revision to the project plans which will make the process more efficient yet equally (or more) effective, we stress that any proposed revisions to the project plans must be submitted in writing to the regulatory agencies which approved the original documents for concurrence before initiating any modified field activities.

Colonel Olson's letter of March 9, 1998, referenced above, states an assumption that field activities at SEAD-4 (Munition Washout Facility) will begin on June 6, 1998. It is our understanding that SEADA may wish to modify the activities and methods detailed in the RI work plan (Project Scoping Plan, October 1996) based upon peer review comments. SEADA should submit any proposed modifications to the state for review sufficiently in advance of initiating any field work.

The state believes that the field work for the SEAD-59/71 investigation was modified and initiated without proper notification to and, where appropriate, review and concurrence from the NYSDEC and NYSDOH. Although there may be ramifications to that action in the future regarding final acceptance of RI data, that is essentially water under the bridge. Colonel Olson's letter states laboratory results from the recent fieldwork are pending and, once these results are received, certain decisions regarding future data needs will be made. Please be aware that the state expects to be included in a formal review of all generated data, including the modified data gathering methods, before decisions are made regarding the future of RI/FS activities at this operable unit.

If you have any questions on this matter, please contact me via telephone at (518) 457-6927 or via email at jaquinn@gw.dec.state.ny.us.

Sincerely,

James A. Quinn
Bureau of Eastern Remedial Action
Division of Environmental Remediation

c: D. Olson
C. Struble
D. Geraghty

October 9, 1997

Mr. Marsden Chen
New York State Department of Environmental Conservation (NYSDEC)
Bureau of Eastern Remedial Action
Division of Hazardous Waste Remediation, Room 208
50 Wolf Road
Albany, NY 12233-7010

Ms. Carla Struble, Remedial Project Manager
USEPA Region II
Emergency & Remedial Response Division
290 Broadway, 18th Floor , E-3
New York, NY 10007-1866

SUBJECT: Remedial Investigation (RI) Schedule at the Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71)

Dear Mr. Chen/Ms. Struble :

Parsons Engineering-Science, Inc. (Parsons ES) has mobilized and begun the RI field work for SEAD-59 and SEAD-71, the Fill Area West of Building 135 (SEAD-59) and the Alleged Paint Disposal Area (SEAD-71) at the Seneca Army Depot Activity (SEDA). In response to the Peer Review process, we are planning to implement the field program in phases, with each phase directing the follow-up phase. The first phase of the field effort involved the implementation of the soil gas and geophysical surveys. This screening data has refined the location and extent of the fill areas. Following the recent completion of these tasks, we are now proceeding with the next phase of field effort that includes soil sampling tasks. These tasks will be performed with the expectation of confirming the screening tasks and further defining the nature and extent of any possible soil impacts. Our goal is to determine if these sites can be effectively remediated via the implementation of a removal action. Should the soil data suggest that groundwater may be impacted then the need to install groundwater monitoring wells will be evaluated as part of the next phase of field efforts.

Soil vapor and geophysical surveys have recently been completed at these sites. Test pitting activities commenced during the first week in October and is expected to continue until through October 24. Surface soil sampling and drilling, i.e. soil borings, are scheduled to commence on October 27, 1997.

At SEAD-59, we are intending on performing up to thirteen (13) test pits and ten (10) soil borings as described in the scoping plan. For SEAD-71, we are intending on installing up to eight (8) test pits and eight (8) soil borings. At SEAD-71, we are anticipating implementing the surface soil sampling program but will decrease the number of samples that we will send to the CLP laboratory to ten (10) instead of the twenty (20) that was proposed in the scoping plan. The exact location of the test pits and soil borings will be as described in the scoping plan but may be modified based upon the results of the screening data.

In addition to the usual headspace screening that is performed with the hand held OVMs, we are also utilizing immunoassay screening techniques to screen soil samples for the presence of PAHs and BTEX compounds. This technique is intended to limit the number of soil samples that we will be sending to the Contract Laboratory, Intec, Inc., formerly Inchcape/Aquatec, Inc. Although the scoping plan indicates that up to three (3) soil samples, one at the surface, one in the middle and one at the bottom of a soil boring, will be submitted to the contract laboratory for NYSDEC CLP analyses, we will only submit one (1) sample from the depth that is the most significantly impacted. We feel justified in reducing the number of soil samples submitted to the contract laboratory because the immunoassay techniques have sufficiently low detection limits, (i.e. 2.5 mg/kg total BTEX and 0.6 mg/kg total PAHs) to detect the presence of source soils. This data will also be combined with both geophysical data and soil gas data to support the decision to implement a removal action. If, following a removal action, further CLP quality soil data is required then that data will collected as part of the confirmatory samples for the removal action. We will be performing immunoassay testing during test pitting efforts that may include up to six (6) tests however, unlike the soil borings, we intend on submitting two samples per test pit. Immunoassay testing will be used to also limit the number of surface soil samples that will be submitted for CLP analyses. For the surface soil sampling effort at SEAD-71 effort we will submit half of the proposed samples to the CLP laboratory. We believe that the immunoassay data, supplemented with some confirmatory CLP data, will be sufficient to reduce costs and provide the basis for a removal action at these sites.

Please find attached a schedule detailing the sampling events and dates upon which these activities are intended to be completed. Please provide Parsons ES with your intended sample split requirements at your earliest convenience so that we can coordinate with your oversight contractor.

Sincerely,

PARSONS ENGINEERING SCIENCE, INC.

Michael Duchesneau, P.E.
Project Manager

h:\eng\seneca\sead5971\epasch1.doc

PARSONS ENGINEERING SCIENCE, INC. • PRUDENTIAL CENTER • 101 HUNTINGTON AVENUE • BOSTON, MA 02199

FACSIMILE COVER SHEET

To: Marsden Chen
Company: NYSDEC
Phone: (518) 457-3976
Fax: (518) 457-3972

From: Michael Duchesneau
Company: Parsons Engineering Science
Phone: (617) 859-2492
Fax: (617) 859-2043
Job No.: 75967

Date: October 9 1997
Pages including this cover page: 4

Comments: **Marsden,**

Steve asked me to fax you this letter so that you can schedule any oversight activities with our field tasks.

Regards
Mike D.

PARSONS ENGINEERING SCIENCE, INC. • PRUDENTIAL CENTER • 101 HUNTINGTON AVENUE • BOSTON, MA 02199

FACSIMILE COVER SHEET

To: Stephen Absolom
Company: Seneca Army Depot Activity
Phone: (607) 869-1281
Fax: (607) 869-1362

From: Michael Duchesneau
Company: Parsons Engineering Science
Phone: (617) 859-2492
Fax: (617) 859-2043
Job No.: 75967

Date: October 9 1997
Pages including this cover page: 4

Comments: **Steve,**

Here is a draft of a letter that I need to send to EPA to schedule split samlpling. Please review and send comments.

Call with any comments or questions.
Regards
Mike D.

PARSONS ENGINEERING SCIENCE, INC. • PRUDENTIAL CENTER • 101 HUNTINGTON AVENUE • BOSTON, MA 02199

FACSIMILE COVER SHEET

To: Carla Struble
Company: US EPA Region 2
Phone: (212) 637-4322
Fax: (212) 637-4360

From: Michael Duchesneau
Company: Parsons Engineering Science
Phone: (617) 859-2492
Fax: (617) 859-2043
Job No.: 75967

Date: October 9 1997
Pages including this cover page: 4

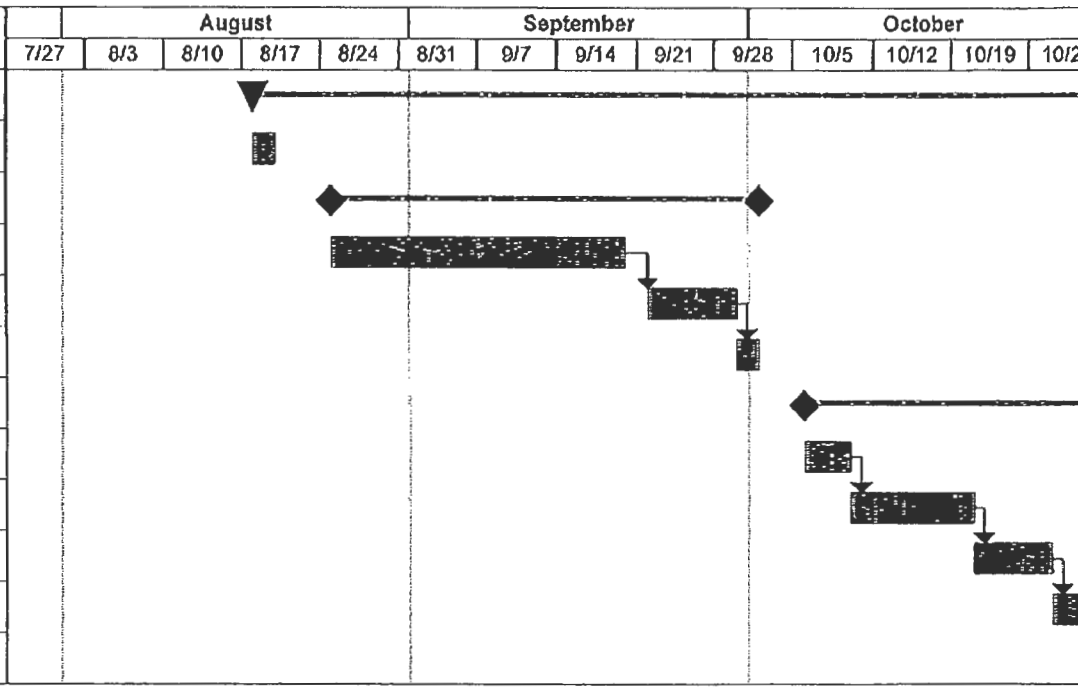
Comments: **Carla,**

Steve asked me to fax you this letter so that we can schedule split samlpling.

Regards
Mike D.

Seneca Army Depot
SEAD - 59/71
Field Work Schedule

	Duration	Start	Finish
71	59d	8/18/97	11/6/97
	2d	8/18/97	8/19/97
Gas 59 & 71	28d	8/25/97	10/1/97
59	20d	8/25/97	9/19/97
	6d	9/22/97	9/29/97
	2d	9/30/97	10/1/97
ng 59 & 71	26d	10/6/97	11/10/97
	4d	10/6/97	10/9/97
	7d	10/10/97	10/20/97
71	5d	10/21/97	10/27/97
59	7d	10/28/97	11/5/97
ampling - 71	3d	11/6/97	11/10/97



Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

PARSONS ENGINEERING SCIENCE, INC. • 30 DAN ROAD • CANTON, MA 02021-2809

FACSIMILE COVER SHEET

To: Stephen Absolom
Company: Seneca Army Depot Activity
Phone: (607) 869-1281
Fax: (607) 869-1362

From: Michael Duchesneau
Company: Parsons Engineering Science
Phone: (617) 859-2492
Fax: (617) 859-2043
Job No.: 75967

Date: March 24 1998
Pages including this cover page:

Comments: **Steve,**

Here are copies of what I faxed to EPA and NYSDEC prior to the sampling at SEAD-59&71.

