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FINAL
PRE-DESIGN INVESTIGATION REPORT
OU 2 GROUNDWATER NCRA
STRATFORD ARMY ENGINE PLANT
Stratford, Connecticut

VOLUME I
TEXT AND TABLES

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1.0 PROJECT DESCRIPTION

Foster Wheeler Environmental Corporation (Foster Wheeler) and Harding Lawson Associates (HLA) have been contracted through the U.S. Army Corps of Engineers – New England District (USACE) to complete a Non-time Critical Removal Action (NCRA) for chromium and volatile organic compound (VOC) source area remediation relative to the groundwater operable unit (Operable Unit [OU] 2) at the Stratford Army Engine Plant (SAEP) under Task Order No. 020 of Contract No. DACW33-94-D-0002. The objectives of this Task Order are to 1) complete additional field activities necessary to provide further characterization of subsurface conditions at SAEP, 2) summarize the results of previous field activities in a report, 3) conduct treatability testing to determine the effectiveness of particular in-situ technologies at reducing contamination in groundwater at the site, and 4) document the decision process for selection of removal actions for OU 2 in an Engineering Evaluation/Cost Analysis (EE/CA). The field activities described as item 1 above, and the treatability testing, described as item 3 above, were completed in August and September 1999. This Pre-Design Investigation Report (PDIR) addresses item 2 of the task order objectives listed above. The EE/CA, described as item 4 above, will be submitted in Draft form in the spring of 2000.

1.1 INTRODUCTION

SAEP is located on approximately 126 acres in Stratford, Connecticut, on the Stratford Point peninsula in the southeast corner of Fairfield County (Figure 1-1). About 76 acres of the land are improved and 48 acres are riparian (water) rights.

SAEP was formerly a government-owned, contractor-operated facility. The U.S. Army owns the land and buildings, and both the U.S. Army and its contractor, AlliedSignal Engines, owned former plant equipment (removed in early 1998). The U.S. Army-owned land, buildings, and equipment were formerly provided to AlliedSignal under a facilities contract for executing government contracts, including the manufacture and testing of turbine engines for the U.S Army. The SAEP property consists of 49 buildings, paved roadways and grounds, and five paved parking lots (Figure 1-2).

Responsibility for the jurisdiction, control, and accountability of SAEP was transferred from the U.S. Army Aviation and Troop command to the U.S. Army Tank-Automotive and Armament Command (TACOM) in September 1995. In October 1995, SAEP was placed on the Base Closure and Realignment (BRAC) list, known as BRAC 95. Pursuant to the Defense Base Closure and Realignment Act of 1990, the BRAC Environmental Restoration Program mandates that environmental contamination on BRAC properties be investigated and remediated, as necessary, prior to disposal and reuse. In August 1998, SAEP was transitioned from an active production facility to caretaker status.

1.2 AUTHORITY

For BRAC 95 facilities, the Environmental Restoration Program begins with an Environmental Baseline Survey (EBS) to describe the environmental condition of the property. ABB Environmental Services (subsequently HLA) published the Final EBS in December 1996. A Remedial Investigation (RI) is currently being conducted by URS Greiner-Woodward Clyde Federal Services (URSGWCFS), under a contract to the USACE Omaha District, to characterize the type and extent of contamination at SAEP and evaluate potential risks to human health and the environment.

In June 1998, chromium contamination was identified in subsurface soil beneath the concrete floor of the former Chromium Plating Facility in Building B-2. The location of the Chromium Plating Facility is indicated in Figure 1-2. SAEP contracted HLA, through a subcontract to AlliedSignal, to perform additional site characterization to develop a removal action recommendation for the site. HLA’s sampling indicated concentrations of hexavalent chromium in soil and groundwater beneath the former Chromium Plating Facility that exceeded Connecticut Department of Environmental Protection (CTDEP) Remediation Standard Regulation (RSR) criteria. HLA’s sampling also identified high concentrations of chromium in dust samples within the building. Based on the concentrations of total chromium in the dust samples, a Time-Critical Removal Action Memorandum (HLA, 1998) was written, proposing decontamination of the former Chromium Plating Facility and further investigation of site soil and groundwater followed by in-situ hexavalent chromium reduction of soil.

The facility decontamination was completed in December 1998. Decontamination procedures included sweeping, the removal of debris and dust from the concrete floor, and pressurized steam washing of the ceiling, overhead beams, walls, and floor. Wipe sampling completed following the decontamination procedures indicated that relatively high concentrations of hexavalent chromium were still present in the concrete floor and in limited areas on overhead beams and walls.

Further soil and groundwater investigations revealed concentrations of hexavalent chromium in groundwater at 100 times previously detected levels (concentrations of up to 950 milligrams per liter [mg/L]), and in an area much larger than expected. In addition, high concentrations of VOCs were detected during the groundwater chromium investigations (concentrations above 500 mg/L). Investigations completed by HLA through May 1999 indicated significant concentrations of VOCs in groundwater in several areas around SAEP facility. As a result of these investigations, a NCRA was recommended by the U.S. Army for hexavalent chromium and VOC groundwater hot-spots at SAEP, part of OU 2.

1.3 PURPOSE AND SCOPE OF NCRA

Data from HLA's groundwater and soil investigations from August 1998 through March 1999 were evaluated and summarized in the Draft Data Package for the Chromium Plating Facility Investigation (HLA, 1999). Investigations completed at SAEP by HLA between August 1998 and June 1999 were contracted through AlliedSignal Inc. to the TACOM.

In order to provide a removal action recommendation for OU 2, additional data was required to more fully characterize and evaluate groundwater contamination at identified VOC source area hot spots. This Pre-Design Investigation Report summarizes the data presented in the Draft Data Package and the additional investigation data collected under the OU 2 NCRA. Using PDIR data, and the results of pilot-scale treatability tests conducted in December 1999 and January 2000, an EE/CA will be written evaluating OU 2 removal action alternatives.

1.4 REPORT ORGANIZATION

This Pre-Design Investigation Report is divided into seven sections, plus Attachments and Appendices. Section 1.0 contains an introduction to the SAEP site and the purpose and scope of the NCRA. Section 2.0 provides information on the history of the SAEP. Section 3.0 outlines the project objectives. Section 4.0 summarizes investigation activities completed at the site. Section 5.0 presents the laboratory analytical program. Section 6.0 presents the results of the investigation, and Section 7.0 contains the Summary and Conclusions.

This report also includes appendices of field boring logs, test pit records, geophysical results, grain-size analysis data, monitoring well details, cone penetrometer logs, seismic refraction survey results, location and elevation survey information, and laboratory analytical data.

2.0 SITE DESCRIPTION AND HISTORY

Section 2.0 of the URSGWCFS RI Work Plan (URSGWCFS, 1998) provides a description of SAEP, including a land use assessment, a physical setting description, an ecological setting description, and a site history. Appendix A of this report contains a copy of Section 2.0 of the URSGWCFS RI Work Plan.

3.0 PROJECT OBJECTIVES

This section summarizes the project objectives for the OU 2 NCRA at SAEP. Three general categories are discussed to address project objectives, including regulatory framework, project goals, and Applicable or Relevant and Appropriate Requirements (ARARs).

3.1 REGULATORY FRAMEWORK

The NCRA for OU 2 at SAEP is being performed under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). In October 1995, SAEP was placed on the BRAC 95 list. The BRAC Environmental Restoration Program mandates that environmental contamination on U.S. Army BRAC properties be investigated and remediated, as necessary, prior to disposal and reuse.

The CTDEP and the U.S. Environmental Protection Agency (USEPA) provide regulatory oversight for the OU 2 NCRA.

3.2 PROJECT GOALS

The primary goal of the OU 2 NCRA is to address high concentrations of hexavalent chromium and chlorinated VOCs in groundwater which may pose a threat to the Housatonic River environment by off-site groundwater migration. As part of the NCRA for OU 2, it was necessary to more fully characterize site conditions, and to provide a recommended removal action to address groundwater contamination. Project activities have been undertaken to address the following OU 2 NCRA goals:

- Establish the presence or absence, and the concentration of VOC vapors beneath SAEP buildings through a soil vapor survey.
- Evaluate the presence or absence of dense non-aqueous phase liquid (DNAPL) contamination at selected subsurface locations through field testing.
- Assess through a geophysical seismic survey the features of the bedrock surface.
- Evaluate the hydraulic properties of the aquifer in the vicinity of the former Chromium Plating Facility with an aquifer-pumping test.
- Use the results of the aquifer test and the cone penetrometer stratigraphic data, to estimate the hydraulic properties of the aquifer in selected other areas of the site.
- Determine the location and elevation of previous sampling locations with an elevation and location survey.
- Test the effectiveness of selected in-situ technologies at reducing hexavalent chromium and VOC contamination in groundwater using treatability testing.

- Document the process used to determine the recommended removal action in an EE/CA.

3.3 REGULATORY COMPLIANCE PLAN (ARARS)

Federal, state, and local laws and statutes were reviewed in the planning stages of the NCRA for two purposes: 1) to determine if permits are required for the proposed field activities, and 2) to evaluate the environmental criteria against which analytical results will be compared. CTDEP RSRs contain criteria which will be followed as one of the driving considerations in the selection and implementation of any removal action(s).

As part of the EE/CA process, the applicable, relevant and appropriate federal, state and local laws, regulations and policies that might impact the various removal activities, either through cost or procedural requirements, will be identified for each of the removal alternatives described in the EE/CA. A table will be prepared for the EE/CA that will present:

- title and citation of the law, regulation or policy;
- a brief summary of the regulatory requirements;
- a brief summary of how the project activities will comply with the spirit of the requirements. (It is assumed that actual permits will not be required for project activities conducted under CERCLA); and
- a brief summary of the impact of the ARARS on the various project aspects (including schedule, cost, design, construction means and methods, monitoring, and operation and maintenance).

Additionally, a summary of the anticipated ARARS effects upon the suggested remedy will be carried through to the Removal Action Memorandum (RAM). A regulatory strategy will be presented in the RAM, which will identify the regulatory drivers, the anticipated affects of the regulatory issues on the removal activity aspects, and the anticipated action, or actions, which will be required to address the ARARS.

3.3.1 Permit Requirements

Disposal of investigation-derived waste (IDW) water is covered under an Emergency Discharge Authorization, which was issued by the CTDEP on March 18, 1999. This authorization covers discharge of wastewater from the SAEP Chemical Waste Treatment Plant (CWTP) generated during investigation and remediation activities completed on-site. The expiration date for this authorization is March 18, 2000. No additional permit requirements for NCRA investigation activities were identified. However, a new permit will potentially be required in the future to address treatment associated with the OU 2 EE/CA selected groundwater removal actions.

3.3.2 Criteria for Comparison to Sample Data

CTDEP has established numerical criteria for various media including target concentrations for indoor air and criteria for soil vapor, soil, groundwater, and surface water. This OU 2 NCRA Pre-Design Investigation Report compares contaminant concentrations against the CTDEP criteria to determine if removal actions are required for a specific media. The criteria considered include:

- Soil analytical data is compared to CTDEP Direct Exposure Criteria (DEC) for Soil (industrial/commercial) and the CTDEP GB Pollutant Mobility Criteria (PMC);
- Groundwater analytical data is compared to CTDEP Surface Water Protection Criteria (SWPC) for substances in groundwater; and
- Soil vapor analytical data is compared to CTDEP industrial/commercial volatilization criteria (I/C VC).

Tables of the results of chemical screening and analysis completed as part of this Pre-Design Investigation are included in Section 6.0, and also contain the respective appropriate criteria for comparison.

4.0 SUMMARY OF INVESTIGATION ACTIVITIES

Previous investigations completed at SAEP include:

1) Preliminary Assessment Screening (completed by URSGWCFS in 1991);
2) Resource Conservation and Recovery Act (RCRA) Facility Assessment (completed by Camp, Dresser & McKee in 1992);
3) Phase I Remedial Investigation (completed by URSGWCFS in 1993);
4) Phase II Remedial Investigation (completed by URSGWCFS in 1996);
5) Environmental Baseline Survey (completed by HLA in 1996);
6) Remedial Investigation (being completed by URSGWCFS from 1998-2000);
7) Preliminary Chromium Plating Facility Investigations (completed by AJS Environmental Services, Inc. in June 1998 and HLA in August 1998);
8) Chromium Plating Facility Decontamination (completed by HLA in December 1998);
9) Chromium Plating Facility Investigations (completed by HLA in 1999);
10) VOC Groundwater Investigations (completed by HLA in 1999); and
11) OU 2 NCRA Pre-Design Investigations.

The first five investigations are summarized in Section 3.0 of the URSGWCFS RI Work Plan (URSGWCFS, 1998). Activities associated with the Remedial Investigation (item 6 above) will be presented in the Draft Remedial Investigation Report, which is scheduled for delivery in March 2000. Activities completed in items 7 through 11 above are described in the following subsections.

The following subsections present a summary of investigations included in this Pre-Design Investigation Report. Table 4-1 presents a summary of the Pre-Design investigations.

4.1 PRELIMINARY CHROMIUM PLATING FACILITY INVESTIGATIONS

Two preliminary investigations were completed at the former Chromium Plating Facility to assess the potential for plating-related contamination. Summaries of the preliminary investigations are presented in the following two subsections.

4.1.1 June 1998 Investigations

In June 1998, TACOM/SAEP hired AJS Environmental Services, Inc. (AJS), through a subcontract to AlliedSignal, to perform soil sampling beneath the floor of the former Chromium Plating Facility. AJS collected over 60 subsurface soil samples from 30 borings (C-1 through C-30), and analyzed the samples for total chromium. Analytical results indicated total chromium concentrations in soil would exceed the CTDEP RSR for hexavalent chromium (if all the total chromium was the hexavalent species); however, no chromium speciation was performed as part of this initial sampling event. The AJS report is presented as Appendix B.

4.1.2 August 1998 Investigations

As a result of the detected chromium contamination, SAEP contracted HLA, through a subcontract to AlliedSignal, to perform additional site characterization and develop removal action alternatives to address the contamination. In August 1998, soil and groundwater samples were collected with a GeoProbe from under the concrete floor of the former Chromium Plating Facility to determine the presence or absence of hexavalent chromium contamination in these media.

The GeoProbe collects subsurface samples by driving a sampling assembly into the subsurface using a hydraulic hammer. Soil samples are collected using a 1-1/4-inch diameter hollow tube equipped with a sampling point and piston stop-screw to prevent soil from entering the tube before the designated interval. Groundwater samples are collected using a 4-foot screened section of rod housed in an outer sleeve. A disposable point is placed at the tip of the outer sleeve to protect the screen while the assembly is driven to depth. At depth, the point is pushed off the end, and the outer sleeve retracted to expose the screen. Tubing connected to a peristaltic pump is then placed down the rods and into the screen to collect groundwater from the desired depth interval.

The following bullets summarize activities completed during the August 1998 GeoProbe investigations:

- Collection of 12 subsurface soil samples (0-7 feet below ground surface [bgs]) from six boring locations (SP-98-01 through SP-98-06).
- Off-site analysis of these samples for total chromium, hexavalent chromium, nickel, manganese, cyanide, total organic carbon, TCLP chromium, and TCLP cyanide.
- Collection of two shallow groundwater samples (7-9 feet bgs) from two of the six borings (WP-98-01 and WP-98-02).
- Off-site analysis of these groundwater samples for hexavalent chromium, nickel, cyanide, ferrous iron, iron and sulfate.

Figures 4-1 identifies the locations of the GeoProbe explorations completed during this phase of the investigation. Tables 4-2 and 4-3 present summaries of GeoProbe soil and groundwater explorations, respectively.

In addition to the GeoProbe soil and groundwater sampling, two dust samples (CD-98-01 and CD-98-02) were collected from the surface of the concrete floor, and analyzed for total chromium and ferrous iron. These samples were collected from areas where a yellow precipitate was evident on rougher surfaces of the concrete floor.

Soil boring logs are presented as Appendix C. Field sample data collection records are presented as Appendix D.

4.2 PLATING FACILITY INTERIOR DECONTAMINATION

As a result of the high concentrations of chromium detected in dust samples CD-98-01 and CD-98-02, it was determined that there was an imminent hazard to workers inside the former Chromium Plating Facility. Therefore, the U.S. Army requested that the interior of the facility be decontaminated under a Time-Critical Removal Action prior to additional investigation activities.

Prior to decontamination, cleanup goals were developed based on the contaminants' potential to pose a risk to human receptors (e.g., commercial or renovation workers). The risk assessment calculations used for the development of cleanup goals were approved by the Massachusetts Department of Environmental Protection (MADEP) for a large-scale surface decontamination project at the former Army Research Laboratory located in Watertown, Massachusetts (ABB-ES, 1996). Risk calculations indicate cleanup goals of 210,000 milligrams per square meter (mg/m^2) for total chromium and 0.53 mg/m^2 for hexavalent chromium will result in a carcinogenic risk of less than the CTDEP guidance value (1×10^{-5}) and a non-carcinogenic risk (i.e., hazard index) less than 1.0 (See Appendix E).

The following bullets summarize activities completed during the facility decontamination.

- Decontamination activities were completed in December 1998.
- Open sumps and holes in the floor were sealed by filling them with concrete.
- Loose debris and dust were swept from the floor of plating facility and placed into boxes and drums for off-site disposal.
- Overhead beams, walls, and floor surfaces were pressure-washed to remove chromium-contaminated dust and residue.
- Rinse water generated during building decontamination activities was collected in a polyethylene tank to remove solids, treated with sodium metabisulfite, and then discharged to SAEP CWTP.
- Wipe sampling and analyses for total chromium and hexavalent chromium, were performed on overhead beams, walls, columns, and floor to evaluate effectiveness of decontamination procedures.
- Concrete dust samples (CD-98-03 through CD-98-07) were collected using a concrete drill, and samples sent to an off-site laboratory (Quanterra) for total chromium and hexavalent chromium analyses.

Figure 4-3 presents the locations of wipe samples collected following facility decontamination.

4.3 PRE-DESIGN INVESTIGATIONS

The following subsections present summaries of the investigations completed by HLA at SAEP from January 1999 through June 1999 through a contract with AlliedSignal. These investigations included chromium-focused soil and groundwater sampling with a GeoProbe, VOC groundwater sampling with a GeoProbe, and VOC groundwater sampling with a cone penetrometer. Table 4-1 presents a summary of these investigations.

4.3.1 Chromium-Focused Investigations

Following preliminary investigations (see Subsection 4.1.2) and facility decontamination, HLA initiated a chromium-focused investigation in the former Chromium Plating Facility to delineate the extent of chromium contamination in soils and groundwater. These investigations were completed in January and February 1999.

4.3.1.1 Subsurface Soils. In January and February of 1999, HLA collected subsurface soil samples from 21 locations (SP-99-01 through SP-99-20, excluding four locations where samples were not collected, and SP-PILOT-01A through SP-PILOT-05A) in and around the former Chromium Plating Facility using a GeoProbe and hand-operated tripod rig (see Figure 4-1 and Table 4-2). A discussion of GeoProbe soil sample collection techniques is presented in Subsection 4.1.2.

Analytical soil samples were generally collected from 0 to 2 and 5 to 7 feet bgs in each boring (see Table 4-2). Soil samples from SP-99-01 through SP-99-20 were analyzed by an off-site laboratory (Quanterra) for total chromium, hexavalent chromium, cyanide and manganese. In addition, Synthetic Precipitate Leaching Procedures (SPLP) analyses for total chromium were performed on select samples (see Table 4-2). Soil samples from SP-PILOT-01A through SP-PILOT-05A were analyzed for total chromium, hexavalent chromium, and ferrous iron. In addition, SPLP analyses for total chromium were performed on select samples (see Table 4-2)

Soil borings SP-PILOT-01A through SP-PILOT-05A were installed in early January 1999 to provide subsurface soil analytical data prior to a proposed pilot test for in-situ reduction of hexavalent chromium. Upon further characterization of the area surrounding the former Chromium Plating Facility, it was determined that the location of the proposed pilot test area be shifted to the north, where hexavalent chromium concentrations in groundwater are higher.

4.3.1.2 Groundwater. In January and February of 1999, HLA collected 182 groundwater samples from 32 sampling locations (WP-99-01 through WP-99-32) in and around the former Chromium Plating Facility using a GeoProbe (see Figure 4-2 and Table 4-3).

A general discussion of GeoProbe groundwater sample collection techniques is presented in Subsection 4.1.2. In the interest of collecting the most data within the project budget, the "drag" technique was employed for collection of multiple groundwater samples within each exploration. This technique involved driving the GeoProbe rods to total depth at the exploration, and pushing off the disposable stainless steel drive point. The 4-foot, 0.010-inch slotted stainless steel screen was then exposed by retracting the outer rods. Purging of the sample intervals was conducted until the parameters of turbidity, conductivity, temperature, and pH stabilized, approximately 3 to 8 gallons per sampling interval. The volume of water within the 1.25-inch diameter screen and rods was approximately 0.06 gallons per foot, or 0.6 gallons per 10-feet. The average deep Geoprobe samples collected were on the order of 60 feet bgs, which correlates to roughly 50 feet of water, or 3 gallons, within the rods. Assuming a minimum purge of 3 gallons, at least 1x the entire volume of water in the rods was purged prior to sampling. In many cases, the formation did not recharge quickly enough to keep up with the pumping rate, and therefore, the screened sample interval was purged dry. Following sufficient recharge for sample volume, a sample was collected. The screen and rods were then retracted to the next sample interval, followed by purging and sample collection. This process was repeated until sampling from the required intervals was completed. The upper one to two feet of the explorations were grouted to ground surface.

Groundwater samples were analyzed on-site by HLA for hexavalent chromium and ferrous iron using Hach™ test kits. The following Hach™ test kits were employed for analysis of groundwater samples during the chromium-focused investigations:

- Hexavalent Chromium by the Hach™ Color disc/Diphenylcarbazide, Hypobromite oxidation method, with a lower reporting limit of 0.1 mg/L, and
- Ferrous Iron by the Hach™ Color disc/1,10 Phenanthroline method. The test kit has a lower limit of reporting of 0.2 mg/L.

Due to the high concentrations of hexavalent chromium present in groundwater, many of the samples required dilution with deionized water prior to analysis by the Hach™ test kits. Collection of field readings of pH, temperature, dissolved oxygen, specific conductivity, turbidity, and oxidation-reduction (REDOX) potential was also performed for each sample. 30 of the groundwater samples were sent for confirmation analysis at an off-site laboratory for hexavalent chromium, inorganic compounds, cyanide, sulfate, and alkalinity. In addition, four samples from exploration locations WP-99-08 and WP-99-09 were sent off-site for analysis for VOCs and semi-volatile organic compounds (SVOCs), due to the presence of a solvent-like odor observed during sample purging activities.

4.3.1.3 Monitoring Well/Piezometer Installation and Sampling. HLA installed 13 piezometers for water level measurement and analytical sampling in the vicinity of the Chromium Plating Facility Investigation during the chromium-focused investigation in January and February 1999. Locations of these wells/piezometers are presented in Figure 4-3. A summary of well/piezometer construction details is presented in Table 4-4. Monitoring well/piezometer construction diagrams are presented in Appendix F.

Monitoring wells and piezometers were installed using a GeoProbe, and are constructed of 1-inch inside diameter (ID) Schedule 40 PVC. Well/piezometer screens are 5 feet in length with 0.010-inch factory slots. Due to the limited ID of the GeoProbe drilling rods, a sandpack was not installed around the well screens.

Groundwater samples were collected from selected wells and tested on-site for hexavalent chromium and ferrous iron using Hach™ test kits (see Subsection 4.3.1.2). Due to the high concentrations of hexavalent chromium present in groundwater, many of the samples required dilution with deionized water prior to analysis by the Hach™ test kits. A summary of the wells/piezometer sampling, including sample interval, sample date, and analyses, is presented in Table 4-5. Note that groundwater samples from PZ-PILOT-01 through PZ-PILOT-07 were collected from the GeoProbe rods during advancement of the borings, not from the completed piezometer.

In addition, HLA completed one round of synoptic water level measurements from the piezometers and monitoring wells on February 11, 1999, at low tide (see Table 4-6).

Four soil samples were also collected for grain size analysis by method ASTM D 422 from the subsurface soils in the northern corner of the Chromium Plating Facility. Samples were collected from:

- PZ-PILOT-06: zero, 4, and 10 feet below ground surface
- SP-PILOT-04A: 4 feet below ground surface

Locations of these explorations are presented in Figure 4-1. Appendix G contains the grain size test results for the samples.

4.3.1.4 Investigation-Derived Waste Soil and personal protective equipment (PPE) IDW was containerized in DOT-approved 55-gallon drums and is staged inside the former Chromium Plating Facility awaiting characterization and disposal.

Purged groundwater was containerized and transported to the Building 63 sump, which connects to the CWTP, where the groundwater was treated for chromium contamination. If high levels of chromium were visually evident, purge water was pre-treated with sodium metabisulfite prior to discharge to the Building 63 sump. Decontamination water containing surfactants and personal protective equipment (PPE) was containerized in DOT-approved 55-gallon drums and is staged inside the former Chromium Plating Facility awaiting characterization and disposal.

4.3.2 Chlorinated VOC Investigations - Groundwater

As a result of the very high concentrations (>100 mg/L) of VOCs detected in GeoProbe explorations WP-99-08 and WP-99-09 during the chromium-focused investigations, the Army requested that HLA delineate the extent of VOC contamination in groundwater emanating from the former Chromium Plating Facility. Investigations were completed under the AlliedSignal contract in March 1999 with a GeoProbe, followed by additional investigations using a cone penetrometer in May 1999.

4.3.2.1 GeoProbe Investigations In March 1999, HLA initiated a VOC groundwater investigation using a GeoProbe and an on-site field laboratory. The objective of this investigation was to delineate the horizontal and vertical extent of VOC groundwater contamination detected in the vicinity of the former Chromium Plating Facility. The following bullets summarize the March 1999 investigations:

- Collection of 126 groundwater samples from 40 sampling locations (WP-99-33 through WP-99-72)
- On-site analysis of these samples for select VOCs using a gas chromatograph (GC)
- Collection of field readings of pH, temperature, dissolved oxygen, specific conductivity, turbidity, and redox potential for each sample
- Split sample collection of 10 groundwater samples for confirmation analysis at an off-site laboratory (Averill Environmental) for VOCs

Figure 4-4 identifies the GeoProbe sampling locations completed during this phase of the investigation; Table 4-3 presents a summary of the GeoProbe explorations

Groundwater samples were collected as described in Subsection 4.3.1.2, and were analyzed on-site by modified USEPA Method 8021B, using an HP 5890 GC with an electrolytic conductivity detector (ELCD) for the following VOCs:

- Tetrachloroethylene (PCE)
- Trichloroethylene (TCE)
- cis- and trans-1,2-Dichloroethylene (cis-1,2-DCE and trans-1,2-DCE)
- Vinyl chloride
- 1,1-dichloroethylene (1,1-DCE)
- 1,1,1-Trichloroethane (1,1,1-TCA)

A photoionization detector was run in tandem with the ELCD, for the purpose of screening for fuel patterns defined by the benzene, toluene, ethylbenzene and total xylenes pattern (BTEX). No BTEX patterns were observed in any of the on-site samples analyzed. No single component BTEX detections were reported in any of the off-site split data results.

Off-site confirmatory water samples were analyzed for VOCs by USEPA Method 8260B at Averill Environmental Laboratories to provide definitive data for confirmation of the on-site laboratory screening data set (USEPA, 1993). Samples were split in the field at the time of sample collection and submitted to both the on-site and off-site laboratories (see Table 4-3).

4.3.2.2 Monitoring Well Sampling. Samples were collected from six existing monitoring wells and analyzed on-site for VOCs (see Subsection 4.3.2.1) in

March 1999 to complement data being collected by the GeoProbe (see Table 4-3). Appendix D contains the field data records for groundwater sample collection.

4.3.2.3 Cone Penetrometer Investigations. HLA completed additional VOC groundwater investigations in April and May 1999 using a cone penetrometer to access depths not attainable by the GeoProbe equipment. Exploration locations CP-99-01 through CP 99-18 are identified on Figure 4-4. Table 4-7 presents a summary of cone penetrometer explorations. The cone penetrometer VOC groundwater investigation is summarized below:

- Nineteen total cone penetrometer explorations were completed for stratigraphic data acquisition and collection of groundwater samples (Table 4-7).
- A total of 87 groundwater samples from the water table to a maximum depth of 158 feet bgs, were sent to an Averill Environmental Laboratories for VOC analyses by USEPA Method 8260B.
- Stratigraphic logs of 17 explorations were recorded to better define in-situ subsurface geologic conditions beneath SAEP.
- Thirty-eight dissipation tests were completed to obtain estimates of in-situ horizontal hydraulic conductivity.

The piezometric cone penetrometer testing (PCPT) and groundwater sampling was performed by stratigraphics, Inc. of Glenn Ellyn, Illinois, during the period from May 5 through May 26, 1999. Exploration depths ranged from 45 to more than 160 feet bgs.

The PCPT technology uses an electronically tipped, stainless steel cone (probe), which, using hydraulic rams, is pushed smoothly and vertically into the overburden. Data was recorded continuously using a data logger and computer as the cone was advanced into the ground. The recorded data included tip (cone) resistance, sleeve friction, instantaneous pore pressure, and soil electrical conductivity. The combination of tip resistance, sleeve friction, and pore pressure data provided continuous stratigraphic logs for geologic and hydrogeologic interpretation and assessment. The data plots are contained in Appendix H. Tip resistance was highest in the gravelly sand strata at SAEP, lower and more variable in the fine to medium sand zone, and consistently very low in the silt zone. Sleeve friction data were generally similar in the gravelly sand and fine to medium sand zones, with a marked change in the silt.

Pore pressure was monitored continuously during the PCPT soundings using a transducer and porous element located on the cone tip. Pore pressure is first registered at the water table when the pen plotter departs from zero. Pore pressure increases with depth below the water table, as a function of hydrostatic pressure. As the cone is pushed into the soil, excess pressures are generated which, in low permeability materials, do not rapidly dissipate. At SAEP, excess pore pressure peaks correlated with decreases in cone tip resistance, which indicated that silty or clay strata were being penetrated.

In addition to the basic data (i.e., tip resistance, sleeve friction, and pore pressure), these data are combined into a line plot showing the ratio of the friction sleeve reading to tip resistance. Increases in this ratio result from decreases in tip resistance, often coupled with increases in sleeve friction, indicative of silty or clay-rich transition zone strata.

Soil electrical conductivity (EC) measurements were collected in each exploration. Soil EC is controlled by the conductance of both the soil particle and the soil pore fluids. Low EC values in saturated soils can be indicative of anomalous geochemistry. In particular, depressed EC zones immediately at the water table may be associated with floating Light Nonaqueous Phase Liquid (LNAPL) compounds. Very low EC zones at interfaces between aquifers and aquitards may be associated with either floating (LNAPL) or sinking (DNAPL) compounds. Gravel interference must be considered when evaluating depressed EC zones in saturated soils. Elevated EC values in saturated soils can be due to increased soil clay content or to increased dissolved salts in the ground water. Increased clay contents are evaluated based on the EC measurements and soil type information.

The groundwater sampler used during sample collection is a shielded wellpoint sampler of heavy construction. The shield prevents sampler contamination while penetrating soils above the sampling depth. After shield retraction, groundwater flows under in-situ pressure conditions, through a 20-inch long screen, into the sample barrel. The sampler is retrieved to pour off the sample and for decontamination. Small diameter hand pumps were used with the sampler to purge the sample interval and acquire sufficient volumes of sample.

A pressure transducer was also placed inside the sampler barrel. This allowed the measurement of sample inflow rate. Analysis of inflow data using rising head slug test methods provided a means of estimating soil hydraulic conductivities.

4.3.2.4 Investigation-Derived Waste (IDW). VOC-contaminated purge water was collected into 55-gallon drums and subsequently treated with a granular activated carbon system prior to discharge to the SAEP CWTP sump at Building 63 (eleven samples were collected following pre-treatment of the water and analyzed on-site to determine the effectiveness of the treatment system). VOC-contaminated decontamination water containing surfactants (Liquinox detergent) was collected into 55-gallon drums and transported off-site for disposal.

4.4 OPERABLE UNIT 2 NCRA INVESTIGATIONS

The following subsections present discussions of Foster Wheeler/HLA pre-design activities completed under the OU 2 NCRA through the TERC contract with the USACE. Activities included a seismic refraction survey, soil boring and piezometer installation, aquifer testing, a location and elevation survey, indoor air sampling, a soil vapor survey, and treatability and pilot-scale testing.

4.4.1 Seismic Refraction Survey

A seismic refraction survey was completed at the SAEP from September 28 through October 1, 1999 with the objective of determining the bedrock depth and configuration beneath the survey area. The survey was performed by Northeast Geophysical Services of Bangor, Maine using a Geometrics ES-2401, 24-channel seismograph, with data being obtained along seven seismic lines totaling 5,593 lineal feet. Seismic data were processed and interpreted using the RIMRock Geophysics SIPT-2 (formerly U.S.G.S. SIPT-2) seismic interpretation program. Seismic survey line locations are presented in Figure 4-5.

In a seismic survey, an interpretation of subsurface densities can be made based on the travel times of sound waves, measured in milliseconds, travelling through and refracting from subsurface layers with contrasting densities. Bedrock travel velocities are the fastest velocities recorded, with lesser velocities being indicative of differing unconsolidated layers above the bedrock. Seismic data are compared to ground truth data, such as borehole information, to calibrate the seismic model for the site.

Under favorable conditions, seismic refraction results can be fairly precise, within +/- 10 percent. Although the SAEP location is a vacant industrial plant, there are still numerous potential “noise” source areas on site including power transformers, fans, maintenance machinery, off-site road traffic, etc. that potentially affected the quality of the seismic data. In fact, one of the survey lines (seismic Line 4) had such poor data quality due to background noise, as well as to a concentration of buried utilities, that an interpretation of this line was difficult, at best. However, results from the rest of the survey produced data of sufficient quality to make interpretations of the depth and configuration of the bedrock surface at SAEP, which are presented in Section 6.0 of this report. Northeast Geophysical Services' report is presented as Appendix I.

4.4.2 Soil Borings, Piezometers, and Extraction Well Installations

In August 1999, three soil borings, 7 piezometers and one extraction well were installed in the vicinity of the former Chromium Plating Facility at SAEP. The objectives of these explorations were to: 1) obtain subsurface soil and groundwater chemical data; 2) collect soil and groundwater samples for treatability testing of hexavalent chromium and VOC treatment technologies; and 3) provide a pumping well and water level observation points for aquifer testing of the subsurface hydraulic conditions. These activities are discussed in the following subsection.

4.4.2.1 Subsurface Soil Sampling. Soil borings PZ-99-01 through PZ-99-03 were drilled to collect subsurface soil for chemical analyses, and to provide subsurface soil for treatability testing (see Subsection 4.4.9). Soil boring PZ-99-01 was drilled inside the Chromium Plating Facility adjacent to the GeoProbe groundwater exploration WP-99-33 (see Figure 4-1), which contained over 800,000 µg/L of TCE in groundwater. Soil boring PZ-99-02 was drilled outside the northern corner of the Chromium Plating Facility adjacent to WP-99-15 (see Figure 4-1), which contained 950 mg/L of hexavalent chromium in groundwater. PZ-99-03 was drilled between Buildings B-2 and B-12 adjacent to WP-99-48 (see Figure 4-4), which contained 100,000 µg/L of 1,1,1-TCA in groundwater.

Subsurface soil samples were collected during the field program using split-spoon samplers and hollow-stem auger (HSAs) as described in Standard Operating Procedure (SOP) No. 1 which is contained in Attachment A, Appendix B (Quality Assurance Project Plan [QAPjP] for The Non-Time Critical Removal Actions For The Stratford Army Engine Plant) of the OU 2 NCRA Work Plan (Foster Wheeler/HLA, 1999). Table 4-8 presents a summary of soil borings including sample depths and analysis performed. Analytical soil samples were sent to an off-site laboratory for analysis for VOCs, SVOCs, metals (including hexavalent chromium and cyanide), SPLP, total organic carbon (TOC), total petroleum hydrocarbons (TPH), and cation exchange capacity (Table 4-8). Off-site laboratory grain-size analyses were also completed on select samples. The results of the grain-size analyses are included in Appendix G. VOC soil samples were preserved in methanol at the time of sample collection as described in SOP No. 13, and decontamination between borings was performed as described in SOP No. 7 (Foster Wheeler/HLA, 1999). At each soil sample location, VOC samples were collected from discrete locations (not composited); all other parameters were sampled from composited and homogenized soils that were collected from the depth of interest.

4.4.2.2 Piezometers. A total of seven piezometers were installed from 8/17/99 through 8/20/99 at three separate locations (soil borings PZ-99-01 through PZ-99-03) in the vicinity of the Chromium Plating Facility. Two sets of three nested piezometers (PZ-99-01 A, B, C and PZ-99-02 A, B, C), consisting of a shallow, mid-depth and deeper piezometer, were set in two borings, with a single shallow piezometer being placed at PZ-99-03 (see Figures 4-1 and 4-4). Table 4-9 presents a summary of the piezometer construction details. The borings were drilled using traditional HSA techniques, and using split-spoons for sample collection (see subsection 4.4.2.1).

The piezometers were constructed of Standard Schedule 40 polyvinyl chloride (PVC) with five-foot lengths of 0.010-inch slotted PVC well screens. All piezometers are one-inch in diameter. Individual well construction specifics are contained in the piezometer/extraction well details in Appendix F. The annulus around each piezometer screen was backfilled with silica sand to a minimum of one-foot above the shallow screens and five feet above the mid-level and deeper screens. Bentonite pellet seals were placed between the individual screened sections in the nested sets to isolate these zones.

The piezometers were developed using a peristaltic pump and surging techniques. Each piezometer was pumped and surged to remove at least as much water that was used during the drilling process and until the field parameters stabilized. Piezometers were completed with flush-mounted protective steel casings cemented into the ground and equipped with locking covers.

4.4.2.3 Extraction Well. One extraction well, EW-99-01, was placed as shown in Figure 4-1 in order to perform aquifer testing within the former Chromium Plating Facility. This well was installed on 8/25/99. This well was constructed of Schedule 40 PVC with a 20-feet of 0.020-inch slotted well screen extending from 20- to 40-feet below ground surface. The extraction well construction details are summarized in Table 4-9 and a construction form is included in Appendix F.

The extraction well was developed using a submersible pump, which pumped the well at variable rates, and at different depths, within the screened interval. Surging of the well with the pump was also performed. Development continued until the pump reached its' maximum output of around 16 gallons per minute (measured by a flow meter), which was sustained over 15 minutes of pumping. Development water from the well was collected in bulk storage tanks that were also used during the aquifer tests (see Subsection 4.4.3). Development water was eventually treated through granular activated carbon (GAC) filters, and then further treated by the facility's wastewater treatment plant. This was not performed until after off-site laboratory confirmation samples of the GAC-treated water determined that the permissible level for VOCs in water (100 parts per billion [ppb] total VOCs) was not exceeded prior to being released to the CWTP.

4.4.3 Aquifer Testing

The following subsections present the details of the aquifer testing performed at the former Chromium Plating Facility in September 1999. A complete aquifer testing report, including data, plots, and interpretation of results, is presented as Appendix J.

4.4.3.1 Objectives. Stepped-rate and constant-rate discharge tests were performed on extraction well EW-99-01. The objectives of the stepped-rate test were to:

- assess immediate aquifer response to pumping;
- identify the approximate specific capacity of the pumping well; and
- determine an appropriate pumping rate for a longer-term constant rate test.

The objectives of the constant-rate test were to:

- determine aquifer hydraulic parameters in the vicinity of the pumping well, including transmissivity (T), hydraulic conductivity (K), and specific yield (S_y).

Additional constant-rate test objectives were to provide observational data on the approximate zone of capture, evaluate the presence of aquifer boundary conditions, and determine the magnitude of tidal influence on groundwater elevations in the area of the test. The tests also provided information on groundwater quality near the areas of known chromium and VOC impact.

4.4.3.2 Technical Approach. The locations of test well EW-99-01 and nearby observation wells and piezometers is shown on Figure 4-1. An aquifer testing summary is presented as Table 4-10.

The tests were performed using facility electric power, electronic pressure transducers, and battery powered automated data recorders. The data recorders and transducers were products of In Situ Inc. of Laramie, Wyoming. Electronic data collection was supplemented by periodic hand-measured water levels. Extraction well EW-99-01 was fitted with a 3.5-inch diameter submersible electric pump (manufactured by Grundfos, Inc.). The pump was placed near the bottom of the screened interval, approximately 40 feet bgs.

Water pumped from EW-99-01 was discharged through PVC hose to a 20,000 gallon roll-off (Frac) tank set outside the former Chromium Plating Facility, approximately 120 feet from the pumping well. The discharge end was placed near the top of the tank, approximately 10 feet above ground. The position of the discharge line was kept at a constant elevation during pumping, and the line was never submerged below the level of discharged water. As the Frac tank filled, water was periodically removed to back-up holding tanks using a separate transfer pump and distribution hoses.

Two in-line flowmeters were used to measure discharge. An electronic digital flow meter (Flowmeter 1) measured totalized flow and instantaneous discharge rate. A second analog meter (Flowmeter 2) recorded totalized flow. The meters were placed approximately twenty feet from the extraction well and were read periodically throughout the course of the pumping tests.

4.4.3.3 Background Measurements. Water level data were collected prior to pumping (antecedent) to assess head variations or trends that could influence interpretation of well responses to pumping stress. Transducers were installed in five monitoring wells: PZ-99-08I, MWCR-99-02, PZ-99-01A, PZ-99-01B, and PZ-99-01C (see Table 4-10). A barometer recorded atmospheric pressure coincident with the electronic water level measurements. Measurements were collected at 60-minute intervals beginning on 8/26/99 at 1902 hours and ending on 8/30/99 at 0902 hours. Water level measurements are recorded as feet below top of each well casing rim.

Background measurements were also collected from PZ-16D; a piezometer located approximately 600 feet from the pumping well, and assumed to be beyond any anticipated measurable pumping effect. Measurements were collected at 10-minute intervals from 1000 hours on 8/27/99 to 1400 hours on 9/02/99, a period of over 5 days.

4.4.3.4 Stepped-Rate Discharge Test. A stepped rate discharge test was initiated at 1000 AM on August 30, 1999 at EW-99-01. Three steps of increasing discharge rate were completed. Pumping interval durations were 120, 120 and 140 minutes, with corresponding discharge rates of 5, 10, and 17 gallons per minute (gpm). Data were collected electronically from piezometers during the test, but were not considered usable due to the marginal observed drawdown response in observation piezometers. The pressure transducer used in EW-99-01 did not record initial water level decline due to initial installation deeper than the transducer’s calibrated depth. Manual measurements, collected using a Slope Indicator water level meter, were used to assess drawdown response in the pumping well.

4.4.3.5 Constant-Rate Discharge Test. A constant-rate discharge test was initiated 0937 hours on August 31, 1999 and ending at 1237 hours on September 2, 1999, a pumping period of 51 hours (3060 minutes). A discharge rate of 15 gpm was chosen for the test and held constant throughout the pumping interval.

Electronic measurements of pressure head were collected in eight observation piezometers, extraction well EW-99-01, and the background piezometer (PZ-16D). These were supplemented by manual water level meter data throughout the course of the pumping test. Two additional transducers installed in PZ-99-02B and PZ-99-02C did not function properly due to faulty connections. Electronic data collection continued for several days past the end of the pumping interval to observe general head trends.

4.4.4 Location and Elevation Survey

The location and elevation of all Foster Wheeler/HLA exploration locations were surveyed by Meridian Engineering of Concord, Massachusetts, registered land surveyor. Horizontal and vertical control points used during previous RI surveys by URSGWCFS at SAEP were used during this survey for consistency. Vertical elevation accuracy was established at 0.01-foot and horizontal location accuracy was set at 0.1-foot. Survey data are presented as Appendix K.

4.4.5 Investigation-Derived Wastes

Handling and disposal of IDW for the OU 2 NCRA investigations were completed as outlined in Section 7.0 of the OU 2 NCRA Work Plan (Foster Wheeler/HLA, 1999).

Soils excavated during drilling activities were placed in 55-gallon Department of Transportation drums and staged in the former Chromium Plating Facility. Contaminated groundwater, including decontamination fluids and well development water generated during the drilling program, was containerized and pumped through 55-gallon drums of activated carbon into a holding tank. Samples were then collected from the holding tank for VOC analysis. If results were less than 100 ppb total VOCs, the water was discharged to the Building 63 sump, and pumped to the CWTP for treatment. If results were greater than 100 ppb total VOCs, then the water was run through the activated carbon until a result of less than 100 ppb was achieved. Decontamination water containing surfactants has been drummed, labeled, and staged in the former Chromium Plating Facility prior to characterization and disposal. Contaminated protective clothing and sampling equipment were drummed, labeled, and placed at a drum staging area in the Chromium Plating Facility prior to disposal.

4.4.6 Soil Vapor Survey

The soil vapor survey was completed in August 1999 to determine if concentrations of VOC vapors in the subsurface exceed the CTDEP Industrial/Commercial Volatilization Criteria (I/C VC) for soil vapor and, therefore, pose a threat to indoor air quality in SAEP buildings. The survey consisted of the collection of soil vapor samples from 52 locations (SG-99-01 through SG-99-52), at depths ranging from 1 to 3 feet bgs using a GeoProbe. Figure 4-4 presents the locations of the soil vapor samples. Table 4-11 presents a summary of soil vapor exploration locations.

Samples were collected at a minimum depth of 1 foot below the bottom of the building floors. Soil vapor samples were collected using a low flow volume pump to purge the entire probe assembly. The pump inlet was then sealed off from the atmosphere at the required depth in the probe, and an in-situ soil vapor sample was drawn into a glass bulb using the pump. The soil vapor sampling procedure, including the equipment to be used and calibration procedures is described in SOP No. 10 in Attachment A of the OU 2 NCRA QAPjP (Foster Wheeler/HLA, 1999). Samples were analyzed on-site using a Photovac10S50 portable GC. Ten percent of samples were collected as duplicates and sent to an off-site laboratory (Quanterra) for analysis by Method 8260B to provide a comparison to on-site data.

Soil vapor samples were analyzed on-site for 1,1-DCE, TCE, PCE, and vinyl chloride using a Photovac 10S50 gas chromatograph. Reporting limits for TCE and PCE were obtained from the USEPA Region I method "Ambient Air Grab Sample Analysis for Volatile Organic Compounds". Reporting limits for vinyl chloride and 1,1-DCE were extrapolated from this method.

4.4.7 Indoor Air Quality Sampling

Following review of the soil vapor sampling results, the USACE requested that Foster Wheeler/HLA conduct indoor air quality monitoring at SAEP. As of January 1, 2000, Foster Wheeler/HLA had completed four rounds of sampling in various buildings at SAEP. Foster Wheeler/HLA submitted a technical memorandum in December 1999, which summarized the results of the first three rounds of sampling completed at the SAEP between September 1, 1999 and October 22, 1999. In addition, the technical memorandum presented a review of detected indoor air contaminants to further assess potential risks to workers, and provide perspective as to the likelihood of potential future risks.

In January 2000, Foster Wheeler/HLA was contracted to perform additional indoor air quality sampling work. The initial round of sampling was completed in early February, and will continue monthly for a period of six months. Following the sampling, a report will be prepared which will:

- summarize all indoor air sampling results to date;
- present a revised risk assessment; and
- recommend proposed future actions regarding indoor air quality.

4.4.8 Treatability and Pilot Testing

Treatability testing (i.e., remedy-screening testing) was completed in August 1999 to evaluate the effectiveness of potential in-situ treatment technologies on site contamination. Three potential treatments, hexavalent chromium reduction using ferrous sulfate, VOC chemical oxidation using potassium permanganate, and VOC chemical oxidation using hydrogen peroxide, were tested on three areas of the site. Test Area 1, named the TCE Area, tested the effectiveness of potassium permanganate and hydrogen peroxide at oxidizing VOCs, primarily TCE. Test Area 2, the Hexavalent Chromium Area, tested the effectiveness of ferrous sulfate at reducing hexavalent chromium. Test Area 3, the 1,1,1-TCA Area tested the effectiveness of potassium permanganate and hydrogen peroxide on VOCs; however, the primary contaminant of concern was 1,1,1-TCA. These three areas are identified in Subsection 4.4.2 with respect to boring locations:

- PZ-99-01 associated with Test Area 1
- PZ-99-02 associated with Test Area 2
- PZ-99-03 associated with Test Area 3

Samples used for treatability testing consisted of aquifer soil and groundwater collected from the depth of maximum contaminant (groundwater) concentrations in the respective hot-spots. A soil sample was collected from the zone of maximum contamination and sent off-site for analysis of VOCs, SVOCs, and inorganics during completion of a soil boring in each hot-spot (see Subsection 4.4.2.1). A pre-test sample of the groundwater/soil mixture (a water sample) also was collected and analyzed on-site for hexavalent and total chromium, ferrous iron, total iron, pH, temperature, and ORP and off-site for VOCs and the water quality parameters: alkalinity, hardness, dissolved calcium, magnesium, and manganese, sulfide, and chloride. Pre-test sample results were used to estimate the contaminant mass in an individual test jar (contaminant mass in soil and groundwater) and subsequently calculate the stoichiometric amount of reagent necessary to complete each test.

Generally, testing was completed using 200 grams of soil and approximately 900 milliliters (mL) of water in each of six 1-liter jars. Testing consisted of the addition of a specified reagent (e.g., ferrous sulfate solution, hydrogen peroxide solution, or potassium permanganate) and the necessary catalysts (e.g., sulfuric acid or ferrous sulfate solution) to the prepared 1-liter jars. Two tests were run for Test Areas 1 and 3, the TCE and the 1,1,1-TCA Areas, respectively. The first test involved the addition of ferrous sulfate catalyst and hydrogen peroxide solution to six jars. A specific volume of a 10 percent ferrous sulfate solution was first added to each jar, then a 5 percent hydrogen peroxide solution was added at various multiples of the stoichiometrically-determined dosage (ranging from zero to 10 times). The second test for Test Areas 1 and 3 involved the addition of a 5 percent solution of potassium permanganate to jars at various multiples of the stoichiometric dosage (ranging from 0 to 4 times).

In Test Area 2, testing consisted of the addition of various volumes of sulfuric acid or sodium hydroxide to adjust each jar's pH, followed by the addition of a 10 percent ferrous sulfate solution. Various dosages of ferrous sulfate were added to the jars, ranging from 0 times the stoichiometric dosage (the control sample) to 2 times the stoichiometric dosage.

The samples were mixed and allowed to settle, then the water was analyzed both on- and off-site to assess the effectiveness of each test condition. The tests determined the chemical dose needed for maximum conversion of contaminants with minimum residual reagent.

Results of both treatability and pilot-scale treatability studies will be presented in a pilot-scale report scheduled for submittal in the summer of 2000.

4.5 REMEDIAL INVESTIGATION ACTIVITIES

The following subsections describe RI field investigations, completed in 1999, which are used in this pre-design investigation report to support geologic, hydrogeologic and VOC groundwater contamination assessments. Information contained in these subsections has been provided by URSGWCFS in advance of the Draft RI Report submittal. The Draft RI Report is scheduled to be issued in March 2000.

4.5.1 Tidal Study and Groundwater Elevation Measurements

A tidal study consisting of long-term groundwater level monitoring of 34 monitoring wells and three surface water stilling wells was completed from July 20 through August 18, 1999. The purpose of the tidal study was to compare tidal variations in surface waters versus groundwater, determine the tidal fluctuations in groundwater across the site, and determine mean groundwater elevations and hydraulic gradients at SAEP. A total of seventeen monitoring wells were monitored for a one-week period. The remaining seventeen monitoring wells and three temporary stilling wells were monitored for a four-week period month in order to gauge the full range of changes during a tidal cycle. The locations of the monitoring wells included in the tidal study are presented in Subsection 6.2.3

As part of the tidal study, three stilling wells for the monitoring of surface water levels and tidal variations in comparison to groundwater levels at SAEP were placed in the Housatonic River, Frash Pond, and the Drainage Channel. The stilling wells were used in order to minimize surface water fluctuations from disturbing the pressure transducer. The groundwater measurements were collected from all wells utilizing In-Situ™ Troll® pressure transducers and data loggers. The transducers were programmed to collect a time and pressure head reading once a hour during the monitoring time period that was then recorded by the data logger.

Tidal fluctuations in surface water bodies produce progressive pressure waves in adjacent aquifers. As these pressure waves propagate inland, groundwater levels and hydraulic gradients continuously fluctuate, creating a situation where a single set of water level measurements cannot be used to accurately characterize groundwater flow. At any point where groundwater tidally fluctuates, the magnitude and direction of the hydraulic gradient fluctuates about the mean or regional hydraulic gradient. The net effect of these fluctuations on groundwater flow can be determined using the mean hydraulic gradient which is calculated by filtering the groundwater level measurements to obtain a mean groundwater elevations. Filtering methods using 71 consecutive hourly water level observations to accurately determine the mean level were utilized in the tidal study (Serfes, 1991).

The filtering method detailed in Serfes, 1991 is used to effectively remove all diurnal and semidiurnal lunar and solar harmonics from 71 consecutive hourly observations. Using moving averages it yields a filtered mean level for the median time of the 71 hours. First, a sequence of mean is computed for 24 observations, starting with observation one for the first mean and observation 48 for the last, yielding a total of 48 means. Second, a similar series of means is computed for 24 of those means yielding 25 means. Last, the mean of those 25 means is computed yielding the mean level at hour 36.

The filtering method can be expressed mathematically as:

Let the consecutive hourly water level values be O (1), O (2), O (3)…, O(71):

The first sequence of means (Xi) is

$$X_i = \sum_{K=0}^{23} \frac{O(K+i)}{24} \text{ where I = 1, 2, 3, …, 48;}$$

the second sequence of means (Yj) is

$$Y_j = \sum_{i=0}^{23} \frac{X(i+j)}{24} \text{ where j = 1, 2, 3, …,25;}$$

then the mean level (M) at hour 36 is

$$M = \sum_{j=1}^{25} \frac{Y_j}{25}$$

The groundwater level monitoring raw data recorded by the data logger was converted into elevations and five 71-hour time periods were chosen for statistical filtering. The five time periods were July 20 through July 23, July 24 through July 26, July 27 through July 29, August 3 through August 5, and August 10 through August 12, 1999. The first two time periods included all 34 monitoring wells and 3 stilling wells. The remaining three time periods included only the wells monitored for four weeks and the three stilling wells.

The mean groundwater elevations from the first two 71-hour periods (7/20 through and 7/23 and 7/24 through 7/26) were used to construct groundwater elevation contour maps (see Subsection 6.2.3). Groundwater elevations for each 71-hour period were divided in to two categories, shallow (<50 feet bgs) and deep (>50 feet bgs) and groundwater elevation contour was developed for each.

4.5.2 Direct Push Groundwater Sampling

A total of 39 direct push borings were installed by URSGWCFS during the remedial investigation for initial characterization of groundwater. The direct push study was used for VOC groundwater screening and placement of permanent monitoring wells (DP5-5 through DP5-9 and DP6-1 through DP6-4), assessment of contaminant impacts to the tidal flat areas (DP2-1 through DP2-4), groundwater screening of a potential chromium hot-spot at Building 3 (DP5-1 through DP5-11) and groundwater screening of on-site and off-site VOC contamination impacting Area 3 (DP3-1 through DP3-13). The 39 direct push boring were installed in four areas (Areas 2, 3, 5, and 6) on the facility. Figure 4-4 depicts the locations of all direct push borings.

The direct push groundwater sampling program was completed with two separate events. The first direct push sampling event consisted of installation of 30 direct push borings from May 3 to June 2, 1999. The direct push borings advanced during the first event were installed by Vironex Environmental Services of Newark, DE using a Geoprobe® vehicle-mounted hydraulic hammer. The second event was completed from November 1 through November 5, 1999 and consisted of the advancement of nine additional direct push borings in Areas 3 and 5. Direct push borings installed during the second direct push groundwater sampling event were advanced by Pine & Swallow Associates, Inc. of Groton, MA using a VibraDrill® all terrain drilling machine. The direct push borings were advanced to a maximum depth of the 60 feet with groundwater samples collected at 10 foot intervals to the bottom of the hole.

The first sampling round was performed using Geoprobe® hydraulic hammer mounted on an all-terrain vehicle. The hydraulic hammer advances a 1-inch diameter direct push point through the unconsolidated materials to the saturated zone via percussion. The direct push point used was a blank casing with telescoping screened point which allowed for vertical profiling sampling from the same boring. Once the desired sampling interval is reached, the telescoping section of the direct push point is lifted exposing the screened portion of the point allowing groundwater to enter the screen. At each sampling level, five well volumes of groundwater were purged prior to sampling using a peristaltic pump. Samples for laboratory analysis were obtained in the appropriate lab-clean glassware using the peristaltic pump and dedicated tubing. Re-usable sampling equipment was decontaminated between sampling locations by rinsing with methanol and distilled water.

The second round of direct push groundwater sampling was performed using microwells. Microwells were used during the second event because of the greater penetration power of this technology. The equipment change from the first round was made in order to minimize the number times of refusal was met which occurred frequently during the first event. Microwells are installed by a high frequency vibratory hammer mounted on a VibraDrill® all terrain drilling machine. Microwells consist of 1.3-inch O.D. steam-cleaned steel pipe whose leading end is fitted with a driven point. Screens, manufactured from the same material, consist of a double row of longitudinal slots 0.015-inch wide. Sequential sampling was performed by driving the well screen to a predetermined depth and collecting a sample. A section of riser pipe is then connected, the well driven to the next sampling interval and a subsequent sample collected. At each sampling level, at least three well volumes were removed with a peristaltic pump by pumping from the top of the water, the tubing is then lowered to the screened interval and another three volumes purged before sampling. Samples for VOC analysis were obtained in lab-clean 40ml vials with septum screw caps using new polyethylene tubing dedicated to each well and sampling interval. A short segment of silicon rubber tubing that is part of the peristaltic pump head is replaced by new tubing between each sampling location. Re-usable sampling equipment was decontaminated between sampling locations by rinsing with methanol and distilled water. The direct push groundwater sampling procedures are outlined in the RI Workplan dated September 23, 1998.

Groundwater samples collected from the berm (DP2-1 through DP2-4) to detect contaminants which potentially could impact the tidal flats were submitted for laboratory analysis of TCL VOCs via USEPA Method 8260B, SVOCs via USEPA Method 8270, Polychlorinated Biphenyls (PCBs) via USEPA Method 8082, TAL Metals via USEPA Method 6010, and Cyanide via USEPA Method 9010B. The sample parameters for the four samples were selected in accordance with the USACE contract modification letter dated April 12, 1999.

During both direct push groundwater sampling events, a mobile laboratory was used on-site to analyze the VOC samples from Areas 2, 3, 5, and 6. A GC was utilized to analyze the groundwater samples. In addition, samples collected from the Building 3 area (DP5-1 through DP-10) were analyzed in the field using field screening kits from the Hach Company for total chromium, hexavalent chromium, and ferrous iron. For Quality Assurance/Quality Control (QA/QC) purposes, split samples for the USACE were collected from 10 percent of the groundwater samples and submitted to Quanterra Environmental Services of West Sacramento, CA by URSGWCFS personnel for analysis.

4.5.3 Monitoring Well Sampling

Two rounds of monitoring well groundwater sampling were completed by URSGWCFS in June/July 1999 and November 1999 during the remedial investigation using low flow rate purging and sampling techniques. Groundwater samples were collected in order to determine the current constituents, concentration, extent and migration of the contaminants in the groundwater at the facility. The groundwater sampling program consisted of newly and previously installed monitoring wells throughout the facility in Areas 1, 2, 3, 4, 5, and 6 of the site. The monitoring wells are depicted on Figure 4-4.

During each sampling round, groundwater purging operations and subsequent groundwater sample collection were completed in accordance with the USEPA Region 1 Low Stress Method using adjustable-rate stainless-steel bladder pumps equipped with dedicated teflon tubing and a flow-through cell. Twenty-four hours prior to purging the monitoring well, a stainless steel bladder pump, with teflon-lined polyethylene tubing and safety line was gently lowered into the well casing, to approximately the mid-point of the saturated screen level (target sampling zone). The bladder pump was placed in the well 24 hours prior to purging in order to allow sediments that were agitated during pump installation to settle. Following the 24-hour stabilization period, a water level measurement was recorded using an electronic water level indicator. These measurements were taken cautiously to the extent practicable, in order to cause minimum turbulence to the static water level. After the water level was recorded, groundwater in each monitoring well was purged. During the purging operations, the pump speed was adjusted to achieve minimal stabilized drawdown, to the extent practicable. In case the drawdown could not be stabilized, the pumping rate was reduced to the minimum allowed by the equipment. The groundwater purging was accompanied by the periodic (average of 3 to 6 minutes) measurement of the field indicator parameters including pH, temperature, specific conductivity, dissolved oxygen, turbidity, and redox potential using a flow-through cell attached to the teflon tubing. Once the field parameters were considered to be stabilized within the limits specified in the USEPA's Low Stress Method, groundwater samples were collected from respective monitoring wells directly from the teflon tubing into sampling vials/jars.

Upon completion of sampling, the sampling jar/vials were placed in coolers with ice and maintained at 4° Celsius. Prior to overnight shipment of the sample to the analytical laboratory, sample labels were completed with sample identification number, project name/number, date, time and parameters and then placed on the sample jars/vials. The samples were wrapped with bubble wrap and placed in the coolers with the completed chain of custody and secured with shipping tape and tamper-proof labels. The samples were shipped to Emax Laboratories, Inc. of Torrance, CA.

4.5.3.1 Round One. The first round of monitoring well groundwater sampling was completed from June 29 through July 13, 1999. A total of 42 monitoring wells were sampled during the first round. Samples were collected in accordance with procedures outlined in the RI Work Plan as outlined above. The samples collected from the monitoring wells were submitted for analysis of TCL VOCs via USEPA Method 8260B, SVOCs via USEPA Method 8270, PCBs via USEPA Method 8082, TAL Metals via USEPA Method 6010, Cyanide via USEPA Method 9010B and Chloride. Sample parameters and well selections for the first sampling round were in accordance with the Groundwater Sampling Plan Addendum to the RI Workplan dated December 23, 1998 URSGWCFS, 1998).

In addition, samples collected from 10 monitoring wells (WC5-3S, PZ-9D, WC-10S, WC-12S, WC2-3D, WC2-1D, WC2-2I, WC5-1s, WC2-2D and PZ-13D) were analyzed for design-related parameters. The design-related parameters consist of pH, conductivity, salinity, total and dissolved manganese and iron, TOC, chemical oxygen demand, biological oxygen demand, Eh, sulfate, sulfide, nitrate, nitrite, ammonia, alkalinity as bicarbonate, dissolved oxygen, nitrogen, chlorides, phosphates. The results of these parameters will be used for feasibility study options and natural attenuation calculations.

In accordance with the URSGWCFS RI Workplan dated September 1998, QA/QC samples were collected during the first sampling round. Three samples (WC-20D1, WC2-3S, and WC3-2D) were submitted for analysis as matrix spike/matrix spike duplicate (MS/MSD) samples. Four samples (WC-09D3, WC-12D3, WC-16D3, and WC-17D3) were submitted as blind duplicates. In addition, four samples (WC-20D1, PZ-1D, WC-4S, and WC3-1I were quality assurance splits for the USACE and submitted to Quanterra Environmental Services of West Sacramento, CA.

The results for the first round of monitoring well groundwater sampling and analysis are used to interpret VOC groundwater contamination, presented in Subsection 6.4.3.

4.5.3.2 Round Two. The second round of monitoring well groundwater sampling was completed by URSGWCFS from November 8 through November 19, 1999. A total of 51 monitoring wells were sampled during the second round. Groundwater samples collected from monitoring wells which were sampled during the first round of groundwater sampling were submitted for analysis of TCL VOCs, SVOCs, and TAL Metals. Monitoring wells which were not sampled during the first sampling round and newly installed monitoring wells were submitted for analysis of TCL VOCs, SVOCs, PCBs, TAL Metals, and Cyanide. Sample parameters and well selections for the second sampling round were in accordance with the Groundwater Sampling Plan Addendum to the RI Workplan dated December 23, 1998.

In accordance with the URSGWCFS RI Work Plan dated September 1998, QA/QC samples were collected during the second sampling round. Three samples (WC-20D1, WC2-3S, and WC3-2D) were submitted for analysis as MS/MSD samples. Four samples (WC-09D3, WC-12D3, WC-16D3, and WC-17D3) were submitted as blind duplicates. In addition, four samples (WC-20D1, PZ-1D, WC-4S, and WC3-1I) were quality assurance splits for the USACE and submitted to Quanterra Environmental Services of West Sacramento, CA.

The results for the second round of monitoring well groundwater samples will be presented in the URSGWCFS Draft RI Report, scheduled to be issued in March 2000.

4.5.4 Slug Tests

Slug tests were completed from November 15 through November 19, 1999 on a total of 34 monitoring wells. The monitoring wells included each of the newly installed monitoring wells including Foster Wheeler/HLA's monitoring wells installed on the causeway (MWCD-99-01A, MWCD-99-01B, MWCD-99-02A, and MWCD-02B) as well as six previously existing monitoring wells (LW-3S, LW-5S, LW-2S, PZ-5D, PZ-9D and WC9-D2) as requested by the USACE. Slug tests are an in-situ measurement of K in the area surrounding the well screen and filter pack. K is a measurement of a porous medium's ability to transmit water with units of distance divided by time.

The slug tests were performed using a "rising head" test which is performed by removing a volume of water from a monitoring well and recording the recovery of the water level within the well. The "rising head" method was selected in order to minimize the tidal fluctuations from influencing the slug test data. Following a manual static water level measurement, an In-Situ Troll pressure transducer and data logger was placed within the well. A Troll data logger was programmed to record data on a logarithmic mode. Next, a dedicated, disposable bailer was lowered into the well below the static water level. The bailer remained at this depth until the water level approached the original static level. To start the test, the data logger test was started, and the bailer was quickly removed in order to simulate instantaneous change in volume in the well. Time and pressure head measurements were then collected until the water level had recovered to within 90 percent of static conditions.

The slug tests completed during the RI were analyzed with the aid of computer software program AQTESOLV. The Bouwer-Rice Solution (1976) was utilized to determine the K value of the aquifer zone in the immediate vicinity of the well screen. Bouwer and Rice (1976) developed an empirical relationship describing the water-level response in an unconfined aquifer to instantaneous withdrawal of water from a well:

$$K = \frac{r_c^2 \ln\left(R_e / r_w\right)}{2d} \frac{1}{t} \ln \frac{h_o}{h_t}$$

where: $r_c =$ radius of the unscreened part of the well where the head is rising

$r_w =$ horizontal distance from well center to undisturbed aquifer

$R_e =$ radial distance over which the difference in head, h_o, is dissipated in the flow system of the aquifer

$d =$ length of the well screen or open section of the well

$h_o =$ head in well at time $t_o = 0$

$h_t =$ head in well at time $t > t_o$

The assumptions the Bouwer and Rice solution make are that the aquifer has areal extent, homogenous and uniform thickness, the potentiometric surface is initially horizontal, the volume of water is discharged from the well instantaneously, the aquifer is confined or unconfined, and flow is steady.

5.0 ANALYTICAL PROGRAM

5.1 SAMPLE IDENTIFICATION

The following discussion of sample identification is generally applicable to samples collected by Foster Wheeler/HLA as presented in Section 4.0. Samples collected for laboratory analysis during the field investigations were typically labeled with an 11-digit sample identification code identifying the site location and type of exploration, horizontal and vertical location, and a modifier. This identification system used for sample numbering allowed for tracking and data manipulation.

The sample identification system consists of 11 alphanumeric characters in four information groups. Undesignated portions of the sample identification use an “X,” or for placeholders to define the sample type, such as; XX = standard sample, XD = duplicate sample, MS = matrix spike sample, and MD = matrix spike duplicate sample.

INFORMATION GROUP ITEM	DIGITS
Site and/or sample type	1-2
Year of sample collection	3-4
Horizontal locators	5-6
Vertical locator	7-9
Modifier (e.g., duplicate)	10, 11

The following are examples of sample identification numbers:

<u>SP9901007XX</u>: a GeoProbe soil exploration (SP) soil sample taken from the location SP-99-01 (in this case, 99 is the last two digits of the year collected, and 01 is the boring number); sample collected from the 5- to 7-foot depth, in feet below ground surface, (007) (the number shown is the bottom depth of the sample interval).

<u>WP9933011XD</u>: a GeoProbe exploration (WP) groundwater sample taken from the location WP-99-33; sample collected from the 9- to 11-foot depth (011); duplicate sample (D).

<u>CP9918005XX</u>: a PCPT exploration (CP) soil sample taken from the location CP-99-18; sample collected from the five-foot depth.

<u>SG9910003MS</u>: a soil vapor exploration (SG) sample taken from the location SG-99-10; sample collected from the 3-foot depth; sample submitted for matrix spike analysis (MS).

Trip blanks were typically identified with the prefix "TB" followed by a six-digit character designated for the month (MM), day (DD), and year (YY) of the sampling. For example, a trip blank associated with samples collected on July 31, 1999 would be identified as "TB073199".

Field blanks were typically identified with the prefix "FB" followed by a six-digit character designated for the month (MM), day (DD), and year (YY) of the sampling. For example, a field blank associated with samples collected on April 30, 1999 would be identified as "FB043099".

5.2 DATA MANAGEMENT

After sample analysis, analytical results were entered into electronic format, either Microsoft Excel or Access. These electronic files were then transferred to the SAEP Geographic Information System (GIS) Microsoft Access database. The SAEP GIS is being prepared concurrently with this report by HLA, under contract to the USACE. Following data validation procedures, the data in the GIS database was edited accordingly. The majority of analytical results tables presented in this report were generated from the GIS database. In some cases, particularly for field analytical results, data tables are retained in their original Microsoft Excel format.

5.3 ANALYTICAL PROGRAM SUMMARY

The following subsections present the three components of the analytical program associated with the Chromium Plating Facility and OU 2 groundwater investigations. A combination of on-site and off-site laboratory analytical data were collected in multiple field programs completed from August 1998 through August 1999. Field investigations and associated analytical programs are summarized on Table 4-1. A summary of the on-site and off-site laboratory analytical programs is presented in the following subsections.

5.3.1 On-site Analytical Procedures

On-site analytical data were collected using a combination of field test kit analyses and GC methods. Test kits were used to analyze water samples for hexavalent chromium and ferrous iron as a practical way to meet a 24-hour holding time and to provide real time data for decisions in field investigations. On-site GC methods were used to provide screening data with definitive confirmation for target VOCs. On-site data were reviewed by the project chemist, and data quality evaluations and interpretations for the on-site data set are presented in Appendix L-2. Descriptions of the analytical procedures are provided in the following subsections.

5.3.1.1 Hach Test Kit Analysis for Chromium and Iron. Groundwater samples were analyzed on-site for Ferrous Iron by the Hach^{TM} Color disc/1,10 Phenanthroline method. The test kit has a lower limit of reporting of 0.2 mg/L. Ferrous iron results are presented in Appendix N-2.

Groundwater samples were analyzed on-site for Hexavalent Chromium by the Hach™ Color disc/Diphenylcarbazide, Hypobromite oxidation method. The test kit has a lower limit of reporting of 0.1 mg/L. Approximately 10 percent of the samples analyzed with the kits were split and submitted for off-site laboratory analysis for hexavalent chromium. Results of the split samples are presented in Appendix L-2. The split sample data indicate excellent comparability of on-site data to off-site results. Based on this comparison Hexavalent chromium data are interpreted to be usable for the purposes of this investigation including contamination assessments, field program decision and direction of explorations, and assessment of contamination concentrations to applicable standards.

5.3.1.2 Field Gas Chromatography for VOC Analysis of Groundwater. Groundwater samples were analyzed on-site by modified USEPA Method 8021B, using an HP 5890 GC with an ELCD for the following chlorinated VOCs:

- PCE
- TCE
- cis-1,2-DCE and trans-1,2-DCE
- vinyl chloride
- 1,1-DCE
- 1,1,1-TCA

A target reporting limit of 1 µg/L was established for the samples based on instrument calibration procedures. Many of the samples contained high concentrations of target compounds requiring dilution of the sample prior to analysis. Reporting limits were adjusted according to the dilution. On-site VOC results are presented in Appendix N-3.

A subset of on-site samples were split in the field and submitted for off-site analysis. Results of the split samples are presented in Appendix L-2. Split sample data indicate excellent comparability of the on-site and off-site data sets. Based on this comparison on-site VOC data are interpreted to be usable for the purposes of this investigation including contamination assessments, field program decision and direction of explorations, and assessment of contamination concentrations to applicable standards.

5.3.1.3 Field Gas Chromatography for VOC Analysis of Soil Gas. Soil gas samples were collected and analyzed on-site using a Photovac 10S50 portable GC. The purpose of the soil gas screening program was to determine if concentrations of VOCs in soil gas exceeded Connecticut indoor air standards, and if additional sampling within buildings would be needed. Analytical procedures were based on standard operating procedures developed by USEPA Region I for analysis of air grab samples (USEPA, 1998). Target compounds included PCE, TCE, 1,1-DCE, and vinyl chloride. A subset of soil gas samples were split in the field and analyzed by an off-site laboratory (Quanterra) to provide data used for comparability evaluations. A discussion of the analytical procedures and split sample data is presented in Appendix L-4.

5.3.2 Off-Site Laboratory Analytical Procedures

Analytical data were obtained from samples submitted for off-site laboratory analysis during several field events during the investigation. Samples were collected to provide confirmation data used in evaluations of data sets generated using on-site analyses, and to provide data on a wider list of target analytes. A summary of the sampling events and off-site laboratory analytical programs is presented in Table 4-1 and Section 4.0.

5.3.2.1 1998 Preliminary Investigation. During preliminary investigations, completed in August 1998, soil, groundwater, and dust samples were submitted for the following analyses:

- Chromium, iron, manganese, and nickel by USEPA Method 6010B (soil only)
- Hexavalent chromium by USEPA Method 7196A
- Ferrous Iron by SM 3500 (water only)
- Cyanide by USEPA 335.2
- Sulfate by USEPA 375.4 (water only)
- TOC (soil only)
- TCLP cyanide and chromium by 1311/6010B (soil only)

Prior to use in this report, analytical results were reviewed by the HLA project chemist. A summary of the chemist review and data quality considerations is presented in Appendix L-1.

5.3.2.2 1999 Chromium-Focused and VOC-Focused Investigations. During field programs completed by HLA in the winter of 1999, off-site soil and groundwater analytical data were obtained from the following analytical methods:

- Volatile Organic Compounds by Method 8260B (water only)
- Semivolatile organic compounds by Method 3550B/8270C (water only)
- Inorganics by 6010B/7471A (soil only)
- SPLP chromium by 1312/6010B (soil only)
- Hexavalent chromium by 7196A and 218.1
- Cyanide by USEPA 9014 and 355.2
- Sulfate by USEPA 300 (water only)
- Alkalinity by USEPA 310.1 (water only)

A subset of off-site hexavalent chromium and VOC results were used as confirmation data for the field screening previously described in Subsection 5.3.1. The remaining data were collected to provide data on other organic and inorganic chemicals that may be present, and to provide water quality data for use in remedial design development. Results for VOCs, SVOCs, and inorganics were validated by Environmental Data Quality using USEPA Region I Tier III validation guidelines. The remaining results were reviewed using requirements in the published method. A summary of the data validation review is presented in Appendix L-3

5.3.2.3 1999 Soil Boring and Treatability Testing. During field programs completed in the August 1999, off-site analytical data were obtained for soil and water samples for the following analytical methods:

- Volatile Organic Compounds by Method 8260B
- Hexavalent chromium by 7196A
- Sulfide by USEPA 376.1
- Alkalinity by USEPA 310.1 (water only)
- Chloride by USEPA 300 (water only)
- Hardness by USEPA 130.2 (water only)
- Calcium, manganese, and magnesium by 6010B (water only)
- SPLP and Total Inorganics by 6010B/7471A (soil only)
- Cyanide by USEPA 9012A
- Semivolatile organics by 8270C
- TPH by USEPA 418.1

Results for VOCs, SVOCs, and inorganics were validated using USEPA Region I Tier III validation guidelines. The remaining results were reviewed using requirements in the published method. A summary of the data validation review is presented in Appendix L-5.

5.3.3 Data Qualification

Data qualified with either “J” (estimated) or “E” (exceeding calibration range) were used in the interpretation of CTDEP RSR criteria exceedances by using the presented value. “E” and “J” flagging codes are presented in the analytical data tables and contaminant distribution figures.

6.0 PRE-DESIGN FIELD INVESTIGATION RESULTS

Results of Pre-Design Investigation activities presented in this section include:

- site geology
- site hydrogeology
- Chromium Plating Facility interior decontamination results
- hexavalent chromium soil and groundwater results
- VOC groundwater chemical results, including delineation of "hot-spots"
- VOCs detected in soil vapor
- VOCs detected in indoor air

6.1 SITE GEOLOGY

The following paragraphs summarize the site geology for the area of SAEP north of Sniffens Lane and east of South Main Street (see Figure 4-4). Sources of data for interpretation of subsurface conditions presented here include the Phase II RI Report (January 1996), boring logs and observations from 1999 RI investigations, and 1998 through 1999 HLA and Foster Wheeler/HLA investigations (including soil borings, PCPT investigations, and the seismic survey).

Geologic cross-sections have been prepared to assist the reader in interpretation of the site geology. Figure 6-1 presents the locations of the geologic cross sections A-A' through G-G'. Geologic cross-sections A-A' through G-G' are presented as Figures 6-2 through 6-8.

A conceptual geologic model has been developed, with stratigraphy descriptions on a macroscopic scale. These descriptions are typically accurate with minor variations in the stratigraphy seen throughout SAEP. The following paragraphs present the conceptual geologic model (from ground surface to bedrock):

> <u>Fill:</u> SAEP is mantled with sand, gravel, and debris fill associated with buildings, roads, utilities, site grading, and other structures. The fill is generally about 2 to 5 feet thick, but locally extends approximately 10 to 15 feet below the ground surface near the dike. Cross-sections A-A' and D-D' through F-F' present views of this fill layer. The fill is thicker near the Dike due to the emplacement of fill over existing intertidal sediments to extend the shoreline of the facility in the 1940s.
>
> <u>Estuarine Silt</u>: Typically, the silt deposits encountered in subsurface samples are characterized as fine silts with very fine sands, rich in organics, and having a sulfur dioxide smell consistent with tidal mud-flat deposits. Thickness of the silt deposits varies from as much as 30 feet to nonexistent in the direction from the Dike toward the interior of the facility (see cross-sections D-D' through G-G').

Silt deposits exist beneath the fill from the length of the Dike southwest toward the location of cross-section B-B' (see Figure 6-1). This aerial extent is consistent with the area of former intertidal flats, which were filled in the 1940s to extend the shoreline of the SAEP property further north and eastward toward the Housatonic River.

Reworked Glacial Outwash: Sand and gravel deposits of glacial origin underlie the fill and silt deposits. The deposits are divided into units of sand, with trace amounts of coarser material of sand and gravel with clay, silt, and cobbles. The working hypothesis for this unit is that glacial deposits have been reworked and sorted by the actions of the meandering Housatonic River. The reworked glacial outwash is thickest beneath the southwestern part of the site (along Main Street, see cross-section C-C'), and thins toward the Housatonic River (see cross-sections D-D' through G-G'). Note that the distinguishing feature of these deposits on the referenced cross-sections is the trace gravel, and loosely cemented gravel zones. The bottom depth of these deposits varies between approximately 20 and 40 feet bgs.

Glacial Outwash: Beneath the reworked glacial outwash, and above the bedrock surface, lies a fine to medium sand with some silt, interpreted to be glacial outwash. The glacial outwash contains silt/clay seams and fine silty sand lenses (see cross-sections A-A' through G-G'). The glacial outwash is generally stratified, and exhibits a fining-down sequence, which has a micaceous component. Micaceous zones are observed in the northwestern area of the site as seen in PCPT explorations CP-99-01, -02, -03, -05, and –09 (see Figure 6-1); these zones are mostly below 60 feet bgs.

Bedrock: Bedrock beneath SAEP has been identified as a black schist with greenstone. Results of the seismic refraction survey, coupled with soil boring information, indicate bedrock depths range from about 49 feet to 184 feet bgs beneath SAEP. These depths translate to elevations of approximately –50 to –175 feet MSL. Figure 6-9 presents the interpretive bedrock surface elevation. It is apparent from seismic survey results that the bedrock surface elevation is highly variable over localized areas. Therefore, it should be noted that the contours presented in Figure 6-9 are generally considered to be accurate within ±10 feet. In general, bedrock is deepest to the northwest along seismic Line 7 and the west end of seismic Line 2, and shallowest to the southeast along seismic Lines 3 and 5, and the east end of seismic Line 2 (see Figure 6-9). Site-wide, results show that the bedrock surface has a general dip direction to the northwest, with the shallowest depths to bedrock being located along Sniffens Lane adjacent to the South Parking Lot area. However, the bedrock surface does appear to dip away rapidly to the southeast as one moves from Sniffens Lane toward the Chemical Waste Treatment Plant (Building B-18), as indicated by the observed –157 feet

MSL elevation (Figure 6-9). Figure 6-9 also presents boring-confirmed bedrock elevations, which are in reasonable agreement with the seismic survey data.

6.2 SITE HYDROGEOLOGY

The following subsections summarize the site hydrogeology for the area of SAEP north of Sniffens Lane and east of South Main Street (see Figure 4-4). Sources of data for interpretation of hydrogeologic conditions presented here include the Phase I and II RI Reports (June 19993 and January 1996), slug test and water level data from 1999 RI investigations, and 1998 through 1999 HLA and Foster Wheeler/HLA investigations (including aquifer testing).

6.2.1 Aquifer Testing Results

As indicated in Subsection 4.4.3, aquifer testing was performed at the Chromium Plating Facility by Foster Wheeler/HLA in September 1999. A complete report of the aquifer testing implementation and results is presented as Appendix J. The following paragraphs summarize the findings of the aquifer testing.

Aquifer testing revealed that the EW-99-01 pumping zone (20 to 40 feet bgs) has high specific capacity that indicates a relatively high aquifer transmissivity. The pumping well responded largely in an unconfined manner with a quick flattening of drawdown that can be associated with either delayed drainage from an unconfined aquifer or leakage through semi-confining overlying soils. Shallow piezometers close to the pumping well exhibited relatively small drawdown responses, indicating that geologic stratification is likely restricting the vertical propagation of pumping stresses. Similar small drawdowns at more distant piezometers screened in the same zone as extraction well EW-99-01 (e.g. PZ-99-01B) suggests that delayed drainage or leakage buffered pumping stresses, indicating the stresses had not yet appeared within this three day test.

Cyclical tidal influence limited the usefulness of data from any of the observation wells, particularly because the drawdown from pumping in observation wells was so small. Tidal variation, while only about 0.03 feet in magnitude, was generally equal to 30 percent or more of the apparent drawdown.

The best estimate of aquifer transmissivity is derived from the pumping well specific capacity. Specific capacity was approximately one gpm per foot of drawdown at each of the four test pumping rates (step test and constant-rate test discharge rates). The T derived empirically from this specific capacity is 1500 gallons per day per foot (gpd/ft) (or 200 feet squared per day [ft^2/day]). Lower values of T, estimated using pumping well drawdown data and various Theis-based curve-matching and straight-line techniques, appear to underestimate the T, probably as a result of relatively large amounts of recharge to the aquifer from leakage or delayed drainage. If these lower values were correct, it would be theoretically impossible to maintain the constant-rate test pumping rate of 15 gpm without de-watering the well.

Using this approximation of T of 200 ft^2/day and the observational evidence that anisotropy (stratification) limits the flow of water from the upper portion of the saturated zone, the aquifer thickness is best approximated at 20 feet, the length of the EW-99-01 wellscreen. Using this thickness produces an estimate of the horizontal hydraulic conductivity for the pumping zone of 10 ft/day, or 7.0×10^{-3} feet per minute (ft/min). This value is consistent with those observed from slug testing results in the same formation and vicinity (see Subsection 6.2.2).

The aquifer storage coefficient could not be calculated from the drawdown data given the small drawdown responses at the monitored observation wells.

6.2.2 Hydraulic Conductivity Estimates

Hydraulic conductivity estimates have been calculated from slug tests, PCPT investigations, and grain size analyses completed at SAEP from 1992 through 1999. A summary of the K estimates is presented in Table 6-1. Hydraulic conductivity results from grain size analyses, slug tests and PCPT explorations generally agree very well (within the same order of magnitude) for the same geologic units/sample depths (see Table 6-2).