Call with any comments or questions.
Regards
Mike D.

Not sent to Army
File
SEAD 59/71

PARSONS ENGINEERING SCIENCE, INC.

MEMORANDUM

TO: Steve Absolom, SEDA
Kevin Healy, USACOE

DATE: September 29, 1999

FROM: Terresa Pietro

COPIES:

SUBJECT: Summary of Removal Actions Considered for SEAD-59, Fill Area West of Building 135 and SEAD-71, Alleged Paint Disposal Area

---

This purpose of this memo is to summarize the findings of investigations conducted at SEADs-59 and 71 and outline the proposed removal action.

Background

SEAD-59 was used for the disposal of construction debris and oily sludges. SEDA personnel have indicated that there may be a large quantity of miscellaneous "roads and grounds" waste buried at the site. It is not known when the disposal took place.

SEAD-71 is a rumored disposal site for paints and/or solvents. It is not known what other activities occurred here. No dates of disposal are available nor is there any information on the number of suspected disposal pits.

Sampling has been done at these sites as part of the ESI and Phase I RI to identify burial sites at SEAD-59 and 71 and to determine their impact on site groundwater and soil.

Soil Gas Investigations Conducted during RI

SEAD-59

A total of 241 soil gas points were sampled and analyzed during the Phase I RI investigation at SEAD-59. This sampling effort revealed one large area and four smaller areas of elevated total volatile organic compounds (VOCs). The larger area of elevated soil gas encompasses most of SEAD-59, extending from north of the unnamed dirt road to the west of the 60,000 gallon oil storage tank, including the mounded fill area. The highest soil gas hits were within the boundaries of the fill area. Maximum total VOC hits of greater than 10 ppmv were observed at three separate locations within the fill area. The four smaller areas of elevated soil gas containing VOCs were detected in an area southeast of the fill area, an area directly southwest of the fill area, another area south of the fill area, and an additional area northwest of the fill area.

SEAD-71

No soil gas survey was performed at SEAD-71.

Test Pit Investigations Conducted during ESI

SEAD-59

Electromagnetic (EM-31, EM-61) and GPR surveys were performed for the ESI and the Phase I RI at SEAD-59 to identify locations where metallic objects were buried. Test pit locations were selected based on the data indicating the strongest presence of disposal pits or debris.

Test pits (TP59-2, TP59-3, TP59-4, TP59-7, TP59-10, TP59-11, TP59-14, TP59-15, TP59-16 and TP59-17) were excavated within the fill area. Debris consisting of concrete, asphalt, metal and wood were found in the test pits located in this area. A layer of petroleum hydrocarbon stained silt (having a petroleum odor) (132ppmv) was observed in the 1.4 to 1.8 feet depth interval of test pit TP59-4.

Three 55-gallon drums were found at approximately 3 feet below grade at the TP59-3 location. The excavation was halted when these drums were unearthed; therefore, the existence of additional drums at greater depths is unknown. One end of one of the horizontally positioned drums was separated from the body of the drum, revealing a white, flexible, plastic-like substance. Some areas of this white substance showed a dark-yellow staining. Drums were also found in test pits TP59-15 and TP59-16. A crushed 15-gallon drum containing black oily stains (16 ppmv) was located six feet below ground surface in TP59-15. Another drum, which did not appear to be leaking, was found in TP59-16. Corroded drum fragments having no contents were found in TP59-10.

In the area directly southwest of the fill area, test pits TP59-13A, TP59-13B, and TP59-13C were excavated. Little debris was encountered in these pits. However, a petroleum-type odor and sheen on the water was noted between 3.5 and 4 feet in TP59-13A and TP59-13C.

In the area south of the fill area, test pits TP59-1, TP59-5, TP59-6, TP59-12A, TP59-12B and TP59-12C were excavated. The excavation at TP59-1 revealed a large quantity of filled 2-gallon paint cans approximately 1 foot below the ground surface covered by a 0.6-ft thick layer of construction debris including a crushed, yellow, 20-gallon waste can and chain-link fencing. Several zones of paint stained soil were observed and screened with an OVM (max reading 560 ppmv). A 5-gallon paint can was observed one foot below the surface at TP59-12A as well as a paint globule and a crushed 1-gallon paint can (no OVM hit). At test pit TP59-12B, a 5-gallon paint can was also uncovered one foot below the surface leaking a brown grease-like substance. White solidified paint was also observed in this interval (OVM = 274ppmv). Construction debris was encountered in TP59-5, the westernmost test pit at SEAD-59, and TP59-6, one of the southernmost test pits at SEAD-59.

Construction debris was encountered in the test pits excavated in the area southeast of the fill area (TP59-8, TP59-9 and TP59-18). Some iron-stained soil was noted between 1.5 and 2 feet below ground surface at TP59-18.

SEAD-71

EM-31 and GPR surveys were performed for the ESI and Phase I RI at SEAD-71 in the western half of the site to help locate the burial pits. Test pit locations were selected based on the data indicating the strongest presence of disposal pits or debris.

TP71-1 identified as construction debris composed of chain link fencing, sheet metal, asphalt, and a crushed, yellow, twenty-gallon drum at 0.75 to 1.3 feet below the ground surface. A 0.75-foot thick

layer of fine angular black debris (resembling creosote or soot) was observed immediately below the construction debris layer.

Test pit TP71-2 was centered over a GPR anomaly located in the storage area. This location was situated along the southern boundary of compacted roadstone. A dark gray to black, possibly stained, fine shale gravel layer was encountered from 0.25 to 1.0 foot below ground surface. The source of the GPR anomaly was not identified at this test pit location.

Test pit TP71-3 was located over a GPR anomaly located north of the road and near the steel garage. Sand and stone slabs were encountered between 0.5 and 2 feet. At 8 feet below ground surface, a slight hydrocarbon odor and stained gray-brown soils were noticed and an OVM reading of 4 to 6 ppm was recorded. A trace of an oily sheen was noted on the clay soil at ten feet and stones at 10.5 to 11 feet were covered with a brown oily liquid.

Test pit TP71-4 was located over a GPR anomaly located north of the road. A stone slab layer was encountered at 1 foot below the surface and other slabs mixed with lumber sand and stone were located between 3 and 7 feet below the surface. At ten feet below ground surface, some iron staining was noted on the soil and an OVM reading of 6 ppm was recorded.

Test pit TP71-5 was located over a GPR anomaly located between the south edge of the road and the southern railroad tracks. Railroad ties were encountered at 3 to 7 feet below ground surface that matched the GPR anomaly. At 12.5 feet below ground surface, an OVM reading of 8 ppm was recorded.

Test pit TP71-6 was located south of the road and north of the railroad and salt shed. Fill within this test pit consisted of black cinders, wood, asphalt bricks, fencing, piping and railroad ties. Sample TP71-6-3 was collected from beneath the black cinders between 3 and 3.5 feet below ground surface.

ESI and Phase I RI Data Summary

The results of the ESI and Phase I RI conducted at SEADs-59 and 71 indicate that past activities on site have impacted the soil quality. It is also possible that past activities at SEAD-59 may have, to a lesser degree, impacted the groundwater quality.

SEAD-59

The ESI and Phase I RI conducted at SEAD-59 identified several areas which have been impacted by releases of volatile organic compounds, semivolatile organic compounds, total petroleum hydrocarbons, and to a lesser extent, heavy metals.

Soil

A total of 20 soil samples were collected from soil borings and test pits as part of the ESI for SEAD-59. A total of 105 samples were collected during the Phase I RI for field screening and 34 of those samples were sent to the laboratory for confirmatory analysis.

In the fill area, polyaromatic hydrocarbon (PAH) compounds were found in surface soil and subsurface soil samples at concentrations exceeding TAGMs, often by several orders of magnitude. Total petroleum hydrocarbons were detected in the majority of the soil samples collected from the fill area. In the area directly southwest of the fill area, there is both physical and chemical evidence of the presence of

hydrocarbons. In the area south of the fill area, several paint cans containing paint were found. BTEX constituents were detected in the sample from this location at concentrations exceeding the associated TAGMs by at least 2 orders of magnitude.

Lead was detected at levels between 2 and 4 times the TAGM in the fill area and in the areas to the south and southeast of the fill area.

Groundwater

The analytical results of the groundwater analyses indicate that the groundwater at SEAD-59 has been moderately impacted by total petroleum hydrocarbons and, to a lesser extent, by metals and semivolatile organic compounds. Total petroleum hydrocarbons were detected at low concentrations in each of the downgradient groundwater samples, and were undetected in the upgradient groundwater samples. Thallium was found in the upgradient and one downgradient groundwater sample at concentrations above the federal MCL. Manganese was found in one downgradient sample at a concentration above the state groundwater criteria. One SVOC was reported at estimated concentrations above groundwater TAGM.

The results of the ESI have identified significant releases of BTEX and PAH compounds in the materials comprising the fill area and disposal pits at SEAD-59. Trace quantities of total petroleum hydrocarbons detected in the fill materials are presumably being leached into the groundwater beneath the site.

SEAD-71

Soil and groundwater were sampled at SEAD-71 as part of the ESI. Soils were also sampled as part of the Phase I RI. Sampling and analyses were based upon historical usage of the area for the disposal of paint and solvents.

Soil

A total of 21 surface soil samples were obtained for chemical analysis as part of the Phase I RI for SEAD-71. Nine soil samples were collected from 4 test pits and screened for BTEX compounds using immunoassay field screening tests. Five test pit soil samples from the 4 test pits were sent to the laboratory for chemical analysis.

No burial pit for paint and solvents was uncovered during either investigation, although the investigations did indicate the soils at SEAD-71 have been impacted by the waste materials which have been disposed of in at least one disposal pit on site. At three test pit locations, polynuclear aromatic hydrocarbons (PAHs) were present at concentrations exceeding the TAGMs. Heavy metals concentrations above the associated criteria values were also present in these three test pits. There is clear evidence that surface soils at SEAD-71 have been impacted by waste materials disposed in the area. Both PAHs and heavy metals were detected above their associated criteria the majority of surface soil samples collected during the Phase I RI.

Groundwater

Groundwater at the site has not been significantly impacted. Metals were the only constituents detected at SEAD-71. Out of the 20 metals found, five (aluminum, iron, lead, manganese, and thallium) were detected at concentrations above groundwater criteria.

Removal Action Plan

The following are the alternatives considered for the removal action at SEAD-59:

Option 1A: Installation of Clay Cover/Slurry Wall
Rationale: Cover will prevent human/animal contact with contaminated soils and will reduce additional leaching of contaminants into groundwater. There is some evidence that the contaminants are leaching into gw so the slurry wall will be installed surrounding covered area to prevent mixing of contaminated gw with non-contaminated gw. Cover and slurry wall will only be installed at Fill Area, which will allow soils from hot spots elsewhere at the site to be excavated and deposited in one location.

Option 1B: Installation of Clay Cover
Rationale: Cover will prevent human/animal contact with contaminated soils and will reduce additional leaching of contaminants into groundwater. Cover will only be installed at Fill Area, which will allow soils from hot spots elsewhere at the site to be excavated and deposited in one location. Since groundwater is not addressed in this option, it is considered and interim solution.