Based on the results in Table 6-1, hydraulic conductivities in the SAEP subsurface range over a scale of four orders of magnitude, from 2.0×10^{-5} to 0.2 ft/min. Results from Table 6-1 have also been placed on the geologic cross sections, Figures 6-2 through 6-8, to assist the reader in interpretation of the spatial distribution of K. The ranges of K of the deposits identified in the subsurface (see Subsection 6.1) are as follows:

- K of the fill ranges from 2.0×10^{-2} to 0.1 ft/min;
- K of the silt ranges from 3.0×10^{-4} to 9.0×10^{-4} ft/min;
- K of the reworked glacial outwash ranges from 6.0×10^{-5} to 2.0×10^{-2} ft/min; and,
- K of the glacial outwash ranges from 1.0×10^{-4} to 3.0×10^{-2} ft/min.

Some general patterns are evident regarding the spatial distribution of the calculated/observed hydraulic conductivities:

- In the glacial outwash, K generally increases from west to east across the site (see Figures 6-2 through 6-4); and
- glacial outwash Ks in the northwestern portion of the facility (i.e., toward the North Parking Lot) are generally 1-2 orders of magnitude lower than Ks to the south and east.

6.2.3 Groundwater Movement

In July and August 1999, URSGWCFS completed long-term groundwater level monitoring in selected monitoring wells to evaluate the impact of tidal cycles on groundwater elevations beneath SAEP. Subsection 4.5.1 presents a discussion of the tidal study and groundwater elevation measurements. A complete discussion of this monitoring program and results will be presented in the URSGWCFS RI Report scheduled for issue as a Draft in March 2000.

Figures 6-10 and 6-11 present mean groundwater elevations, and interpretive groundwater elevations, for two time periods: July 20-23, 1999 and July 24-26, 1999, respectively. The contours presented on Figures 6-10 and 6-11 represent a vertical average of groundwater elevations; groundwater contour maps for individual hydrogeologic units will be presented in the URSGWC Draft RI Report. Mean groundwater elevations on the main portion of the facility appear to range from approximately 2.30 feet mean sea level (MSL) beneath Building B-2 to 1.00 feet MSL beneath Building B-19, located near the Dike on the eastern side of the facility (see Figures 6-10 and 6-11). Groundwater flow is interpreted to be generally from west to east/northeast toward the Housatonic River across the central portion of the facility. However, moving from the central portion of Building B-2 toward the northwest, groundwater flow direction appears to rotate to a more northerly direction (see Figure 6-10). In addition, there is potentially some component of groundwater flow from beneath Building B-2 off-site to the southwest (see Figures 6-10 and 6-11). Due to the lack of groundwater elevation data beneath the intertidal flats, there is some question as to the specific groundwater flow direction beneath the flats.

Horizontal gradients vary widely across the main portion of the facility. In the vicinity of Building B-2, the horizontal gradient is estimated to be on the order of 0.0001 feet/foot (see Figures 6-10 and 6-11). In contrast, the hydraulic gradient is more significant from the eastern end of Building B-16 to the northeast, on the order of 0.002 feet/foot. Appendix M contains the hydrogeologic calculations.

Vertical hydraulic gradients have been calculated using groundwater elevations presented on Figures 6-10 and 6-11. These calculations are presented in Appendix M. Vertical hydraulic gradients at well pair WC-19S/WC-19D1 in the west parking lot (see Figures 6-10 and 6-11) are approximately 0.0017 feet/foot, downward, which is indicative of recharging conditions. Moving horizontally downgradient, vertical gradients likely flatten, and then reverse to upward toward the Housatonic River, near the Dike. Evidence of discharging conditions from deep to shallow within the aquifer are seen in the upward vertical gradients in well pairs WC-5S/P2-5D and WC-3S/WC2-3I (see Appendix M for calculations).

Groundwater flow velocities are likely to vary widely beneath the facility, based on the range of observed hydraulic conductivities and gradients. Beneath the center of Building B-2, assuming a K of $5x10^{-3}$ ft/min., horizontal gradient of 0.0001 feet/foot, and a porosity of 0.3, groundwater flow velocity is on the order of 0.002 feet/day in the reworked glacial outwash. However, to the east of Building B-16, assuming a K of 0.03 ft/min., a horizontal gradient of 0.002 feet/foot, and a porosity of 0.3, groundwater flow velocity is on the order of 0.30 feet/day in the reworked glacial outwash.

6.2.4 Summary of Hydrogeology

The following summarizes the hydrogeology for the area of SAEP north of Sniffens Lane and east of South Main Street (see Figure 6-10):

- The depth to water in this area of the facility ranges from approximately 4 to 11 feet bgs, depending upon the surface elevation and tidal influence.
- The estimated Ks of the geologic materials are as follows: fill $2.0\text{x}10^{-2}$ to 0.1 ft/min; silt $3.0\text{x}10^{-4}$ to $9.0\text{x}10^{-4}$ ft/min; reworked glacial outwash $6.0\text{x}10^{-5}$ to $2.0\text{x}10^{-2}$ ft/min.; and glacial out wash $1.0\text{x}10^{-4}$ to $3.0\text{x}10^{-2}$ ft/min.
- Horizontal hydraulic gradients range from 0.0001 feet/foot beneath Building B-2 to 0.002 feet/foot to the east of Building B-16.
- Vertical hydraulic gradients indicate a downward (recharging) potential to the south and west of Main Street; flattening gradients toward the central portion of the facility; and upward (discharging) potential in the vicinity of the Dike near the Housatonic River.
- Overall groundwater flow direction is from west to east/northeast, toward the Housatonic River.
- There is potentially some component of flow from beneath Building B-2 off-site to the southwest.
- Groundwater flow velocities in the glacial outwash are estimated to be on the order of 0.002 feet/day beneath Building B-2 and 0.3 feet/day to the east of Building B-16 toward Building B-19 and the Dike.

6.3 PLATING FACILITY DECONTAMINATION RESULTS

As presented in Section 4.2, the interior of the former Chromium Plating Facility was decontaminated in December 1998. Following the decontamination procedures, wipe samples were collected from the floor, walls, and beams for analysis of total and hexavalent chromium. In addition, five concrete samples (CD-98-03 through CD-98-07) were collected for off-site analyses. Table 6-2 presents the results of these post-decontamination analysis, and indicates exceedances of HLA’s risk-based cleanup standards (see Appendix E). Figure 6-12 presents wipe sample locations with concentrations exceeding risk-based cleanup standards.

The following summarizes the results of observations and sampling completed following decontamination of the former Chromium Plating Facility:

- Visible loose dust and debris was successfully removed during the decontamination.
- Wipe sampling results indicate exceedances of HLA's risk-based cleanup standards for hexavalent chromium on northwestern and southern areas of the concrete floor, the northernmost wall, and the northernmost columns and overhead beams (see Figure 6-12).
- Concrete dust sampling indicates concentrations of hexavalent chromium in the concrete of the floor exceed HLA's risk-based cleanup standards (see Figure 6-12).
- Visual observations of concrete cores collected from the northwestern-most area of the former Chromium Plating Facility in January 1999 indicate chromium contamination exists through the entire thickness of the concrete floor in this area.

- Removal action alternatives will be evaluated in the OU 2 EE/CA.

6.4 NATURE AND DISTRIBUTION OF CONTAMINATION

The following subsections detail the nature and distribution of contamination detected during the Pre-design Investigation activities described in Section 4.0 of this report. Subsection 6.4.1 presents the nature and distribution of chromium in soils associated with the former Chromium Plating Facility in Building B-2. Subsection 6.4.2 presents the distribution of hexavalent chromium in groundwater in the vicinity of the former Chromium Plating Facility. Subsection 6.4.3 presents the nature and distribution of select chlorinated VOCs in groundwater on the main portion of the facility. VOCs detected in the soil vapor survey are discussed in Subsection 6.4.4. A brief summary of indoor air quality sampling results through December 1999 is presented in Subsection 6.4.5.

6.4.1 Chromium in Soils

As discussed in Subsections 4.1, 4.3, and 4.4, several investigations were completed in the vicinity of the former Chromium Plating Facility to evaluate the potential impacts of plating activities to the subsurface soils and groundwater. Table 6-3 presents a summary of chromium, and other inorganics, at concentrations exceeding CTDEP Industrial/Commercial Direct Exposure Criteria (I/C DEC) and PMC in soils in the vicinity of the former Chromium Plating Facility. Appendix N contains complete data tables for soil sample analytical results.

Contamination of subsurface soils by chromium is observed beneath the entire former Chromium Plating Facility. Concentrations of total chromium from SPLP analyses were detected at up to 25.5 mg/L (see Figure 6-13), versus the PMC of 0.5 mg/L. The concentrations of hexavalent chromium in soils are generally less than I/C DEC of 100 mg/kg. The only exception is at SP-99-11 where 640 mg/kg of hexavalent chromium was detected in the shallow sample, and 513 mg/kg of hexavalent chromium was detected in the 4-6 foot sample. Generally, the higher chromium concentrations were detected in the northern corner of the former Chromium Plating Facility (see Figure 6-13).

6.4.2 Chromium and Inorganics in Groundwater

The extent of chromium in groundwater was investigated during both 1998 and 1999, as discussed in Section 4.0. Results of the sampling and analyses demonstrate that hexavalent chromium is present in groundwater beneath the former Chromium Plating Facility. Figure 6-14 presents the horizontal extent of hexavalent chromium exceeding the SWPC of 0.11 mg/L. The vertical distribution of hexavalent chromium in groundwater is presented in Figures 6-15 and 6-16. Table 6-4 presents a summary of hexavalent chromium and other inorganics detected in groundwater at concentrations exceeding SWPC.

Figure 6-14 presents what appears to be two distinct hexavalent chromium groundwater plumes beneath the former Chromium Plating Facility. The smaller of the two, located beneath the southeast end of the facility, is approximately 80 feet by 130 feet in area (10,400 square feet), with a maximum concentration of 11 mg/L of hexavalent chromium. The larger of the two plumes appears to emanate from the northwestern end of the facility, centered around a maximum concentration of 950 mg/L of hexavalent chromium in groundwater at location WP-99-15, 30-34 feet bgs (see Figure 6-14 and Table 6-4). This second, larger plume extends radially from WP-99-15 160 feet to the northwest, 135 feet to the northeast, 90 feet to the southeast, and 100 feet to the southwest. This plume covers an approximate area of 40,000 square feet. The plume extends beneath Buildings B-10 and B-12, in the approximate direction of groundwater flow (north to northeast). The extremely small groundwater horizontal gradients appear to have limited extensive migration of the hexavalent chromium in groundwater.

One possible reason for the distribution of hexavalent chromium in these two distinct plumes may be a result of the high TCE concentrations in groundwater between the two plumes (see Subsection 6.4.3.2). The high concentrations of TCE (greater than 800,000 µg/L) may be causing anaerobic conditions within the groundwater, which would cause the hexavalent chromium to transform to a reduced state (i.e., trivalent chromium). Pilot-scale treatability test results indicate that injection of potassium permanganate in this area resulted in increasing concentrations of hexavalent chromium in groundwater, which supports the hypothesis.

Vertical distribution of the hexavalent chromium in groundwater is generally limited to less than 35 feet bgs (see Figures 6-15 and 6-16). The exception is near the suspected source area in the northern corner of the former Chromium Plating Facility, where hexavalent chromium is detectable in groundwater up to a depth of 45 feet bgs (exploration location WP-99-15). Although there are very small groundwater vertical gradients in this area (see Subsection 6.2.3), the hexavalent chromium plume extends to an approximate depth of 40 feet bgs. One possible explanation for this deep distribution is the probable high density of the former plating solutions relative to groundwater.

However, it appears that the relative differences in vertical to horizontal permeability in the fine sands and silts at approximately 30 feet bgs impeded vertical movement of the hexavalent chromium plume, causing the plume to spread horizontally (see Figures 6-15 and 6-16). In addition, the intrusion of denser, saline water beneath the facility may provide an additional barrier to vertical migration of the hexavalent chromium. Plots of the electrical conductivity (a measure of salinity) of groundwater beneath SAEP are presented in Appendix O, and were provided by the USACE. It is also possible that as the hexavalent chromium migrates away from the source area, it encounters reducing conditions resulting in conversion to trivalent chromium

It is apparent by reviewing groundwater in Table N-2 of Appendix N, that hexavalent chromium makes up over 95 percent of the total chromium detected in the groundwater samples analyzed by the on-site screening method. Also apparent from reviewing Table 6-4 is that, except for two samples (WP-99-29 at the 36- to 40-foot sample and WP-99-31 at the 20- to 24-foot sample), ferrous iron is present only where hexavalent chromium is absent. Additionally, an observation made during the field investigations was that samples containing concentrations greater than approximately 3 mg/L of hexavalent chromium exhibited a yellow color, which increased in intensity with increasing concentrations.

Additional inorganics detected in groundwater at concentrations above their respective SWPC in the vicinity of the former Chromium Plating Facility include cadmium, copper, and cyanide (see Table 6-4). Cadmium was detected at concentrations of 0.0173 mg/L in WP-99-15 (26 to 30 feet bgs) and 0.0066 mg/L in WP-99-11 (47 to 51 feet bgs). The SWPC for cadmium is 0.006 mg/L. Copper was detected at concentrations of 0.423 mg/L in WP-99-12 (7 to 9 feet bgs), 0.085 mg/L mg/L in WP-99-09 (7 to 11 feet bgs), and 0.0061 mg/L in WP-99-01 (8 to 10 feet bgs). The SWPC for copper is 0.048 mg/L. Cyanide was detected at concentrations of 0.535 mg/L in WP-99-15 (26 to 30 feet bgs) and 0.182 mg/L in WP-99-12 (20 to 24 feet bgs). The SWPC for cyanide is 0.052 mg/L. Detection of inorganics in addition to chromium in samples from explorations WP-99-11 and WP-99-15 is not surprising, given the usage of these additional inorganics in plating processes. However, the detection of copper in WP-99-01, WP-99-09, and WP-99-12 is not consistent with the distribution of the chromium in groundwater. In addition, the detection of cyanide in WP-99-12 is not consistent with the distribution of the chromium in groundwater plume

6.4.3 VOCs in Groundwater

The following subsections present an assessment of chlorinated VOC contamination in groundwater beneath the main portion of the SAEP facility, bounded by Main Street to the south, and Sniffens Lane to the east. Subsections 6.4.3.1 presents a discussion of chlorinated VOC exceedances of CTDEP SWPC within this area. Subsections 6.4.3.2 through 6.4.3.4 present more detailed discussions of three chlorinated VOC groundwater “hot-spots” or areas in which chlorinated VOC concentrations exceed 100,000 µg/L in groundwater. These “hot-spots” are considered to be potential source areas for facility-wide groundwater contamination, and will be the primary focus of the OU 2 NCRA EE/CA, in addition to the hexavalent chromium groundwater plume.

Data presented in the following subsections includes HLA groundwater VOC data collected in 1999, as well as Round 1 (July and August 1999) RI groundwater sampling analytical data, and direct-push groundwater data from the RI.

6.4.3.1 SWPC VOC Exceedances in Groundwater. The objective of this subsection is to identify the VOC groundwater contamination at concentrations exceeding the CTDEP SWPC. The four VOCs which exceed SWPC over the majority of the main portion of the facility are 1,1-DCE, PCE, TCE, and 1,1,1-trichloroethene (1,1,1-TCA). Figure 6-17 presents the estimated horizontal extent of these four VOC at concentrations exceeding their respective SWPC. Figures 6-18 through 6-24 presents cross-sections A-A’ through G-G’ respectively, which show the vertical extent of VOCs in groundwater at concentrations exceeding the SWPC. The location of these geologic cross-sections is shown on Figure 6-1. These figures are intended to provide an overview of vertical distribution of SWPC exceedances of 1,1-DCE, PCE, TCE, and 1,1,1-TCA. The SWPC for these four VOCs are:

1,1-DCE	96 µg/L
PCE	88 µg/L
TCE	2,340 µg/L
1,1,1-TCA	62,000 µg/L

Table 6-5 presents a summary of 1999 groundwater data with concentrations of these four VOCs exceeding their respective SWPC.

1,1-DCE appears to be one of the most widespread of the four VOCs exceeding SWPC in groundwater beneath the main portion of the facility (see Figure 6-17). 1,1-DCE was detected in groundwater at concentrations above the SWPC of 96 µg/L from just south of the North Parking Lot, eastward south of the Dike to Sniffens Lane, and southward bisecting the Chromium Plating Facility (Figure 6-17). The maximum concentration of 1,1-DCE detected in groundwater is 9,400 µg/L at piezometer PZ-99-03, located between Buildings B-2 and B-12. The highest concentrations of 1,1-DCE appear to be co-located with 1,1,1-TCA SWPC exceedances. Under methanogenic conditions, 1,1,1-TCA is known to transform abiotically to 1,1-DCE, which subsequently transforms to vinyl chloride (Verschueren, 1996). Given this potential transformation, and the co-location of the highest concentrations of 1,1-DCE with 1,1,1-TCA, the source of the 1,1-DCE may be the transformation/degradation of 1,1,1-TCA.

PCE was detected at concentrations exceeding its SWPC of 88 µg/L over an area from Building B-13 eastward in a widening plume that encompasses Buildings B-10, B-48, B-8, B-7, B-4, and B-19 to Sniffens Lane. The maximum concentration of PCE detected in groundwater was 1,900 µg/L in GeoProbe exploration WP-99-45, located between Buildings B-48 and B-16.

TCE was detected at concentrations exceeding its SWPC of 2,340 µg/L over an area from the northern end of Building B-2 eastward in a widening plume toward the former Chromium Plating Facility, and terminating just to the east of Building B-3A near the Dike (see Figure 6-17). The maximum concentration of TCE detected was 830,000 µg/L in GeoProbe exploration WP-99-33, located beneath the former Chromium Plating Facility.

1,1,1-TCA was detected at concentrations exceeding its SWPC of 62,000 µg/L over a much more limited area than the other three chlorinated VOCs. The area of exceedances by this compound is located in the central portion of Building B-2 (see Figure 6-17). As indicated on Figure 6-17, the dashed line of 1,1,1-TCA SWPC exceedance indicates some question as to whether the exceedance should be one, or two areas, each focused around explorations CP-99-08 and WP-99-48, respectively.

6.4.3.2 Chlorinated VOC Hot-Spot No. 1. Chlorinated VOC Hot-Spot Number 1 is located beneath the Chromium Plating Facility in Building B-2. During the chromium-focused groundwater investigation in January 1999, TCE was detected in Geoprobe exploration WP-99-09 at a concentration exceeding 130,000 µg/L at a depth of 29 feet bgs. Detection of concentrations of TCE in this range prompted the groundwater VOC-focused investigations which were completed from February through May 1999 (see Subsection 4.3.2).

Figure 6-25 presents the horizontal delineation of VOC Hot-Spot No. 1, as well as the cross-section locations. Cross-sections VOC 1-A/A’ and VOC 1-B/B’ are presented as Figures 6-26 and 6-27, respectively. Table 6-5 presents a summary of 1999 groundwater data with concentrations of VOCs exceeding their respective SWPC.

The estimated horizontal extent of TCE in groundwater at concentrations exceeding 100,000 µg/L is presented in Figure 6-25, and covers the majority of the footprint of the former Chromium Plating Facility. The source of the TCE is suspected to be from degreasing operations completed as part of the former Chromium Plating Facility operations.

The vertical distribution of TCE in groundwater beneath the former Chromium Plating Facility appears to be controlled by the layer of silt and very fine sand, the top of which is at an elevation of approximately –20 feet MSL (see Figures 6-26 and 6-27). The lower vertical permeability of the silt and very fine sand appear to have impeded, to a large extent, the vertical migration of the highest concentrations (>100,000 µg/L) of TCE in groundwater. The current conceptual model for this hot-spot is that TCE migrated from the plating facility vertically through the unsaturated zone, into and beneath the water table, to the surface of the silt and very fine sand aquitard. Over time, the TCE has diffused into the silt and very fine sand aquitard. The highest concentration of TCE detected was 830,000 µg/L in exploration WP-99-33, immediately above the surface of the aquitard (see Figure 6-26). Concentrations of TCE beneath the aquitard are generally less than the SWPC of 2,340 µg/L (see Figures 6-26 and 6-27).

The depth to bedrock beneath the former Chromium Plating Facility varies from –60 feet MSL to –110 feet MSL, dipping from east to west. Analytical results from explorations CP-99-10 (73 to 75 feet bgs sample) and WP-99-33 (76 to 80 feet bgs sample) indicate that TCE is not present at concentrations exceeding the SWPC at depths near the bedrock surface.

The concentrations of TCE at Hot-Spot No. 1 are indicative of the possible presence of a non-aqueous phase liquid (NAPL). The solubility of TCE in water is approximately 1,100,000 µg/L. The highest concentration of TCE detected in groundwater (830,000 µg/L) is approximately 75% of TCE's solubility limit in water. Visual observation of subsurface soil and groundwater samples did not reveal the presence of any TCE NAPL. Shake tests were performed on soil and groundwater samples using Sudan IV dye (see Table 4-8) to test for the presence of NAPL, but test results were negative.

Groundwater temperatures in the vicinity of VOC Hot-Spot No. 1 range from approximately 19 to 21°C, compared to groundwater temperatures outside the hot-spot in the range of 12 to 16°C (see Appendix D). The elevated groundwater temperatures may be indicative of potential biologic degradation of the chlorinated solvents within the hot-spot.

6.4.3.3 Chlorinated VOC Hot-Spot No. 2. Chlorinated VOC Hot-Spot No. 2 is located between Buildings B-48 and B-16 (see Figure 6-28). The primary VOC detected at high concentrations in this area is TCE. Figure 6-28 presents the horizontal delineation of VOC Hot-Spot No. 2, as well as the cross-section locations. Cross-sections VOC 2-A/A’ and VOC 2-B/B’ are presented as Figures 6-29 and 6-30, respectively. Table 6-5 presents a summary of 1999 groundwater data with concentrations of VOCs exceeding their respective SWPC.

The estimated horizontal extent of TCE in groundwater at concentrations exceeding 100,000 µg/L is presented in Figure 6-28, and covers an area roughly 75 feet in diameter. It is possible the area of TCE concentrations exceeding 100,000 µg/L is larger than that depicted (see Figure 6-28) (i.e., it may extend beneath Building B-16). The source of the TCE is suspected to be from disposal on the ground surface, and/or degreasing operations completed in Building B-16.

The vertical distribution of TCE in groundwater at VOC Hot-Spot No. 2 appears to be controlled by the layer of sandy silt, the top of which is at an elevation of approximately –8 feet MSL (see Figures 6-29 and 6-30). The lower vertical permeability of the sandy silt appears to have impeded, to a large extent, the vertical migration of the highest concentrations (>100,000 µg/L) of TCE in groundwater. It is likely that TCE migrated from the ground surface vertically through the unsaturated zone, into and beneath the water table, to an area within the sandy silt. In addition, the intrusion of denser, saline water beneath the facility may provide an additional barrier to vertical migration of the dissolved TCE (see Appendix O). The highest concentration of TCE detected was 264,000 µg/L in exploration WP-99-45, within the sandy silt (see Figure 6-29). Concentrations of TCE beneath the sandy silt are generally less than 1,000 µg/L, and less than the SWPC of 2,340 µg/L (see Figures 6-29 and 6-30). It is also apparent from the cross-sections (Figures 6-29 and 6-30) and Figure 6-28 that the higher concentrations of TCE (>1,000 µg/L) from this hot-spot have not reached the Dike or the intertidal flats.

The depth to bedrock in the vicinity of VOC Hot-Spot No. 2 varies from –90 feet MSL to –105 feet MSL, dipping from southeast to northwest. Analytical results from exploration WP-99-45 indicate that TCE concentrations do not exceed the SWPC of 2,340 µg/L at a depth of 60 feet. However, the concentration of TCE detected in nearby monitoring well WC2-3D (100 feet south of WP-99-33), screened on the top of bedrock, is 3,100 µg/L. This indicates that some TCE has migrated vertically through the subsurface soils to the bedrock surface.

The concentrations of TCE at Hot-Spot No. 2 are indicative of the possible presence of a non-aqueous phase liquid (NAPL). The solubility of TCE in water is approximately 1,100,000 µg/L. The highest concentration of TCE detected in groundwater (264,000 µg/L) is approximately 24% of TCE's solubility limit in water. Visual observation of subsurface soil and groundwater samples did not reveal the presence of any TCE NAPL.

Additional chlorinated VOCs detected at concentrations exceeding SWPC in the vicinity of Hot-Spot No. 2 are PCE at 1,900 µg/L (WP-99-45, 11-15 feet bgs), and 1,1-DCE at 4,500 µg/L (WP-99-45, 11-15 feet bgs). Due to the dilutions required for analysis of samples containing high TCE concentrations, some of the results indicated other VOCs were not detected. Therefore, it is possible that the concentrations of PCE and 1,1-DCE reported above may not be the highest ones in the vicinity of Hot-Spot No. 2.

6.4.3.4 Chlorinated VOC Hot-Spot No. 3. Chlorinated VOC Hot-Spot No. 3 is located in the center of Building B-2 (see Figure 6-28). The primary VOC detected at high concentrations in this area is 1,1,1-TCA. Figure 6-28 presents the horizontal delineation of VOC Hot-Spot No. 2, as well as the cross-section locations. Cross-sections VOC 3-A/A’ and VOC 3-B/B’ are presented as Figures 6-31 and 6-32, respectively. Table 6-5 presents a summary of 1999 groundwater data with concentrations of VOCs exceeding their respective SWPC.

The estimated horizontal extent of 1,1,1-TCA in groundwater at concentrations exceeding 100,000 µg/L is presented in Figure 6-28, and covers an area roughly 350 feet long by 100 feet wide. The extent depicted on Figure 6-28 is based on extrapolation of concentrations from CP-99-08 to WP-99-48. However, it is possible the area of 1,1,1-TCA concentrations exceeding 100,000 µg/L is actually two distinct areas, each focused around these explorations (see Figure 6-28). The source of the 1,1,1-TCA is suspected to be from degreasing operations completed in this general area of Building B-2.

The vertical distribution of 1,1,1-TCA in groundwater at VOC Hot-Spot No. 3 is depicted in Figures 6-31 and 6-32. PCPT logs indicate that the geology is primarily uniform fine sand with silty sand, with a 10-foot thick gravelly zone centered vertically at –20 feet MSL. Unlike the geology at VOC Hot-Spots Nos. 1 and 2, there is no apparent layer of silt which would attenuate the vertical migration of 1,1,1-TCA. The conceptual model for this hot-spot indicates that 1,1,1-TCA migrated from the ground surface vertically through the unsaturated zone, into and beneath the water table, to bedrock. The intrusion of denser, saline water beneath the facility may provide a barrier to vertical migration of the dissolved fraction of 1,1,1-TCA (see Appendix O). The highest concentration of 1,1,1-TCA detected was 280,000 µg/L in exploration CP-99-08 at a depth of approximately –24 feet MSL (see Figure 6-31). It is apparent from Figure 6-31 that the 1,1,1-TCA has migrated to the bedrock surface (approximately –152 feet MSL) in the vicinity of exploration CP-99-08. The depth to bedrock in the vicinity of VOC Hot-Spot No. 3 varies from approximately –144 feet MSL to –170 feet MSL, dipping from southeast to northwest. The concentration of 1,1,1-TCA in groundwater at the bedrock surface is 210,000 µg/L (see Figure 6-31). As indicated in Figures 6-31 and 6-32, the extent of 1,1,1-TCA near the bedrock surface has been delineated to the southeast of CP-99-08 (see exploration CP-99-18), but is not completely delineated to the east (toward exploration WP-99-48) and northwest (toward exploration CP-99-06).

Figure 6-32 interprets the shallower 1,1,1-TCA groundwater contamination exceeding 100,000 µg/L to extend from CP-99-08 to WP-99-48. The rationale for this interpretation is based on the historical usage of 1,1,1-TCA in degreasing operations in this portion of Building B-2.

The concentrations of 1,1,1-TCA at Hot-Spot No. 3 are indicative of the possible presence of a NAPL. The solubility of 1,1,1-TCA in water is approximately 1,500,000 µg/L. The highest concentration of 1,1,1-TCA detected in groundwater (280,000 µg/L) is approximately 19 percent of 1,1,1-TCA's solubility limit in water. Visual observation of subsurface soil and groundwater samples did not reveal the presence of any 1,1,1-TCA NAPL.

Additional chlorinated VOCs exceeding SWPC in the vicinity of Hot-Spot No. 3 are TCE at concentrations up to 20,000 µg/L (CP-99-08, near the bedrock surface), and 1,1-DCE at concentrations up to 9,000 µg/L (CP-99-08, 44 to 46 feet bgs). Under methanogenic conditions, 1,1,1-TCA is known to transform abiotically to 1,1-DCE, which subsequently transforms to vinyl chloride (Verschueren, 1996). Given this potential transformation, and the co-location of the highest concentrations of 1,1-DCE with 1,1,1-TCA, the source of the 1,1-DCE may be the transformation/degradation of 1,1,1-TCA. SVOC analytical results from CP-99-08 32 to 24, and 44 to 46, feet bgs samples were non-detect.

Groundwater temperatures in the vicinity of VOC Hot-Spot No. 3 range from approximately 21 to 25°C, compared to groundwater temperatures outside the hot-spot in the range of 12 to 16°C (see Appendix D). The elevated groundwater temperatures may be indicative of potential biologic degradation of the chlorinated solvents within the hot-spot.

6.4.4 VOCs in Soil Vapor

Comparison of the groundwater data to CTDEP I/C VC indicates that the groundwater contamination by VOCs is likely a contributing source of VOCs detected in soil vapor. As indicated in Table 6-6, concentrations of 1,1-DCE, vinyl chloride, 1,1,1-TCA, PCE, and TCE in groundwater (at depths less than 15 feet below ground surface) exceed the CTDEP I/C VC for groundwater. It is possible that there are solvent residuals in the vadose zone which also contribute to soil vapor contamination however, the 100+ shallow soil borings conducted during the RI did not reveal any significant solvent residuals. The majority of the soil vapor I/C VC exceedances are for 1,1-DCE and vinyl chloride. The distribution of these exceedances is presented as Figure 6-33.

The objective of the soil vapor survey completed in August 1999 was to determine if concentrations of VOC vapors in the subsurface soil above the water table exceed the CTDEP I/C VC for soil vapor, and therefore pose a threat to indoor air quality in SAEP buildings. The following paragraphs present a summary of the soil vapor survey results. Analytical results, including notation of I/C VC, are presented in Table 6-7. Figure 6-34 presents the locations of the soil vapor samples and denotes exceedances of the I/C VC.

Analytical results from the soil vapor survey indicate that soil vapor in the SAEP subsurface exceeds I/C VC for the chlorinated VOCs vinyl chloride, 1,1-DCE, and TCE. VOC soil vapor concentrations beneath the central portion of Building B-2, extending northeast and east toward Buildings B-15 and B-16, respectively, generally exceed CTDEP I/C VC (see Figure 6-33). However, not all of the explorations in this region indicate exceedance of the criteria. Vinyl chloride was detected at concentrations exceeding the I/C VC of 1 ppmv in explorations SG-99-15 and SG-99-48 (see Table 6-7). 1,1-DCE was detected at concentrations exceeding the I/C VC of 1 ppmv in explorations SG-99-04, -10, -17, -18, -41, -49, and –50. TCE was detected at concentrations exceeding the I/C VC of 16 ppmv in explorations SG-99-04, -06 -10, -47, and –51.

In general, the distribution of soil vapor VOC I/C VC exceedances is co-located with groundwater contamination by the same chlorinated VOCs. One exception is in the southeastern end of Building B-2 at exploration SG-99-51, where the concentration of TCE (110 ppmv) exceeded the I/C VC of 16 ppmv by an order of magnitude. Figure 6-17 does not indicate exceedance of the SWPC for TCE in groundwater in this area. With regard to soil gas contaminant distribution, utility trenches and the presence of shallow building foundations may provide preferential pathways and barriers, respectively.

6.4.5 VOCs in Indoor Air

Due to the results of the soil vapor survey, TACOM/SAEP contracted Foster Wheeler/HLA to conduct an indoor air quality sampling program to assess the impact of soil vapor on indoor air quality. Foster Wheeler/HLA submitted a technical memorandum in December 1999, which summarized the results of the first three rounds of sampling completed at the SAEP between September 1, 1999 and October 22, 1999. In addition, the technical memorandum presented a review of detected indoor air contaminants to further assess potential risks to workers, and provide perspective as to the likelihood of potential future risks.

Analytical results from Round 3 of indoor air quality sampling indicated concentrations of 1,1-DCE and vinyl chloride exceeding CTDEP Industrial/Commercial Indoor Air Target Concentrations (I/C IATC) in a number of sample locations in the following buildings:

- B-1 (outside security headquarters)
- B-2 (Meyers lease area, and near the boiler room)
- B-9
- B-12
- B-48
- B-65

VOC concentrations did not exceed CTDEP I/C IATC on samples from the 2nd and 3rd floors of Building 1.

The following bullets summarize the results of Rounds 1-3 of indoor air quality sampling:

- Exceedances of CTDEP I/C IATC are widespread in buildings at SAEP.
- Contaminants detected in indoor air samples are also found in soil vapor samples, and groundwater.
- Maximum detected concentrations of three compounds (vinyl chloride, TCE, and 1,1-DCE) exceed I/C IATC.
- A preliminary screening-level risk evaluation showed that the cumulative excess cancer risk does not exceed the CTDEP criteria of $1\text{x}10^{-5}$.
- Cancer risks for three compounds calculated based on maximum concentrations exceed the CTDEP cancer risk limit for individual compounds. However, if exposures to these levels of contaminants are limited to 5 years, risk levels are not exceeded.
- Maximum concentrations likely overestimate risks.
- No short-term or long-term workplace exposure standards are exceeded.
- Additional sampling should be performed to continue to assess indoor air contamination levels.

In January 2000, Foster Wheeler/HLA was contracted to perform additional indoor air quality sampling work. The initial round of sampling was completed in early February, and will continue monthly for a period of six months. Following the sampling, a report will be prepared which will:

- summarize all indoor air sampling results to date; and
- present a revised risk assessment.

7.0 SUMMARY AND CONCLUSIONS

The following subsections summarize the findings of the OU 2 pre-design investigations, and present significant conclusions.

7.1 GEOLOGY AND HYDROGEOLOGY

A conceptual geologic model has been developed, with stratigraphy descriptions on a macroscopic scale. These descriptions are relatively accurate with minor variations in the stratigraphy seen throughout SAEP. The following bullets present a summary of the conceptual geologic model (from ground surface to bedrock) for the area of SAEP north of Sniffens Lane and east of South Main Street:

- <u>Fill:</u> consists of sand, gravel, and debris fill associated with buildings, roads, utilities, site grading, and other structures:
    - generally 2 to 5 feet thick, but locally extends approximately 10 to 15 feet below the ground surface near the Dike
    - thicker near the Dike due to the emplacement of fill over existing intertidal sediments to extend the shoreline of the facility in the 1940s
- <u>Estuarine Silt</u>: characterized as fine silts with very fine sands, rich in organics:
    - thickness of the silt deposits varies from as much as 30 feet near the Dike, to nonexistent near Main Street
    - the aerial extent is consistent with the area of former intertidal flats, which were filled in the 1940s to extend the shoreline of the SAEP property
- <u>Reworked Glacial Outwash:</u> characterized by sand and gravel deposits of glacial origin, divided into units of sand, with trace amounts of coarser material of sand and gravel with clay, silt, and cobbles:
    - working hypothesis for this unit is that glacial deposits have been reworked and sorted by the actions of the meandering Housatonic River
    - thickest beneath the southwestern part of the site (along Main Street), and thins toward the Housatonic River
    - distinguishing feature is the trace gravel, and loosely cemented gravel zones
    - bottom depth of these deposits varies between approximately 20 and 40 feet bgs.
- <u>Glacial Outwash:</u> characterized by fine to medium sand with some silt, interpreted to be glacial outwash:
    - contains silt/clay seams and fine silty sand

        - generally stratified, exhibiting a fining-down sequence, which has a micaceous component
        - thickness of this unit varies from approximately 20 to 130 feet
    - <u>Bedrock:</u> black schist with greenstone:
        - bedrock depths range from about 49 feet to 184 feet bgs beneath SAEP, or elevations of approximately –50 to –175 feet MSL
        - bedrock surface elevation is highly variable over localized areas
        - bedrock is deepest to the northwest, and shallowest to the southeast along Sniffens Lane and toward the Dike
        - bedrock surface has a general dip direction to the northwest

The following bullets summarizes the hydrogeology for the area of SAEP north of Sniffens Lane and east of South Main Street:

- The depth to water in this area of the facility ranges from approximately 4 to 11 feet bgs, depending upon the surface elevation and tidal influence;
- The estimated Ks of the geologic materials are as follows: fill 2.0×10^{-2} to 0.1 ft/min; silt 3.0×10^{-4} to 9.0×10^{-4} ft/min; reworked glacial outwash 6.0×10^{-5} to 2.0×10^{-2} ft/min.; and glacial out wash 1.0×10^{-4} to 3.0×10^{-2} ft/min;
- In the glacial outwash, K generally increases from west to east across the site; glacial outwash Ks in the northwestern portion of the facility (i.e., toward the North Parking Lot) are generally 1-2 orders of magnitude lower than Ks to the south and east;
- Horizontal hydraulic gradients range from 0.0001 feet/foot beneath Building B-2 to 0.002 feet/foot to the east of Building B-16;
- Vertical hydraulic gradients indicate a downward (recharging) potential to the south and west of Main Street; flattening gradients toward the central portion of the facility; and upward (discharging) potential in the vicinity of the Dike near the Housatonic River;
- Overall groundwater flow direction is from west to east/northeast, toward the Housatonic River; and
- There is potentially some component of flow from beneath Building B-2 off-site to the southwest.
- Groundwater flow velocities in the glacial outwash are estimated to be on the order of 0.002 feet/day beneath Building B-2 and 0.3 feet/day to the east of Building B-16 toward Building B-19 and the Dike.

7.2 CHROMIUM PLATING FACILITY DECONTAMINATION

The following bullets summarizes the results of the decontamination of the former Chromium Plating Facility:

- Post-decontamination wipe sampling results from the former Chromium Plating Facility surfaces indicate exceedances of calculated risk-based cleanup standards for hexavalent chromium on northwestern and southern areas of the concrete floor, the northernmost wall, and the northernmost columns and overhead beams;

- Concrete dust sampling indicates concentrations of hexavalent chromium in the concrete of the floor exceed calculated risk-based cleanup standards;
- Visual observations of the interior surfaces indicated a marked decrease in dust, however, the sampling results suggest a risk is still present for exposure to hexavalent chromium inside the facility; and
- The OU 2 NCRA EE/CA will address alternatives for removal actions regarding the residual contamination.

7.3 CHROMIUM CONTAMINATION IN SOIL AND GROUNDWATER

The following bullets summarize the results of the soil and groundwater investigations in the vicinity of the former Chromium Plating Facility:

- Contamination of subsurface soils by chromium is observed beneath the entire former Chromium Plating Facility;
- Concentrations of total chromium in soils from SPLP analyses were detected at up to 25.5 mg/L, versus the PMC of 0.5 mg/L;
- Concentrations of hexavalent chromium in soils are generally less than I/C DEC of 100 mg/kg;
- Hexavalent chromium is present in groundwater beneath the former Chromium Plating Facility at concentrations up to 950 mg/L;
- The source of the hexavalent chromium is attributable to the former plating operations completed at the facility;
- The conceptual model for the distribution of hexavalent chromium is infiltration of plating solutions through cracks in the concrete floor and waste lines, which subsequently migrated through the subsurface soils to the water table and deeper into the subsurface;
- The depth of the hexavalent chromium contamination in groundwater can be explained by the probable high density of the former plating solutions relative to groundwater;
- The relative differences in vertical to horizontal permeability in the fine sands and silts at approximately 30 feet bgs impeded vertical movement of the hexavalent chromium plume, causing the plume to spread horizontally;
- In addition, the intrusion of denser, saline water beneath the facility may provide an additional barrier to vertical migration of the hexavalent chromium;
- The relatively flat horizontal groundwater gradient has limited the horizontal spreading of the hexavalent chromium;
- The OU2 NCRA EE/CA will evaluate potential removal actions to mitigate the hexavalent chromium concentrations in groundwater in the vicinity of the former Chromium Plating Facility.

7.4 CHLORINATED VOC GROUNDWATER HOT-SPOTS

The four chlorinated VOCs which exceed SWPC in groundwater over the majority of the main portion of the SAEP facility are 1,1-DCE, PCE, TCE, and 1,1,1-TCA. Review of the groundwater analytical data indicates three areas of chlorinated VOC concentrations in groundwater exceeding 100,000 µg/L, which have been identified as groundwater "hot-spots". These hot-spots are probable sources of continuing groundwater contamination. The following subsections summarize the major findings at each of the three chlorinated VOC groundwater hot-spots.

7.4.1 Chlorinated VOC Hot-Spot No. 1

The following bullets summarize the findings for Chlorinated VOC Hot-Spot No. 1:

- Chlorinated VOC Hot-Spot No. 1 is located beneath the former Chromium Plating Facility in Building B-2;
- The estimated horizontal extent of TCE in groundwater at concentrations exceeding 100,000 µg/L covers the majority of the footprint of the former Chromium Plating Facility;
- The vertical distribution of TCE in groundwater beneath the former Chromium Plating Facility appears to be controlled by the layer of silt and very fine sand, the top of which is at an elevation of approximately –20 feet MSL;
- The lower vertical permeability of the silt and very fine sand appear to have impeded, to a large extent, the vertical migration of the highest concentrations (>100,000 µg/L) of TCE in groundwater;
- The conceptual model for this hot-spot is that TCE migrated from the plating facility vertically through the unsaturated zone, into and beneath the water table, to the surface of the silt and very fine sand aquitard. Concentrations of other chlorinated VOCs were less than 100,000 µg/L at this location;
- The highest concentration of TCE detected was 830,000 µg/L in exploration WP-99-33, immediately above the surface of the aquitard;
- Analytical results indicate that TCE is not present at concentrations exceeding the SWPC of 2,340 µg/L at depths near the bedrock surface;
- The highest concentration of TCE detected in groundwater (830,000 µg/L) is approximately 75 percent of TCE's solubility limit in water, which is indicative of the possible presence of TCE NAPL;
- Visual observation of subsurface soil and groundwater samples, and shake tests performed using Sudan IV dye, did not reveal the presence of any TCE NAPL.
- The OU2 NCRA EE/CA will evaluate potential removal actions to mitigate the VOC contamination in groundwater at Hot-Spot No.1.

7.4.2 Chlorinated VOC Hot-Spot No. 2

The following bullets summarize the findings for Chlorinated VOC Hot-Spot No. 2:

- Chlorinated VOC Hot-Spot No. 2 is located between Buildings B-48 and B-16;
- The estimated horizontal extent of TCE in groundwater at concentrations exceeding 100,000 µg/L covers an area roughly 75 feet in diameter;
- It is possible the area of TCE concentrations exceeding 100,000 µg/L is larger than that depicted (i.e., it may extend beneath Building B-16);
- The vertical distribution of TCE in groundwater appears to be controlled by the layer of sandy silt, the top of which is at an elevation of approximately –8 feet MSL;
- The lower vertical permeability of the sandy silt appears to have impeded, to a large extent, the vertical migration of the highest concentrations (>100,000 µg/L) of TCE in groundwater;
- In addition, the intrusion of denser, saline water beneath the facility may provide an additional barrier to vertical migration of the dissolved TCE;
- The conceptual model for this hot-spot is that TCE migrated from the ground surface vertically through the unsaturated zone, into and beneath the water table, to the sandy silt;
- The highest concentration of TCE detected was 264,000 µg/L, within the sandy silt;
- Concentrations of TCE beneath the sandy silt are generally less than 1,000 µg/L, and less than the SWPC of 2,340 µg/L;
- The depth to bedrock in the vicinity of VOC Hot-Spot No. 2 varies from –90 feet MSL to –105 feet MSL, dipping from southeast to northwest;
- Analytical results from exploration WP-99-45 indicate that TCE concentrations do not exceed the SWPC of 2,340 µg/L at a depth of 60 feet; however, the concentration of TCE detected in nearby monitoring well WC2-3D (100 feet south of WP-99-33), screened on the top of bedrock, is 3,100 µg/L, indicating that some TCE has migrated vertically to the bedrock surface;
- Review of the analytical data also indicate that the higher concentrations of TCE (>1,000 µg/L) from this hot-spot have not reached Dike or the intertidal flats;
- 1,1-DCE, 1,1,1-TCA, PCE, and vinyl chloride were also detected in groundwater samples associated with VOC Hot-Spot No. 2.
- The highest concentration of TCE detected in groundwater (264,000 µg/L) is approximately 24 percent of TCE's solubility limit in water, which is indicative of the possible presence of TCE NAPL;
- Visual observation of subsurface soil and groundwater samples did not reveal the presence of any TCE NAPL;
- The OU2 NCRA EE/CA will evaluate potential removal actions to mitigate the VOC contamination in groundwater at Hot-Spot No.2.

7.4.3 Chlorinated VOC Hot-Spot No. 3

The following bullets summarize the findings for Chlorinated VOC Hot-Spot No. 3:

- Chlorinated VOC Hot-Spot No. 3 is located in the center of Building B-2;
- The estimated horizontal extent of 1,1,1-TCA in groundwater at concentrations exceeding 100,000 µg/L covers an area roughly 350 feet long by 100 feet wide;
- The horizontal extent is based on extrapolation of concentrations from CP-99-08 to WP-99-48, however, it is possible the area of 1,1,1-TCA concentrations exceeding 100,000 µg/L is actually two distinct areas, each focused around these explorations;
- The conceptual model for this hot-spot is that 1,1,1-TCA migrated from the ground surface vertically through the unsaturated zone, into and beneath the water table, to bedrock;
- The intrusion of denser, saline water beneath the facility may provide an additional barrier to vertical migration of the dissolved 1,1,1-TCA;
- The highest concentration of 1,1,1-TCA detected was 280,000 µg/L in exploration CP-99-08 at a depth of approximately –24 feet MSL;
- 1,1,1-TCA has migrated to the bedrock surface (approximately –152 feet MSL) in the vicinity of exploration CP-99-08, where the concentration of 1,1,1-TCA is 210,000 µg/L;
- The extent of 1,1,1-TCA near the bedrock surface has been delineated to the southeast of CP-99-08, but is not completely delineated to the east (toward exploration WP-99-48) and northwest (toward exploration CP-99-06);
- The 1,1,1-TCA near the bedrock surface appears to be contained by a depression in the bedrock surface;
- The highest concentration of 1,1,1-TCA detected in groundwater (280,000 µg/L) is approximately 19 percent of 1,1,1-TCA's solubility limit in water, which is indicative of the possible presence of 1,1,1-TCA NAPL;
- Visual observation of groundwater samples did not reveal the presence of any 1,1,1-TCA NAPL.
- Under methanogenic conditions, 1,1,1-TCA is known to transform abiotically to 1,1-DCE, which subsequently transforms to vinyl chloride (Verschueren, 1996). Given this potential transformation, and the co-location of the highest concentrations of 1,1-DCE with 1,1,1-TCA, the source of the 1,1-DCE is suspected to be the transformation/degradation of 1,1,1-TCA.
- 1,1-DCE, TCE, PCE, and vinyl chloride were also detected in groundwater samples associated with VOC Hot-Spot No. 3.
- The OU2 NCRA EE/CA will evaluate potential removal actions to mitigate the VOC contamination in groundwater at Hot-Spot No.3.

7.5 SOIL VAPOR AND INDOOR AIR QUALITY RESULTS

The following bullets summarize the results of the soil vapor survey:

- Analytical results from the soil vapor survey indicate that soil vapor in the SAEP subsurface exceeds I/C VC for the chlorinated VOCs vinyl chloride, 1,1-DCE, and TCE;

- VOC soil vapor concentrations beneath the central portion of Building B-2, extending northeast and east toward Buildings B-15 and B-16, respectively, generally exceed CTDEP I/C VC, however, not all of the explorations in this region indicate exceedance of the criteria;
- The distribution of soil vapor VOC I/C VC exceedances is co-located with groundwater contamination by the same chlorinated VOCs.

The following bullets summarize the results of the first three rounds of indoor air quality monitoring:

- Initial rounds of indoor air quality sampling indicate that the VOCs detected in soil vapor samples are adversely affecting indoor air quality;
- Analytical results from Round 3 of indoor air quality sampling indicated concentrations of 1,1-DCE and vinyl chloride exceeding CTDEP Industrial/Commercial Indoor Air Target Concentrations (I/C IATC) in a number of sample locations in Buildings B-2, B-9, B-12, B-48, and B-65;
- VOC concentrations did not exceed CTDEP I/C IATC on samples from the 2nd and 3rd floors of Building 1;
- Maximum detected concentrations (from the three rounds of sampling) of three compounds (vinyl chloride, TCE, and 1,1-DCE) exceed I/C IATC;
- A preliminary screening level risk evaluation showed that the cumulative excess cancer risk met the CTDEP criteria of $1x10^{-5}$;
- No short-term or long-term workplace exposure standards are exceeded.
- In January 2000, Foster Wheeler/HLA was contracted to perform additional indoor air quality sampling work. The initial round of sampling was completed in early February, and will continue monthly for a period of six months. Following the sampling, a report will be prepared which will summarize the data and present a risk screening assessment.
- The OU 2 NCRA EE/CA will not directly address VOC soil vapor or indoor air exceedances. However, alternatives for application of any in-situ removal action will be developed, with the additional goal of attempting to address vadose zone and shallow groundwater VOC contamination issues.

7.6 POTENTIAL OU 2 NCRA PRE-DESIGN INVESTIGATION DATA GAPS

The following bullets summarize potential data gaps in the OU 2 Pre-Design Investigation activities:

- There is limited stratigraphic information (no physical soil samples) for potential removal action design in the vicinity of VOC Hot-Spot No. 3, located in the center of Building B-2.

- Delineation of VOC groundwater contamination near the bedrock surface between the former Chromium Plating Facility (VOC Hot-Spot No. 1) and the center of Building B-2 (VOC Hot-Spot No. 3) is limited.
- VOC Hot-Spot No. 2, located between Buildings B-48 and B-16, may extend beneath Building B-16; however, there is no groundwater data beneath Building B-16 to confirm this possible scenario.
- Soil vapor sample SG-99-51, located in the eastern end of Building B-2, indicates relatively high concentrations of TCE in the vadose zone; however, there is limited groundwater data in the vicinity of this exploration to assess potential associated groundwater contamination.

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

1,1-DCE	1,1-dichloroethene
1,1,1-TCA	1,1,1-trichloroethane
1,1,2-TCA	1,1,2-trichloroethane
1,1,2,2-TCA	1,1,2,2-tetrachloroethane
cis-1,2-DCE	cis-1,2-dichloroethene
1,2-DCE	1,2-dichloroethane
AJS	AJS Environmental Services, Inc.
ARARs	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
bgs	below ground surface
BRAC	Base Closure and Realignment Act
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Response, Compensation, and Liability Act
cpm	counts per minute
CTDEP	Connecticut Department of Environmental Protection
CWTP	Chemical Waste Treatment Plant
DEC	Direct Exposure Criteria
DGPS	Digital Global Positioning System
DNAPL	dense non-aqueous phase liquid
EBS	Environmental Baseline Survey
EC	electrical conductivity
EE/CA	Engineering Evaluation/Cost Analysis
ELCD	electrotylic conductivity detector
EMI	electromagnetic induction
ft^2/minute	feet per minute
Foster Wheeler	Foster Wheeler Environmental Corporation
GAC	granular activated carbon
GC	gas chromatograph
GIS	Geographic Information System
gpm	gallon per minute
GPR	ground-penetrating radar
HLA	Harding Lawson Associates
HSA	hollow-stem augers
I/C DEC	Industrial/Commercial Direct Exposure Criteria
I/C IATC	Industrial/Commercial Indoor Air Target Concentrations
I/C VC	Industrial/Commercial Volatilization Criteria

ID	inside diameter
IDW	investigation-derived waste
K	hydraulic conductivity
MADEP	Massachusetts Department of Environmental Protection
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mg/m^2	milligrams per square meter
MHz	megahertz
ML	milliliters
MSL	mean sea level
MS/MSD	matrix spike/matrix spike duplicate
mV	millivolts
NAPL	non-aqueous phase liquid
NCRA	Non-time Critical Removal Action
OU	Operable Unit
PCB	Polychlorinated Biphenyls
PCE	tetrachloroethene
PCPT	piezometric cone penetrometer testing
PDIR	Pre-Design Investigation Report
PID	photoionization detector
PMC	Pollutant Mobility Criteria
ppb	parts per billion
PPE	personal protective equipment
ppmv	parts per million volume
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPjP	Quality Assurance Project Plan
RAM	Removal Action Memorandum
Redox	reduction/oxidation potential
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RL	reporting limit
RSRs	Remediation Standard Regulations
S_y	specific yield
SAEP	Stratford Army Engine Plant
SOP	Standard Operating Procedure
SPLP	Synthetic Precipitate Leaching Procedure
SPT	Standard Penetration ‘Test

SQL	sample quantitation limit
SVOC	semi-volatile organic compound
SWPC	Surface Water Protection Criteria
T	transmissivity
TACOM	U.S. Army Tank-Automotive and Armament Command
TAL	Target Analyte List
TCE	trichloroethene
TDEMI	Time Domain Electromagnetic Induction
TERC	Total Environmental Restoration Contract
TOC	Total Organic Carbon
TPH	total petroleum hydrocarbons
URSGWCFS	URS Greiner-Woodward Clyde Federal Services
USACE	U.S. Army Corps of Engineers – New England District
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

ABB Environmental Services, Inc., 1996. Final Environmental Baseline Survey Report, Stratford Army Engine Plant, Stratford, Connecticut, prepared for U.S. Army Environmental Center.

Foster Wheeler Environmental Corporation Harding Lawson Associates (Foster Wheeler/HLA), 1999. Final Work Plan for the Non-Time Critical Removal Action for Chromium and VOC Groundwater Contamination. Prepared for the U.S. Army Corps of Engineers, August 1999.

HLA, 1999. Draft Data Package.

URS Greiner-Woodward Clyde Federal Services (URSGWCFS), 1998. Remedial Investigation Work Plan for the Stratford Army Engine Plant. Prepared for the U.S. Department of the Army, October 26, 1998.

U.S. Environmental Protection Agency (USEPA), 1998. "USEPA Region 1 Ambient Air Grab Sample Analysis for Volatile Organic Compounds"; EIA-FLDGRAB1.SOP; March 1998.

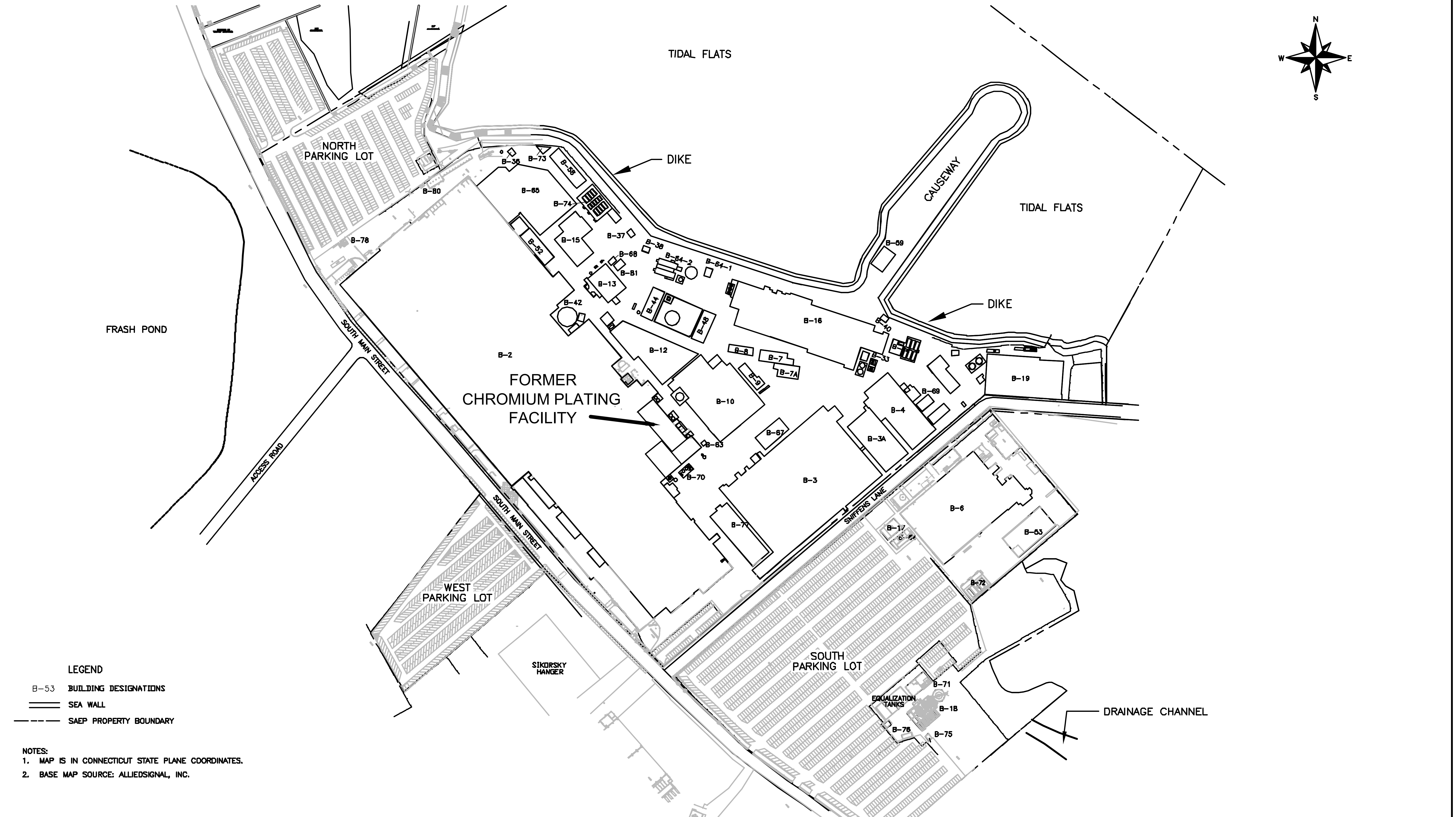
U.S. Environmental Protection Agency (USEPA), 1993. Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA. Office of Emergency and Remedial Response. USEPA/540-R-93-057, Washington DC, August 1993.

Verschueren, K., 1996. Handbook of Environmental Data on Organic Chemicals. 3rd Edition, 1996

Woodward-Clyde Consultants (W-C), 1996. Phase II Remedial Investigation Report (Phase I), Stratford Army Engine Plant, Connecticut. Prepared for the U.S. Army Corps of Engineers.

Woodward-Clyde Consultants (W-C), 1993. Remedial Investigation Report (Phase I), Stratford Army Engine Plant, Connecticut. Prepared for the U.S. Army Corps of Engineers, Omaha District.

Woodward-Clyde Consultants (W-C), 1991. Final Preliminary Assessment Screening, Stratford Army Engine Plant, Connecticut. Prepared for the U.S. Army Corps of Engineers, Omaha District.



NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

0 150 300 600 FEET

SCALE: 1"=300'

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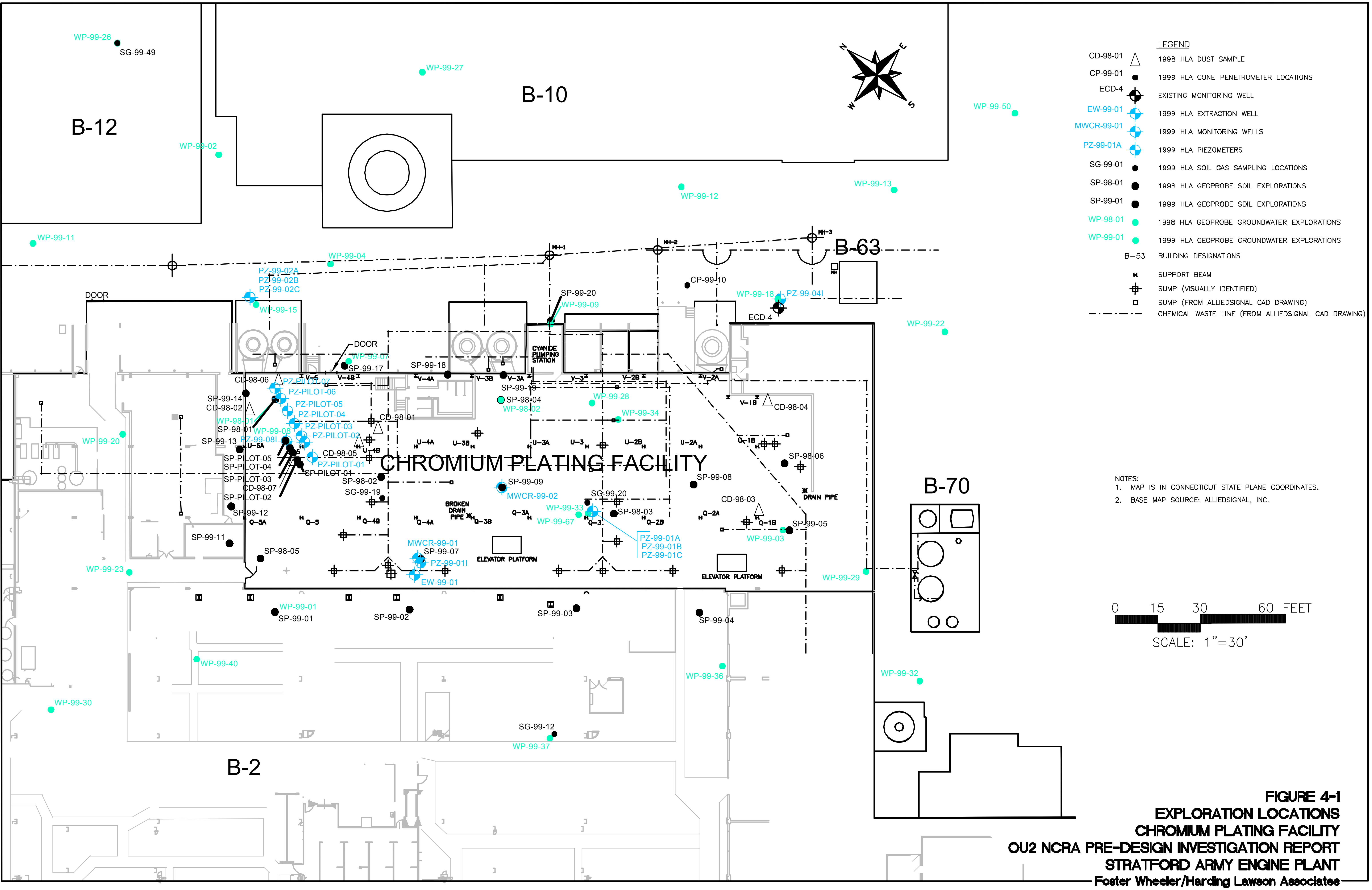
FIGURE 1-2
SITE FEATURES
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates



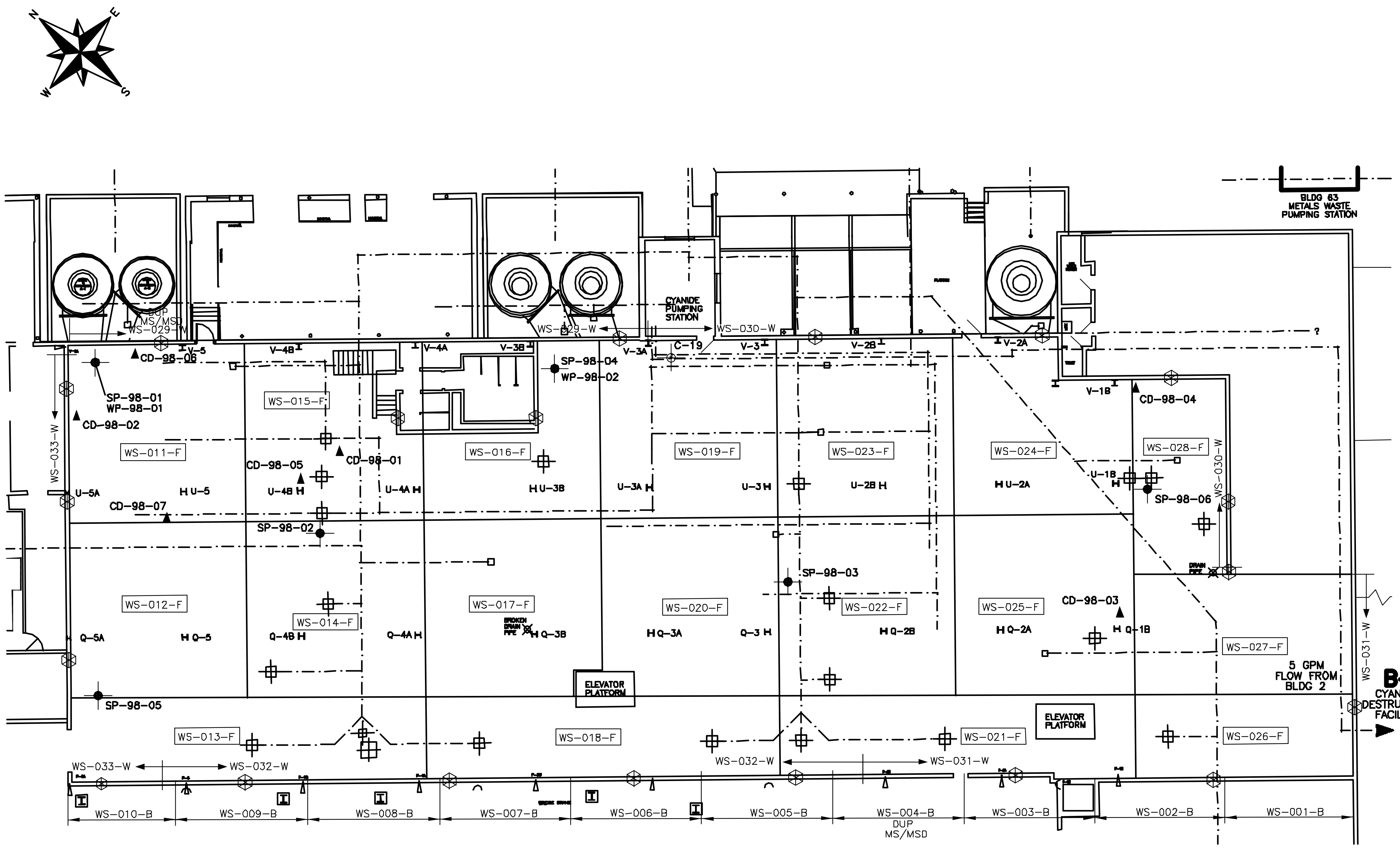
LEGEND

CD-98-01	△	1998 HLA DUST SAMPLE
CP-99-01	●	1999 HLA CONE PENETROMETER LOCATIONS
ECD-4	⊕	EXISTING MONITORING WELL
EW-99-01	⊕	1999 HLA EXTRACTION WELL
MWCR-99-01	⊕	1999 HLA MONITORING WELLS
PZ-99-01A	⊕	1999 HLA PIEZOMETERS
SG-99-01	●	1999 HLA SOIL GAS SAMPLING LOCATIONS
SP-98-01	●	1998 HLA GEOPROBE SOIL EXPLORATIONS
SP-99-01	●	1999 HLA GEOPROBE SOIL EXPLORATIONS
WP-98-01	●	1998 HLA GEOPROBE GROUNDWATER EXPLORATIONS
WP-99-01	●	1999 HLA GEOPROBE GROUNDWATER EXPLORATIONS
B-53		BUILDING DESIGNATIONS
	⌶	SUPPORT BEAM
	⌖	SUMP (VISUALLY IDENTIFIED)
	◻	SUMP (FROM ALLIEDSIGNAL CAD DRAWING)
	-·-·-	CHEMICAL WASTE LINE (FROM ALLIEDSIGNAL CAD DRAWING)

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

FIGURE 4-1
EXPLORATION LOCATIONS
CHROMIUM PLATING FACILITY
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254002.DWG 2-07-2000 DEL



LEGEND

WS-002-B ↔	BEAM SAMPLING LOCATION
WS-011-F	FLOOR SAMPLING LOCATION
WS-011-W ⊗	LOCATIONS OF WALL SAMPLES
SP-98-05 ●	GEOPROBE EXPLORATION
CD-98-02 ▲	CONCRETE DUST SAMPLE
H	SUPPORT COLUMN
⊞	SUMP (VISUALLY IDENTIFIED)
□	SUMP (FROM ALLIEDSIGNAL CAD DRAWING)
—·—·—	CHEMICAL WASTE LINE (FROM ALLIEDSIGNAL CAD DRAWING)

NOTE:

COLUMN SAMPLING:

WS-035-C	FROM COLUMNS U-5, Q-5, U-4B, Q-4B
WS-036-C	FROM COLUMNS U-4A, Q-4A, U-3B, Q-3B
WS-037-C	FROM COLUMNS U-3A, Q-3A, U-3, Q-3
WS-038-C	FROM COLUMNS U-2B, Q-2B, U-2A, Q-2A
WS-039-C	FROM COLUMNS U-1B, Q-1B AND SOUTHERNMOST COLUMNS (NOT ON MAP)

0 10 20 40 FEET

SCALE: 1"=20'

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254026.DWG 2-07-2000 DEL

FIGURE 4-2
WIPE SAMPLE LOCATIONS
CHROMIUM PLATING FACILITY
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PRE-DESIGN\FIGURES\4/254019.DWG 2-07-2000 DEL

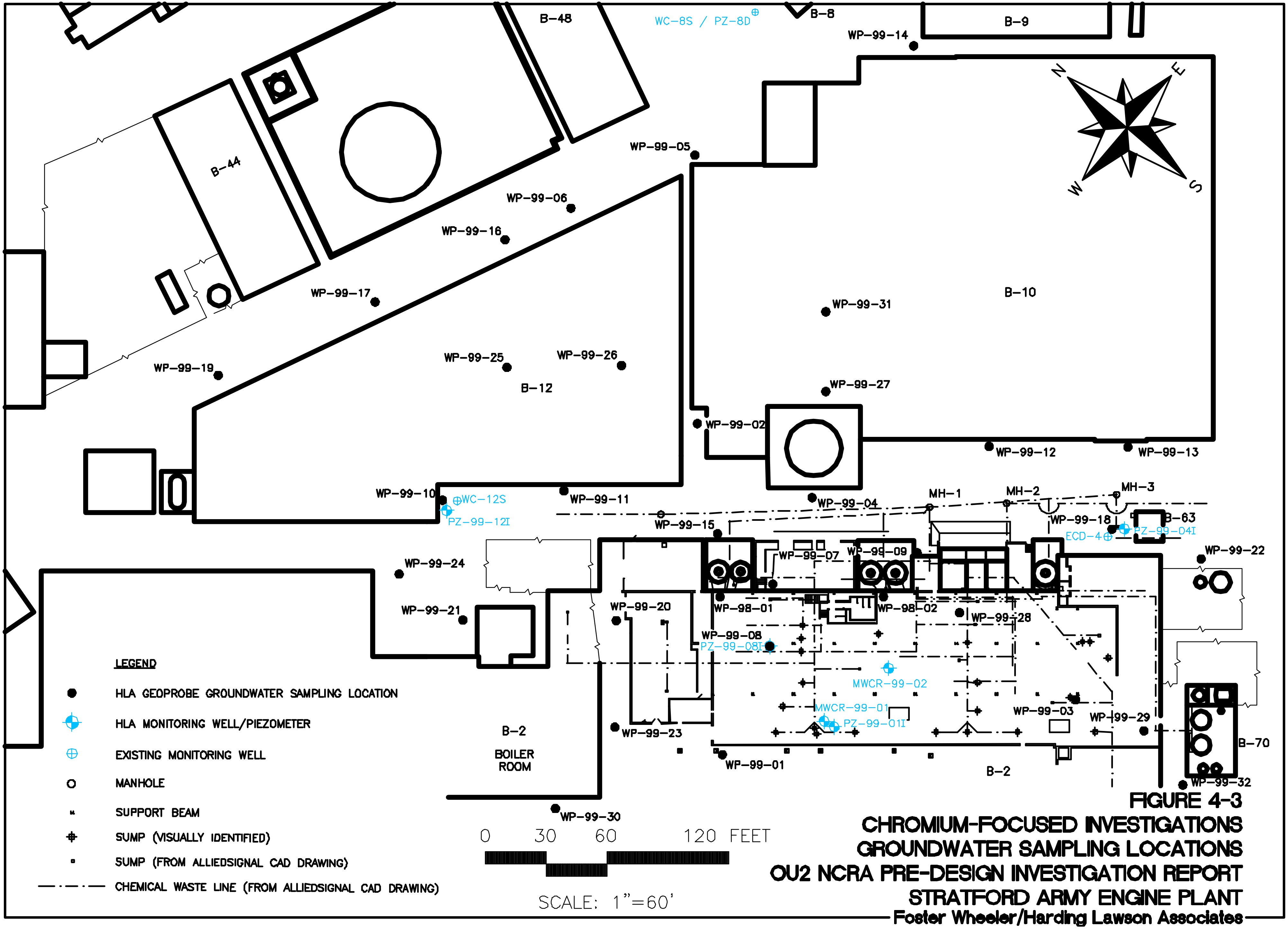
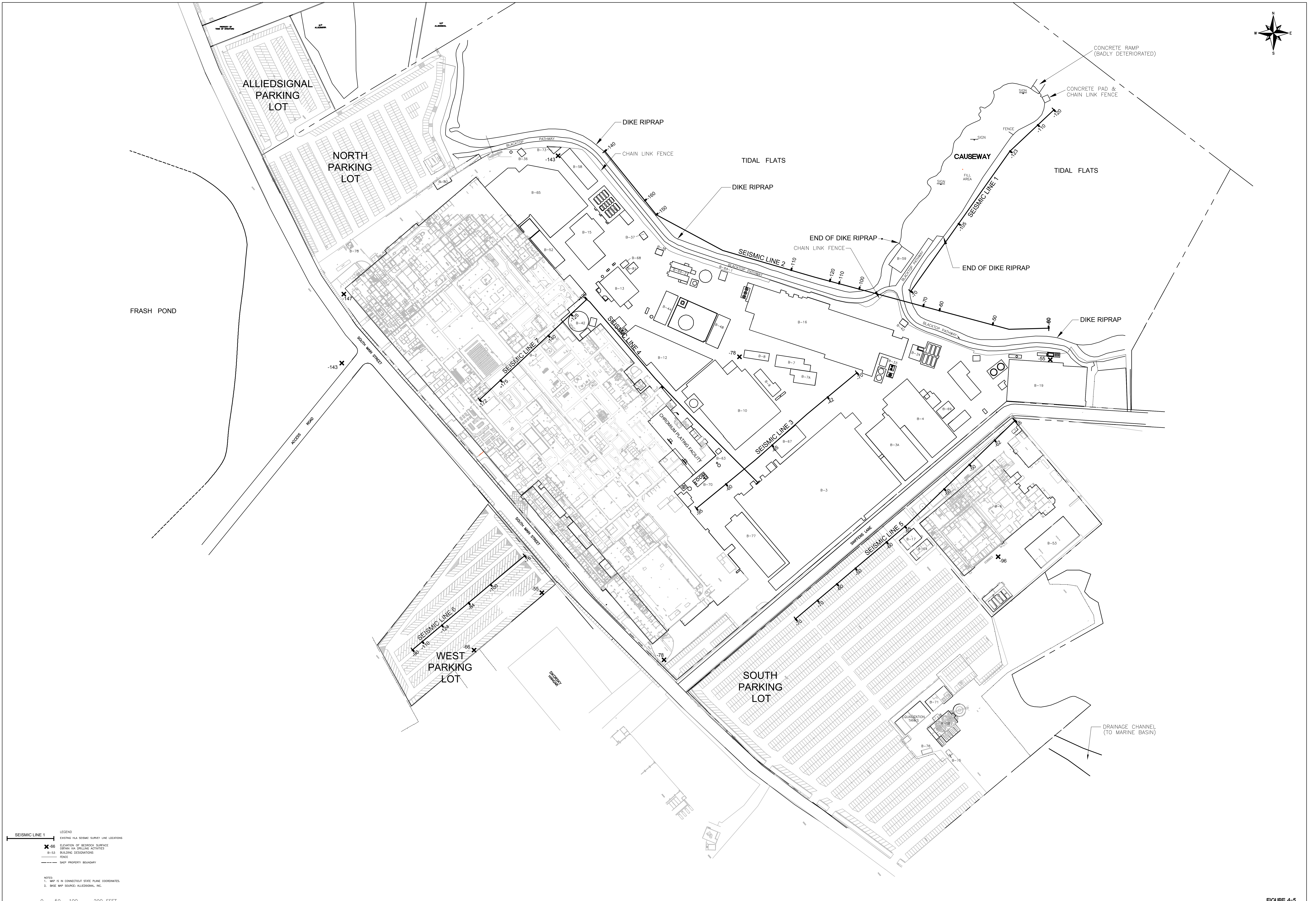


FIGURE 4-3

CHROMIUM-FOCUSED INVESTIGATIONS
GROUNDWATER SAMPLING LOCATIONS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

FIGURE 4-4
FACILITY-WIDE EXPLORATION LOCATIONS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates



LEGEND

SEISMIC LINE 1 — EXISTING HLA SEISMIC SURVEY LINE LOCATIONS

✖ -66 — ELEVATION OF BEDROCK SURFACE OBTAIN VIA DRILLING ACTIVITIES

B–53 — BUILDING DESIGNATIONS

FENCE

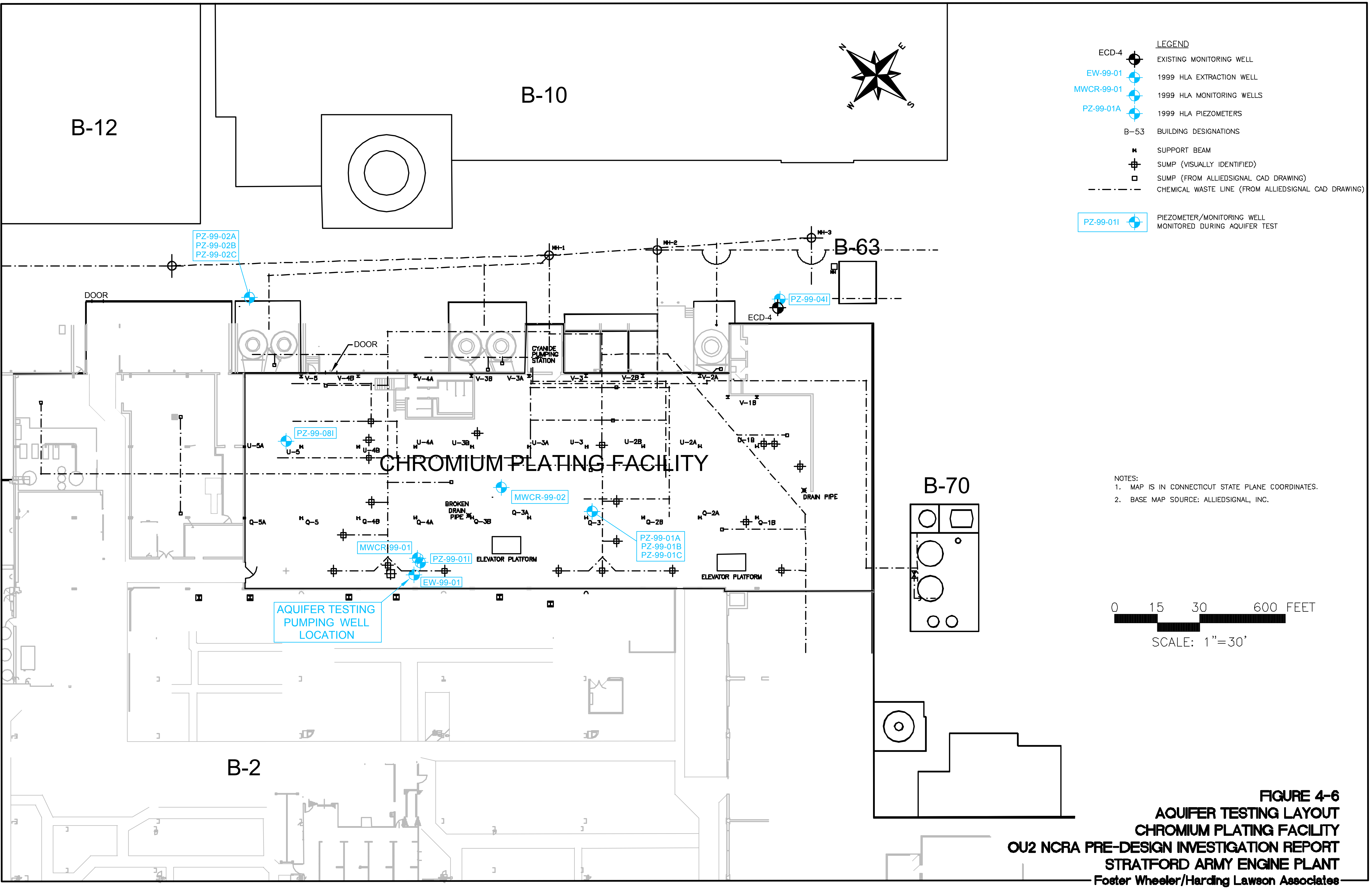
SAEP PROPERTY BOUNDARY

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

0 50 100 200 FEET
SCALE: 1"=100'

FIGURE 4-5
SEISMIC REFRACTION SURVEY LINE LOCATIONS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254044.DWG 2-04-2000 DEL



NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

FIGURE 4-6
AQUIFER TESTING LAYOUT
CHROMIUM PLATING FACILITY
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47264046.DWG 2-10-2000 DEL

LEGEND

CP-99-01 ●	EXISTING HLA CONE PENETROMETER LOCATIONS
EW-99-01 ⊕	EXISTING HLA EXTRACTION WELL
MWCD-99-01A ⊕	EXISTING HLA MONITORING WELLS
MWCR-99-01 ⊕	EXISTING HLA MONITORING WELLS
PZ-99-01A ⊕	EXISTING HLA PIEZOMETER/MONITORING WELL LOCATIONS
SG-99-01 ●	1999 HLA SOIL GAS SAMPLING LOCATIONS
SP-98-01 ●	1998 HLA GEOPROBE SOIL EXPLORATIONS
SP-99-01 ●	1999 HLA GEOPROBE SOIL EXPLORATIONS
WP-98-01 ●	1998 HLA GEOPROBE GROUNDWATER EXPLORATIONS
WP-99-01 ●	1999 HLA GEOPROBE GROUNDWATER EXPLORATIONS
DP57 ●	EXISTING U.R.S.-GRENIER / WOODWARD-CLYDE DIRECT-PUSH
⊕	EXISTING REMEDIAL INVESTIGATION PIEZOMETER/MONITORING WELL LOCATIONS
A ├──┤ A'	CROSS-SECTION LOCATIONS
B-53	BUILDING DESIGNATIONS
────	CHAIN LINK FENCE
── ─ ─ ─	SAEP PROPERTY BOUNDARY

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

0 50 100 200 FEET
SCALE: 1"=100'