Option 1C: Installation of Vegetative Cover
Rationale: Cover will prevent human/animal contact with contaminated soils. Cover will only be installed at Fill Area, which will allow soils from hot spots elsewhere at the site to be excavated and deposited in one location. Since groundwater is not addressed in this option, it is considered and interim solution.

Option 2: Excavation/Stabilization/Disposal On-Site
Rationale: Stabilization will treat all three classes of contaminants present (VOC, SVOC, metals) and will immobilize contaminants and allow for disposal on-site without further groundwater treatment measures. A topsoil/vegetative cover will prevent human/animal contact with stabilized soils.

Option 3: Excavation/Disposal Off-Site
Rationale: Excavation and off-site disposal will permanently remove contamination from the site and prevent all human/animal contact and leaching of contaminants. No long-term monitoring or maintenance will be necessary.

Option 4: Excavate Buried Drums and Paint Cans/Confirmatory Sampling/Risk Assessment
Rationale: Will allow the removal of the potential source areas and provide a better definition of the risks at the site in order to improve focus of future actions.

The following are the alternatives considered for the removal action at SEAD-71:

Option 1: Excavation/Disposal at SEAD-59
Rationale: Contaminated soils are all surface soils. Excavation and disposal under the cover at SEAD-59 will permanently remove contamination from the SEAD-71 and prevent all human/animal contact and leaching of contaminants at SEAD-71. No long term monitoring will be required at SEAD-71.

Option 2: Excavation/Stabilization/Disposal On-Site
Rationale: Stabilization will treat all three classes of contaminants present (VOC, SVOC, metals) and will immobilize contaminants and allow for disposal on-site without further groundwater treatment measures. A topsoil/vegetative cover will prevent human/animal contact with stabilized soils.

Option 3: Excavation/Stabilization/Disposal Off-Site
Rationale: Excavation and off-site disposal will permanently remove contamination from the site and prevent all human/animal contact and leaching of contaminants. No long-term monitoring or maintenance will be necessary.

Option 4: Risk Assessment
Rationale: Will provide a better definition of the risks at the site in order to improve focus of future actions.

Cost

The following sheets detail the components included in the each option's cost estimate and a summary of the total costs for each option. A more detailed cost breakdown is provided in Table 1 for SEAD-59 and Table 2 for SEAD-71.

SEAD-59

Option	*Cost*
1A. Clay Cover/Slurry Wall	***$1,862,611***
1B. Clay Cover	***$1,849,439***
1C. Vegetative Cover	***$1,656,654***
2. Excavation/Stabilization/Disposal On-site	***$3,410,013***
3. Excavation/Disposal Off-Site	***$3,061,078***
4. Excavate Buried Drums and Paint Cans/ Confirmatory Sampling/ Risk Assessment	***$526,637***

SEAD-71

Option	*Cost*
1. Excavation/Disposal at SEAD-59	***$1,261,120***
2. Excavation/Stabilization/Disposal On-site	***$2,863,983***
3. Excavation/Stabilization/Disposal Off-Site	***$1,856,107***
4. Risk Assessment	***$82,816***

We'd like to go over the proposed alternatives with you at your earliest convenience and discuss what option SEDA would like to pursue.

Table 1
Cost Estimate Alternatives for SEAD-59

	Option 1A	Option 1B	Option 1C	Option 2	Option 3	Option 4
Cost Component	**Clay Cover/ Slurry Wall**	**Clay Cover**	**Vegetative Cover**	**Excavation/ Stabilization/ Disposal On-Site**	**Excavation/ Disposal Off Site**	**Excavate Buried Drums and Pain Cans/Confirmato Sampling/Risk Assessment**
Mobilization and Preparation	$ 79,078	$ 79,078	$ 79,079	$ 75,954	$ 79,078	$ 78,2
Sampling and Testing	$ 36,072	$ 36,072	$ 36,072	$ 245,870	$ 126,876	$ 97,6
Site Work (incl. excavation of drums and paint cans)	$ 368,245	$ 360,145	$ 241,605	$ 366,930	$ 448,411	$ 80,5
Groundwater Collection and Treatment	$ 18,608	$ 18,608	$ 18,608	$ 54,083	$ 21,254	
Treatment of Hazardous Waste	NA	NA	NA	$ 667,013	NA	
Disposal	$ 4,021	$ 4,021	$ 4,021	$ 112,021	$ 1,200,821	$ 4,8
Site Restoration	$ 5,820	$ 5,820	$ 5,820	$ 7,474	$ 5,820	
Risk Assessment	NA	NA	NA	NA	NA	$ 60,0
Demobilization	$ 18,005	$ 18,005	$ 18,005	$ 18,191	$ 13,005	$ 13,0
Cost to Prime	**$ 529,848**	**$ 521,749**	**$ 103,208**	**$ 1,547,537**	**$ 1,895,265**	**$ 334,2**
Field OH (5%)	$ 26,342	$ 25,937	$ 403,208	$ 76,502	$ 94,763	$ 16,7
Home Office (4.6%)	$ 25,447	$ 25,056	$ 19,330	$ 70,382	$ 87,182	$ 16,1
Profit (5.8%)	$ 33,561	$ 33,045	$ 25,494	$ 88,742	$ 109,925	$ 21,2
Bond (1.4%)	$ 8,571	$ 8,439	$ 6,511	$ 24,719	$ 30,620	$ 5,4
Cost to Owner	**$ 623,769**	**$ 614,226**	**$ 474,553**	**$ 1,807,882**	**$ 2,217,756**	**$ 393,8**
Design Contingency (5%)	$ 31,188	$ 30,711	$ 23,728	$ 90,394	$ 110,888	$ 15,8
Escalation (5%)	$ 32,748	$ 32,247	$ 24,914	$ 94,914	$ 116,432	$ 20,1
Construction Contingency (12%)	$ 82,525	$ 81,262	$ 62,783	$ 238,694	$ 293,409	$ 41,8
Other (3.5%)	$ 26,934	$ 26,521	$ 20,485	$ 78,116	$ 95,847	$ 16,3
Construction Management (8%)	$ 63,773	$ 62,797	$ 48,517	$ 184,800	$ 226,747	$ 38,5
Project Cost	**$ 860,937**	**$ 847,765**	**$ 654,980**	**$ 2,494,799**	**$ 3,061,078**	**$ 526,6**
Annual Costs	$ 57,927	$ 57,927	$ 57,927	$ 52,927	$ -	$
Present Worth Cost (30 year)	$ 1,001,674	$ 1,001,674	$ 1,001,674	$ 915,214	$ -	$
Total Evaluated Price	**$ 1,862,611**	**$ 1,849,439**	**$ 1,656,654**	**$ 3,410,013**	**$ 3,061,078**	**$ 526,6**

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Table 2
Cost Estimate Alternatives for SEAD-71

Cost Component	Option 1	Option 2	Option 3	Option 4
	Excavation/ Disposal at SEAD-59	Excavation/ Stabilization/ Disposal On-Site	Excavation/ Stabilization/ Disposal Off-Site	Risk Assessment
Mobilization and Preparation	$ 76,617	$ 82,819	$ 76,819	NA
Sampling and Testing	$ 162,784	$ 180,256	$ 162,784	NA
Site Work	$ 355,726	$ 545,740	$ 350,297	NA
Groundwater Collection and Treatment	NA	NA	NA	NA
Treatment of Hazardous Waste	$ 119,730	$ 344,313	$ 119,730	NA
Disposal	$ 38,000	$ 38,950	$ 418,950	NA
Site Restoration	$ 5,104	$ 5,104	$ 5,104	NA
Risk Assessment	NA	NA	NA	$ 60,000
Demobilization	$ 17,846	$ 17,846	$ 17,846	NA
Cost to Prime	**$ 775,807**	**$ 1,215,029**	**$ 1,151,530**	**$ 60,000**
Field OH (5%)	$ 38,790	$ 60,751	$ 57,576	$ -
Home Office (4.6%)	$ 37,471	$ 58,686	$ 55,619	$ -
Profit (5.8%)	$ 49,420	$ 77,399	$ 73,354	$ -
Bond (1.4%)	$ 12,621	$ 19,766	$ 18,733	$ -
Cost to Owner	**$ 914,110**	**$ 1,431,631**	**$ 1,356,812**	**$ 60,000**
Design Contingency (5%)	$ 45,257	$ 50,849	$ 55,177	$ 3,000
Escalation (5%)	$ 47,968	$ 74,124	$ 70,599	$ 3,150
Construction Contingency (12%)	$ 120,880	$ 186,792	$ 177,911	$ 7,938
Other (3.5%)	$ 39,488	$ 61,019	$ 58,117	$ 2,593
Construction Management (8%)	$ 93,416	$ 144,353	$ 137,489	$ 6,134
Project Cost	**$ 1,261,120**	**$ 1,948,769**	**$ 1,856,107**	**$ 82,816**
Annual Costs	$ -	$ 52,927	$ -	$ -
Present Worth Cost (30 year)	$ -	$ 915,214	$ -	$ -
Total Evaluated Price	**$ 1,261,120**	**$ 2,863,983**	**$ 1,856,107**	**$ 82,816**

SEAD-59 REMOVAL OPTION 1A: CLAY COVER/SLURRY WALL

The following are the components included in the cost estimate for the Clay Cover/Slurry Wall option at SEAD-59:

1. Remove full drums and containers buried at the Fill Area. Full drums will be placed in overpack and disposed of in a hazardous waste landfill. Full paint cans will placed in drums and disposed of in a hazardous waste landfill.
2. Excavate soils from Area 2, 3, 4 and Others (approximately 4125cy). Remove full drums/containers buried at these areas.
3. Dewater excavation and store in holding tank for testing.
4. Treat water (from dewatering excavation) by air stripping, if necessary and discharge into storm drain, sewer, or drainage ditch, as available.
5. Transport drums/containers to hazardous waste landfill. (Assume total of 20 drums for landfill disposal for entire site.)
6. Add excavated soils from SEAD-59, and possibly from SEAD-71, to the Fill Area.
7. Install slurry wall surrounding the Fill Area (10 ft depth, 2 ft wide, 1025 ft total length).
8. Install clay cover over the fill area (1.5 acres) which includes a gas collection/venting layer, groundwater drainage system, vegetative top.
9. Install monitoring wells. Monitor groundwater and vented gas semi-annually for 30 years.

NOTE: $5000/yr is included in Annual Cost (shown below) for cover maintenance.