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254011.DWG 2-08-2000 DEL

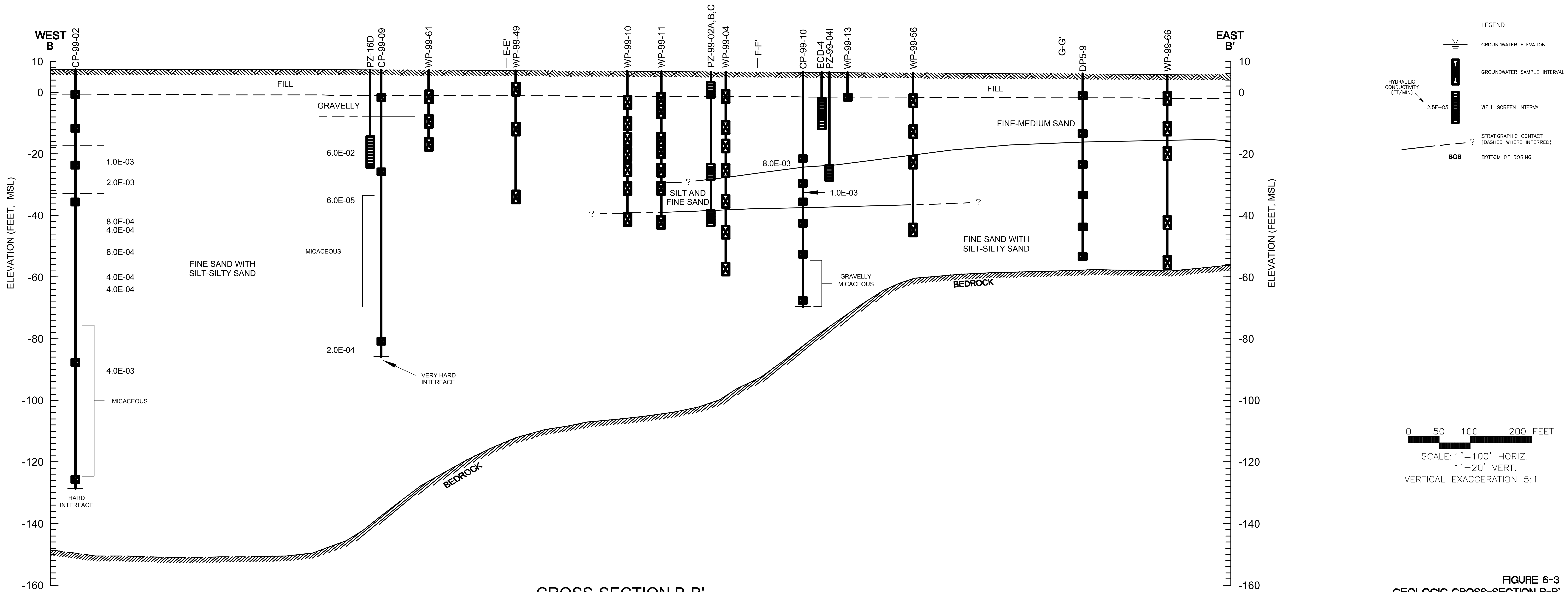
FIGURE 6-1
CROSS-SECTION LOCATIONS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

CROSS-SECTION A-A'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-2
GEOLOGIC CROSS-SECTION A-A'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254012.DWG 2-03-2000 DEL



CROSS-SECTION B-B'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-3
GEOLOGIC CROSS-SECTION B-B'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

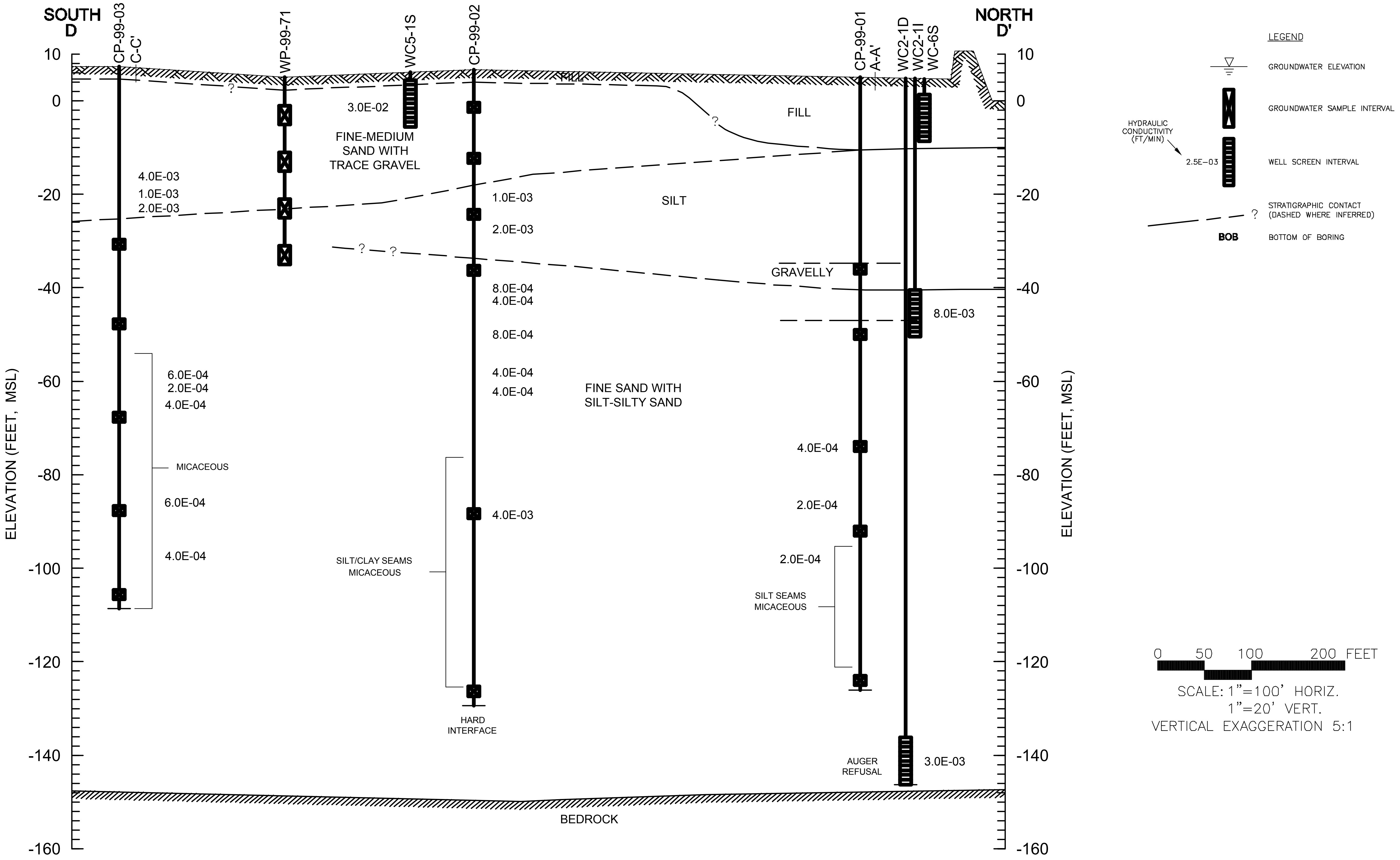
G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254013.DWG 2-03-2000 DEL

CROSS-SECTION C-C'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\4725401 4.DWG 2-07-2000 DEL

FIGURE 6-4
GEOLOGIC CROSS-SECTION C-C'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

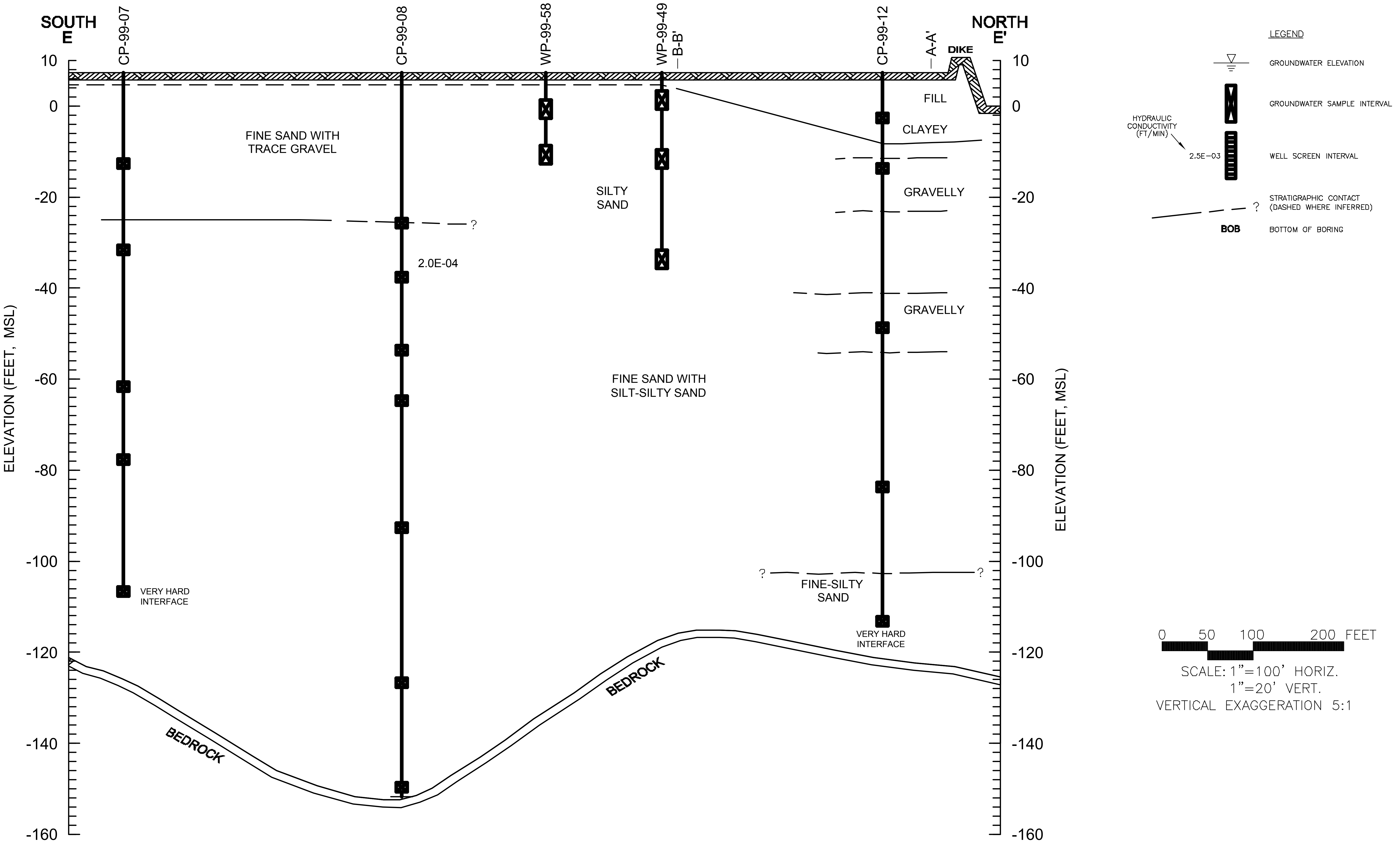


CROSS-SECTION D-D'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-5
GEOLOGIC CROSS-SECTION D-D'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254015.DWG 2-07-2000 DEL

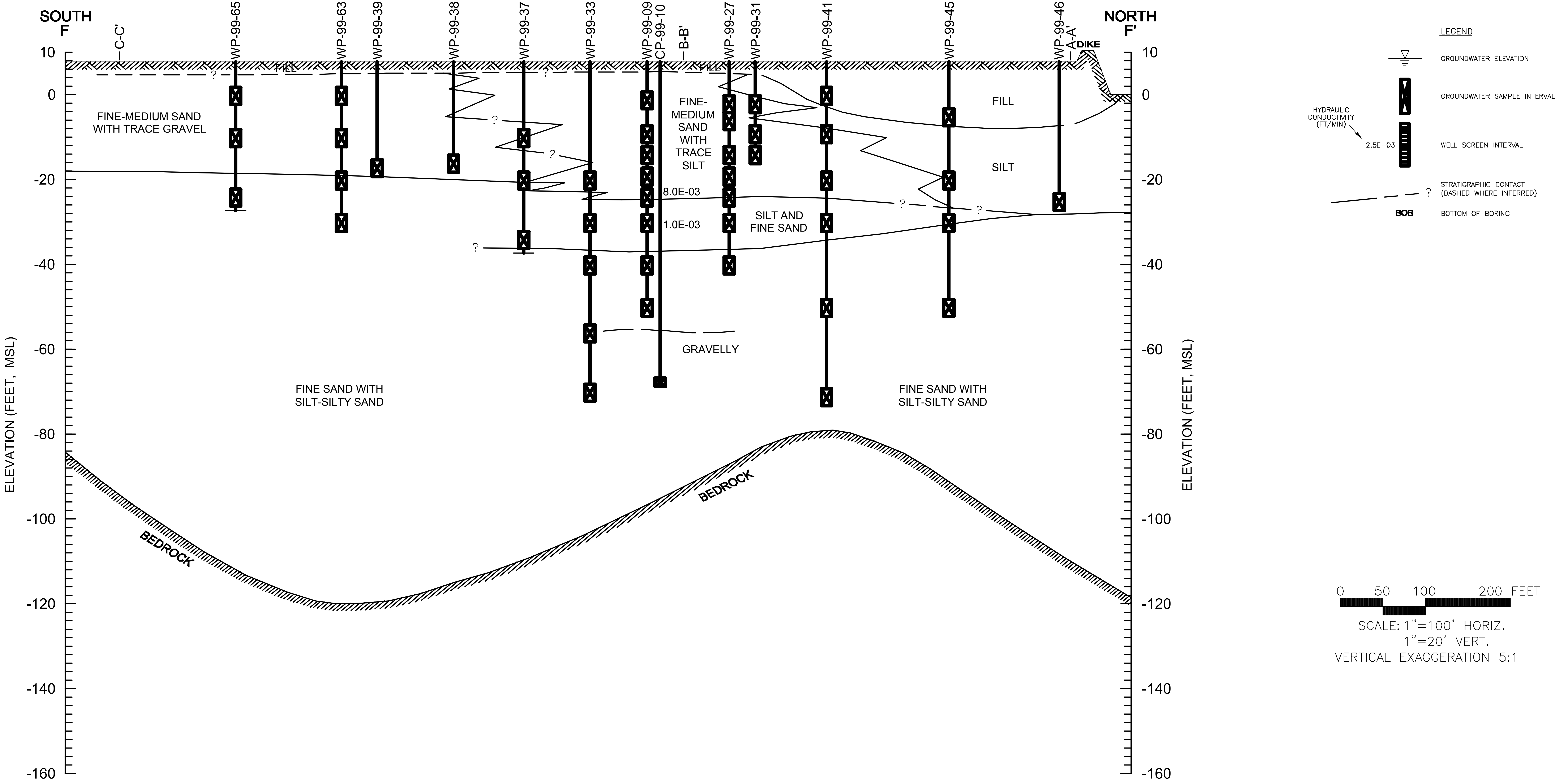


CROSS-SECTION E-E'

LOCATION OF PROFILE IS SHOWN ON FIGURE _-_

FIGURE 6-6
GEOLOGIC CROSS-SECTION E-E'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254016.DWG 2-02-2000 DEL

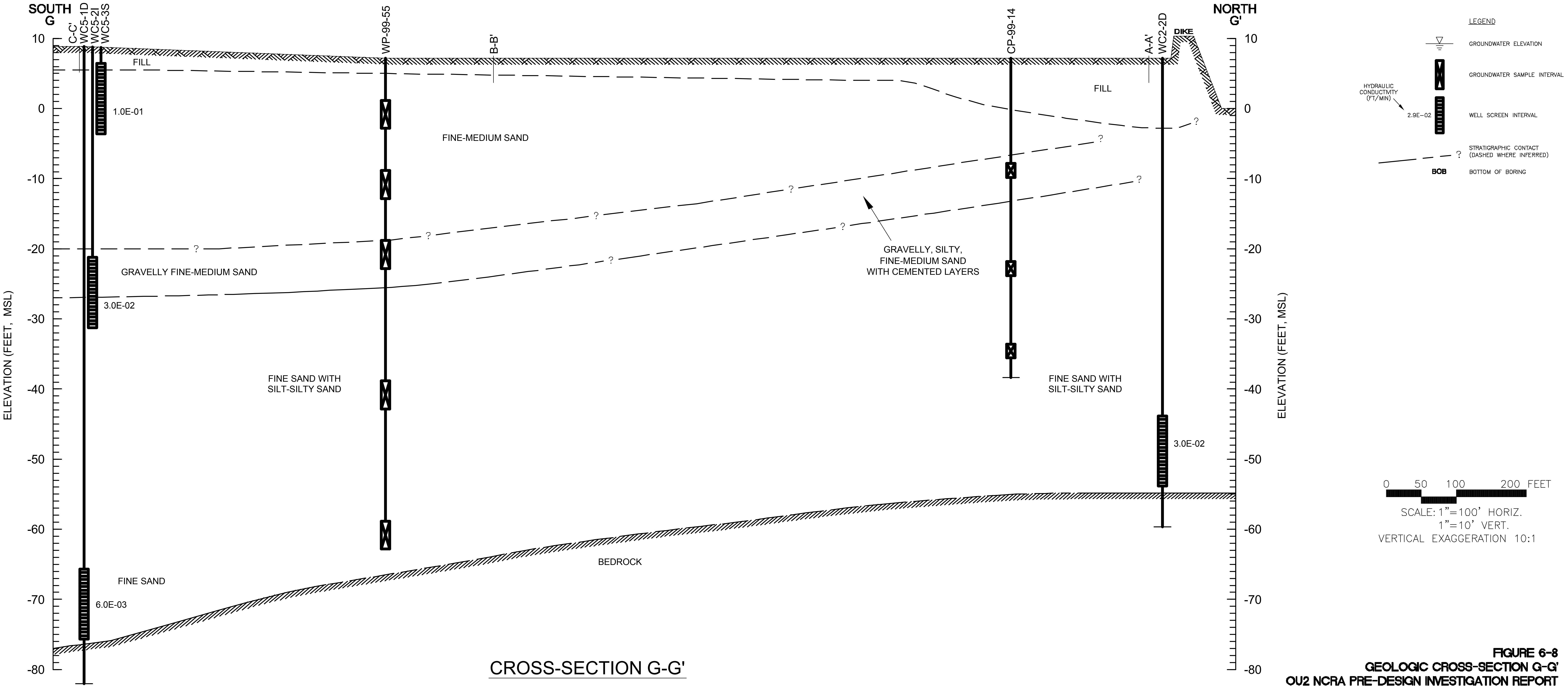


CROSS-SECTION F-F'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-7
GEOLOGIC CROSS-SECTION F-F'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47264017.DWG 2-02-2000 DEL

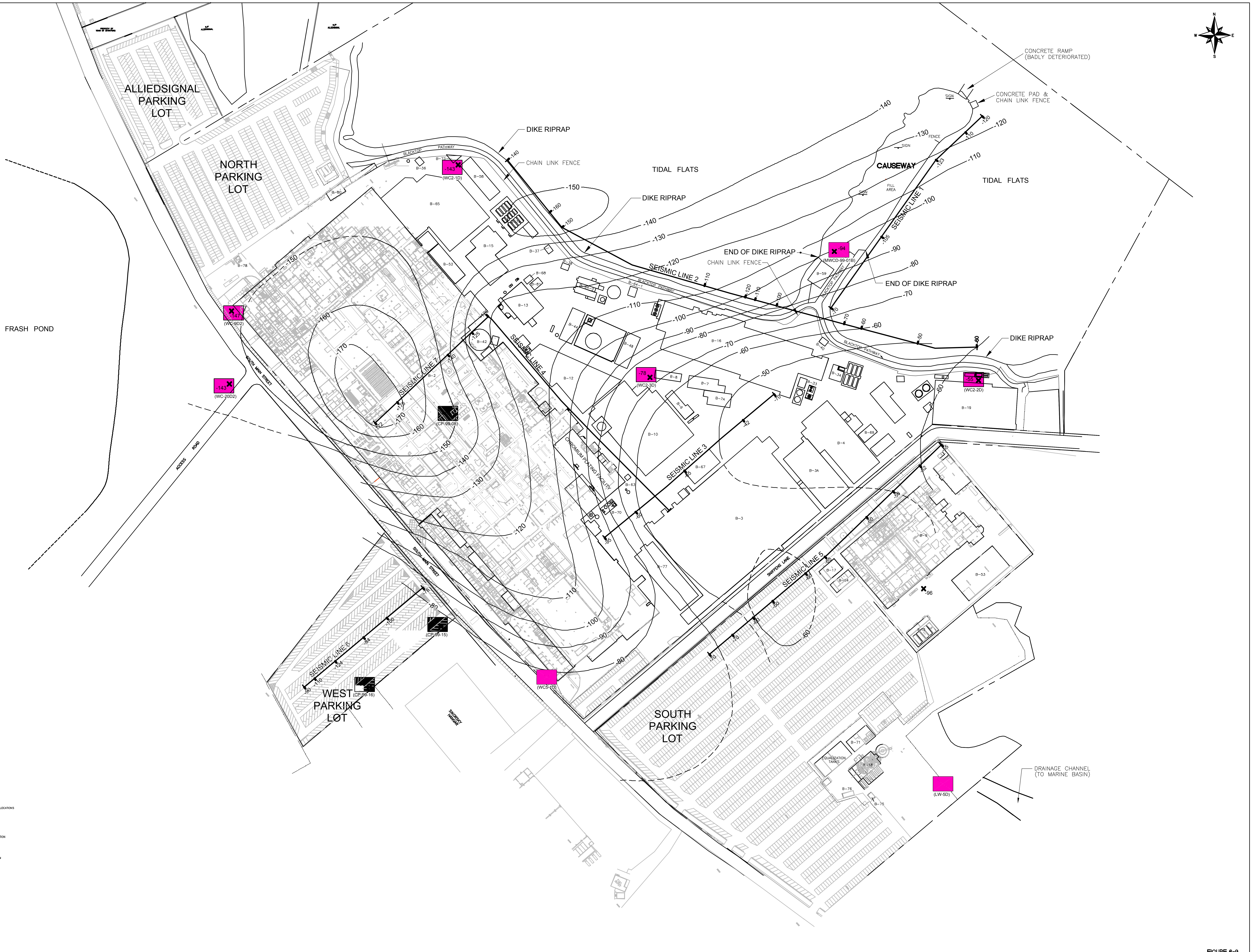


CROSS-SECTION G-G'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254018.DWG 2-02-2000 DEL

FIGURE 6-8
GEOLOGIC CROSS-SECTION G-G'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates



LEGEND

SEISMIC LINE 1	EXISTING HLA SEISMIC SURVEY LINE LOCATIONS
-80	INTERPRETIVE BEDROCK ELEVATION CONTOUR (FEET, MEAN SEA LEVEL) DASHED WHERE INFERRED
-78 ✕	BORING-CONFIRMED BEDROCK ELEVATION
(WC5-1D)	(LOCATION IDENTIFICATION)
■	ESTIMATED BEDROCK ELEVATION FROM CONE PENETROMETER EXPLORATION
(CP-99-16)	(LOCATION IDENTIFICATION)
B-53	BUILDING DESIGNATIONS
──	FENCE
━ ‒ ‒ ━	SAEP PROPERTY BOUNDARY

NOTES:

1. INTERPRETIVE BEDROCK CONTOUR INTERVALS WERE GENERATED USING BOTH BORING-CONFIRMED BEDROCK ELEVATIONS AND SEISMIC SURVEY DATA.
2. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
3. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

0 50 100 200 FEET
SCALE: 1"=100'

FIGURE 6-9
INTERPRETIVE BEDROCK ELEVATION CONTOUR MAP
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

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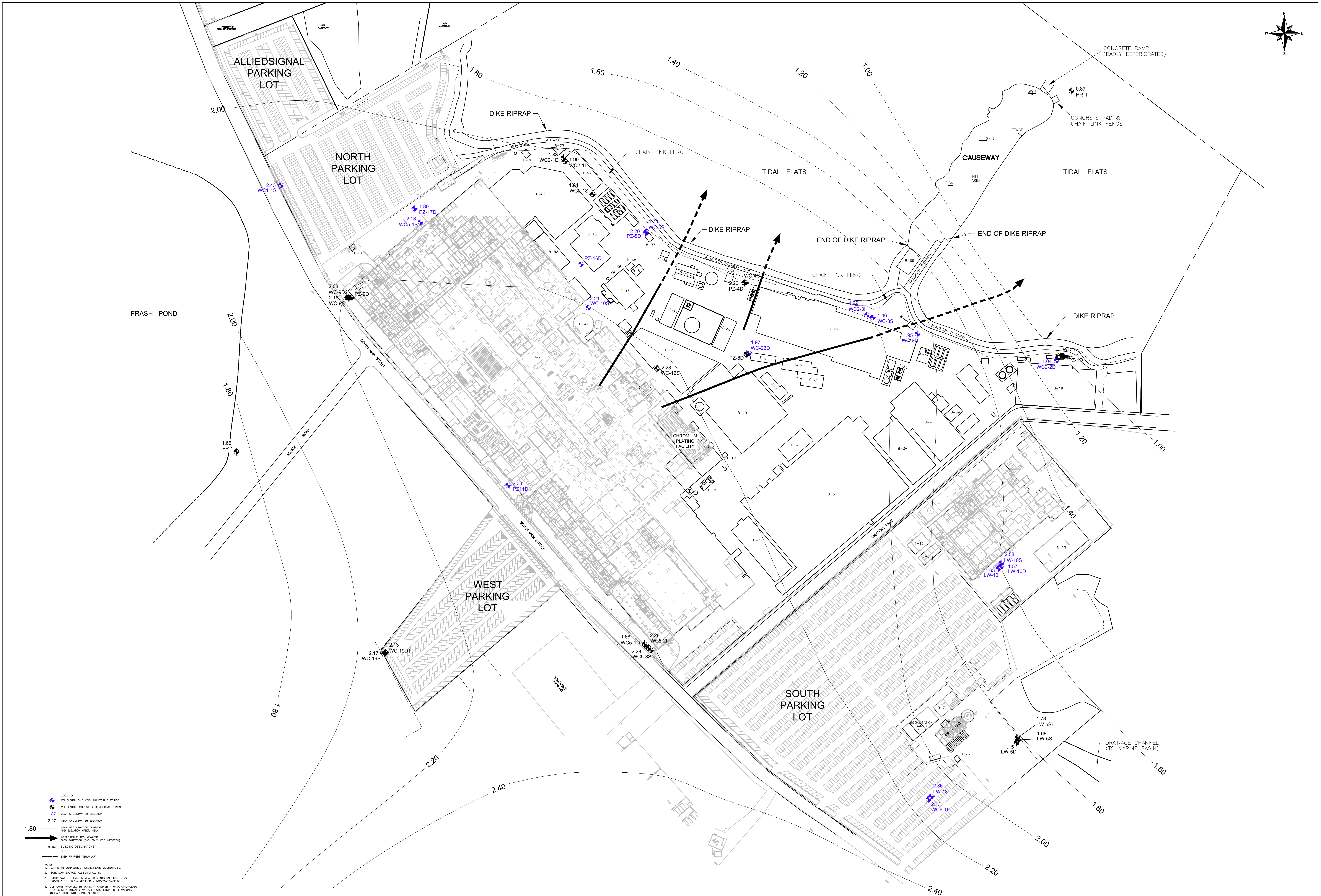


LEGEND

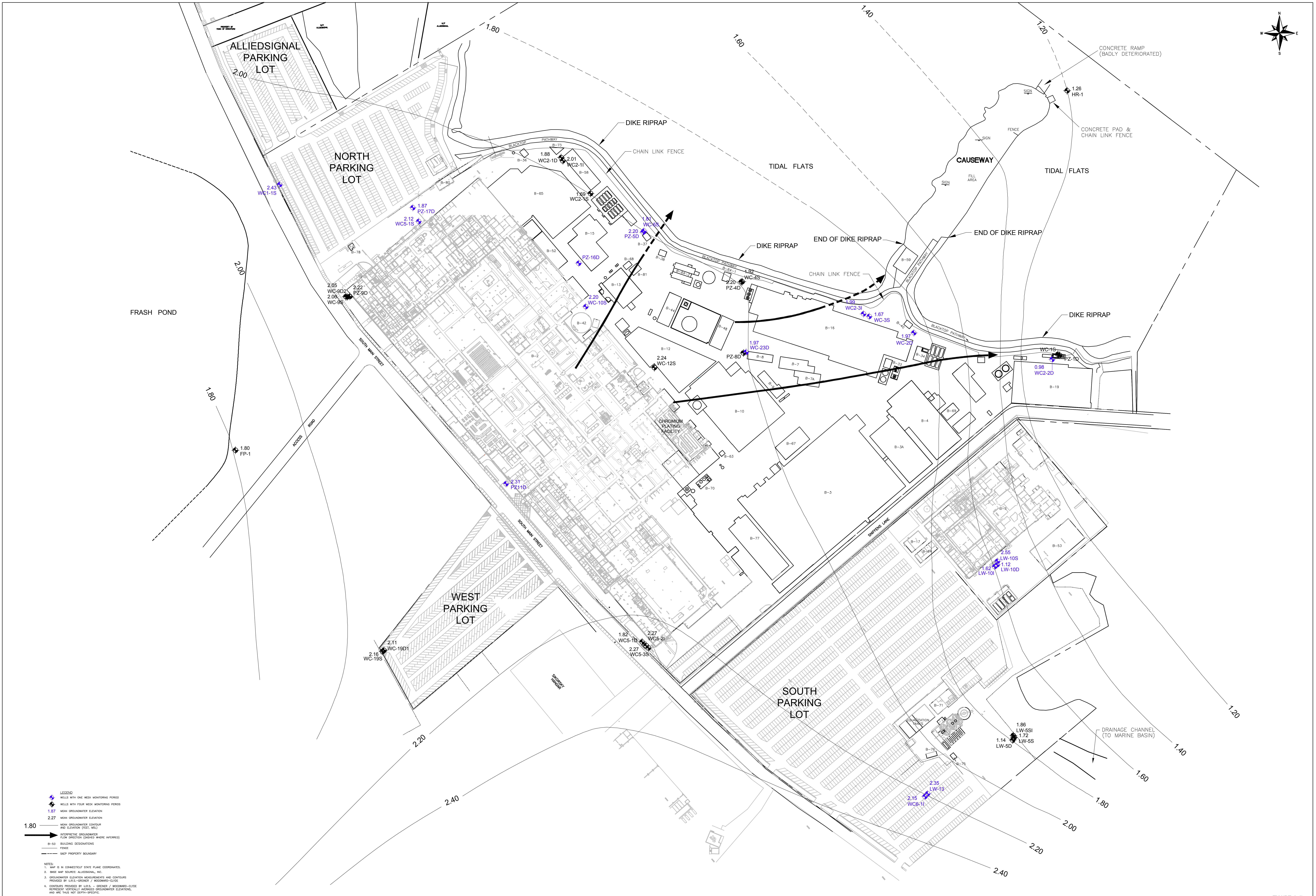
●	WELLS WITH ONE WEEK MONITORING PERIOD
●	WELLS WITH FOUR WEEK MONITORING PERIOS
1.87	MEAN GROUNDWATER ELEVATION
2.27	MEAN GROUNDWATER ELEVATION
1.80 ———	MEAN GROUNDWATER CONTOUR AND ELEVATION (FEET, MSL)
➞	INTERPRETIVE GROUNDWATER FLOW DIRECTION (DASHED WHERE INFERRED)
B-53	BUILDING DESIGNATIONS
———	FENCE
— — —	SAEP PROPERTY BOUNDARY

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.
3. GROUNDWATER ELEVATION MEASUREMENTS AND CONTOURS PROVIDED BY U.R.S.– GREINER / WOODWARD-CLYDE.
4. CONTOURS PROVIDED BY U.R.S. – GREINER / WOODWARD-CLYDE REPRESENT VERTICALLY AVERAGED GROUNDWATER ELEVATIONS, AND ARE THUS NOT DEPTH-SPECIFIC.

0 50 100 200 FEET
SCALE: 1"=100'

FIGURE 6-10
JULY 20 - JULY 23, 1999 MEAN
INTERPRETIVE GROUNDWATER ELEVATION CONTOURS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254008.DWG 3-14-2000 SMC



LEGEND

WELLS WITH ONE WEEK MONITORING PERIOD

WELLS WITH FOUR WEEK MONITORING PERIOS

1.87 MEAN GROUNDWATER ELEVATION

2.27 MEAN GROUNDWATER ELEVATION

1.80 MEAN GROUNDWATER CONTOUR AND ELEVATION (FEET, MSL)

INTERPRETIVE GROUNDWATER FLOW DIRECTION (DASHED WHERE INFERRED)

B-53 BUILDING DESIGNATIONS

FENCE

SAEP PROPERTY BOUNDARY

NOTES:

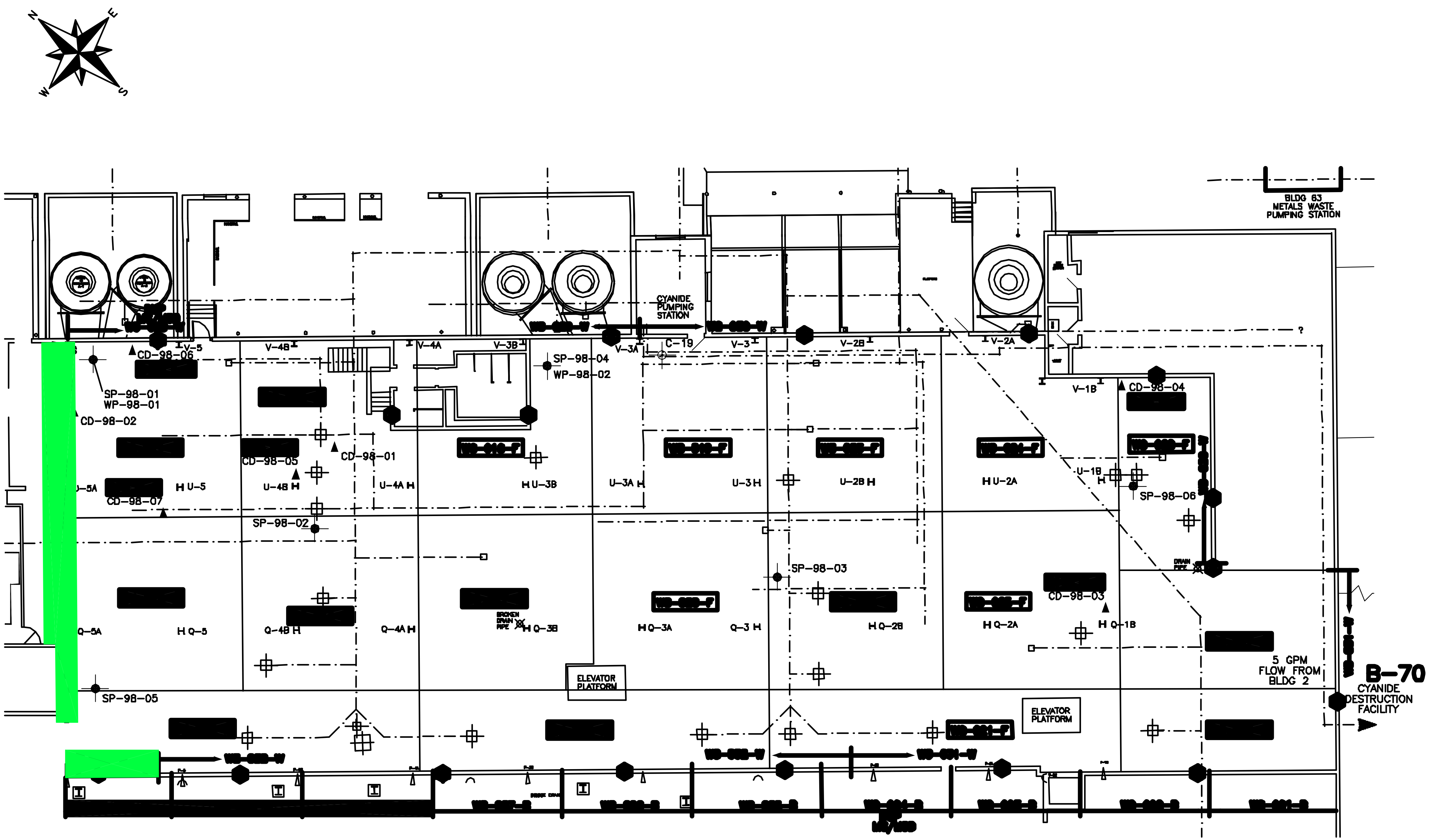
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.
3. GROUNDWATER ELEVATION MEASUREMENTS AND CONTOURS PROVIDED BY U.R.S.-GREINER / WOODWARD-CLYDE
4. CONTOURS PROVIDED BY U.R.S. - GREINER / WOODWARD-CLYDE REPRESENT VERTICALLY AVERAGED GROUNDWATER ELEVATIONS, AND ARE THUS NOT DEPTH-SPECIFIC.

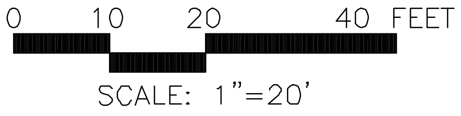
0 50 100 200 FEET

SCALE: 1"=100'

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254009.DWG 3-14-2000 SMC

FIGURE 6-11
JULY 24 - JULY 26, 1999 MEAN
INTERPRETIVE GROUNDWATER ELEVATION CONTOURS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates





LEGEND

WD-033-B	BEAM SAMPLING LOCATION
WD-011-F	FLOOR SAMPLING LOCATION
WD-011-W ⬢	LOCATIONS OF WALL SAMPLES
SP-98-05	GEOPROBE EXPLORATION
CD-98-02 ▲	CONCRETE DUST SAMPLE
H	SUPPORT COLUMN
⌖	SUMP (VISUALLY IDENTIFIED)
□	SUMP (FROM ALLIEDSIGNAL CAD DRAWING)
— · — · —	CHEMICAL WASTE LINE (FROM ALLIEDSIGNAL CAD DRAWING)
■	CONCENTRATION OF HEXAVALENT CHROMIUM IN CONCRETE SAMPLE
🟩	WALL WIPE SAMPLE RESULT EXCEEDS RISK-BASED CLEANUP CRITERIA
■	BEAM WIPE SAMPLE RESULT EXCEEDS RISK-BASED CLEANUP CRITERIA
■	FLOOR WIPE SAMPLE RESULT EXCEEDS RISK-BASED CLEANUP CRITERIA

NOTE:

COLUMN SAMPLING:

WD-035-C FROM COLUMNS U-5, Q-5, U-4B, Q-4B
WD-036-C FROM COLUMNS U-4A, Q-4A, U-3B, Q-3B
WD-037-C FROM COLUMNS U-3A, Q-3A, U-3, Q-3
WD-038-C FROM COLUMNS U-2B, Q-2B, U-2A, Q-2A
WD-039-C FROM COLUMNS U-1B, Q-1B AND SOUTHERNMOST COLUMNS (NOT ON MAP)

FIGURE 6-12
POST DECONTAMINATION RESULTS
CHROMIUM PLATING FACILITY
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\4726420.DWG 2-02-2000 DEL

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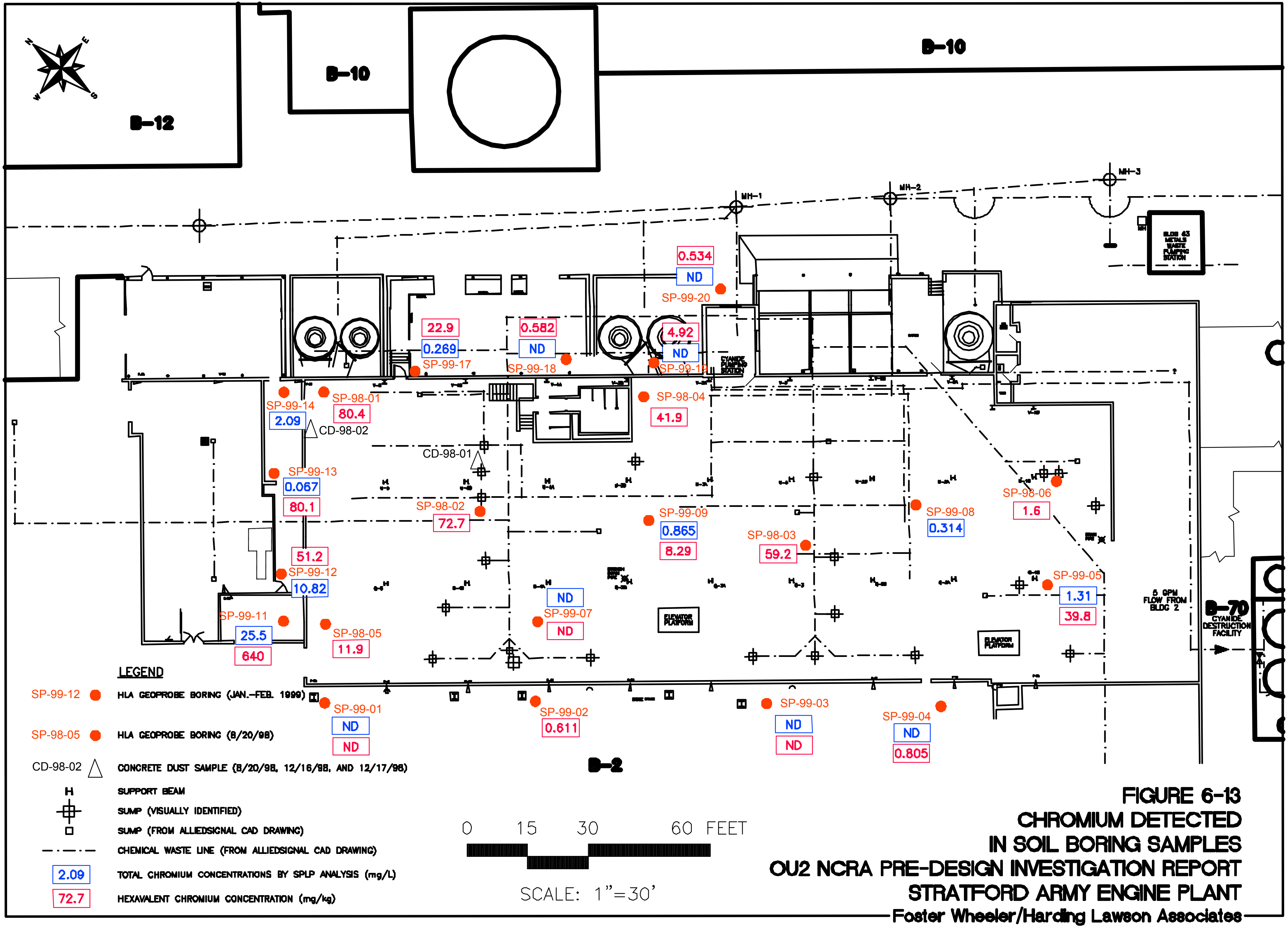


FIGURE 6-13

CHROMIUM DETECTED IN SOIL BORING SAMPLES

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT

STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

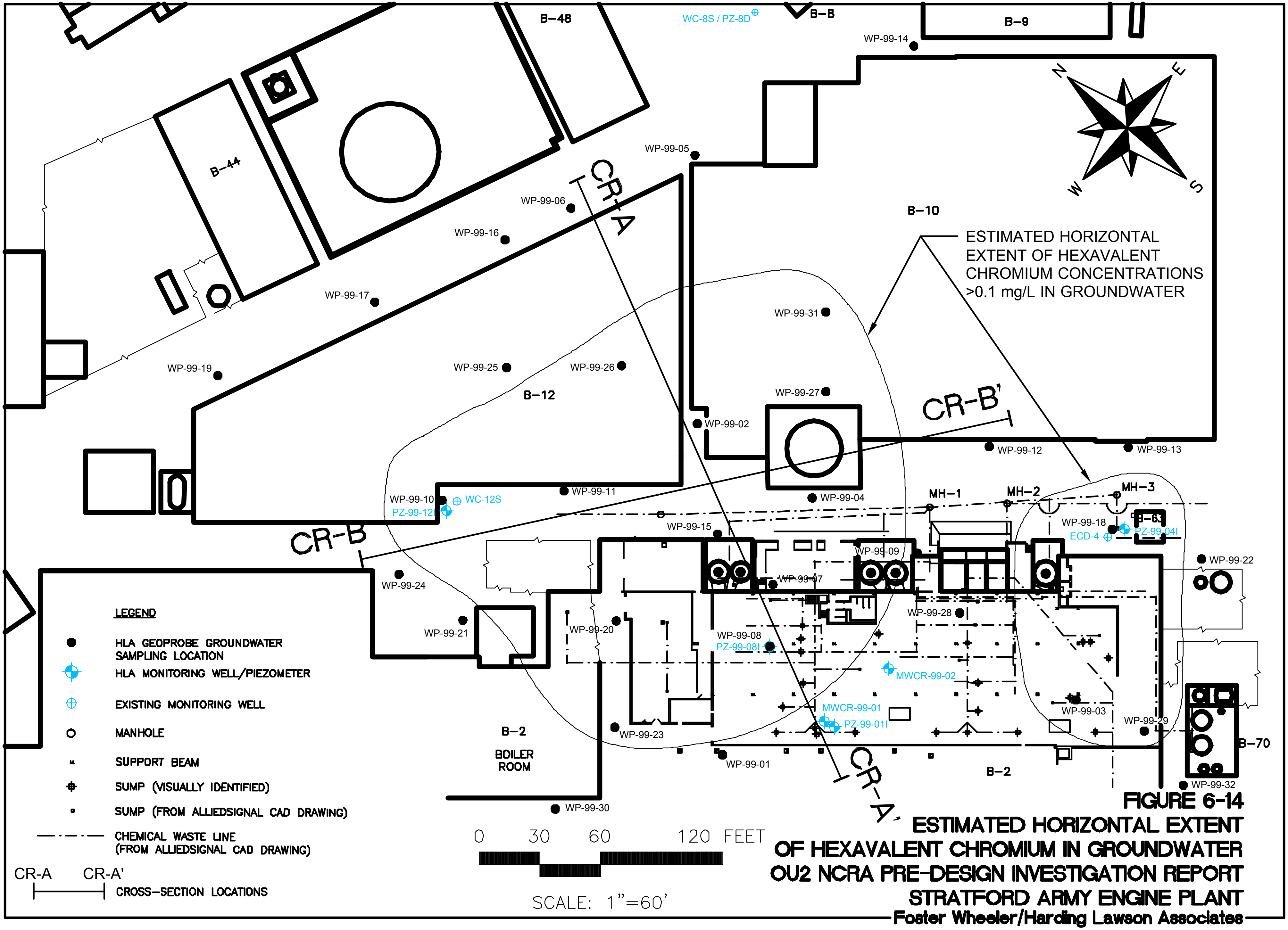


FIGURE 6-14
ESTIMATED HORIZONTAL EXTENT OF HEXAVALENT CHROMIUM IN GROUNDWATER
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

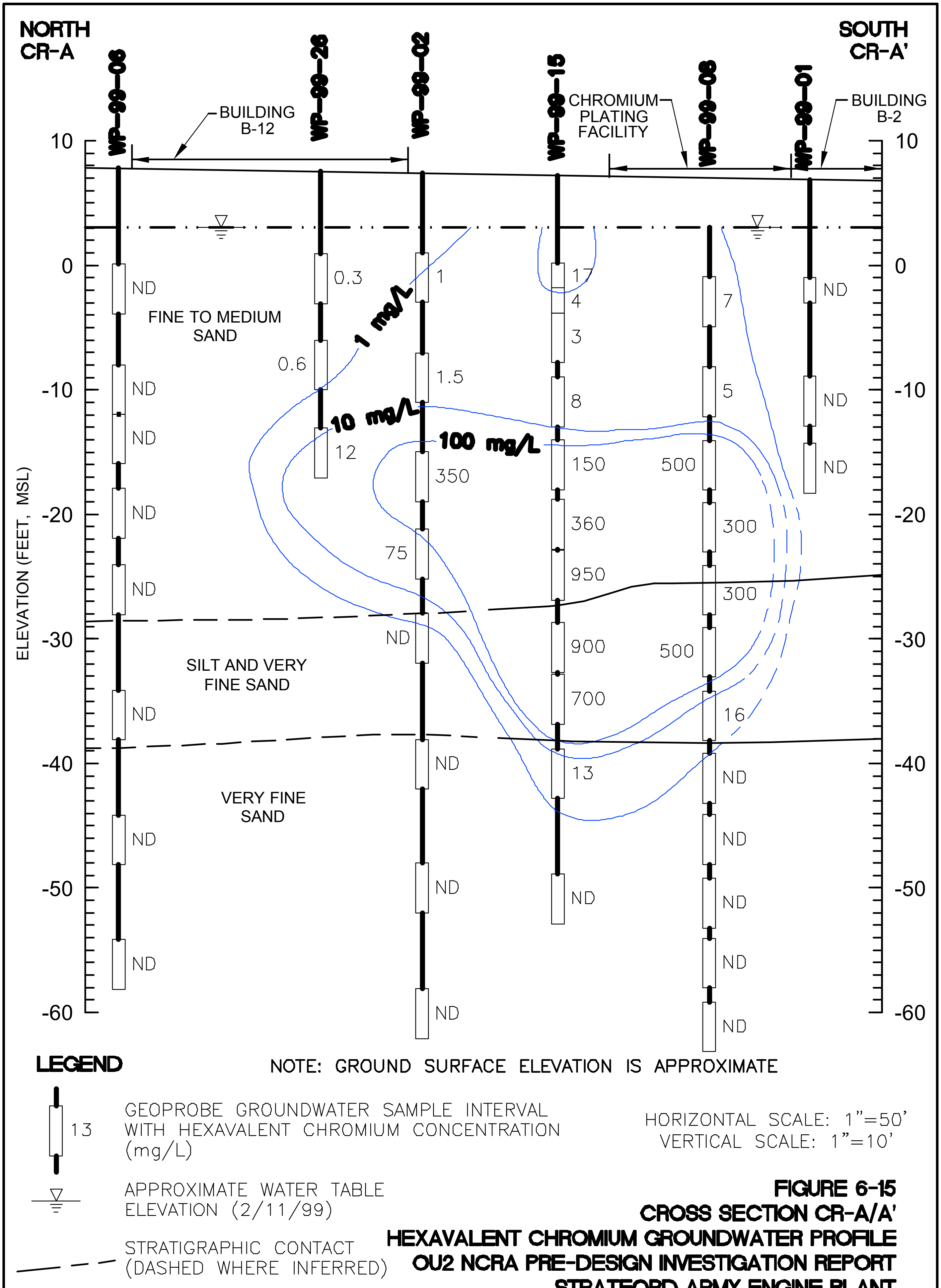
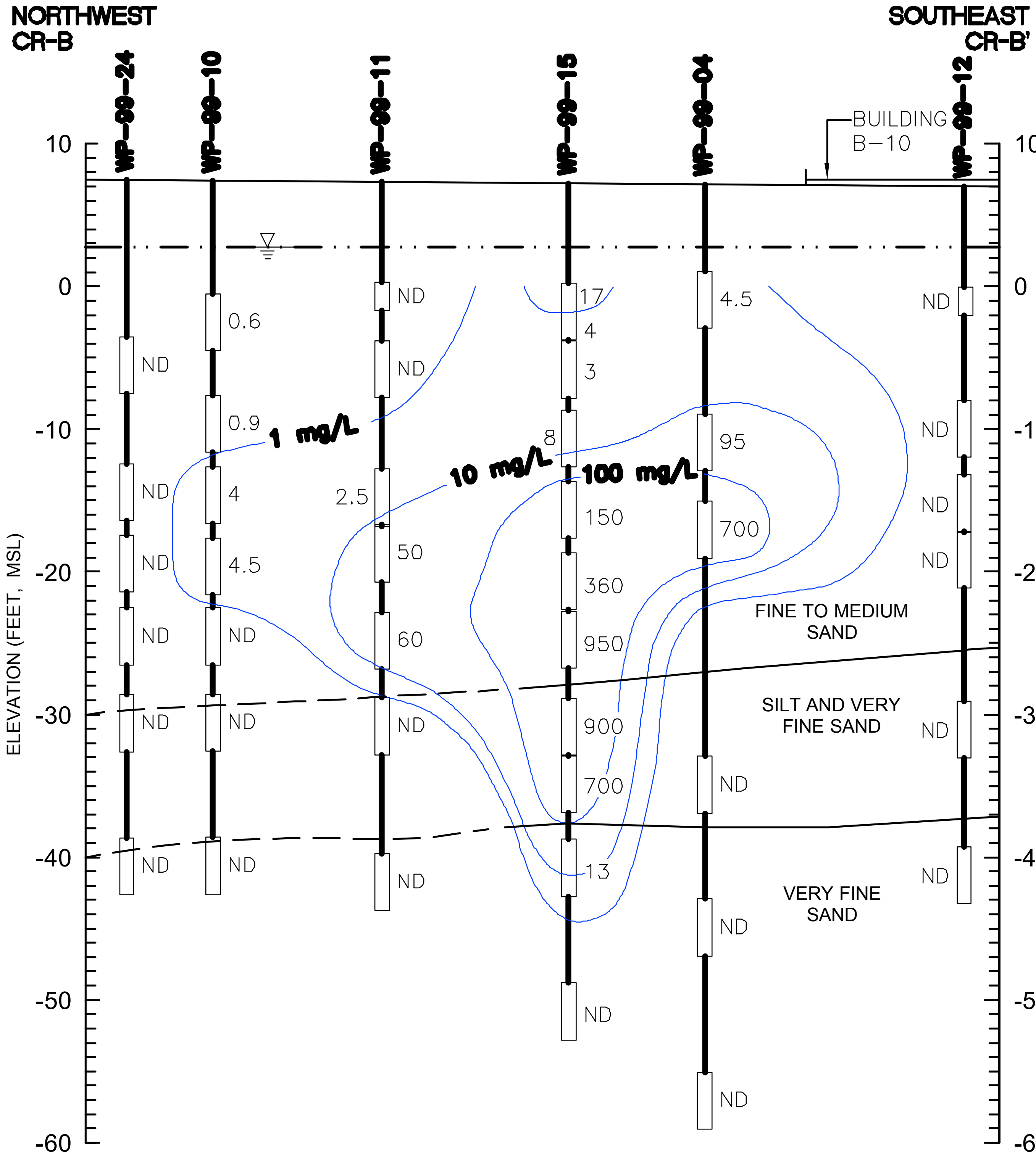


FIGURE 6-15
CROSS SECTION CR-A/A'
HEXAVALENT CHROMIUM GROUNDWATER PROFILE
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254029.DWG 2-15-2000 SMC



NOTE: GROUND SURFACE ELEVATION IS APPROXIMATE

LEGEND

13 GEOPROBE GROUNDWATER SAMPLE INTERVAL WITH HEXAVALENT CHROMIUM CONCENTRATION (mg/L)

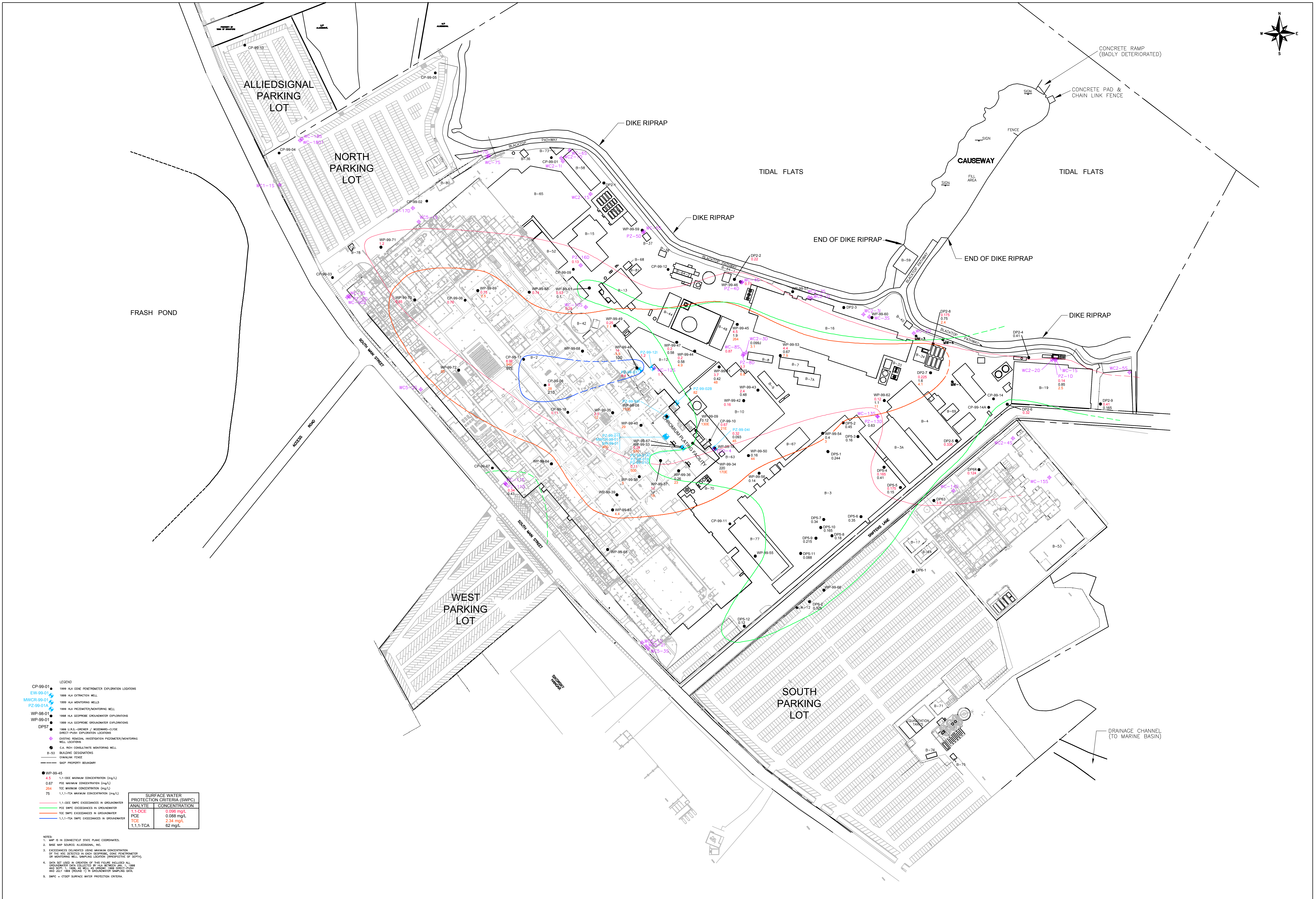
∇ APPROXIMATE WATER TABLE ELEVATION (2/11/99)

— — STRATIGRAPHIC CONTACT (DASHED WHERE INFERRED)

HORIZONTAL SCALE: 1"=50'
VERTICAL SCALE: 1"=10'

FIGURE 6-16
CROSS-SECTION CR-B/B'
HEXAVALENT CHROMIUM GROUNDWATER PROFILE
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254028.DWG 2-03-2000 DEL



LEGEND

CP-99-01 ●	1999 HLA CONE PENETROMETER EXPLORATION LOCATIONS
EW-99-01	1999 HLA EXTRACTION WELL
MWCR-99-01	1999 HLA MONITORING WELLS
PZ-99-01A	1999 HLA PIEZOMETER/MONITORING WELL
WP-98-01 ●	1998 HLA GEOPROBE GROUNDWATER EXPLORATIONS
WP-99-01 ●	1999 HLA GEOPROBE GROUNDWATER EXPLORATIONS
DP57 ●	1999 U.R.S.-GRENIER / WOODWARD-CLYDE DIRECT-PUSH EXPLORATION LOCATIONS
⌖	EXISTING REMEDIAL INVESTIGATION PIEZOMETER/MONITORING WELL LOCATIONS
●	C.A. RICH CONSULTANTS MONITORING WELL
B-53	BUILDING DESIGNATIONS
──	CHAINLINK FENCE
━ ━ ━	SAEP PROPERTY BOUNDARY

● WP-99-45

4.5	1,1-DCE MAXIMUM CONCENTRATION (mg/L)
0.67	PCE MAXIMUM CONCENTRATION (mg/L)
264	TCE MAXIMUM CONCENTRATION (mg/L)
75	1,1,1-TCA MAXIMUM CONCENTRATION (mg/L)

🟥	1,1-DCE SWPC EXCEEDANCES IN GROUNDWATER
🟩	PCE SWPC EXCEEDANCES IN GROUNDWATER
🟧	TCE SWPC EXCEEDANCES IN GROUNDWATER
🟦	1,1,1-TCA SWPC EXCEEDANCES IN GROUNDWATER

SURFACE WATER PROTECTION CRITERIA (SWPC)

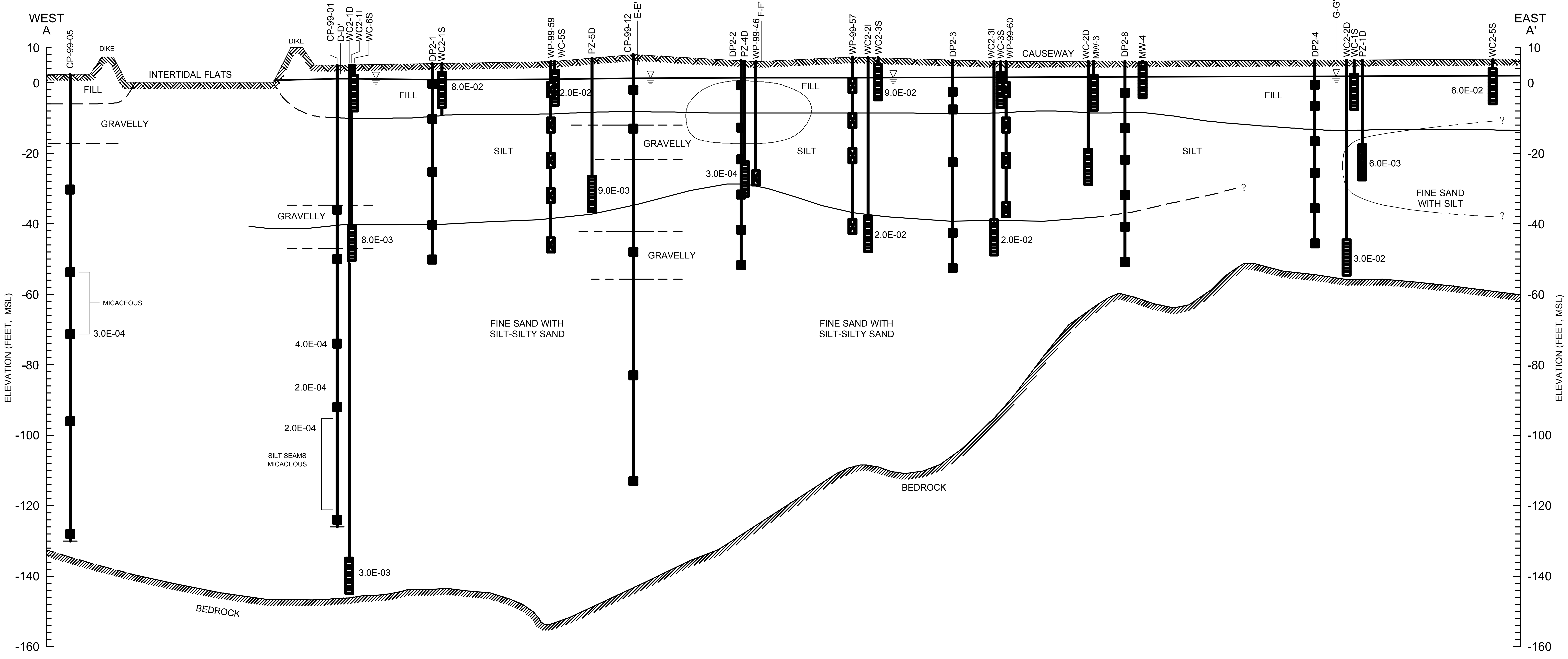
ANALYTE	CONCENTRATION
1,1-DCE	0.096 mg/L
PCE	0.088 mg/L
TCE	2.34 mg/L
1,1,1-TCA	62 mg/L

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.
3. EXCEEDANCES DELINEATED USING MAXIMUM CONCENTRATION OF THE VOC DETECTED IN EACH GEOPROBE, CONE PENETROMETER OR MONITORING WELL SAMPLING LOCATION (IRRESPECTIVE OF DEPTH).
4. DATA SET USED IN CREATION OF THIS FIGURE INCLUDED ALL GROUNDWATER DATA COLLECTED BY HLA BETWEEN JAN. 1, 1999 AND SEPT. 1, 1999, AS WELL AS URSGWC 1999 DIRECT-PUSH AND JULY 1999 (ROUND 1) RI GROUNDWATER SAMPLING DATA.
5. SWPC = CTDEP SURFACE WATER PROTECTION CRITERIA.

0 50 100 200 FEET
SCALE: 1"=100'

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254022.DWG 05-23-2000 DEL

FIGURE 6-17
ESTIMATED HORIZONTAL EXTENT OF SELECT VOCs EXCEEDING SWPC IN GROUNDWATER
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates



CROSS-SECTION A-A'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

LEGEND

▽	GROUNDWATER ELEVATION
▮	DIRECT PUSH GROUNDWATER SAMPLE INTERVAL
HYDRAULIC CONDUCTIVITY (FT/MIN) 6.4E-02 ▮	WELL SCREEN INTERVAL
— — — ?	STRATIGRAPHIC CONTACT (DASHED WHERE INFERRED)
BOB	BOTTOM OF BORING
— — — ?	ESTIMATED EXTENT OF VOCs IN GROUNDWATER EXCEEDING SURFACE WATER PROTECTION CRITERIA (SWPC)
▮	PURPLE SHADING INDICATES SWPC EXCEEDANCE OFF BY ONE OR MORE VOC IN GROUNDWATER

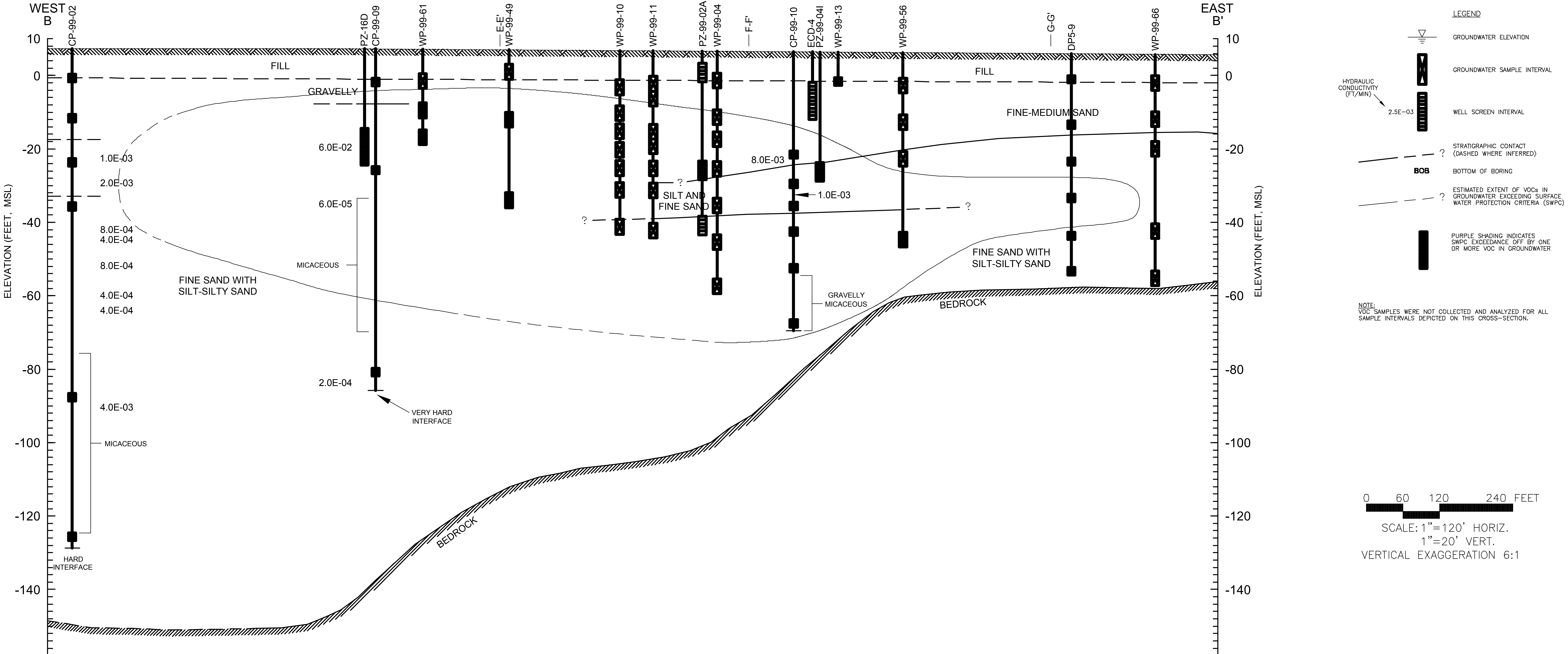
NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

0 60 120 240 FEET

SCALE: 1"=120' HORIZ.
1"=20' VERT.
VERTICAL EXAGGERATION 6:1

FIGURE 6-18
ESTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC CROSS-SECTION A-A'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254035.DWG 2-08-2000 DEL



NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

CROSS-SECTION B-B'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-19
ESTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC CROSS-SECTION B-B'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254036.DWG 2-08-2000 DEL

NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

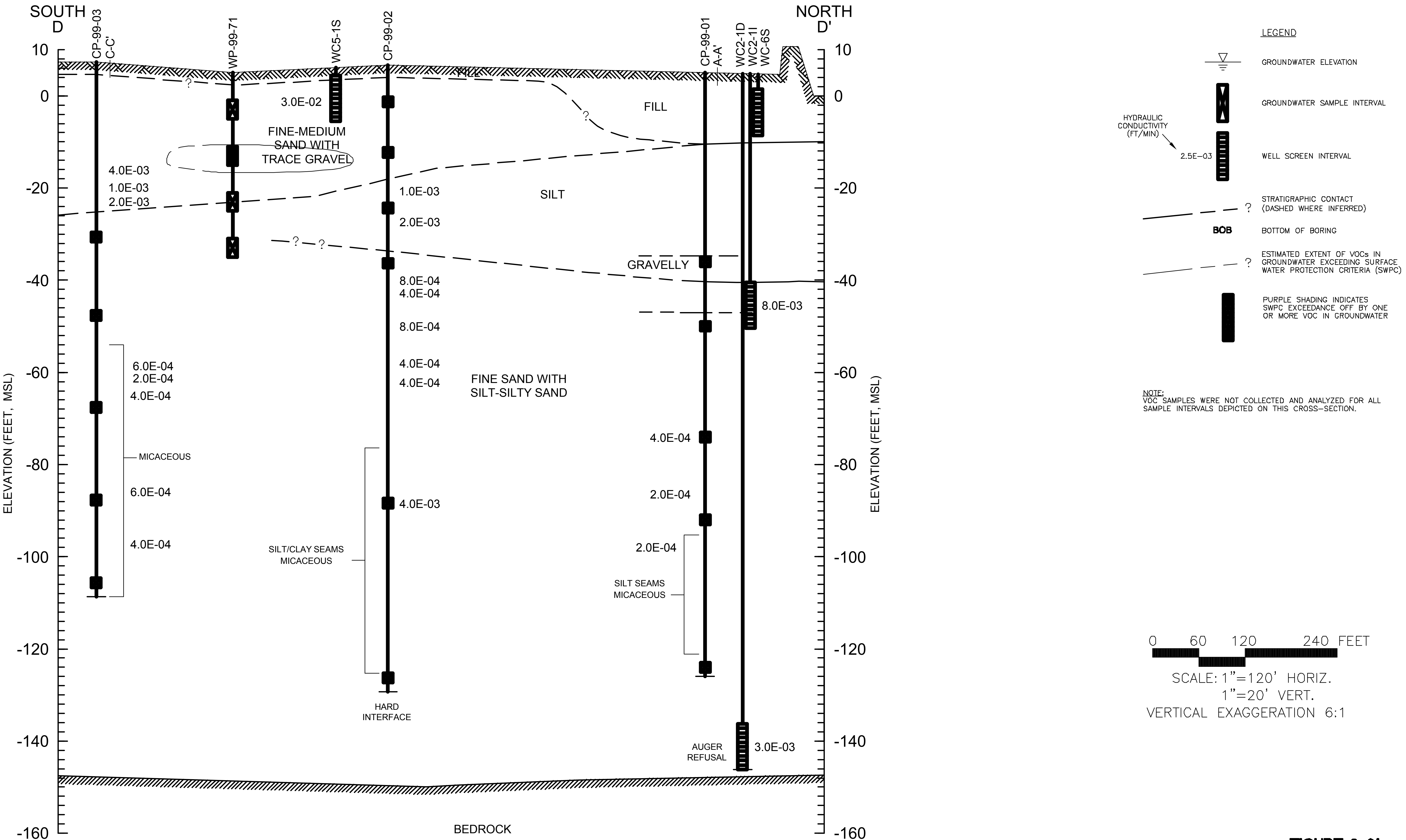
NOTE:
THERE ARE NO SWPC EXCEEDANCES FOR VOCs IN SAMPLES COLLECTED FROM EXPLORATION LOCATIONS PRESENTED ON THIS FIGURE

CROSS-SECTION C-C'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-20
ESTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC CROSS-SECTION C-C'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254037.DWG 2-15-2000 SMC



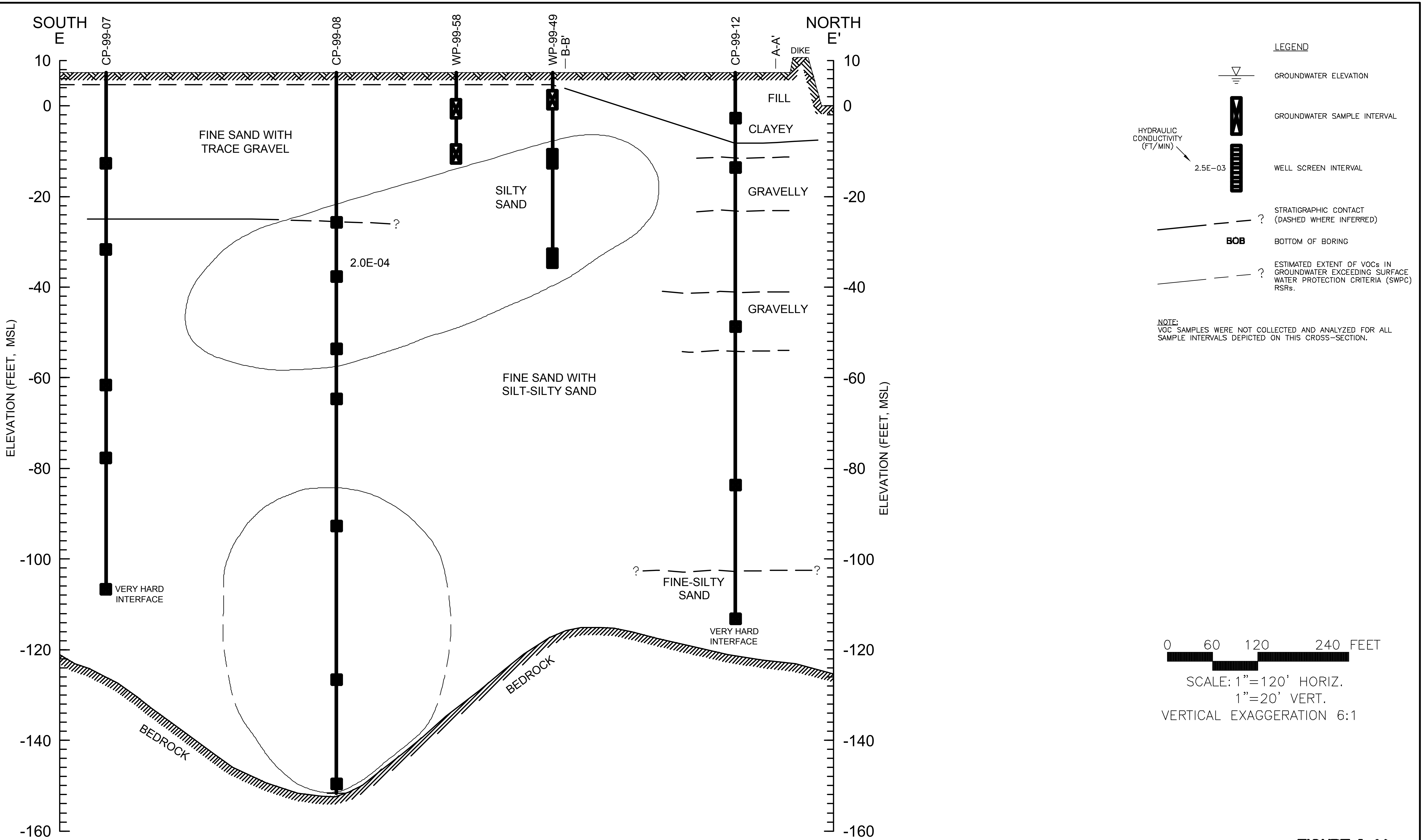
NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

CROSS-SECTION D-D'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-21
ESTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC CROSS-SECTION D-D'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\4726403B.DWG 2-15-2000 SMC



NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

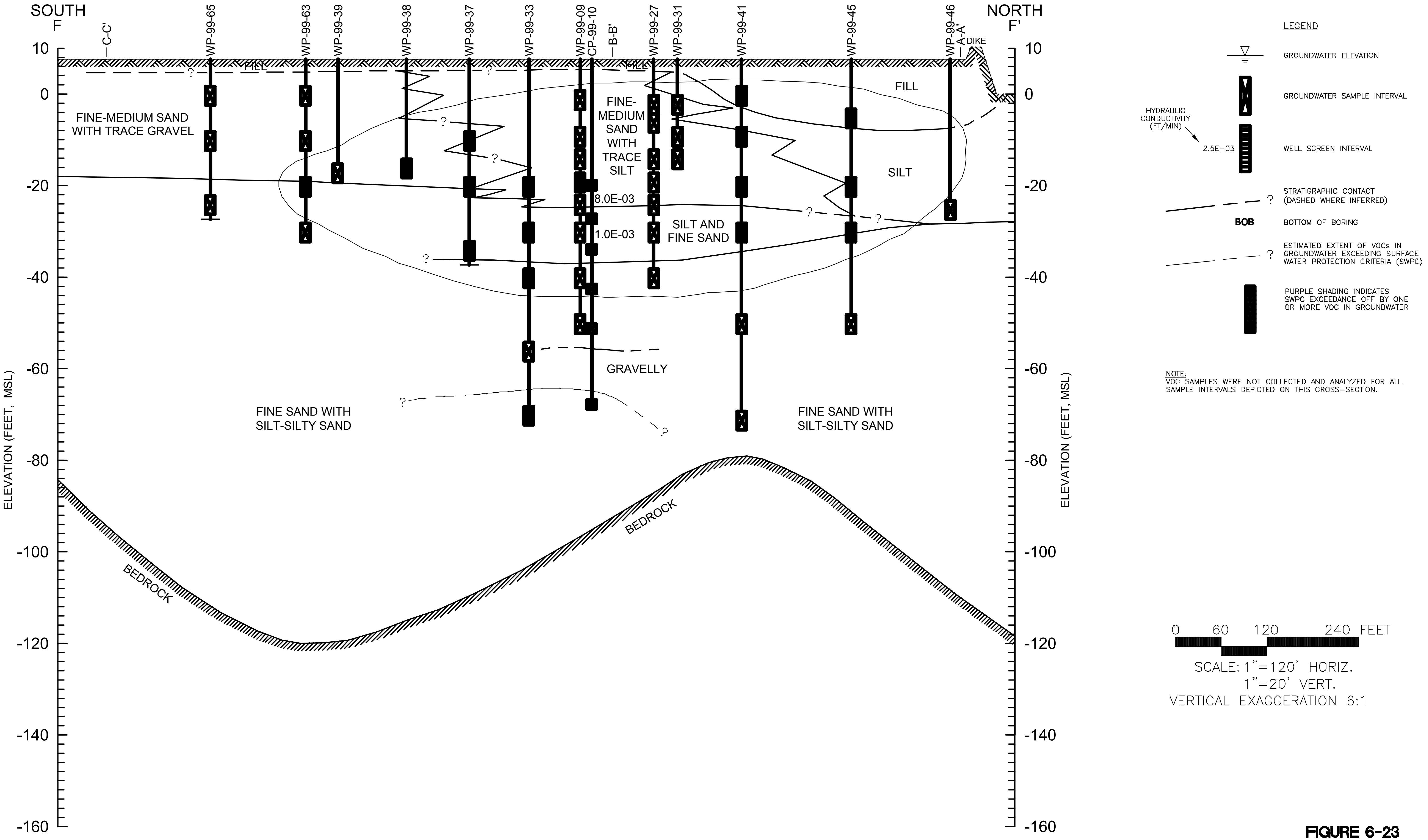
SCALE: 1"=120' HORIZ.
1"=20' VERT.
VERTICAL EXAGGERATION 6:1

CROSS-SECTION E-E'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-22
EXTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC RSRs CROSS-SECTION E-E'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254039.DWG 2-08-2000 DEL



NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

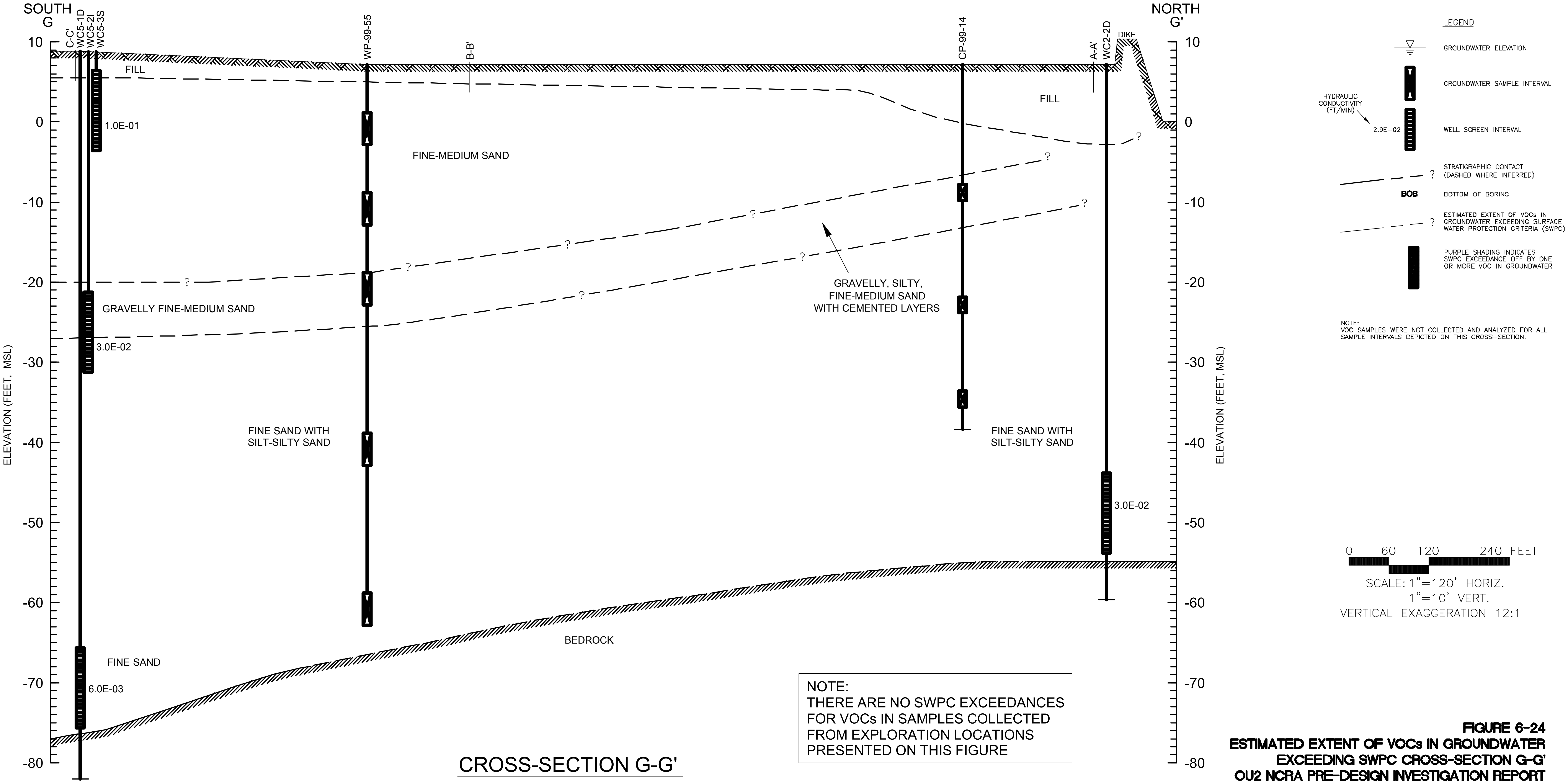
SCALE: 1"=120' HORIZ.
1"=20' VERT.
VERTICAL EXAGGERATION 6:1

CROSS-SECTION F-F'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-23
ESTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC CROSS-SECTION F-F'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254040.DWG 2-15-2000 SMC



NOTE:
VOC SAMPLES WERE NOT COLLECTED AND ANALYZED FOR ALL SAMPLE INTERVALS DEPICTED ON THIS CROSS-SECTION.