Cost to Prime:	$529,848
Cost to Owner:	$623,769
Project Cost:	$860,937
Annual Monitoring Costs:	$57,927
30 Year Present Worth Cost:	$1,001,674
TOTAL EVALUATED PRICE:	**$1,862,611**

SEAD-59 REMOVAL OPTION 1B: CLAY COVER

The following are the components included in the cost estimate for the Clay Cover option at SEAD-59:

1. Remove full drums and containers buried at the Fill Area. Full drums will be placed in overpack and disposed of in a hazardous waste landfill. Full paint cans will placed in drums and disposed of in a hazardous waste landfill.
2. Excavate soils from Area 2, 3, 4 and Others (approximately 4125cy). Remove full drums/containers buried at these areas.
3. Dewater excavation and store in holding tank for testing.
4. Treat water (from dewatering excavation) by air stripping, if necessary and discharge into storm drain, sewer, or drainage ditch, as available.
5. Transport drums/containers to hazardous waste landfill. (Assume total of 20 drums for landfill disposal for entire site.)
6. Add excavated soils from SEAD-59, and possibly from SEAD-71, to the Fill Area.
7. Install clay cover over the Fill Area (1.5 acres) which includes a gas collection/venting layer, groundwater drainage system, vegetative top.
8. Install monitoring wells. Monitor groundwater and vented gas semi-annually for 30 years.

NOTE: $5000/yr is included in Annual Cost (shown below) for cover maintenance.

Cost to Prime:	$521,749
Cost to Owner:	$614,226
Project Cost:	$847,765
Annual Monitoring Costs:	$57,927
30 Year Present Worth Cost:	$1,001,674
TOTAL EVALUATED PRICE:	**$1,849,439**

SEAD-59 REMOVAL OPTION 1C: VEGETATIVE COVER

The following are the components included in the cost estimate for the Vegetative Cover option at SEAD-59:

1. Remove full drums and containers buried at the Fill Area. Full drums will be placed in overpack and disposed of in a hazardous waste landfill. Full paint cans will placed in drums and disposed of in a hazardous waste landfill.
2. Excavate soils from Area 2, 3, 4 and Others (approximately 4125cy). Remove full drums/containers buried at these areas.
3. Dewater excavations and store in holding tank for testing.
4. Treat water (from dewatering excavations) by air stripping, if necessary and discharge into storm drain, sewer, or drainage ditch, as available.
5. Transport drums/containers to hazardous waste landfill. (Assume total of 20 drums for landfill disposal for entire site.)
6. Add excavated soils from SEAD-59, and possibly from SEAD-71, to the Fill Area.
7. Install vegetative cover over Fill Area (1.5 acres).
8. Install monitoring wells. Monitor groundwater semi-annually for 30 years.

NOTE: $5000/yr is included in Annual Cost (shown below) for cover maintenance.

Cost to Prime:	$403,208
Cost to Owner:	$474,553
Project Cost:	$654,980
Annual Monitoring Costs:	$57,927
30 Year Present Worth Cost:	$1,001,674
TOTAL EVALUATED PRICE:	**$1,656,654**

SEAD-59 REMOVAL OPTION 2: EXCAVATION/STABILIZATION/ DISPOSAL ON-SITE

The following are the components included in the cost estimate for the Excavation/Stabilization/ Dispose On-Site option at SEAD-59:

1. Layout areas to be excavated.
2. Dewater excavation and store in holding tank for testing and treatment.
3. Excavate soils (23,025cy for entire site, depths of 3 to 9.5 ft depending on area of site).
4. Treat water by air stripping and discharge into storm drain, sewer, or drainage ditch, as available.
5. Screen excavated soils to remove debris.
6. Dispose of screened debris. Full drums will be placed in overpack and disposed of in hazardous waste landfill. Full paint cans will placed in drums and disposed of in hazardous waste landfill. Construction debris will be disposed of as solid waste.
7. Stabilize screened soil. A cement-based mixture is assumed to be the stabilizing media unless treatability studies prove the cement ineffective. Pozzolan-based or thermoplastic (asphalt batching) mixtures will be used as alternatives.
8. Return stabilized soil to excavations.
9. Cover with topsoil and vegetative cover.
10. Install monitoring wells (if additional wells are necessary). Monitor groundwater semi-annually for 30 years.

Cost to Prime:	$1,547,537
Cost to Owner:	$1,807,882
Project Cost:	$2,494,799
Annual Monitoring Costs:	$52,927
30 Year Present Worth Cost:	$915,214
TOTAL EVALUATED PRICE:	**$3,410,013**

SEAD-59 REMOVAL OPTION 4: EXCAVATE BURIED DRUMS and PAINT CANS/CONFIRMATORY SAMPLING/RISK ASSESSMENT

The following are the components included in the cost estimate for the Excavate Buried Drums and Paint Cans/Confirmatory Sampling/Risk Assessment option at SEAD-59:

1. Layout areas to be excavated.
2. Excavate soils (4,300CY at varying depths).
3. Remove drums and paint cans.
4. Overpack drums and ship off-site for disposal. (Assume total of 20 drums for landfill disposal for entire site.)
5. Sample groundwater in excavation and soil from the walls and sides of excavation.
6. Fill in excavations with clean fill.
7. Perform risk assessment.

Cost to Prime:	$334,264
Cost to Owner:	$393,853
Project Cost:	$526,637

No Annual Monitoring/Maintenance Costs Assumed.

TOTAL EVALUATED PRICE: $526,637

SEAD-71 REMOVAL OPTION 1: EXCAVATION/DISPOSAL AT SEAD-59

The following are the components of the Excavation/Disposal at SEAD-59 cost estimate for SEAD-71 soils:

1. Layout areas to be excavated.
2. Excavate soils (approx. 8900cy, 3 ft. depth).
3. Screen excavated soils to remove debris.
4. Dispose of screened debris. Construction debris will be disposed of as a solid waste.
5. Stabilize screened soil. (About 275-cy of SEAD-71 soils will need to be stabilized due to lead levels above the TCLP limit (800mg/kg)). A cement-based mixture is assumed to be the stabilizing media unless treatabilty studies prove the cement ineffective. Pozzolan-based or thermoplastic (asphalt batching) mixtures will be used as alternatives.
6. Transport excavated soils to SEAD-59.
7. Backfill excavation with clean fill obtained off-site.
8. Cover with topsoil and vegetative cover (1.8 acres).

Cost to Prime:	$775,807
Cost to Owner:	$914,110
Project Cost:	$1,261,120

No Annual Monitoring/Maintenance Costs Assumed.

TOTAL EVALUATED PRICE: $1,261,120

SEAD-71 REMOVAL OPTION 2: EXCAVATION/STABILIZATION/ DISPOSAL ON-SITE

The following are the components included in the cost estimate for the Excavation/Stabilization/ Disposal On-site option at SEAD-71:

1. Layout areas to be excavated.
2. Excavate soils (approximately 8900cy, 3 ft. depth).
3. Screen excavated soils to remove debris.
4. Dispose of screened debris. Construction debris will be disposed of as solid waste.
5. Stabilize screened soil. A cement-based mixture is assumed to be the stabilizing media unless treatabilty studies prove the cement ineffective. Pozzolan-based or thermoplastic (asphalt batching) mixtures will be used as alternatives.
6. Backfill excavation with stabilized soil.
7. Cover with topsoil and vegetative cover (1.8 acres).
8. Install 4 monitoring wells (if additional wells are necessary). Monitor groundwater semi-annually for 30 years.

Cost to Prime:	$1,215,029
Cost to Owner:	$1,431,631
Project Cost:	$1,948,769
Annual Monitoring Costs:	$52,927
30 Year Present Worth Cost:	$915,214
TOTAL EVALUATED PRICE:	**$2,863,983**

SEAD-71 REMOVAL OPTION 3: EXCAVATION/STABILIZATION/ DISPOSAL OFF-SITE

The following are the components included in the cost estimate for the Excavation/Stabilization/ Off-site Disposal option at SEAD-71:

1. Layout areas to be excavated.
2. Excavate soils (approx. 8900cy, 3ft depth).
3. Screen excavated soils to remove debris.
4. Dispose of screened debris. Construction debris will be disposed of as solid waste.
5. Stabilize screened soil. (About 275cy of SEAD-71 soils will need to be stabilized due to lead levels > the TCLP limit (800mg/kg)). A cement-based mixture is assumed to be the stabilizing media unless treatability studies prove the cement ineffective. Pozzolan-based or thermoplastic (asphalt batching) mixtures will be used as alternatives.
6. Transport excavated soils to landfill.
7. Backfill excavation with clean fill obtained off-site.
8. Cover with topsoil and vegetative cover (1.8 acres).

Cost to Prime:	$1,151,530
Cost to Owner:	$1,356,812
Project Cost:	$1,856,107

No Annual Monitoring/Maintenance Costs Assumed.

TOTAL EVALUATED PRICE: $1,856,107

SEAD-71 REMOVAL OPTION 4: RISK ASSESSMENT

The following are the components included in the cost estimate for the Risk Assessment option at SEAD-59:

1. Perform risk assessment to determine if any further action is needed.

Cost to Prime:	$60,000
Cost to Owner:	$60,000
Project Cost:	$82,816

No Annual Monitoring/Maintenance Costs Assumed.

TOTAL EVALUATED PRICE: $82,816

ANNUAL GROUNDWATER MONITORING COSTS

The following are the components included in the cost estimate for the annual groundwater monitoring:

1. Sampling of 4 wells, twice a year. A total of six samples will be collected per event (4 wells + dup + qc).
2. Each event will last 4 days and require a crew of 2 people. (2 wells sampled/day + 1 day set up + 1 day demob = 4 days/person/event, 2 people, 2 events/year)
3. VOCs, SVOCs, and metals analyses for each sample collected.
4. All equipment, supplies, and health and safety supplies necessary for the 2 events.

Cost to Prime:	$32,633
Cost to Owner:	$38,451
Project Cost:	$52,927
TOTAL EVALUATED PRICE:	**$52,927**

PARSONS ENGINEERING SCIENCE, INC.

MEMORANDUM

TO: Steve Absolom, SEDA
Janet Fallo
Kevin Healy

DATE: December 15, 2000

FROM: Eliza Schacht

COPIES:

SUBJECT: Removal Actions Considered for SEAD-59, Fill Area West of Building 135 and SEAD-71, Alleged Paint Disposal Area
Cost Comparison of Three Alternatives for SEAD-59

This memo provides you with a cost comparison of three alternatives for SEAD-59, which are based on our telephone conference call on September 27, 2000. Please refer to the memo that I sent you dated June 28, 2000, which summarizes the findings of investigations conducted at SEADs-59 and 71 and includes soil data tables and figures showing the remedial action areas. Attached are the TRACES cost estimate summaries for three alternatives for SEAD-59.

The following table lists the costs of each Alternative for SEAD-59.

Alternatives	
1A. Solid Waste Landfill Cover/Slurry Wall	**$3,820,673**
2. Excavation/LTTD/Disposal On-site	**$10,567,958**
3. Excavation/Disposal Off-Site	**$7,081,350**

The following changes were made in the Alternatives and cost estimates based on our conference call on September 27, 2000 and our discussion with NYSDEC and the EPA on July 31, 2000.

1. The contingencies in the MCASES program, which were developed by our cost estimating group, were reviewed. Most contingencies appear to be reasonable and were left unchanged except the design contingency, which was reduced from 10% to 2%. Design costs including reports and workplans were added to the cost estimates as line items.
2. Based on the comments of Marsden Chen (NYSDEC) concerning data gaps for areas not excavated during the remedial action, 40 soil borings located in a grid pattern (50-foot spacing) in the Area south of the road were added to each alternative.
3. The on-site stabilization option was changed to include the use of the on-site LTTD unit.
4. The landfill cover was revised to conform to the NYSDEC Part 360 Solid Waste Landfill requirements.
5. The cost of excavating, screening, and stockpiling was consolidated into one line item costing $20/cy based on clarification of the Sessler quote.

Regarding Alternative 2 (LTTD/Vegetative Cover), stabilization at the LTTD will treat the SVOCs. In the fill area, PAH compounds were found in several surface and subsurface soil samples at concentrations exceeding TAGM criteria. TPHs were detected in the majority of the soil samples collected from the fill area. Lead, mercury, and zinc were also detected in several soil samples at concentrations above TAGM. However, it does not appear that the concentrations of any compounds are above TCLP. The stabilized soil from the LTTD, which will have metals concentrations above TAGM criteria, will be covered with a vegetative cover to prevent human/animal contact with the metals in the soils.

Assumptions

The following assumptions were used to develop the cost estimates for the three alternatives:

- The contractor(s) will mobilize to the site, clear and grub the areas of work, establish access roads and survey the areas to be remediated. It was estimated that 3 acres of land will require light clearing and grubbing. Clearing and grubbing is necessary to perform soil capping, soil excavation, sediment excavation, and stockpiling.
- Erosion control (silt fence and haybales) will be installed around excavation areas and stockpile areas. Erosion control is necessary to prevent soil particles from migrating off-site and into drainage swales during construction. The erosion control will be maintained throughout construction.
- A temporary fence will be installed around the site for all alternatives.
- A surveyor will be on site for approximately 10 days to layout the excavation areas and survey record information.
- In situ volumes of material are based on the areas and proposed excavation depths shown in Figure 4-1. For costs based on a per cubic yard basis, such as excavation and hauling, an expansion factor of 30 percent was used to estimate ex situ volumes for soil.. An additional 10% was used to address the uncertainty of the volume estimation. For costs based on weight, a conversion factor of 1.5 tons of moist material per cubic yard was used for estimating purposes. The 30 percent expansion factor was not applied to weight calculations. The volume of material requiring excavation, or soil covering may vary depending on the results of the cleanup verification sampling.
- The total in situ volume of soil is estimated to be 18,900 cubic yards in the Fill Area and 4,125 cubic yards in Areas 2, 3, 4, and Others. Using an expansion factor of 30 percent and an additional factor of 10 percent for the uncertainty of the volume estimation, the ex situ volume of soil is estimated to be 26,460 and 5,775 cubic yards, respectively.
- Cleanup verification sampling of the soil will be conducted at a frequency of one sample every 2500 square feet (i.e. 50 ft by 50 ft grids) in the Fill Area. For Areas 2, 3, 4, and Others, which are small excavations, five samples will be collected at each site (17 sites). This frequency will be revised based on the actual cleanup verification work plan.
- Excavated soil will be placed in a stockpile area prior to treatment and/or disposal. The stockpile areas will be lined (and covered) with a 6-mil polyethylene liner. Each pile will consist of 150 cubic yards of soil and will occupy a space of approximately 50 x 50 square feet. Prior to off-site disposal, one composite sample from each pile will be obtained and submitted for TCLP analysis
- TCLP testing for off-site disposal will be conducted at a frequency of one sample every 150 cubic yards. This value will be revised during final design after selection of the off-site landfill.

- Transportation and disposal costs are based on quotes from Earthwatch Waste Systems, Inc. and Waste Management, Inc. Based on these quotes, transportation and disposal of RCRA Hazardous Material (i.e. overpacked drums) to an off-site facility will cost $133 each. In addition, transportation and disposal of non-hazardous soil and debris (i.e. soil which passes the TCLP test and does not require stabilization) in an off-site Subtitle D landfill will cost $40 per ton.. For cost estimating purposes, it has been assumed that all material will not fail the TCLP test and will not require stabilization prior to off-site disposal.
- Based on the soil data from SEAD-59, it was assumed that 75% of the excavated soil (25,650 tons) will have PAH concentrations above TAGM and will require treatment at the LTTD.
- Cost estimates were developed for all alternatives based on removing geophysical anomalies and remediating soils with metals greater than site-specific background concentrations and semi-volatile organics concentrations greater than TAGM values.
- Excavated soil will be stockpiled and tested for Toxicity Characteristic Leaching Procedure (TCLP) prior to being disposed. Material passing the TCLP criteria will be transported and disposed off-site in a Subtitle D Landfill for Alternative 3. For Alternative 2, material passing TCLP will be backfilled into the Fill Area and covered with a vegetative cover. Based on the data collected from the site to date, we do not expect any soil to exceed TCLP.
- For Alternative 1, a NYSDEC Part 360 Solid Waste Landfill cover will be placed over the Fill Area. This cover will consist of top soil, 24" protective layer, geomembrane, 12" gas venting layer, and a drainage layer. The area is estimated to be 63,796 sf. For Alternative 2, a vegetative cover will be placed over the Fill Area. For all alternatives, Areas 2, 3, 4, and Others will be backfilled using common fill and topsoil.

Post-Closure Monitoring

- Site groundwater will be monitored on a semi-annual basis. Currently, there are approximately 5 groundwater monitoring wells at SEAD-59. New wells will be installed as necessary to ensure that the monitoring program is sufficient to detect any migration from the area.

Operation and Maintenance (O & M)

O & M and monitoring costs, which include labor, maintenance materials, and purchased services, have been estimated. Alternatives 1 and 2 requires O & M, such as maintaining the integrity of the soil cover that may become compromised due to erosion, runoff and freeze/thaw conditions. Periodic re-seeding may also be necessary to minimize soil lose due to surface erosion. There are no O&M activities associated with Alternative 3.

Markups and Contingencies

Construction costs include those expenditures required to implement a remedial action. Both direct and indirect costs are considered in the development of construction cost estimates Direct costs include construction costs or expenditures for equipment, labor, and materials required to implement a remedial action Indirect costs include those associated with engineering, construction management, and other services necessary to carry out a remedial action.

The following markups were used to develop the detail cost estimates for all the alternatives.

Contractor Costs (cost to owner)

The contractor costs shown below are the costs to the owner for markup on the direct costs to the prime contractor for implementation of the remedial action. The prime contractors' direct costs include all materials, equipment, and labor for management of all subcontractors and field construction work. The prime contractor is typically contracted directly to the owner (COE NE/NY SEDA).

Contractor costs are calculated as a percentage of the running total of the contractors direct costs as:

- 5% for field office support. Field office support includes items such as supervision at the job, site, temporary facilities, temporary material storage, temporary utilities, operation and maintenance of temporary job-site facilities, preparatory work, health and safety supplies and requirements, transportation vehicles, cleanup, and equipment costs not chargeable to a specific task.
- 15% for home office support. Home office support includes items such as management and office staff salary and expense, main office building furniture and equipment, utilities, general communications and travel, supplies, general business insurance, and taxes. It also includes job specific items such as engineering and shop drawings/surveys, insurance (project coverage), schedules & reports, and quality control.
- 10% for profit. Profit provides the contractor with an incentive to perform the work as efficiently as possible. The profit used in the cost estimates is based on the current average profit for contractors in the Syracuse area.
- 4% for bond. The bond rate is based on recommendations from the USACE Engineering Instructions – Construction Cost Estimates (September 1997) for hazardous, toxic and radioactive waste (HTRW) projects.

Owner Costs

Owner costs shown below are costs that are typically accounted for as part of the overall project costs for completion of the Remedial Action at SEAD-59. These costs are the contingency costs used to account for potential cost increases due to uncertainties associated with conceptual remedial design construction projects.

Owner's cost are calculated as a percentage of running total as:

- 2% for design contingency. Design contingencies include construction cost increases due to design incompleteness, detail changes, alternative design changes, and associated costing inaccuracy. (A separate cost line item was included in the MCASES cost estimation for remedial design work plan, remedial design, remedial action workplan, health and safety plan, QA/QC plan, and sampling and analysis plan.)
- 3% for escalation. This item reflects the cost inflation beyond the effective pricing date of the baseline estimate. A rate of 3% per year is assumed.
- 25% for construction contingency. Construction contingencies are a reserve for construction cost increases due to adverse or unexpected conditions such as unforeseeable relocations, site conditions,

utility lines in unknown locations, quantity overruns, or other unforeseen problems beyond interpretation at the time of or after contract award The construction contingency used is based on recommendations from the USACE Engineering Instructions – Construction Cost Estimates (September 1997) for remedial action projects and on prior experience.

- 3.5% for other costs. Other government costs include the following: engineering during construction (EDC) (1.5%). as-builts (0.5%), operation and maintenance (O&M) manuals (0.5%). and government laboratory quality assurance (1.0%). These rates are based on recommendations from the USACE Engineering Instructions – Construction Cost Estimates (September 1997) for remedial action projects.
- 8% for construction management. These rates are based on recommendations from the USACE Engineering Instructions – Construction Cost Estimates (September 1997) for remedial action projects.

If you need any additional information (MCASES cost estimates, etc.) or have any questions, please call me at 781-401-2361. We would like to discuss this project next week in order to submit the EE/CA for SEADs-59 and 71.

Eliza Schacht, P.E.
Task Order Manager

TABLE 1
SENECA ARMY DEPOT ACTIVITY
SEAD-59 AND 71 EE/CA
DETAIL COST ESTIMATES

	ALTERNATIVE 1 NYSDEC Part 360 Landfill Cover	ALTERNATIVE 2 LTTD/Vegetative Cover	ALTERNATIVE 3 Off-site Disposal
Cost to Prime [1]	$1,482,992	$4,886,579	$3,495,413
Cost to Owner [2]	$2,047,160	$6,750,220	$4,823,970
Project Cost [3]	$3,005,130	$9,908,960	$7,081,350
Annual O&M Costs [4]	$5,000	$5,000	$0
Annual Post Remediation Monitoring Costs	$42,163	$33,110	$0
Present Worth O&M and Monitoring Cost (30 year) [5]	$815,543	$658,998	$0
Total Evaluated Price [6]	$3,820,673	$10,567,958	$7,081,350

NOTES

1 Cost to Prime (Contractor) is the sum of the direct costs plus any sales tax, subcontractor markups, and adjust pricing that have been applied in the project.

2 Cost to Owner is the sum of the Cost to Prime plus prime contractor Indirect Cost. Also known as the bid amount or construction contract cost.