NOTE:
THERE ARE NO SWPC EXCEEDANCES FOR VOCs IN SAMPLES COLLECTED FROM EXPLORATION LOCATIONS PRESENTED ON THIS FIGURE

CROSS-SECTION G-G'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-1

FIGURE 6-24
ESTIMATED EXTENT OF VOCs IN GROUNDWATER
EXCEEDING SWPC CROSS-SECTION G-G'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

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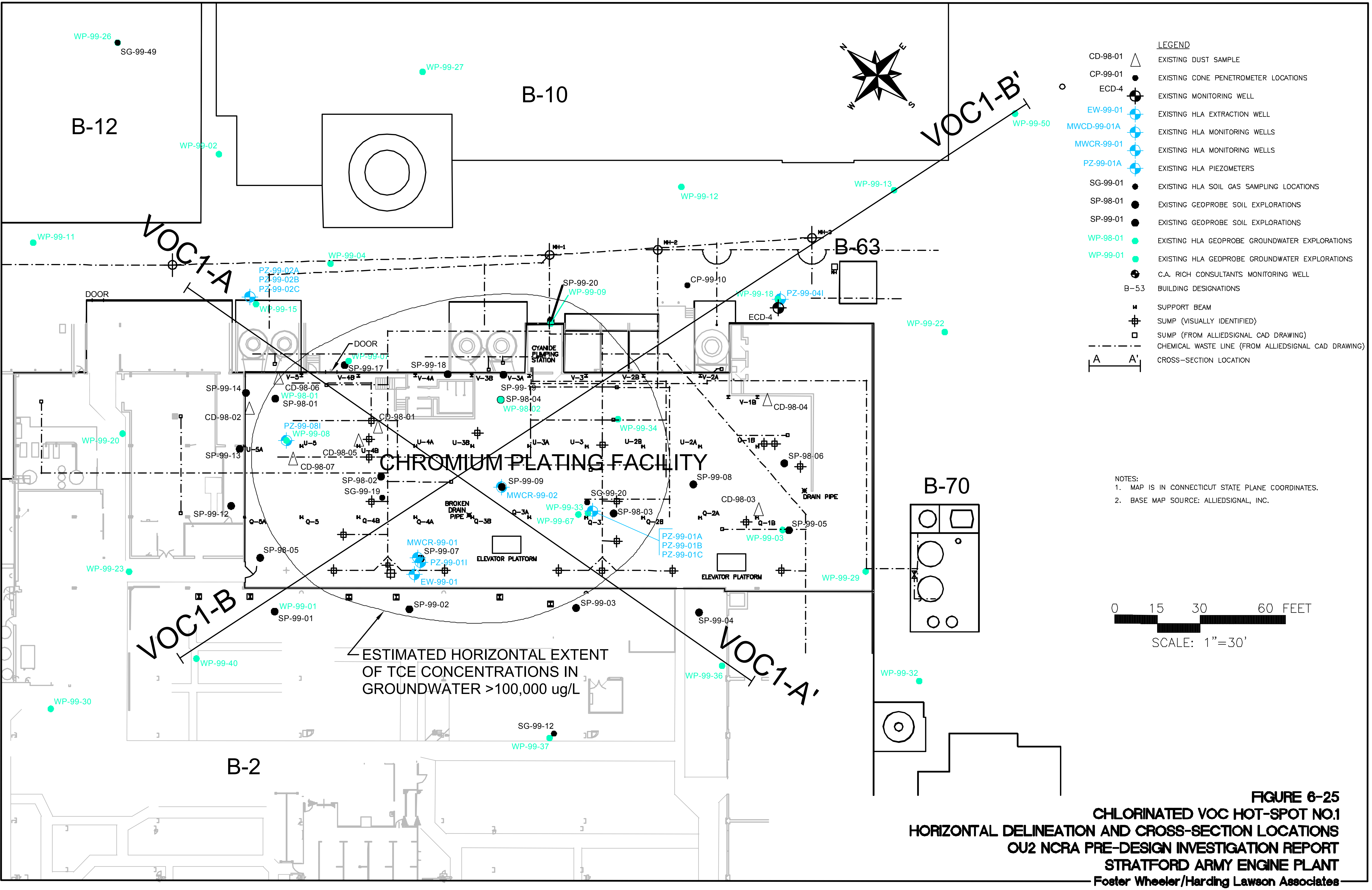


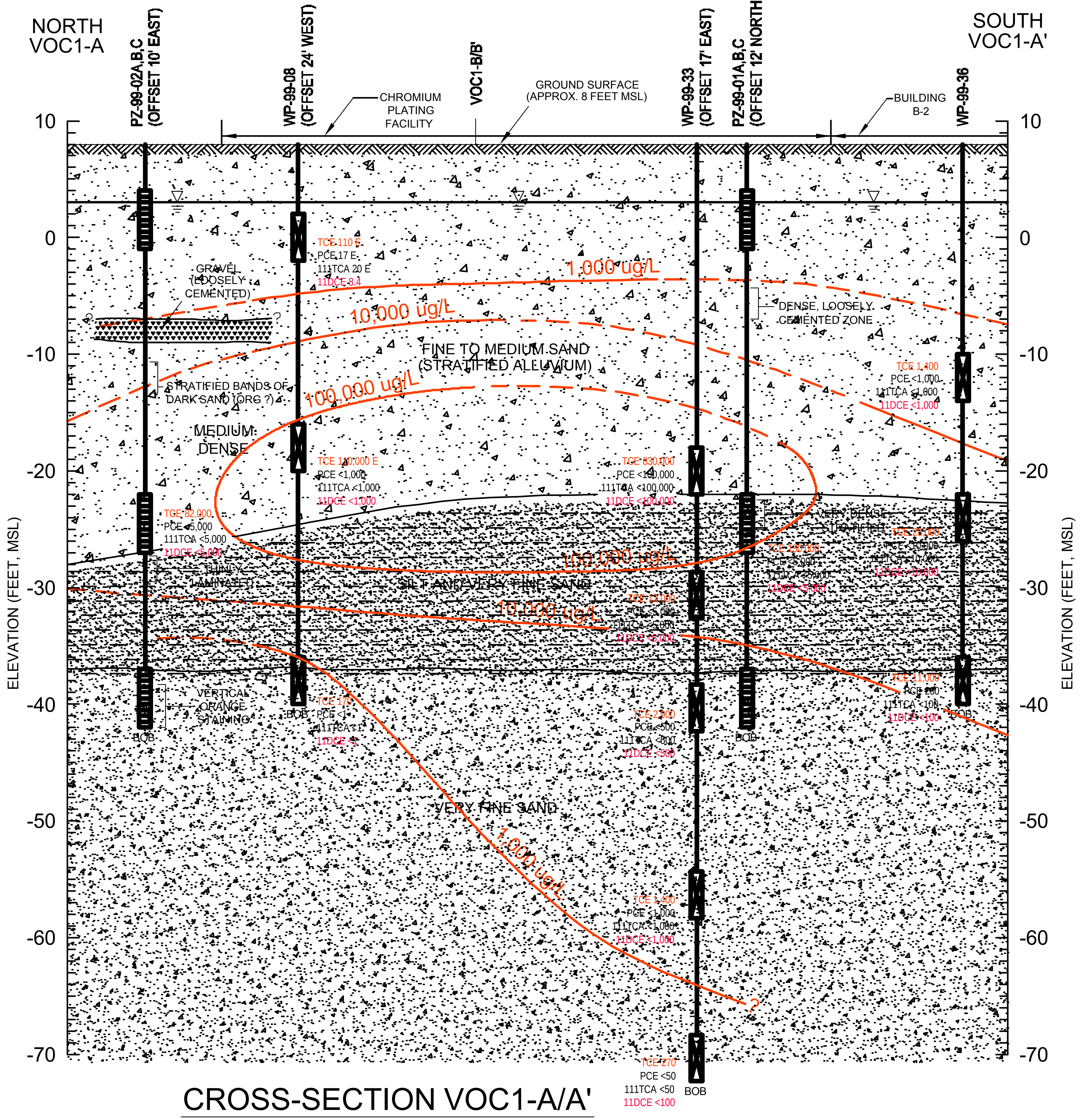
LEGEND

CD-98-01	△	EXISTING DUST SAMPLE
CP-99-01	●	EXISTING CONE PENETROMETER LOCATIONS
ECD-4	⊕	EXISTING MONITORING WELL
EW-99-01	⊕	EXISTING HLA EXTRACTION WELL
MWCD-99-01A	⊕	EXISTING HLA MONITORING WELLS
MWCR-99-01	⊕	EXISTING HLA MONITORING WELLS
PZ-99-01A	⊕	EXISTING HLA PIEZOMETERS
SG-99-01	●	EXISTING HLA SOIL GAS SAMPLING LOCATIONS
SP-98-01	●	EXISTING GEOPROBE SOIL EXPLORATIONS
SP-99-01	●	EXISTING GEOPROBE SOIL EXPLORATIONS
WP-98-01	●	EXISTING HLA GEOPROBE GROUNDWATER EXPLORATIONS
WP-99-01	●	EXISTING HLA GEOPROBE GROUNDWATER EXPLORATIONS
	⊕	C.A. RICH CONSULTANTS MONITORING WELL
B-53		BUILDING DESIGNATIONS
	H	SUPPORT BEAM
	⊕	SUMP (VISUALLY IDENTIFIED)
	☐	SUMP (FROM ALLIEDSIGNAL CAD DRAWING)
	—·—·—	CHEMICAL WASTE LINE (FROM ALLIEDSIGNAL CAD DRAWING)
A A'		CROSS-SECTION LOCATION

FIGURE 6-25
CHLORINATED VOC HOT-SPOT NO.1
HORIZONTAL DELINEATION AND CROSS-SECTION LOCATIONS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47264025.DWG 2-09-2000 DEL



CROSS-SECTION VOC1-A/A'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-25

LEGEND

▽	GROUNDWATER ELEVATION
▮	DIRECT PUSH GROUNDWATER SAMPLE INTERVAL
▤	WELL SCREEN INTERVAL
— — ?	STRATIGRAPHIC CONTACT (DASHED WHERE INFERRED)
BOB	BOTTOM OF BORING
TCE	TRICHLOROETHENE
PCE	TETRACHLOROETHENE
111TCA	1,1,1–TRICHLOROETHANE
11DCE	1,1–DICHLOROETHENE

ALL RESULTS ARE IN ug/L

E	INDICATES EXCEEDANCES OF UPPER END OF CALIBRATION RANGE.
100,000 ug/L — — ?	INTERPRETED TCE ISO–CONCENTRATION CONTOUR (ug/L) (DASHED WHERE INFERRED)

0 15 30 600 FEET

SCALE: 1"=30' HORIZ.
1"=10' VERT.

FIGURE 6-26

INTERPRETIVE VERTICAL DISTRIBUTION OF VOCs IN GROUNDWATER
CHLORINATED VOC HOT-SPOT NO.1
CROSS-SECTION VOC1-A/A'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Foster Wheeler/Harding Lawson Associates

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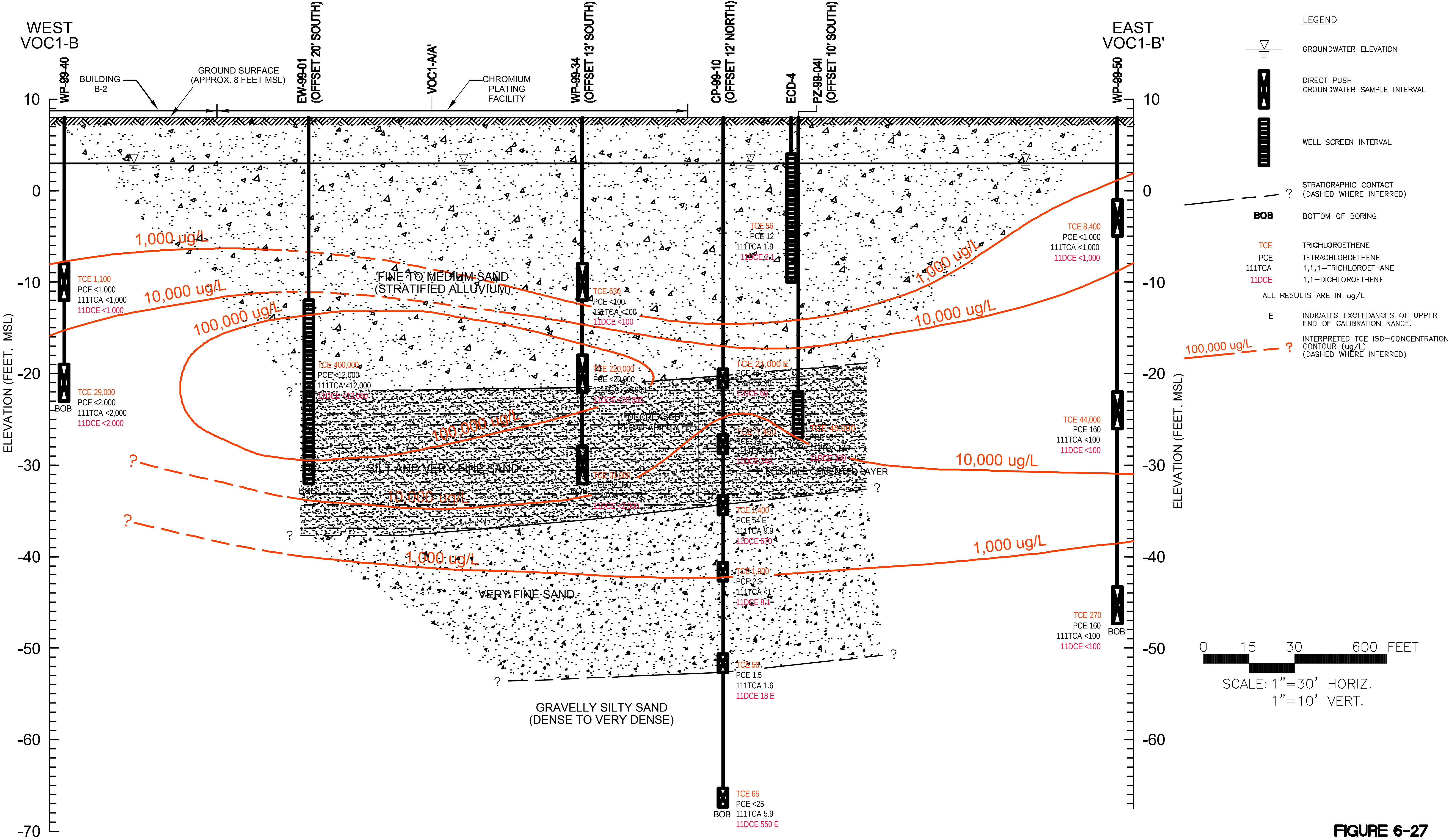
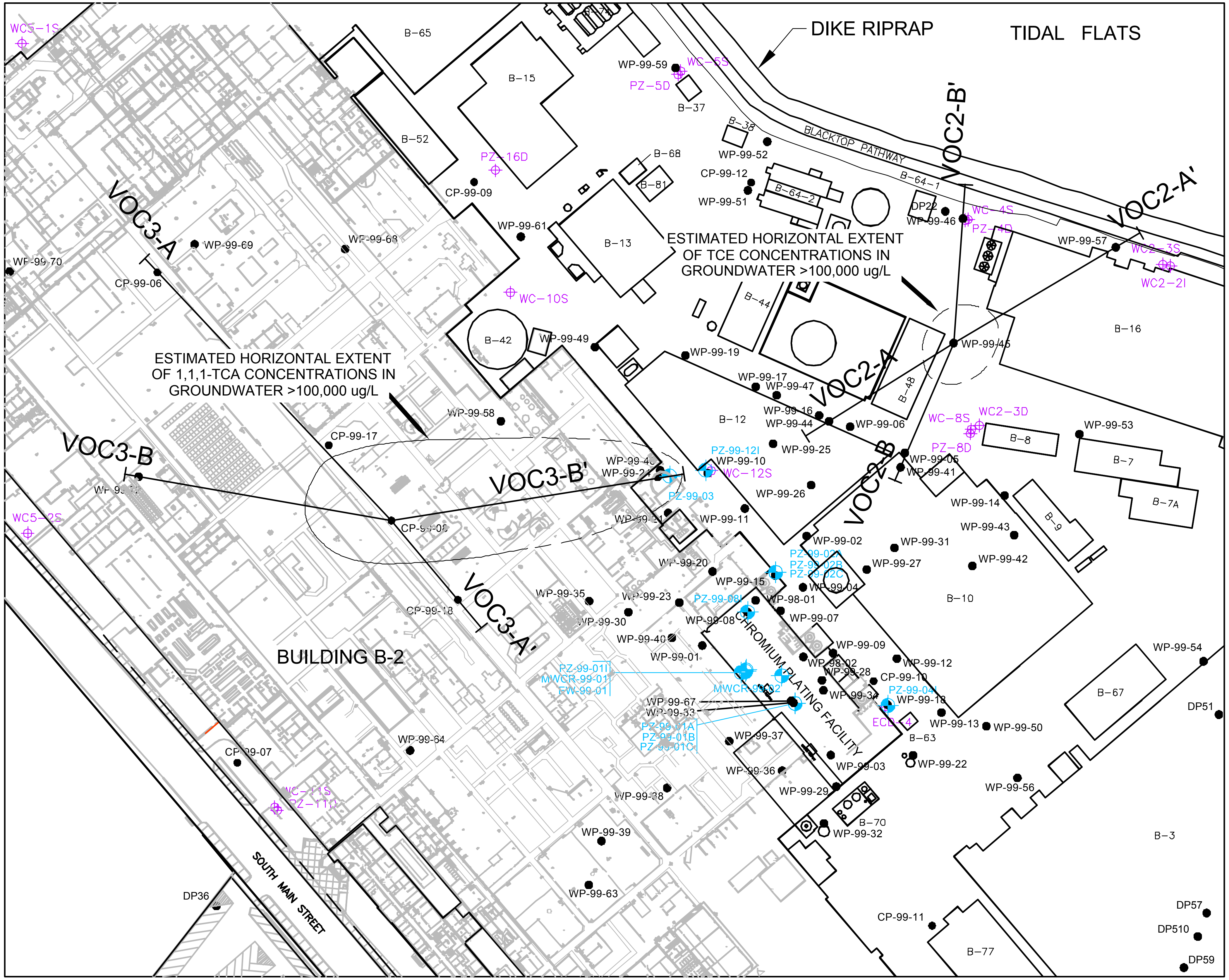


CROSS-SECTION VOC1-B/B'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-25

FIGURE 6-27
INTERPRETIVE VERTICAL DISTRIBUTION OF VOCs IN GROUNDWATER
CHLORINATED HOT-SPOT NO.1
CROSS-SECTION VOC1-B/B'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254023.DWG 5-23-2000 DEL



LEGEND

CP-99-01 ●	EXISTING HLA CONE PENETROMETER LOCATIONS
EW-99-01	EXISTING HLA EXTRACTION WELL
MWCD-99-01A	EXISTING HLA MONITORING WELLS
MWCR-99-01	EXISTING HLA MONITORING WELLS
PZ-99-01A	EXISTING HLA PIEZOMETER/MONITORING WELL LOCATIONS
WP-98-01 ●	1998 HLA GEOPROBE GROUNDWATER EXPLORATIONS
WP-99-01 ●	1999 HLA GEOPROBE GROUNDWATER EXPLORATIONS
DP57 ●	EXISTING U.R.S.-GRENIER / WOODWARD-CLYDE DIRECT-PUSH
WC-11S	EXISTING REMEDIAL INVESTIGATION PIEZOMETER/MONITORING WELL LOCATIONS
A A'	CROSS-SECTION LOCATIONS
B-53	BUILDING DESIGNATIONS
———	CHAIN LINK FENCE
—-—-	SAEP PROPERTY BOUNDARY

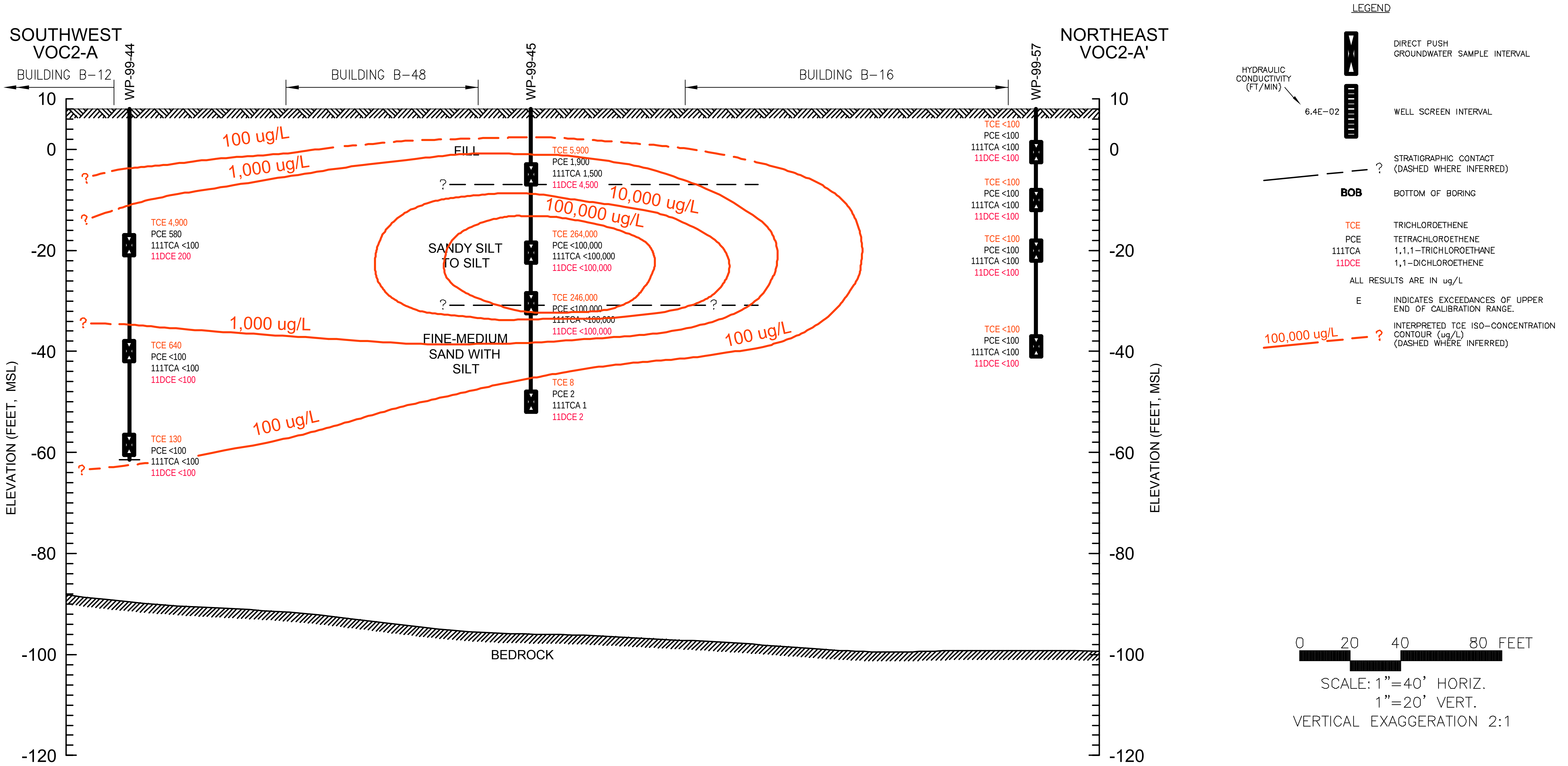
NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

0 60 120 240 FEET

SCALE: 1"=120'

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\4725403O.DWG 2-09-2000 DEL

FIGURE 6-28
CHLORINATED VOC HOT-SPOTS NOS. 2 AND 3
HORIZONTAL DELINEATION AND CROSS-SECTION LOCATIONS
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates



CROSS-SECTION VOC2-A - VOC2-A'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-28

FIGURE 6-29
INTERPRETIVE VERTICAL DISTRIBUTION
OF VOCs IN GROUNDWATER
CHLORINATED VOC HOT-SPOT NO.2
CROSS-SECTION VOC2-A/A'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

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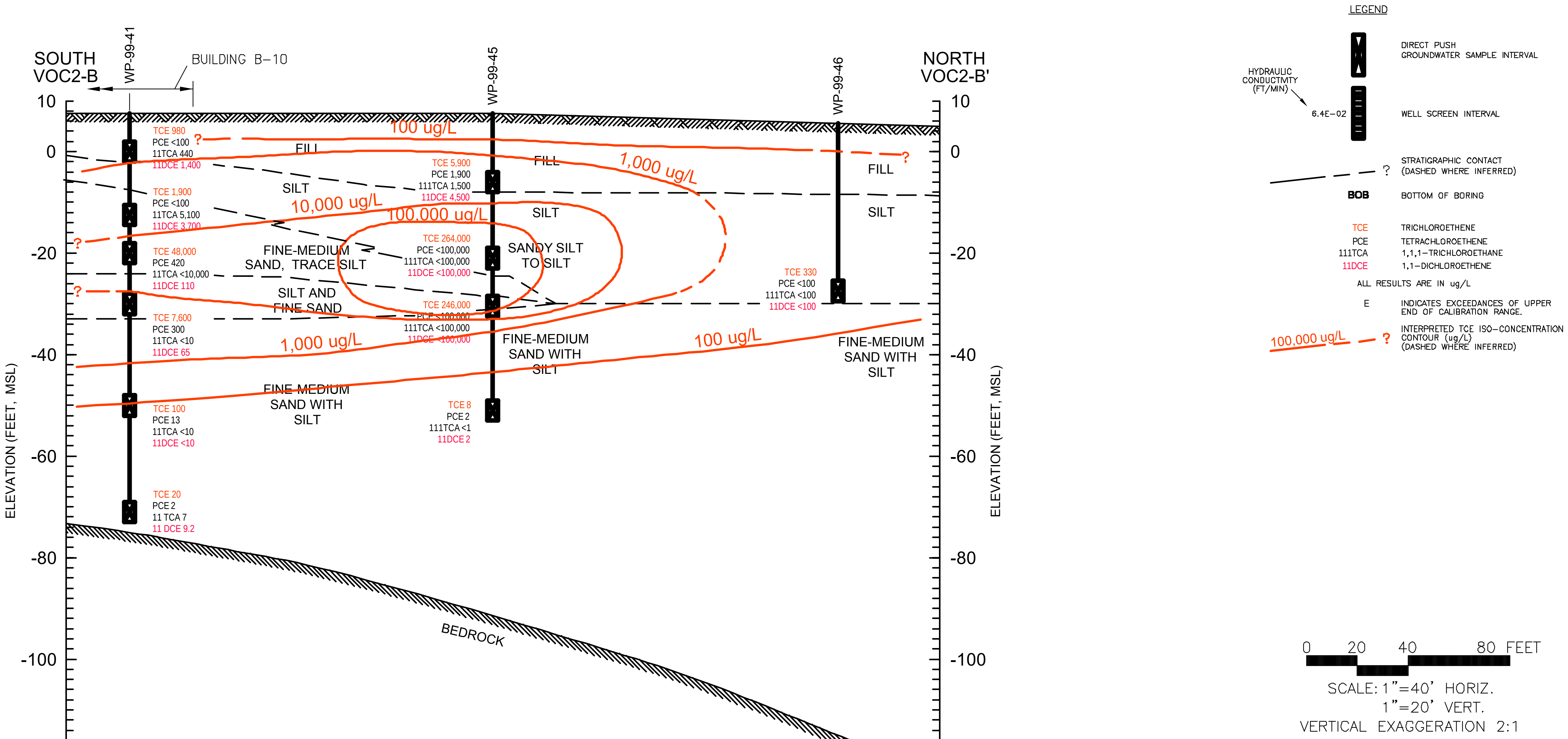
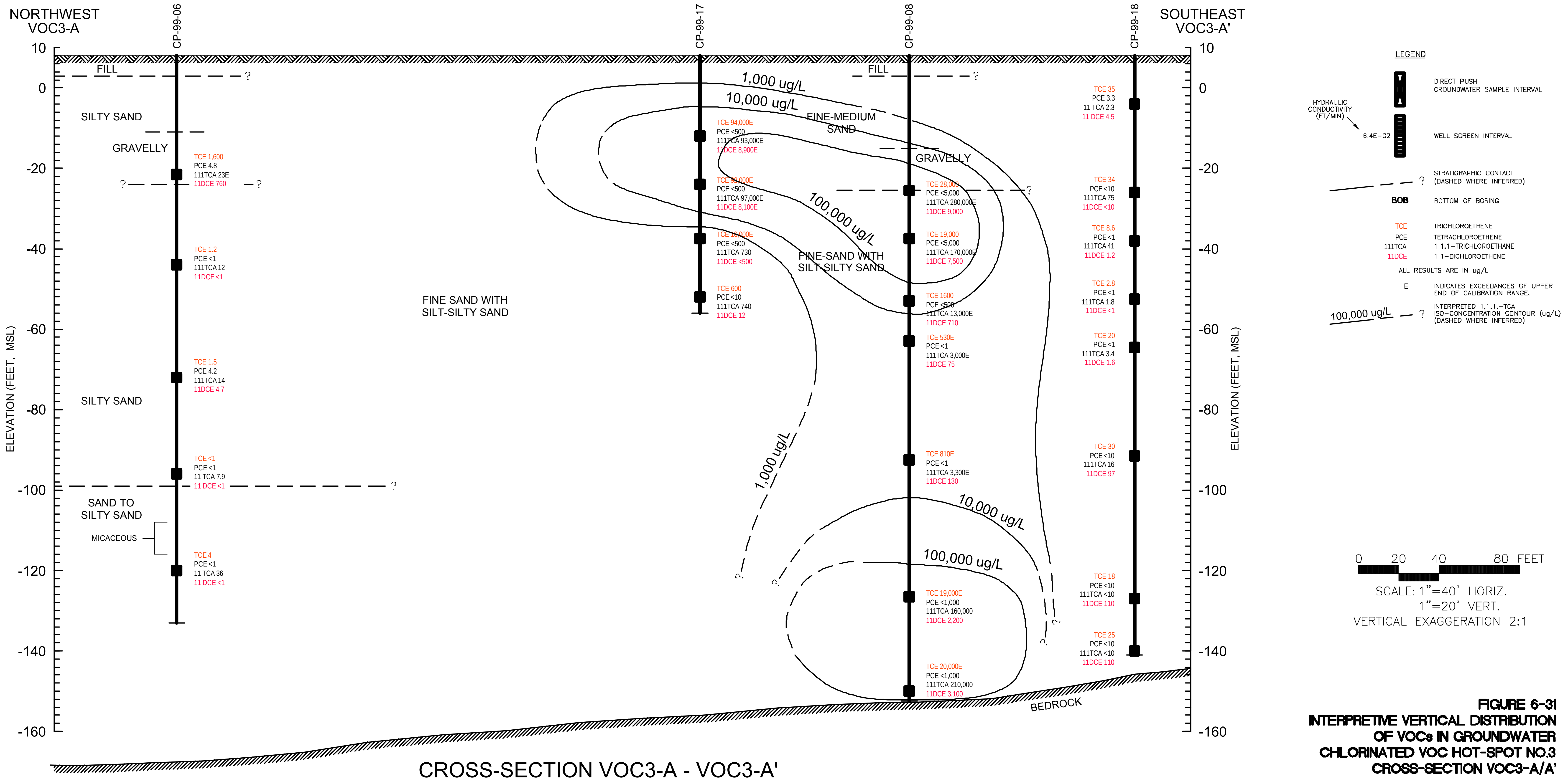


CROSS-SECTION VOC2-B - VOC2-B'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-28

FIGURE 6-30
INTERPRETED VERTICAL DISTRIBUTION
OF VOCs IN GROUNDWATER
CHLORINATED VOC HOT-SPOT NO.2
CROSS-SECTION VOC2-B/B'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\0020\OU2\PREDESIGN\FIGURES\47254033.DWG 5/19/00



CROSS-SECTION VOC3-A - VOC3-A'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-28

FIGURE 6-31
INTERPRETIVE VERTICAL DISTRIBUTION
OF VOCs IN GROUNDWATER
CHLORINATED VOC HOT-SPOT NO.3
CROSS-SECTION VOC3-A/A'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

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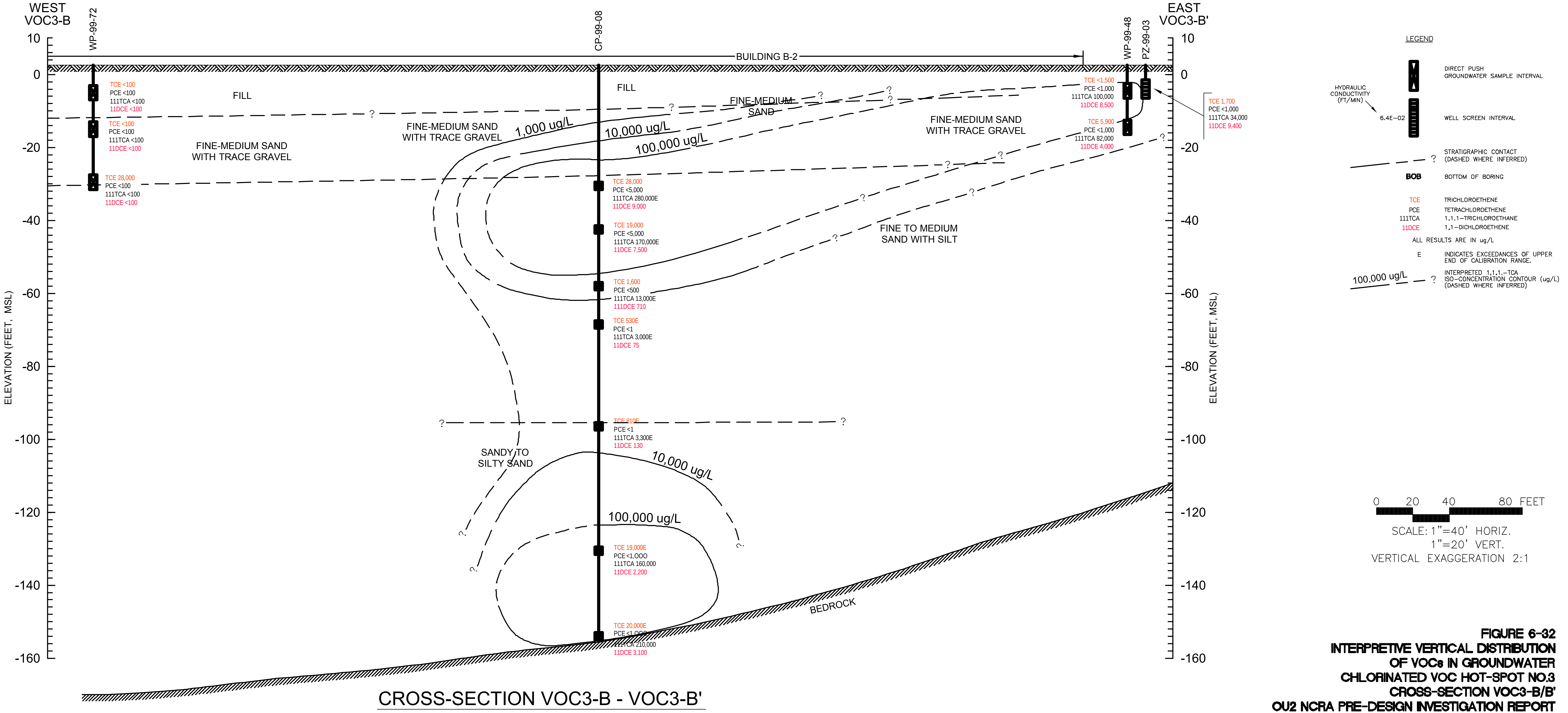
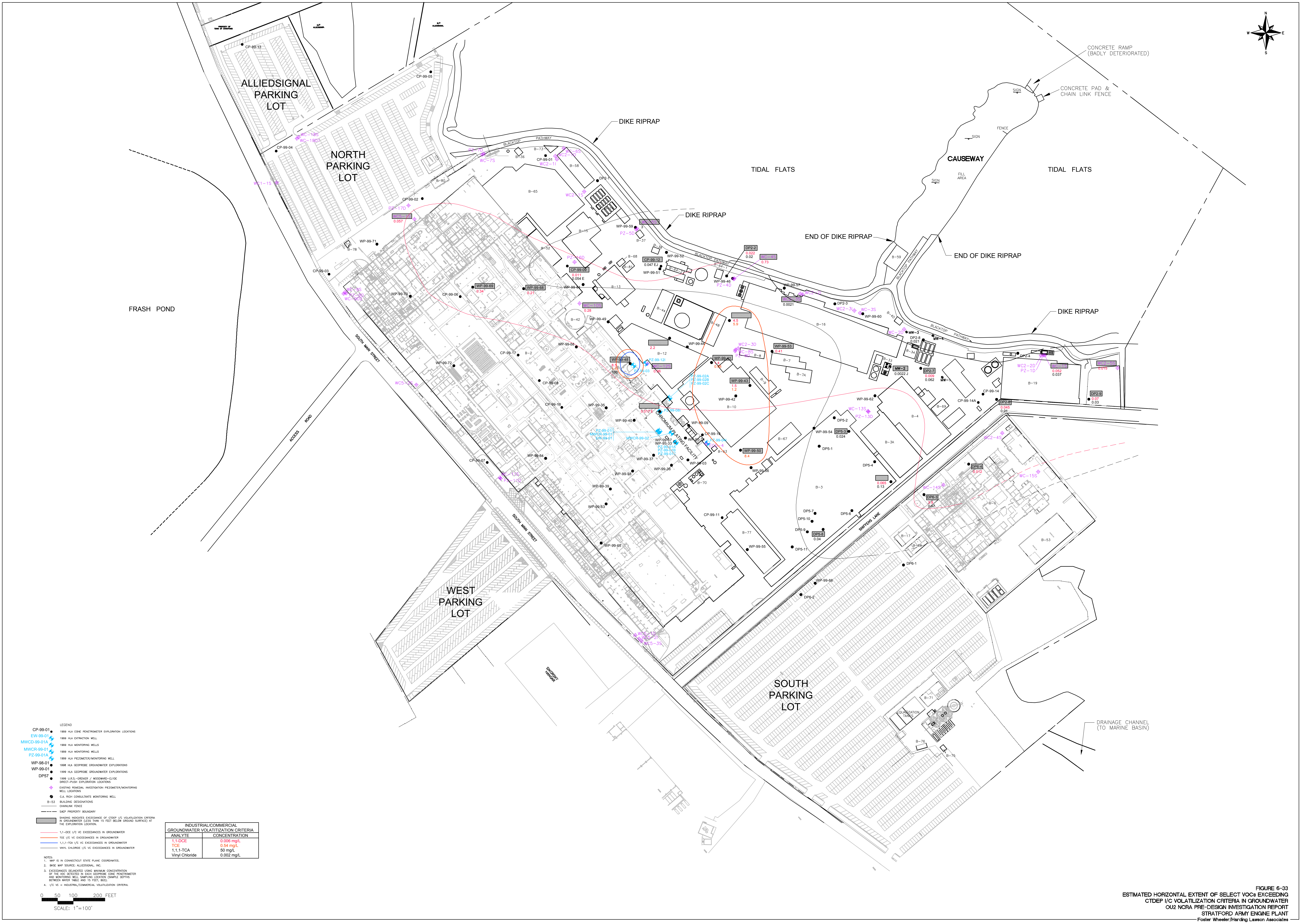


CROSS-SECTION VOC3-B - VOC3-B'

LOCATION OF PROFILE IS SHOWN ON FIGURE 6-28

FIGURE 6-32
INTERPRETIVE VERTICAL DISTRIBUTION
OF VOCs IN GROUNDWATER
CHLORINATED VOC HOT-SPOT NO.3
CROSS-SECTION VOC3-B/B'
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254032.DWG 5/19/00



	LEGEND
CP-99-01 ●	1999 HLA CONE PENETROMETER EXPLORATION LOCATIONS
EW-99-01 ⊕	1999 HLA EXTRACTION WELL
MWCD-99-01A ⊕	1999 HLA MONITORING WELLS
MWCR-99-01 ⊕	1999 HLA MONITORING WELLS
PZ-99-01A ⊕	1999 HLA PIEZOMETER/MONITORING WELL
WP-98-01 ●	1998 HLA GEOPROBE GROUNDWATER EXPLORATIONS
WP-99-01 ●	1999 HLA GEOPROBE GROUNDWATER EXPLORATIONS
DP57 ●	1999 U.R.S.-GRENIER / WOODWARD-CLYDE DIRECT-PUSH EXPLORATION LOCATIONS
⌖	EXISTING REMEDIAL INVESTIGATION PIEZOMETER/MONITORING WELL LOCATIONS
●	C.A. RICH CONSULTANTS MONITORING WELL
B-53	BUILDING DESIGNATIONS
——	CHAINLINK FENCE
— — —	SAEP PROPERTY BOUNDARY
▨	SHADING INDICATES EXCEEDANCE OF CTDEP I/C VOLATILIZATION CRITERIA IN GROUNDWATER (LESS THAN 15 FEET BELOW GROUND SURFACE) AT THE EXPLORATION LOCATION.
——	1,1-DCE I/C VC EXCEEDANCES IN GROUNDWATER
——	TCE I/C VC EXCEEDANCES IN GROUNDWATER
——	1,1,1-TCA I/C VC EXCEEDANCES IN GROUNDWATER
——	VINYL CHLORIDE I/C VC EXCEEDANCES IN GROUNDWATER

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.
3. EXCEEDANCES DELINEATED USING MAXIMUM CONCENTRATION OF THE VOC DETECTED IN EACH GEOPROBE CONE PENETROMETER AND MONITORING WELL SAMPLING LOCATION (SAMPLE DEPTHS BETWEEN WATER TABLE AND 15 FEET, BGS).
4. I/C VC = INDUSTRAL/COMMERCIAL VOLATILIZATION CRITERIA.