3 Project Cost is the sum of the Direct, Indirect, and Owner costs for the project

4 Annual Costs are costs that will occur yearly due to activities such as maintenance or monitoring.

5. Present Worth Cost is based on a 4% interest rate over the number of years specified above. (Refer to Table E-2)

6. Total Evaluated Price is the sum of the Project Cost and Present Worth Cost.

7 Soil remediated to lead concentrations as noted

TABLE 2
SENECA ARMY DEPOT ACTIVITY
SEAD-4 FEASIBILITY STUDY
REMEDIAL ALTERNATIVES RETAINED FOR DETAILED ANALYSIS

ALTERNATIVE	TECHNOLOGIES AND PROCESSES
1	**On-site Containment: NYSDEC Part 360 Solid Waste Landfill Cover** - Mobilize, site prep, clear/grub, erosion control, access roads, and survey - Excavate geophysical anomalies in Fill Area - Excavate Areas 2, 3, 4, Other located south of the road. - Screen out drums, debris, paint cans - Perform cleanup confirmatory testing in Areas 2, 3, 4, Others. - Perform 40 soil borings in a grid pattern in the area south of the road to fill the data gap - Areas south of the road will be backfilled with clean fill - Transport and dispose drums, debris, and paint cans in an off-site landfill - Place a 6 NYCRR Part 360 Solid Waste Landfill cover over the Fill Area - Construct a slurry wall around the Fill Area - Backfill Areas 2, 3, 4, Others with common fill and topsoil and hydroseed - Demobilize - Long-term O & M and monitoring
2	**On-site Treatment:: Excavate/Stabilize at LTTD/On-site Disposal/Vegetative Cover** - Mobilize, site prep, clear/grub, erosion control, access roads, and survey - Excavate the Fill Area and Areas South of the Road (Areas 2, 3, 4, Other) - Perform cleanup confirmatory testing - Screen out drums, debris, and paint cans. - Perform 40 soil borings in a grid in the area south of the road to fill the data gap - Stockpile soil and perform testing - Stabilize soil exceeding TAGM criteria for PAHs at the on-site LTTD - Transport and dispose drums, paint cans, and non-exempt construction debris in off-site hazardous waste landfill - Transport soil back to the Fill Area and backfill - Construct a vegetative cover over the backfilled soils at the Fill Area to prevent human/animal contact with soil - BackFill the Fill Area and Areas 2, 3, 4, and Other will common fill and topsoil and hydroseed. - Demobilize - Long-term monitoring for RCRA Indicators
3	**Off-Site Disposal: Excavate/Off-site Disposal** - Mobilize, site prep, clear/grub, erosion control, access roads, and survey - Excavate the Fill Area and Areas South of the Road (Areas 2, 3, 4, Other) - Perform cleanup confirmatory testing. - Screen out drums, debris, and paint cans - Perform 40 soil borings in a grid in the area south of the road to fill the data gap - Stockpile soil and perform TCLP testing, which is requird for non-hazardous landfill disposal - Transport and dispose drums and paint cans in an off-site hazardous waste landfill - Transport and dispose soil and construction debris in an off-site solid waste landfill - Backfill the Fill Area and Areas 2, 3, 4, and Other will common fill and topsoil and hydroseed - Demobilize

Table 2-6
Summary of Compounds Detected in Soil During
SEAD-59 ESI and Phase I RI

EE/CA - SEADs 59/71
Seneca Army Depot Activity

COMPOUND	UNIT	NUMBER OF ANALYSES	NUMBER OF DETECTIONS	FREQUENCY OF DETECTION	MAXIMUM VALUE	NUMBER ABOVE TAGM	TAGM
VOLATILE ORGANICS							
1,1,1-Trichloroethane	UG/KG	55	0	0 00%	0	0	800.
1,1,2,2-Tetrachloroethane	UG/KG	55	0	0.00%	0	0	600
1,1,2-Trichloroethane	UG/KG	55	0	0 00%	0	0	
1,1-Dichloroethane	UG/KG	55	0	0 00%	0	0	200.
1,1-Dichloroethene	UG/KG	55	0	0.00%	0	0	400
1,2-Dichloroethane	UG/KG	55	0	0 00%	0	0	100
1,2-Dichloroethene (total)	UG/KG	55	0	0 00%	0	0	
1,2-Dichloropropane	UG/KG	55	0	0 00%	0	0	
Acetone	UG/KG	55	1	1 82%	150	0	200.
Benzene	UG/KG	55	3	5.45%	5900	2	60
Bromodichloromethane	UG/KG	55	0	0.00%	0	0	
Bromoform	UG/KG	55	0	0 00%	0	0	
Carbon disulfide	UG/KG	55	1	1 82%	4	0	2,700
Carbon tetrachloride	UG/KG	55	0	0.00%	0	0	600
Chlorobenzene	UG/KG	55	0	0 00%	0	0	1,700
Chlorodibromomethane	UG/KG	55	0	0.00%	0	0	
Chloroethane	UG/KG	55	0	0 00%	0	0	1,900
Chloroform	UG/KG	55	0	0 00%	0	0	300
Cis-1,3-Dichloropropene	UG/KG	55	0	0.00%	0	0	
Ethyl benzene	UG/KG	55	4	7 27%	260000	1	5,500
Methyl bromide	UG/KG	55	0	0 00%	0	0	
Methyl butyl ketone	UG/KG	55	0	0.00%	0	0	
Methyl chloride	UG/KG	55	1	1.82%	1	0	
Methyl ethyl ketone	UG/KG	55	3	5.45%	36	0	300.
Methyl Isobutyl ketone	UG/KG	55	0	0 00%	0	0	1,000.
Methylene chloride	UG/KG	55	2	3 64%	2	0	100
Styrene	UG/KG	55	0	0.00%	0	0	
Tetrachloroethene	UG/KG	55	0	0 00%	0	0	1,400.
Toluene	UG/KG	55	8	14.55%	830000	1	1,500
Total Xylenes	UG/KG	55	6	10.91%	1000000	1	1,200.
Trans-1,3-Dichloropropene	UG/KG	55	0	0 00%	0	0	
Trichloroethene	UG/KG	55	2	3.64%	2	0	700
Vinyl chloride	UG/KG	55	0	0 00%	0	0	200.
SEMIVOLATILE ORGANICS							
1,2,4-Trichlorobenzene	UG/KG	54	1	1.85%	28	0	3,400
1,2-Dichlorobenzene	UG/KG	54	0	0.00%	0	0	7,900
1,3-Dichlorobenzene	UG/KG	54	0	0.00%	0	0	1,600
1,4-Dichlorobenzene	UG/KG	54	0	0.00%	0	0	8,500
2,2'-oxybis(1-Chloropropane)		21	0	0.00%	0	0	
2,4,5-Trichlorophenol	UG/KG	54	0	0 00%	0	0	100.
2,4,6-Trichlorophenol	UG/KG	54	0	0 00%	0	0	
2,4-Dichlorophenol	UG/KG	54	0	0.00%	0	0	400
2,4-Dimethylphenol	UG/KG	54	0	0 00%	0	0	
2,4-Dinitrophenol	UG/KG	54	0	0.00%	0	0	200
2,4-Dinitrotoluene	UG/KG	54	0	0 00%	0	0	

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2,6-Dinitrotoluene	UG/KG	54	0	0.00%	0	0	1,000.
2-Chloronaphthalene	UG/KG	54	0	0.00%	0	0	
2-Chlorophenol	UG/KG	54	0	0.00%	0	0	800.
2-Methylnaphthalene	UG/KG	54	37	68.52%	67000	2	36,400
2-Methylphenol	UG/KG	54	0	0.00%	0	0	100
2-Nitroaniline	UG/KG	54	0	0.00%	0	0	430
2-Nitrophenol	UG/KG	54	0	0.00%	0	0	330.
3,3'-Dichlorobenzidine	UG/KG	54	0	0.00%	0	0	
3-Nitroaniline	UG/KG	54	0	0.00%	0	0	500.
4,6-Dinitro-2-methylphenol	UG/KG	54	0	0.00%	0	0	
4-Bromophenyl phenyl ether	UG/KG	54	0	0.00%	0	0	
4-Chloro-3-methylphenol	UG/KG	54	0	0.00%	0	0	240
4-Chloroaniline	UG/KG	54	0	0.00%	0	0	220
4-Chlorophenyl phenyl ether	UG/KG	54	0	0.00%	0	0	
4-Methylphenol	UG/KG	54	2	3.70%	83	0	900.
4-Nitroaniline	UG/KG	54	0	0.00%	0	0	
4-Nitrophenol	UG/KG	54	0	0.00%	0	0	100.
Acenaphthene	UG/KG	54	39	72.22%	20000	0	50,000.
Acenaphthylene	UG/KG	54	29	53.70%	5700	0	41,000
Anthracene	UG/KG	54	36	66.67%	38000	0	50,000
Benzo[a]anthracene	UG/KG	54	44	81.48%	67000	31	224.
Benzo[a]pyrene	UG/KG	54	43	79.63%	70000	33	61
Benzo[b]fluoranthene	UG/KG	54	46	85.19%	58000	13	1,100
Benzo[ghi]perylene	UG/KG	54	39	72.22%	35000	0	50,000.
Benzo[k]fluoranthene	UG/KG	54	41	75.93%	48000	12	1,100
Bis(2-Chloroethoxy)methane	UG/KG	54	0	0.00%	0	0	
Bis(2-Chloroethyl)ether	UG/KG	54	0	0.00%	0	0	
Bis(2-Chloroisopropyl)ether	UG/KG	34	0	0.00%	0	0	
Bis(2-Ethylhexyl)phthalate	UG/KG	54	33	61.11%	15000	0	50,000
Butylbenzylphthalate	UG/KG	54	4	7.41%	1000	0	50,000
Carbazole	UG/KG	54	36	66.67%	33000	0	
Chrysene	UG/KG	54	45	83.33%	63000	26	400
Di-n-butylphthalate	UG/KG	54	22	40.74%	250	0	8,100
Di-n-octylphthalate	UG/KG	54	5	9.26%	11	0	50,000.
Dibenz[a,h]anthracene	UG/KG	54	34	62.96%	17000	29	14
Dibenzofuran	UG/KG	54	34	62.96%	18000	1	6,200
Diethyl phthalate	UG/KG	54	15	27.78%	12	0	7,100.
Dimethylphthalate	UG/KG	54	0	0.00%	0	0	2,000
Fluoranthene	UG/KG	54	46	85.19%	160000	1	50,000.
Fluorene	UG/KG	54	38	70.37%	38000	0	50,000
Hexachlorobenzene	UG/KG	54	0	0.00%	0	0	410
Hexachlorobutadiene	UG/KG	54	0	0.00%	0	0	
Hexachlorocyclopentadiene	UG/KG	54	0	0.00%	0	0	
Hexachloroethane	UG/KG	54	0	0.00%	0	0	
Indeno[1,2,3-cd]pyrene	UG/KG	54	42	77.78%	34000	4	3,200
Isophorone	UG/KG	54	0	0.00%	0	0	4,400
N-Nitrosodiphenylamine	UG/KG	54	0	0.00%	0	0	

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N-Nitrosodipropylamine	UG/KG	54	0	0 00%	0	0	
Naphthalene	UG/KG	54	35	64 81%	29000	2	13,000
Nitrobenzene	UG/KG	54	0	0.00%	0	0	200
Pentachlorophenol	UG/KG	54	0	0 00%	0	0	1,000.
Phenanthrene	UG/KG	54	46	85.19%	140000	2	50,000.
Phenol	UG/KG	54	2	3.70%	17	0	30
Pyrene	UG/KG	54	47	87 04%	120000	1	50,000
PESTICIDES/PCBS							
4,4'-DDD	UG/KG	54	31	57 41%	450	0	2,900
4,4'-DDE	UG/KG	54	34	62.96%	150	0	2,100.
4,4'-DDT	UG/KG	54	31	57 41%	350	0	2,100
Aldrin	UG/KG	54	2	3 70%	1.2	0	41
Alpha-BHC	UG/KG	54	4	7 41%	14	0	110.
Alpha-Chlordane	UG/KG	54	13	24 07%	81	0	
Aroclor-1016	UG/KG	54	0	0 00%	0	0	1000/10000(a)
Aroclor-1221	UG/KG	54	0	0.00%	0	0	1000/10000(a)
Aroclor-1232	UG/KG	54	0	0 00%	0	0	1000/10000(a)
Aroclor-1242	UG/KG	54	0	0.00%	0	0	1000/10000(a)
Aroclor-1248	UG/KG	54	0	0.00%	0	0	1000/10000(a)
Aroclor-1254	UG/KG	54	2	3 70%	63	0	1000/10000(a)
Aroclor-1260	UG/KG	54	0	0 00%	0	0	1000/10000(a)
Beta-BHC	UG/KG	54	7	12 96%	4 7	0	200
Delta-BHC	UG/KG	54	7	12 96%	8.5	0	300
Dieldrin	UG/KG	54	4	7.41%	4 9	0	44
Endosulfan I	UG/KG	54	8	14 81%	26	0	900.
Endosulfan II	UG/KG	54	5	9 26%	7.1	0	900
Endosulfan sulfate	UG/KG	54	5	9.26%	20	0	1,000
Endrin	UG/KG	54	9	16 67%	46	0	100.
Endrin aldehyde	UG/KG	54	12	22.22%	17	0	
Endrin ketone	UG/KG	54	9	16 67%	77	0	
Gamma-BHC/Lindane	UG/KG	54	0	0.00%	0	0	60
Gamma-Chlordane	UG/KG	54	11	20.37%	100	0	540
Heptachlor	UG/KG	54	0	0 00%	0	0	100
Heptachlor epoxide	UG/KG	54	14	25 93%	10	0	20.
Methoxychlor	UG/KG	54	2	3 70%	110	0	
Toxaphene	UG/KG	54	0	0 00%	0	0	
METALS							
Aluminum	MG/KG	54	54	100.00%	20600	1	19,520.
Antimony	MG/KG	54	12	22 22%	424	1	6
Arsenic	MG/KG	54	54	100.00%	6.1	0	8.9
Barium	MG/KG	54	54	100.00%	304	1	300
Beryllium	MG/KG	54	54	100 00%	0.91	0	1.13
Cadmium	MG/KG	54	20	37.04%	3 2	1	2.46
Calcium	MG/KG	54	54	100 00%	214000	4	125,300
Chromium	MG/KG	54	54	100 00%	25 5	0	30

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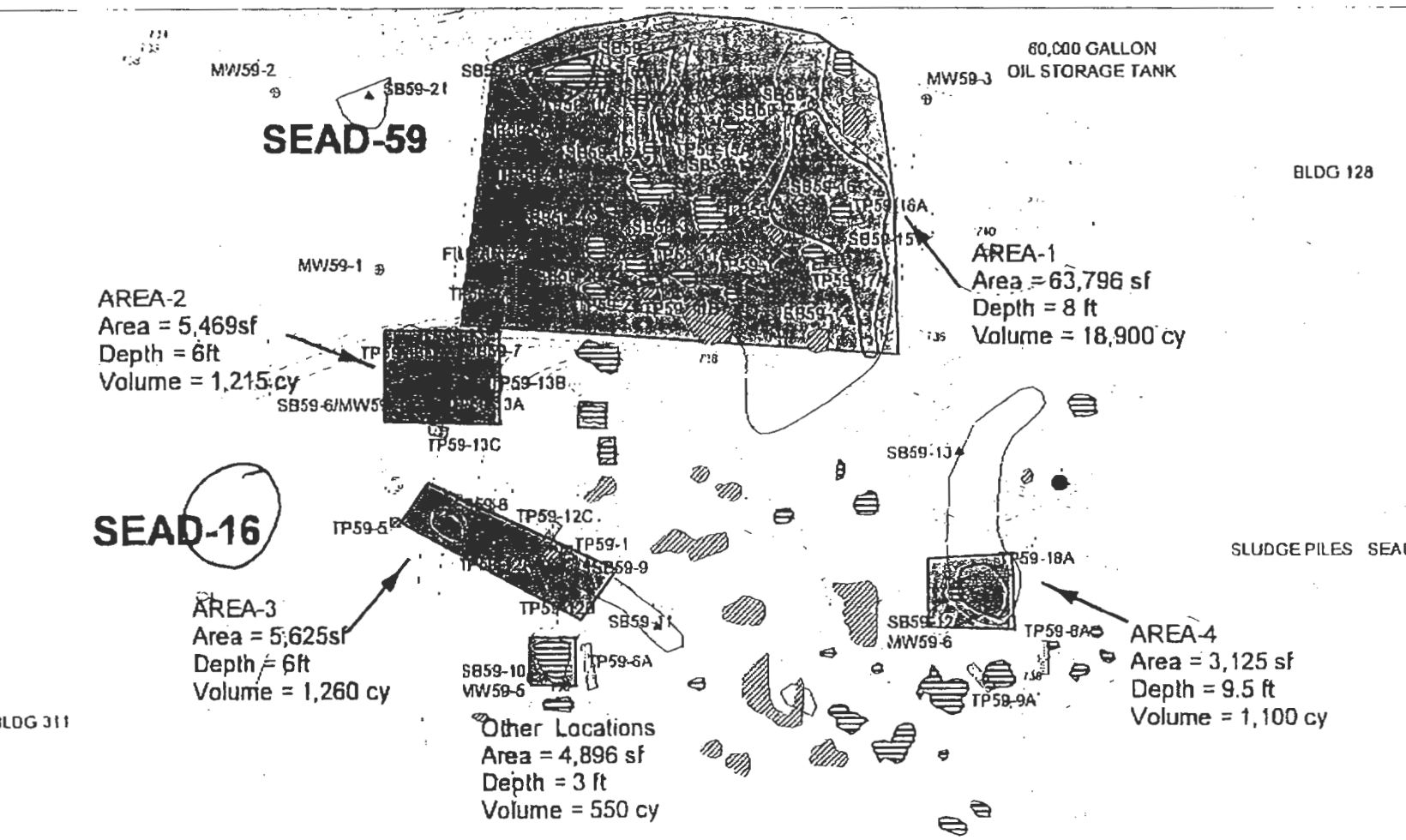
COMPOUND	UNIT	NUMBER OF ANALYSES	NUMBER OF DETECTIONS	FREQUENCY OF DETECTION	MAXIMUM VALUE	NUMBER ABOVE TAGM	TAGM
Cobalt	MG/KG	54	54	100 00%	14 7	0	30.
Copper	MG/KG	54	54	100 00%	36 1	1	33.
Cyanide	MG/KG	54	0	0.00%	0	0	.35
Iron	MG/KG	54	54	100 00%	33300	0	37,410
Lead	MG/KG	54	54	100 00%	139	29	24 4
Magnesium	MG/KG	54	54	100 00%	34400	1	21,700
Manganese	MG/KG	54	54	100.00%	1150	1	1,100.
Mercury	MG/KG	54	34	62 96%	1 6	11	.1
Nickel	MG/KG	54	54	100.00%	41.4	0	50.
Potassium	MG/KG	54	54	100 00%	2520	0	2,623
Selenium	MG/KG	54	18	33.33%	2 2	1	2
Silver	MG/KG	54	4	7.41%	4.1	1	8
Sodium	MG/KG	54	43	79 63%	2310	16	188
Thallium	MG/KG	54	0	0 00%	0	0	.855
Vanadium	MG/KG	54	54	100.00%	41 9	0	150.
Zinc	MG/KG	54	54	100.00%	1550	6	115.
OTHER ANALYSES							
Total Petroleum Hydrocarbons	MG/KG	55	35	63 64%	19700	NA	
Nitrate/Nitrite Nitrogen	MG/KG	34	34	100.00%	9 9	NA	

Notes:
(a) The TAGM values for PCBs is 1000ug/kg for surface soils and 10,000ug/kg for subsurface soils.


SEAD-59
SEAD-16
60,000 GALLON
OIL STORAGE TANK
BLDG 128
SLUDGE PILES SEAD
BLDG 311
MW59-2
SB59-21
MW59-3
MW59-1
SB59-6/MW59-6
TP59-13C
TP59-13B
TP59-16A
SB59-15
TP59-12C
TP59-1
TP59-9
TP59-5
TP59-18A
TP59-8A
TP59-9A
SB59-10
MW59-5
TP59-6A
AREA-1
Area = 63,796 sf
Depth = 8 ft
Volume = 18,900 cy
AREA-2
Area = 5,469sf
Depth = 6ft
Volume = 1,215 cy
AREA-3
Area = 5,625sf
Depth = 6ft
Volume = 1,260 cy
AREA-4
Area = 3,125 sf
Depth = 9.5 ft
Volume = 1,100 cy
Other Locations
Area = 4,896 sf
Depth = 3 ft
Volume = 550 cy
Base Map Features
ected Source of Geophysical Anomalies
Known Surface Debris
Unknown Surface Debris
Gas
20 ppm or greater
10 ppm - 20 ppm
Phase I RI Test Pit Location
ESI Test Pit Location
Monitoring Well Location
Soil Boring Location
Area to be Remediated
Note: Areas described as "others" in the text are the Unknown Surface Debris Areas
100
0
100 Feet
N
PARSONS
PARSONS ENGINEERING
SENECA ARMY DEPO
FIGURE 1-1
SENECA ARMY DEPOT
RI/CA - SEAD-59 AND
SOIL AREAS TO BE RE
JOB NUMBER
DATE
JUNE 1999

	QUANTY UOM	CONTRACT	DES CONT	ESCALATN	CON CONT	OTHER	CON MGMT	TOTAL COST	UNIT COST
33 Remedial Action									
33.01 Mobilization	1.00 EA	5,290	110	160	1,390	240	570	7,760	7761.84
TOTAL Mobilization	1.00 EA	5,290	110	160	1,390	240	570	7,760	7761.84
33.02 Sampling, & Testing									
33.02.06 Groundwater from	1.00 EA	3,870	80	120	1,020	180	420	5,680	5677.83
33.02.12 Soil - off site d	1.00 EA	35,060	700	1,070	9,210	1,610	3,810	51,470	51465.51
33.02.16 Confirmatory-Soil	1.00 EA	116,040	2,320	3,550	30,480	5,330	12,620	170,340	170335.03
33.02.18 Soil Boring Grid	1.00 EA	58,020	1,160	1,780	15,240	2,670	6,310	85,170	85167.51
33.02.20 IDW from Soil Bor	1.00 EA	19,340	390	590	5,080	890	2,100	28,390	28389.17
TOTAL Sampling, & Testi	1.00 EA	232,320	4,650	7,110	61,020	10,680	25,260	341,040	341035.06
33.03 Site Work									
33.03.02 Clearing and Grub	3.00 ACR	4,400	90	130	1,160	200	480	6,460	2152.58
33.03.08 Survey Remediatio	1.00 ACR	27,870	560	850	7,320	1,280	3,030	40,910	40910.82
33.03.11 Erosion control	1.00 LF	211,850	4,240	6,480	55,640	9,740	23,040	310,980	310983.09
TOTAL Site Work	1.00 EA	244,120	4,880	7,470	64,120	11,220	26,540	358,350	358351.66
33.04 Fencing	1.00 EA	63,630	1,270	1,950	16,710	2,920	6,920	93,400	93400.60
33.05 Wastewater									
33.05. 1 Wastewater	1.00 EA	22,150	440	680	5,820	1,020	2,410	32,510	32508.19
TOTAL Wastewater	1.00 EA	22,150	440	680	5,820	1,020	2,410	32,510	32508.19
33.07 Air Stripping	1.00 EA	19,390	390	590	5,090	890	2,110	28,470	28466.90
33.10 Soil Remediation									
33.10.02 Sitework - Areas	1.00 EA	258,270	5,170	7,900	67,830	11,870	28,080	379,130	379127.08
33.10.04 Sitework - Area 1	1.00 EA	13,620	270	420	3,580	630	1,480	20,000	19999.66
33.10.05 Drum Removal	1.00 EA	4,880	100	150	1,280	220	530	7,170	7170.29
33.10.06 Disposal	1.00 EA	206,310	4,130	6,310	54,190	9,480	22,430	302,860	302858.85
33.10.07 Multi-Layer Imper	1.00 EA	300,040	6,000	9,180	78,810	13,790	32,630	440,450	440445.23
33.10.11 Slurry Wall	1.00 EA	142,740	2,850	4,370	37,490	6,560	15,520	209,530	209534.95
TOTAL Soil Remediation	1.00 EA	925,870	18,520	28,330	243,180	42,560	100,680	1,359,140	1359136.07
33.18 Confirmatory Soil Bo	1.00 EA	19,980	400	610	5,250	920	2,170	29,340	29336.15
33.26 Demobilization									

	QUANTY	UOM	CONTRACT	DES CONT	ESCALATN	CON CONT	OTHER	CON MGMT	TOTAL COST	UNIT COST
33.26.04 Decontaminate Equ	1.00	EA	12,190	240	370	3,200	560	1,330	17,890	17887.61
33.26.06 Demobilization	1.00	EA	4,870	100	150	1,280	220	530	7,160	7155.04
TOTAL Demobilization	1.00	EA	17,060	340	520	4,480	780	1,860	25,040	25042.66
33.31 Well Installation	1.00	EA	5,240	100	160	1,380	240	570	7,690	7685.35
33.35 Remedial Design	1.00	EA	492,120	9,840	15,060	129,260	22,620	53,510	722,410	722409.10
TOTAL Remedial Action	1.00	EA	2,047,160	40,940	62,640	537,690	94,100	222,600	3,005,130	3005133.58

	QUANTY UOM	CONTRACT	DES CONT	ESCALATN	CON CONT	OTHER	CON MGMT	TOTAL COST	UNIT COST
33 Remedial Action									
33.01 Mobilization	1.00 EA	5,290	110	160	1,390	240	570	7,760	7761.84
TOTAL Mobilization	1.00 EA	5,290	110	160	1,390	240	570	7,760	7761.84
33.02 Sampling, & Testing									
33.02.06 Groundwater	1.00 EA	14,500	290	440	3,810	670	1,580	21,290	21291.88
33.02.11 Soil	1.00 EA	168,800	3,380	5,170	44,340	7,760	18,360	247,800	247796.91
33.02.16 Confirmatory-Soil	1.00 EA	150,850	3,020	4,620	39,620	6,930	16,400	221,440	221435.54
33.02.17 Post LTTD Treatmc	1.00 EA	90,890	1,820	2,780	23,870	4,180	9,880	133,430	133429.10
33.02.18 Soil Boring Grid	1.00 EA	58,020	1,160	1,780	15,240	2,670	6,310	85,170	85167.51
33.02.20 IDW from Soil Bor	1.00 EA	19,340	390	590	5,080	890	2,100	28,390	28389.17
TOTAL Sampling, & Testi	1.00 EA	502,410	10,050	15,370	131,960	23,090	54,630	737,510	737510.11
33.03 Site Work									
33.03.02 Clearing and Grub	3.00 ACR	4,400	90	130	1,160	200	480	6,460	2152.58
33.03.08 Survey Remediatio	1.00 ACR	27,870	560	850	7,320	1,280	3,030	40,910	40910.82
33.03.11 Erosion control	1.00 LF	211,850	4,240	6,480	55,640	9,740	23,040	310,980	310983.09
TOTAL Site Work	1.00 EA	244,120	4,880	7,470	64,120	11,220	26,540	358,350	358351.66
33.04 Fencing	1.00 EA	63,630	1,270	1,950	16,710	2,920	6,920	93,400	93400.60
33.05 Wastewater									
33.05. 1 Wastewater	1.00 EA	22,150	440	680	5,820	1,020	2,410	32,510	32508.19
TOTAL Wastewater	1.00 EA	22,150	440	680	5,820	1,020	2,410	32,510	32508.19
33.07 Air Stripping	1.00 EA	19,390	390	590	5,090	890	2,110	28,470	28466.90
33.10 Soil Remediation									
33.10.02 Sitework - Soils	1.00 EA	1,094,100	21,880	33,480	287,370	50,290	118,970	1,606,090	1606086.26
33.10.04 Drum Removal	1.00 EA	4,880	100	150	1,280	220	530	7,170	7170.29
33.10.06 Disposal: hazardo	1.00 EA	217,970	4,360	6,670	57,250	10,020	23,700	319,970	319967.21
33.10.10 Vegetative Cover	1.00 EA	135,700	2,710	4,150	35,640	6,240	14,760	199,200	199203.98
33.10.15 LTTD	1.00 EA	3,906,190	78,120	119,530	1,025,960	179,540	424,750	5,734,090	5734094.95
TOTAL Soil Remediation	1.00 EA	5,358,850	107,180	163,980	1,407,500	246,310	582,710	7,866,520	7866522.69
33.18 Confirmatory Soil Bo	1.00 EA	19,980	400	610	5,250	920	2,170	29,340	29336.15
33.26 Demobilization									

** PROJECT OWNER SUMMARY - SUBSYSTM (Rounded to 10's) **

		QUANTY	UOM	CONTRACT	DES CONT	ESCALATN	CON CONT	OTHER	CON MGMT	TOTAL COST	UNIT COST
33.26.04	Decontaminate Equ	1.00	EA	12,190	240	370	3,200	560	1,330	17,890	17887.61
33.26.06	Demobilization	1.00	EA	4,870	100	150	1,280	220	530	7,160	7155.04
TOTAL	Demobilization	1.00	EA	17,060	340	520	4,480	780	1,860	25,040	25042.66
33.28	Remedial Design	1.00	EA	492,120	9,840	15,060	129,260	22,620	53,510	722,410	722409.10
33.30	Well Installation	1.00	EA	5,240	80	160	1,370	240	570	7,650	7646.83
TOTAL	Remedial Action	1.00	EA	6,750,220	134,980	206,560	1,772,940	310,260	734,000	9,908,960	9908956.73

	QUANTY UOM	CONTRACT	DES CONT	ESCALATN	CON CONT	OTHER	CON MGMT	TOTAL COST	UNIT COST
33 Remedial Action									
33.01 Mobilization	1.00 EA	5,290	110	160	1,390	240	570	7,760	7761.84
TOTAL Mobilization	1.00 EA	5,290	110	160	1,390	240	570	7,760	7761.84
33.02 Sampling, & Testing									
33.02.06 Groundwater	1.00 EA	14,500	290	440	3,810	670	1,580	21,290	21291.88
33.02.08 Groundwater - Mon	1.00 EA	5,800	120	180	1,520	270	630	8,520	8516.75
33.02.11 Soil	1.00 EA	168,800	3,380	5,170	44,340	7,760	18,360	247,800	247796.91
33.02.13 Confirmatory-Soil	1.00 EA	150,850	3,020	4,620	39,620	6,930	16,400	221,440	221435.54
33.02.16 Soil Boring Grid	1.00 EA	58,020	1,160	1,780	15,240	2,670	6,310	85,170	85167.51
33.02.18 IDW from Soil Bor	1.00 EA	19,340	390	590	5,080	890	2,100	28,390	28389.17
TOTAL Sampling, & Testi	1.00 EA	417,310	8,350	12,770	109,610	19,180	45,380	612,600	612597.76
33.03 Site Work									
33.03.02 Clearing and Grub	3.00 ACR	4,400	90	130	1,160	200	480	6,460	2152.58
33.03.08 Survey Remediatio	1.00 ACR	27,870	560	850	7,320	1,280	3,030	40,910	40910.82
33.03.11 Erosion control	1.00 LF	211,850	4,240	6,480	55,640	9,740	23,040	310,980	310983.09
TOTAL Site Work	1.00 EA	244,120	4,880	7,470	64,120	11,220	26,540	358,350	358351.66
33.04 Fencing	1.00 EA	63,630	1,270	1,950	16,710	2,920	6,920	93,400	93400.60
33.05 Wastewater									
33.05.1 Wastewater	1.00 EA	22,150	440	680	5,820	1,020	2,410	32,510	32508.19
TOTAL Wastewater	1.00 EA	22,150	440	680	5,820	1,020	2,410	32,510	32508.19
33.07 Air Stripping	1.00 EA	19,390	390	590	5,090	890	2,110	28,470	28466.90
33.10 Soil Remediation									
33.10.02 Sitework - Soils	1.00 EA	1,269,440	25,390	38,840	333,420	58,350	138,040	1,863,480	1863479.13
33.10.04 Drum Removal	1.00 EA	4,880	100	150	1,280	220	530	7,170	7170.29
33.10.06 Disposal:	1.00 EA	2,317,670	46,350	70,920	608,740	106,530	252,020	3,402,220	3402220.09
TOTAL Soil Remediation	1.00 EA	3,591,990	71,840	109,910	943,440	165,100	390,580	5,272,870	5272869.51
33.18 Confirmatory Soil Bo	1.00 EA	19,980	400	610	5,250	920	2,170	29,340	29336.15
33.26 Demobilization									
33.26.04 Decontaminate Equ	1.00 EA	12,190	240	370	3,200	560	1,330	17,890	17887.61

	QUANTY	UOM	CONTRACT	DES CONT	ESCALATN	CON CONT	OTHER	CON MGMT	TOTAL COST	UNIT COST
33.26.06 Demobilization	1.00	EA	4,870	100	150	1,280	220	530	7,160	7155.04
TOTAL Demobilization	1.00	EA	17,060	340	520	4,480	780	1,860	25,040	25042.66
33.31 Remedial Design	1.00	EA	423,050	8,460	12,950	111,110	19,450	46,000	621,020	621019.20
TOTAL Remedial Action	1.00	EA	4,823,970	96,480	147,610	1,267,020	221,730	524,540	7,081,350	7081354.48