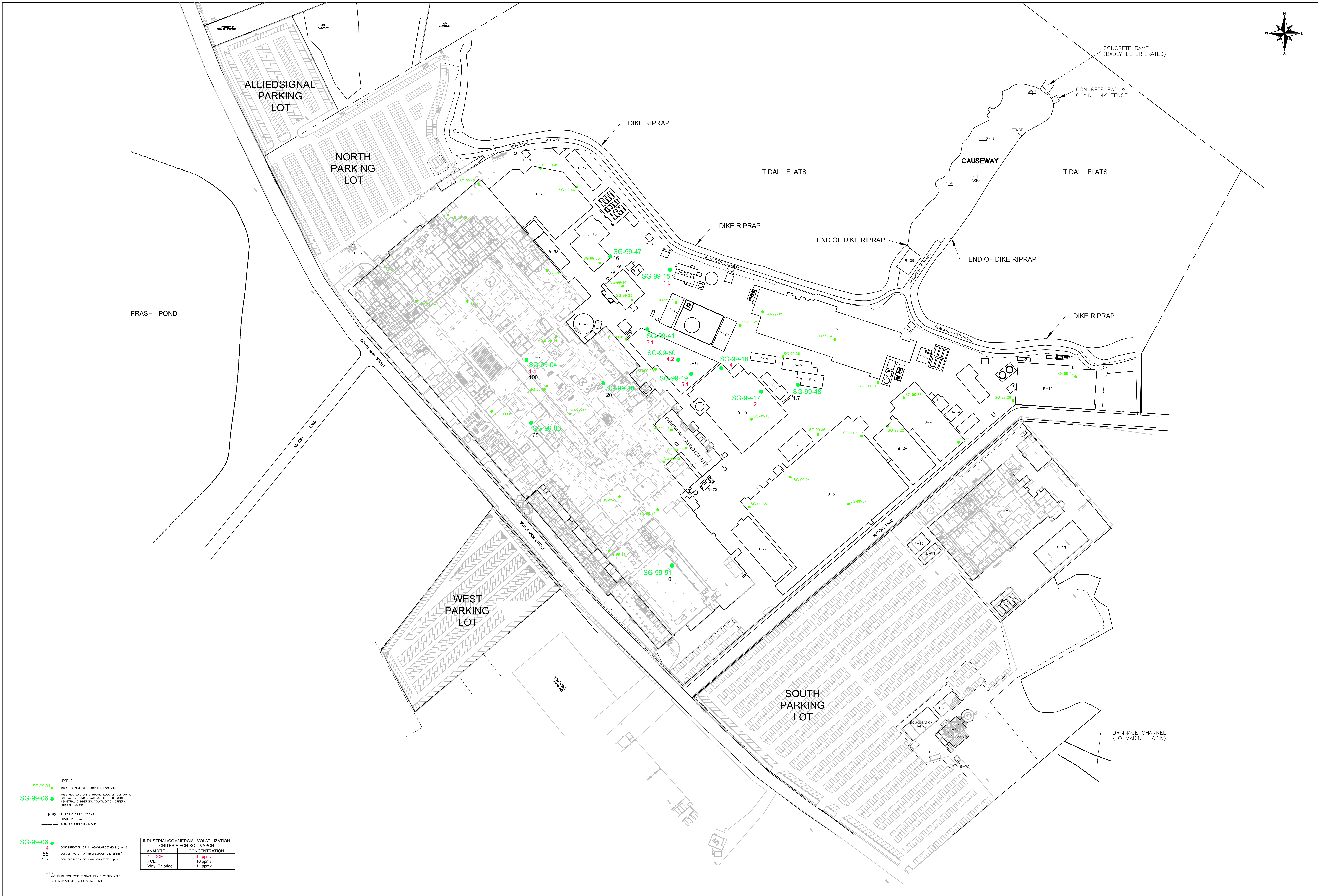
0 50 100 200 FEET

SCALE: 1"=100'

INDUSTRIAL/COMMERCIAL GROUNDWATER VOLATITIZATION CRITERIA	
ANALYTE	CONCENTRATION
1,1-DCE	0.006 mg/L
TCE	0.54 mg/L
1,1,1-TCA	50 mg/L
Vinyl Chloride	0.002 mg/L

G:\PROJECTS\TERCS\PROJECTS\DO20\OU2\PREDESIGN\FIGURES\47254048.DWG 05-23-2000 DEL

FIGURE 6-33
ESTIMATED HORIZONTAL EXTENT OF SELECT VOCs EXCEEDING
CTDEP I/C VOLATILIZATION CRITERIA IN GROUNDWATER
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates



LEGEND

SG-99-01 ● 1999 HLA SOIL GAS SAMPLING LOCATIONS

SG-99-06 ● 1999 HLA SOIL GAS SAMPLING LOCATION CONTAINING SOIL VAPOR CONCENTRATIONS EXCEEDING CTDEP INDUSTRIAL/COMMERCIAL VOLATILIZATION CRITERIA FOR SOIL VAPOR

B-53 BUILDING DESIGNATIONS

CHAINLINK FENCE

SAEP PROPERTY BOUNDARY

SG-99-06 ●
1.4 CONCENTRATION OF 1,1-DICHLOROETHENE (ppmv)
65 CONCENTRATION OF TRICHLOROEHTENE (ppmv)
1.7 CONCENTRATION OF VINYL CHLORIDE (ppmv)

INDUSTRIAL/COMMERCIAL VOLATILIZATION CRITERIA FOR SOIL VAPOR

ANALYTE	CONCENTRATION
1,1-DCE	1 ppmv
TCE	16 ppmv
Vinyl Chloride	1 ppmv

NOTES:
1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.

0 50 100 200 FEET
SCALE: 1"=100'

FIGURE 6-34
SOIL VAPOR LOCATIONS EXCEEDING
CTDEP I/C VOLATILIZATION CRITERIA
OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT
Foster Wheeler/Harding Lawson Associates

G:\PROJECTS\TERCS\PROJECTS\D020\OU2\PREDESIGN\FIGURES\47254047.DWG 5--24-2000 DEL

TABLE 4-1

SUMMARY OF HLA PRE-DESIGN INVESTIGATIONS

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Investigation Description	Investigation Method	General Location	Exploration Identifications	Target Contaminants	Analysis Location	Laboratory	Dates Of Investigation	Contract Vehicle
Preliminary Investigations	GeoProbe Soil Samples	Chromium Plating Facility	SP-98-01 through SP-98-06	Chromium	Off-Site	Quanterra	Aug-98	AlliedSignal
	GeoProbe Groundwater Samples	Chromium Plating Facility	WP-98-01 and WP-98-02	Chromium	Off-Site	Quanterra	Aug-98	AlliedSignal
	Dust Samples	Chromium Plating Facility	CD-98-01 and CD-98-02	Chromium	Off-Site	Quanterra	Aug-98	AlliedSignal
Chromium Plating Facility Interior Decontamination	Wipe Samples	Chromium Plating Facility		Chromium	Off-Site	Averill Environmental	Dec-98	AlliedSignal
	Concrete Samples	Chromium Plating Facility		Chromium	Off-Site	Averill Environmental	Dec-98	AlliedSignal
Chromium-Focused Investigation	GeoProbe Soil Samples	Chromium Plating Facility	SP-99-01 through SP-99-21	Chromium	Off-Site	Averill Environmental	Jan-99	AlliedSignal
	GeoProbe Groundwater Samples	Vicinity of Chromium Plating Facility	WP-99-01 through WP-99-32	Chromium	On-Site w/confirmation	HLA/Averill Environmental	Jan-99	AlliedSignal
	Piezometer Installation	Vicinity of Chromium Plating Facility		Chromium	On-Site	HLA	Jan-99	AlliedSignal
	Monitoring Well and Piezometer Sampling	Vicinity of Chromium Plating Facility		VOCs	Off-Site	Averill Environmental	Feb-99	AlliedSignal
VOC-Focused Groundwater Investigation	GeoProbe Groundwater Samples	Facility-Wide	WP-99-33 through WP-99-72	VOCs	On-Site w/confirmation	HLA/Averill Environmental	Mar-99	AlliedSignal
	Monitoring Well Sampling	Select Locations		VOCs	On-Site	HLA	Mar-99	AlliedSignal
	Cone Penetrometer Groundwater Sampling	Facility-Wide	CP-99-01 through CP-99-18	VOCs	Off-Site	Averill Environmental	May-99	AlliedSignal
Operable Unit 2 NCRA	Soil Vapor Sampling	Facility-Wide	SG-99-01 through SG-99-52	VOCs	On-Site w/confirmation	HLA/Quanterra	Aug-99	Foster Wheeler TERC
	Indoor Air Quality Sampling	Buildings 1,2,9,12,48,65		Chlorinated VOCs	Off-Site	Quanterra & Air Toxics	Initiated Sep-99	Foster Wheeler TERC
	Soil Boring Soil Sampling	Chromium Plating Facility	PZ-99-01 through PZ-99-03	VOCs and Chromium	Off-Site	Quanterra	Aug-99	Foster Wheeler TERC
	Seismic Refraction Survey	Facility-Wide		N/A	N/A	N/A	Sep-99	Foster Wheeler TERC
	Bench Scale Testing	Chromium Plating Facility	PZ-99-01 through PZ-99-03	VOCs and Chromium	On-Site and Off-Site	HLA/Quanterra	Aug-99	Foster Wheeler TERC
	Aquifer Pumping Tests	Chromium Plating Facility					Sep-99	Foster Wheeler TERC
	Pilot Tests	Chromium Plating Facility		VOCs and Chromium	On-Site and Off-Site	HLA/Laucks Testing	Dec-99	Foster Wheeler TERC

TABLE 4-2
GEOPROBE SOIL SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft bgs)	Date Collected	Off-site Total Cr, Hex Cr, CN and Mn	Off-site Ni and TOC	Off-site TCLP, Total Cr and CN	Off-site Hex Cr, Total Cr, Fe(II)	Off-site SPLP, Total Cr	Associated Explorations
SP-98-01	9	0.5-2.5	8/20/98	X	X	X			WP-98-01
		7-9	8/20/98	X	X				
SP-98-02	9	0.5-2.5	8/20/98	X	X	X			
		7-9	8/20/98	X	X				
SP-98-03	9	0.5-2.5	8/20/98	X	X	X			
		7-9	8/20/98	X	X				
SP-98-04	9	0.5-2.5	8/20/98	X	X	X			WP-98-02
		7-9	8/20/98	X	X				
SP-98-05	9	0.5-2.5	8/20/98	X	X	X			
		7-9	8/20/98	X	X				
SP-98-06	9	0.5-2.5	8/20/98	X	X	X			
		7-9	8/20/98	X	X				
SP-99-01	8	0-4	1/6/99	X				X	WP-99-01
		4-8	1/6/99	X					
SP-99-02	4.5	0-2	1/6/99	Cr only					
SP-99-03	7	0-2	1/6/99	X				X	
		5-7	1/6/99	X					
SP-99-04	7	0-2	1/6/99	X				X	
		5-7	1/6/99	X					
SP-99-05	7	0-2	1/11/99	X				X	WP-99-03
		5-7	1/11/99	X					
SP-99-07	7	0-2	1/8/99	X				X	MWCR-99-01
		5-7	1/8/99	X					
SP-99-08	7	0-2	2/7/99	X				X	
		5-7	2/7/99	X					
SP-99-09	7	0-2	1/9/99	X				X	MWCR-99-02
		5-7	1/9/99	X					
SP-99-11	8	0-2	1/5/99	X				X	
		6-8	1/6/99	X					
SP-99-12	7	0-2	1/12/99	X				X	
		5-7	1/12/99	X					
SP-99-13	7	0-2	1/12/99	X					
		5-7	1/12/99	X				X	
SP-99-14	7	0-2	2/7/99	X					
		5-7	2/7/99	X				X	
SP-99-17	7	0-2	1/7/99	X				X	WP-99-07
		5-7	1/7/99	X					
SP-99-18	7	0-2	1/7/99	X				X	

TABLE 4-2
GEOPROBE SOIL SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft bgs)	Date Collected	Off-site Total Cr, Hex Cr, CN and Mn	Off-site Ni and TOC	Off-site TCLP, Total Cr and CN	Off-site Hex Cr, Total Cr, Fe(II)	Off-site SPLP, Total Cr	Associated Explorations
		5-7	1/7/99	X					
SP-99-19	7	0-2	1/7/99	X					
		5-7	1/7/99	X				X	
SP-99-20	9	0-2	1/7/99	X				X	WP-99-09
		5-7	1/7/99	X					
SP-99-SUMP	N/A	surface	1/12/99	X				X	
SP-PILOT-01A	7	0-2	1/10/99	X			X	X	
		5-7	1/10/99	X			X		
SP-PILOT-02A	7	0-2	1/10/99	X			X	X	
		5-7	1/10/99	X			X		
SP-PILOT-03A	7	0-4	1/10/99	X			X	X	
		5-7	1/10/99	X			X		
SP-PILOT-04A	8	0-2	1/10/99	X			X	X	
		4-8	1/10/99	X			X		
SP-PILOT-05A	7	0-2	1/10/99	X			X		
		5-7	1/10/99	X			X	X	

Notes:

bgs = below ground surface
Cn = cyanide
Cr = chromium
ft = feet
Hex = hexavalent
Mn = manganese
Ni = Nickel
SPLP = synthetic precipitation leaching procedures
TCLP = toxicity characteristics leaching procedures
TOC = total organic carbon

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-98-01	9	7-9	8/20/98		X			SP-98-01
WP-98-02	9	7-9	8/20/98		X			SP-98-04
WP-99-01	25	8-10	1/6/99	Fe(II) only	X			SP-99-01
		16-20	1/24/99	X				
		21-25	1/24/99	X				
WP-99-02	71	8-12	1/21/99	X				
		16-20	1/21/99	X				
		24-28	1/21/99	X				
		30-34	1/22/99	X	X			
		37-41	1/22/99	X	X			
		47-51	1/22/99	X	X			
		57-61	1/22/99	X	X			
		67-71	1/22/99	X	X			
WP-99-03	49	5-9	1/11/99	X				SP-99-05
		11-15	1/11/99	X				
		16-20	1/11/99	X				
		21-25	1/11/99	X				
		26-30	1/11/99	X	X			
		30-34	1/24/99	X				
		40-44	1/24/99	X				
		45-49	1/24/99	X	X			
WP-99-04	66	6-10	1/22/99	X				
		16-20	1/22/99	X				
		22-26	1/22/99	X				
		30-34	1/22/99	X				
		40-44	1/22/99	X				
		50-54	1/22/99	X				
		62-66	1/22/99	X				
WP-99-05	60	6-10	1/23/99	X				
		16-20	1/23/99	X				
		26-30	1/23/99	X				
		36-40	1/23/99	X				
		46-50	1/23/99	X				

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-05		56-60	1/23/99	X				
WP-99-06	66	8-12	1/23/99	X				
		16-20	1/23/99	X				
		20-24	1/24/99	X				
		26-30	1/23/99	X				
		32-36	1/23/99	X				
		42-46	1/23/99	X				
		52-56	1/23/99	X				
		62-66	1/23/99	X				
WP-99-07	9	7-9	1/7/99	Fe(II) only	X			SP-99-17
WP-99-08	70	8-12	2/9/99	X			X(and SVOCs)	PZ-99-08I
		15-19	2/9/99	X				
		21-25	2/9/99	X				
		26-30	2/9/99	X			X(and SVOCs)	
		31-35	2/9/99	X				
		36-40	2/9/99	X				
		41-45	2/9/99	X				
		46-50	2/9/99	X	X		X(and SVOCs)	
		51-55	2/9/99	X				
		56-60	2/9/99	X				
		61-65	2/9/99	X				
		66-70	2/9/99	X				
WP-99-09	60	7-9	1/8/99	Fe(II) only	X			SP-99-20
		15-19	1/27/99	X				
		20-24	1/27/99	X				
		25-29	1/27/99	X	X		X(and SVOCs)	
		30-34	1/27/99	X				
		36-40	1/27/99	X				
		46-50	1/27/99	X				
		56-60	1/27/99	X				

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-10	50	8-12	1/25/99	X				PZ-99-12I
		15-19	1/25/99	X				SP-99-12I
		20-24	1/25/99	X				
		25-29	1/25/99	X				
		30-34	1/25/99	X				
		36-40	1/25/99	X				
		46-50	1/25/99	X				
WP-99-11	51	7-9	1/8/99	Fe(II) only	X			
		11-15	1/12/99	X				
		20-24	1/12/99	X				
		24-28	1/12/99	X	X			
		30-34	1/21/99	X	X			
		36-40	1/21/99	X				
		47-51	1/21/99	X	X			
WP-99-12	50	7-9	1/7/99	Fe(II) only	X			
		15-19	1/12/99	X				
		20-24	1/12/99	X				
		24-28	1/12/99	X	X			
		30-34	2/3/99	X				
		36-40	2/3/99	X				
		46-50	2/3/99	X				
WP-99-13	9	7-9	1/8/99	Fe(II) only	X			
WP-99-14	9	7-9	1/8/99	Fe(II) only	X			
WP-99-15	60	7-9	1/10/99	X				
		9-11	1/10/99	X				
		11-15	1/10/99	X				
		16-20	1/10/99	X				
		21-25	1/11/99	X				
		26-30	1/11/99	X	X			
		30-34	1/20/99	X				
		36-40	1/20/99	X				
		40-44	1/20/99	X				
		46-50	1/20/99	X				

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-15		56-60	1/20/99	X	X			
WP-99-16	50	8-12	1/26/99	X				
		15-19	1/26/99	X				
		20-24	1/26/99	X				
		25-29	1/26/99	X				
		30-34	1/26/99	X	X			
		36-40	1/26/99	X				
		46-50	1/26/99	X				
WP-99-17	50	8-12	1/26/99	X				
		15-19	1/26/99	X				
		20-24	1/26/99	X				
		25-29	1/26/99	X				
		30-34	1/26/99	X	X			
		36-40	1/26/99	X				
		46-50	1/26/99	X				
WP-99-18	50	8-12	1/27/99	X				PZ-99-04I
		15-19	1/27/99	X	X			
		20-24	1/27/99	X				
		25-29	1/27/99	X				
		30-34	1/27/99	X				
		36-40	1/27/99	X				
		46-50	1/27/99	X				
WP-99-19	34	10-14	1/26/99	X				
		20-24	1/26/99	X				
		30-34	1/26/99	X				
WP-99-20	60	8-12	1/28/99	X				
		15-19	1/28/99	X				
		20-24	1/28/99	X				
		25-29	1/28/99	X	X			
		30-34	1/28/99	X				
		36-40	1/28/99	X				
		46-50	1/28/99	X				
		56-60	1/28/99	X				

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-21	50	10-14	1/28/99	X				
		20-24	1/28/99	X				
		25-29	1/28/99	X				
		30-34	1/28/99	X				
		36-40	1/28/99	X				
		46-50	1/28/99	X				
WP-99-22	40	8-12	1/29/99	X				
		15-19	1/29/99	X				
		20-24	1/29/99	X	X			
		25-29	1/29/99	X				
		30-34	1/29/99	X				
		36-40	1/29/99	X				
WP-99-23	25	8-12	2/3/99	X				
		15-19	2/3/99	X				
		21-25	2/3/99	X				
WP-99-24	50	11-15	2/4/99	X				
		20-24	2/4/99	X				
		25-29	2/4/99	X				
		30-34	2/4/99	X	X			
		36-40	2/4/99	X				
		46-50	2/4/99	X				
WP-99-25	50	8-12	2/6/99	X				
		15-19	2/6/99	X				
		20-24	2/6/99	X				
		25-29	2/6/99	X				
		30-34	2/6/99	X				
		36-40	2/6/99	X				
		46-50	2/6/99	X				
WP-99-26	26	8-12	2/6/99	X				
		15-19	2/6/99	X				
		22-26	2/6/99	X				

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-27	50	8-12	2/5/99	X				
		12-16	2/5/99	X				
		20-24	2/5/99	X				
		25-29	2/5/99	X	X			
		30-34	2/5/99	X				
		36-40	2/5/99	X				
		46-50	2/5/99	X				
WP-99-28	40	8-12	2/4/99	X				
		15-19	2/4/99	X				
		20-24	2/4/99	X	X			
		25-29	2/4/99	X				
		30-34	2/4/99	X				
		37-40	2/4/99	X				
WP-99-29	50	8-12	2/4/99	X				
		13-17	2/4/99	X				
		18-22	2/4/99	X				
		25-29	2/4/99	X				
		36-40	2/4/99	X				
		46-50	2/4/99	X				
WP-99-30	30	8-12	2/6/99	X				
		15-19	2/6/99	X				
		21-24	2/6/99	X				
		27-30	2/6/99	X				
WP-99-31	24	8-12	2/5/99	X				
		15-19	2/5/99	X				
		20-24	2/5/99	X				
WP-99-32	40	8-12	2/8/99	X				
		15-19	2/8/99	X				
		21-25	2/8/99	X				
		27-31	2/8/99	X				
		36-40	2/8/99	X				

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-33	80	26-30	3/8/99			X		
		36-40	3/8/99			X		
		46-50	3/8/99			X		
		62-66	3/9/99			X		
		76-80	3/9/99			X	X	
WP-99-34	40	16-20	3/9/99			X	X	
		26-30	3/9/99			X	X	
		36-40	3/9/99			X	X	
WP-99-35	26	22-26	3/9/99			X		
WP-99-36	48	18-22	3/9/99			X		
		30-34	3/9/99			X		
		44-48	3/9/99			X		
WP-99-37	44	16-20	3/9/99			X		
		26-30	3/9/99			X		
		40-44	3/9/99			X		
WP-99-38	26	22-26	3/10/99			X		
WP-99-39	27	23-27	3/10/99			X		
WP-99-40	31	16-20	3/11/99			X		
		27-31	3/11/99			X		
WP-99-41	81	6-10	3/11/99			X		
		16-20	3/11/99			X		
		26-30	3/11/99			X	X	
		36-40	3/11/99			X		
		56-60	3/11/99			X		
		77-81	3/11/99			X	X	
WP-99-42	23	19-23	3/11/99			X		
WP-99-43	82	6-10	3/11/99			X		
		16-20	3/11/99			X		
		26-30	3/11/99			X		
		36-40	3/11/99			X		
		56-60	3/11/99			X		
		78-82	3/11/99			X		

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-44	69	25-29	3/12/99			X		
		46-50	3/12/99			X		
		65-69	3/12/99			X		
WP-99-45	60	11-15	3/16/99			X		
		26-30	3/16/99			X		
		36-40	3/16/99			X		
		56-60	3/16/99			X		
WP-99-46	35	31-35	3/17/99			X		
WP-99-47	21	6-10	3/17/99			X	X	
		17-21	3/17/99			X	X	
WP-99-48	19	5-9	3/18/99			X		
		15-19	3/18/99			X		
WP-99-49	43	4-8	3/18/99			X		
		17-21	3/18/99			X		
		39-43	3/18/99			X		
WP-99-50	55	9-13	3/18/99			X		
		31-34	3/18/99			X		
		51-55	3/18/99			X		
WP-99-51		No Sample						
WP-99-52		No Sample						
WP-99-53	32	5.5-9.5	3/22/99			X		
		16-20	3/22/99			X		
		29.5-32	3/22/99			X		
WP-99-54	62	8-10	3/23/99			X		
		18-20	3/23/99			X		
		28-30	3/23/99			X		
		48-50	3/23/99			X		
		60-62	3/23/99			X	X	
WP-99-55	70	6-10	3/23/99			X		
		16-20	3/23/99			X		
		26-30	3/23/99			X		
		46-50	3/23/99			X		
		66-70	3/23/99			X	X	

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-56	52	6-10	3/23/99			X		
		16-20	3/23/99			X		
		26-30	3/23/99			X		
		48-52	3/23/99			X		
WP-99-57	50	6-10	3/24/99			X		
		16-20	3/24/99			X		
		26-30	3/24/99			X		
		46-50	3/24/99			X		
WP-99-58	19	6-10	3/24/99			X		
		16.5-19	3/24/99			X		
WP-99-59	54	6-10	3/24/99			X		
		16-20	3/24/99			X		
		26-30	3/24/99			X		
		36-40	3/24/99			X		
		50-54	3/24/99			X		
WP-99-60	44	6-10	3/24/99			X		
		16-20	3/24/99			X		
		26-30	3/24/99			X		
		40-44	3/24/99			X		
WP-99-61	28	6-10	3/25/99			X		
		16-20	3/25/99			X		
		24-28	3/25/99			X		
WP-99-62	63	6-10	3/25/99			X		
		16-20	3/25/99			X		
		26-30	3/25/99			X		
		46-50	3/25/99			X		
		59-63	3/25/99			X		
WP-99-63	40	6-10	3/26/99			X		
		16-20	3/26/99			X		
		26-30	3/26/99			X		
		36-40	3/26/99			X		

TABLE 4-3
GEOPROBE GROUNDWATER SAMPLE EXPLORATIONS SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Sample Date	On-site Hex Cr and Fe(II)	Off-site metals SO4, CN, Alk	On-site VOCs	Off-site VOCs	Associated Explorations
WP-99-64	30	6-10	3/29/99			X		
		16-20	3/29/99			X		
		26-30	3/29/99			X		
WP-99-65	34	6-10	3/30/99			X		
		16-20	3/30/99			X		
		31-34	3/30/99			X		
WP-99-66	63	6-10	3/30/99			X		
		16-20	3/30/99			X		
		26-30	3/30/99			X		
		46-50	3/30/99			X		
		59-63	3/30/99			X		
WP-99-67	20	6-10	3/31/99			X		
		16-20	3/31/99			X		
WP-99-68	80	6-10	3/31/99			X		
		16-20	3/31/99			X		
		26-30	3/31/99			X		
		46-50	3/31/99			X		
		66-70	3/31/99			X		
		76-80	3/31/99			X		
WP-99-69	30	6-10	3/31/99			X		
		16-20	3/31/99			X		
		26-30	3/31/99			X		
WP-99-70	30	6-10	3/31/99			X		
		16-20	3/31/99			X		
		26-30	3/31/99			X		
WP-99-71	40	6-10	4/1/99			X		
		16-20	4/1/99			X		
		26-30	4/1/99			X		
		36-40	4/1/99			X		
WP-99-72	34	6-10	4/1/99			X		
		16-20	4/1/99			X		
		30-34	4/1/99			X		

TABLE 4-4
MONITORING WELL/PIEZOMETER CONSTRUCTION SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

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Exploration ID	Date Installed	Total Depth (ft bgs)	Screened Interval (ft/bgs)	Construction Material	Associated Explorations
MWCR-99-01	1/8/99	9	3.5-8.5	Schedule 40 PVC	SP-99-07
MWCR-99-02	1/9/99	9	3.3-8.3	Schedule 40 PVC	SP-99-09
PZ-99-01I	2/10/99	19	13.85-18.85	Schedule 40 PVC	
PZ-99-04I	2/10/99	35.1	30-35	Schedule 40 PVC	WP-99-18
PZ-99-08I	2/10/99	21	16-21	Schedule 40 PVC	WP-99-08
PZ-99-12I	2/10/99	21.15	16.15-21.15	Schedule 40 PVC	WP-99-10
PZ-PILOT-01	1/10/99	7.2	2.2-7.2	Schedule 40 PVC	
PZ-PILOT-02	1/10/99	7.18	2.18-7.18	Schedule 40 PVC	
PZ-PILOT-03	1/10/99	7.8	2.8-7.8	Schedule 40 PVC	
PZ-PILOT-04	1/9/99	9.45	4.45-9.45	Schedule 40 PVC	
PZ-PILOT-05	1/9/99	11.23	6.23-11.23	Schedule 40 PVC	
PZ-PILOT-06	1/9/99	13.25	8.25-13.25	Schedule 40 PVC	
PZ-PILOT-07	1/9/99	10.3	10.3-15.3	Schedule 40 PVC	

TABLE 4-5
MONITORING WELL/PIEZOMETER SAMPLE SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Installed By HLA	Total Depth (ft bgs)	Screened Interval (ft bgs)	Sample Date	On-site Cr and Fe(II) Analyses	Off-site metals, SO4, CN Analyses	On-site VOC Analysis	Off-site VOC Analysis	Associated Explorations
MWCR-99-01	X	8	6-8	1/8/99	X			X (2/11/99)	SP-99-07
MWCR-99-02	X	8	6-8	1/9/99	X				SP-99-09
PZ-PILOT-01	X	7	5-7	1/10/99	X				
PZ-PILOT-02	X	7	5-7	1/10/99	X				
PZ-PILOT-03	X	8	6-8	1/10/99	X				
PZ-PILOT-04	X	9	7-9	1/9/99	X				
PZ-PILOT-05	X	11	6-11	1/9/99	X				
PZ-PILOT-06	X	13	9-13	1/9/99	X				
PZ-PILOT-07	X	19	10-12	1/9/99	X				
			17-19	1/9/99	X				
PZ-8D		30.85	24-30	1/13/99	X	X			
ECD-4		18	8-18	1/22/99	X				
PZ-99-01I	X	19	14-19	2/11/99				X	
PZ-99-04I	X	35	30-35	2/11/99				X	WP-99-18
PZ-99-08I	X	21	16-21	2/11/99					WP-99-08
PZ-99-12I	X	21	16-21	2/11/99				X	WP-99-10
				2/11/99				X	
PZ-4D			24-30	3/16/99			X		
		38.6	28-38	3/17/99			X		
			24-30	3/29/99			X		
PZ-16D		28.2	18-28	3/29/99			X		
PZ-5D		43.65	33-43	3/30/99			X		
PZ-13D		31.8	21-31	3/30/99			X		
PZ-11D		34.2	24-34	4/1/99			X		

Notes:

bgs = below ground surface
CN = cyanide
Cr = chromium
ft = feet
Fe(II) = ferrous iron
S04 = sulfate
VOCs = volatile organic compounds

TABLE 4-6
GROUNDWATER ELEVATIONS

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

LOCATION	SURVEY DATA (FT,MSL)		DEPTH TO H2O (T.O.R., FT)[1]	GROUNDWATER ELEV. (FT, MSL)
	T.O.R. ELEV.	GROUND ELEV		
ECD-4	8.03	8.08	5.32	2.71
MWCR-99-01	9.28	8.10	6.58	2.70
MWCR-99-02	9.25	8.00	6.57	2.68
PZ-8D	6.79	7.43	4.32	2.47
PZ-99-01I	8.39	8.00	5.69	2.70
PZ-99-04I	7.50	7.90	4.83	2.67
PZ-99-08I	11.22	8.00	8.53	2.69
PZ-99-12I	7.70	8.20	5.11	2.59

1. Water level measurements collected 2/11/99 at approximately 1115 hours; low tide in Bridgeport, CT occurred at 1345 hours.

T.O.R. - Top of PVC well riser

FT,MSL - feet above mean sea level

TABLE 4-7
PCPT EXPLORATION SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

EXPLORATION IDENTIFICATION	TOTAL DEPTH (FEET BGS)	SAMPLE INTERVAL (FEET BGS)	OFF-SITE VOC ANALYSIS	IN-SITU PERMEABILITY TEST (FEET BGS)
CP-99-01	131.6	40 - 41.5	X	
		54 - 55.8	X	
		78 - 79.8	X	79.4
		96 - 97.8	X	92.4
		128 - 130.3	X	104.3
CP-99-02	136.3	7 - 8.8	X	
		18 - 19.8	X	
		30 - 31.8	X	27.1
		42.4 - 44.2	X	34.2/ 47.8/ 50.1/ 57.3/ 66.8/ 69.6
		94 - 95.8	X	97/ 99.1
		131.5 -133.3	X	
CP-99-03	116.4	37.2 - 39	X	21.5/ 27/ 30.3
		54.5 - 56	X	63.9/ 66.3
		74.4 - 76.2	X	72.8
		94.7 - 96.5	X	92.4/ 102.2
		112.3 - 114	X	
CP-99-04	162.4	32 - 33.8	X	20.8
		43.2 - 45	X	
		86 - 87.8	X	
		110 - 111.8	X	125.8
		157.4 - 159.1	X	
CP-99-05	132.8	30.8 - 32.8	X	
		54.6 - 56.4	X	
		72.5 - 74.3	X	71.2
		97 - 98.8	X	
		129.7 - 131.4	X	
CP-99-06	139.5	28 - 29.8	X	30.5
		50 - 51.8	X	42.6/ 60.1
		78 - 79.8	X	
		112 - 113.8	X	115.9
		126.2 - 128	X	125.8
CP-99-07	115.7	18.4 - 20.3	X	
		37.4 - 39.2	X	
		68 - 69.8	X	
		84 - 85.8	X	
		113.2 - 115	X AND SVOCs	
CP-99-08	158.8	32 - 33.8	X AND SVOCs	
		44 - 45.8	X AND SVOCs	
		60.2 - 62	X	40.2
		71.2 - 73	X	
		99.2 - 101	X	
		133.2 - 135	X	
		156.3 - 158.5	X	
CP-99-09	92.6	9 - 11	X	
		33 - 34.5	X	44.6
		88 - 89.8	X	92.5
CP-99-10	75.9	27 - 28.8	X	30.2
		34.5 - 36.3	X	38
		40.8 - 42.6	X	
		48 - 49.8	X	
		57.8 - 59.6	X	
		73.3 - 75.1	X	
CP-99-11	78.6	14.5 - 16.3	X	
		44.6 - 46.4	X	
		58 - 59.8	X	

TABLE 4-7
PCPT EXPLORATION SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

EXPLORATION IDENTIFICATION	TOTAL DEPTH (FEET BGS)	SAMPLE INTERVAL (FEET BGS)	OFF-SITE VOC ANALYSIS	IN-SITU PERMEABILITY TEST (FEET BGS)
CP-99-11		75.7 - 77.5	X	
CP-99-12	121.6	9 - 10.8	X	
		19.6 - 21.4	X	
		54.6 - 56.4	X	
		90 - 91.8	X	
		119.8 - 121.6	X	
CP-99-13	144.7	--		49.7/ 53/ 56.2/ 86/ 89.9
CP-99-14A	45.4	15.3 - 18.1	X	
		29 - 30.8	X	
		40.6 - 42.4	X	
CP-99-15	59.2	29.7 - 31.5	X	
		39 - 40.8	X	
		45.5 - 47	X	
		57.4 - 59.2	X	
CP-99-16	94.8	26.7 - 28.5	X	
		34.6 - 36.4	X	
		51 - 52.8	X	
		62.7 - 63.5	X	
		75.5 - 77.5	X	
		92.3 - 94	X	
CP-99-17	64	APPROX. 20	X	
		29 - 31.8	X	
		44 - 45.8	X	
		60.9 - 62.7	X	
CP-99-18	148	11.5 - 13.3	X	
		33 - 34.8	X	
		44 - 45.8	X	
		59.2 - 61	X	
		71.4 - 73.2	X	
		98.6 - 100.4	X	
		132.6 - 134.4	X	
		146.2 - 148	X	

TABLE 4-8
SOIL BORINGS EXPLORATION SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Sample Interval (ft/bgs)	Off-site Analyses									On-site Sudan IV Dye Test
		VOCs	SVOCs	Metals & Cyanide	Hexavalent Chromium	TOC	TPH	SPLP Metals	Cation Exchange Capacity	Grain Size	
PZ-99-01	3-5							x			
	5-7										
	10-12	x	x	x	x	x	x		x		
	12-14									x	
	15-17										x
	20-22										x
	25-27	x									x
	30-32										x
	35-37										x
	40-42										x
	45-47										x
Total Depth 52'	50-52										x
PZ-99-02	3-5							x			x
	5-7										
	10-12										
	12-14										
	15-17										
	20-22										
	25-27	x	x	x	x	x	x		x	x	x
	30-32	x	x	x	x	x	x		x	x	x
	35-37										x
	40-42										x
	45-47										
Total Depth 52'	50-52	x	x	x	x	x	x		x	x	
PZ-99-03	5-7										x
	7-9										x
	10-12	x	x	x	x	x	x		x	x	x
	15-17										x
	20-22	x	x	x	x	x	x		x		x
	25-27										x
	30-32	x	x	x	x	x	x		x	x	x
	35-37										x
Total Depth 42'	40-42										x

TABLE 4-9
PIEZOMETER AND EXTRACTION WELL CONSTRUCTION SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Date Installed	Total Depth (ft bgs)	Screened Interval (ft/bgs)	Construction Material
PZ-99-01A	8/23/99	60	4-9	Schedule 40 PVC
PZ-99-01B	8/23/99	60	30-35	Schedule 40 PVC
PZ-99-01C	2/10/99	60	45-50	Schedule 40 PVC
PZ-99-02A	2/10/99	52	4-9	Schedule 40 PVC
PZ-99-02B	2/10/99	52	30-35	Schedule 40 PVC
PZ-99-02C	2/10/99	52	45-50	Schedule 40 PVC
PZ-99-03	1/10/99	7.2	4-9	Schedule 40 PVC
EW-99-01	8/25/99	42	19.5-39.5	Schedule 40 PVC

TABLE 4-10
AQUIFER TESTING SUMMARY - CONSTANT-DISCHARGE TEST

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Radial Distance from EW-99-01 (ft)	Screened Interval (ft/bgs)	Antecedent Trend Monitoring	Measurement Method
EW-99-01	0	19.5-39.5		Manual
PZ-99-01I	5	14-19		Transducer
MWCR-99-01	7	6-8		Transducer
MWCR-99-02	44	6-8	x	Transducer
PZ-99-08I	65	16-21		Transducer
PZ-99-01A	66	4-9	x	Transducer
PZ-99-01B	66	30-35	x	Transducer
PZ-99-01C	66	45-50	x	Transducer
PZ-99-02A	108	4-9		Transducer
PZ-99-02B	108	30-35		Manual
PZ-99-02C	108	45-50		Manual
PZ-99-04I	161	30-35	x	Transducer
PZ-16D	600	18-28	x	Transducer

TABLE 4-11
SOIL VAPOR EXPLORATIONS SUMMARY

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration Identification	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Date Collected	On-Site Analysis Target VOC	Off-Site Analysis Target VOC	Sample Identification
SG-99-01	3.5	3.0 - 3.5	8/4/99	X		SG9901003XF
SG-99-02	3.5	3.0 - 3.5	8/4/99	X		SG9902003XF
SG-99-03	3.5	3.0 - 3.5	8/4/99	X		SG9903003XF
SG-99-04	3.5	3.0 - 3.5	8/4/99	X	X	SG9904003XF
SG-99-05	3.5	3.0 - 3.5	8/4/99	X		SG9905003XF
SG-99-06	3.5	3.0 - 3.5	8/4/99	X		SG9906003XF
SG-99-07	3.5	3.0 - 3.5	8/4/99	X		SG9907003XF
SG-99-08	3.5	3.0 - 3.5	8/4/99	X		SG9908003XF
SG-99-09	3.5	3.0 - 3.5	8/5/99	X		SG9909003XF
SG-99-10	3.5	3.0 - 3.5	8/5/99	X		SG9910003XF
SG-99-11	3.5	3.0 - 3.5	8/5/99	X		SG9911003XF
SG-99-12	3.5	3.0 - 3.5	8/5/99	X		SG9912003XF
SG-99-13	3.5	3.0 - 3.5	8/5/99	X		SG9913003XF
SG-99-14	3.5	3.0 - 3.5	8/5/99	X		SG9914003XF
SG-99-15	3.5	3.0 - 3.5	8/5/99	X		SG9915003XF
SG-99-16	3.5	3.0 - 3.5	8/5/99	X		SG9916003XF
SG-99-17	3.5	3.0 - 3.5	8/5/99	X		SG9917003XF
SG-99-18	3.5	3.0 - 3.5	8/5/99	X		SG9918003XF
SG-99-19	3.5	3.0 - 3.5	8/6/99	X		SG9919003XF
SG-99-20	3.5	3.0 - 3.5	8/6/99	X		SG9920003XF
SG-99-21	3.5	3.0 - 3.5	8/6/99	X		SG9921003XF
SG-99-22	3.5	3.0 - 3.5	8/6/99	X		SG9922003XF
SG-99-23	3.5	3.0 - 3.5	8/6/99	X		SG9923003XF
SG-99-24	3.5	3.0 - 3.5	8/6/99	X		SG9924003XF
SG-99-25	3.5	3.0 - 3.5	8/9/99	X		SG9925003XF
SG-99-26	3.5	3.0 - 3.5	8/9/99	X		SG9926003XF
SG-99-27	3.5	3.0 - 3.5	8/9/99	X		SG9927003XF
SG-99-28	3.5	3.0 - 3.5	8/9/99	X		SG9928003XF
SG-99-29	3.5	3.0 - 3.5	8/9/99	X		SG9929003XF
SG-99-30	3.5	3.0 - 3.5	8/9/99	X		SG9930003XF
SG-99-31	3.5	3.0 - 3.5	8/9/99	X		SG9931003XF
SG-99-32	3.5	3.0 - 3.5	8/10/99	X		SG9932003XF
SG-99-33	3.5	3.0 - 3.5	8/10/99	X		SG9933003XF
SG-99-34	3.5	3.0 - 3.5	8/10/99	X		SG9934003XF
SG-99-35	3.5	3.0 - 3.5	8/10/99	X		SG9935003XF
SG-99-36	3.5	3.0 - 3.5	8/10/99	X		SG9936003XF
SG-99-37	3.5	3.0 - 3.5	8/10/99	X	X	SG9937003XF
SG-99-38	3.5	3.0 - 3.5	8/10/99	X		SG9938003XF
SG-99-39	3.5	3.0 - 3.5	8/10/99	X		SG9939003XF
SG-99-40	3.5	3.0 - 3.5	8/10/99	X		SG9940003XF
SG-99-41	3.5	3.0 - 3.5	8/10/99	X		SG9941003XF
SG-99-42	3.5	3.0 - 3.5	8/10/99	X		SG9942003XF
SG-99-43	3.5	3.0 - 3.5	8/10/99	X		SG9943003XF
SG-99-44	3.5	3.0 - 3.5	8/10/99	X		SG9944003XF
SG-99-45	3.5	3.0 - 3.5	8/10/99	X		SG9945003XF
SG-99-46	3.5	3.0 - 3.5	8/10/99	X		SG9946003XF
SG-99-47	3.5	3.0 - 3.5	8/10/99	X		SG9947003XF
SG-99-48	3.5	3.0 - 3.5	8/10/99	X	X	SG9948003XF

TABLE 4-11
SOIL VAPOR EXPLORATIONS SUMMARY

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration Identification	Total Depth (ft bgs)	Sample Interval (ft/bgs)	Date Collected	On-Site Analysis Target VOC	Off-Site Analysis Target VOC	Sample Identification
SG-99-49	3.5	3.0 - 3.5	8/10/99	X		SG9949003XF
SG-99-50	3.5	3.0 - 3.5	8/10/99	X	X	SG9950003XF
SG-99-51	3.5	3.0 - 3.5	8/10/99	X		SG9951003XF
SG-99-52	3.5	3.0 - 3.5	8/10/99	X		SG9952003XF

TABLE 6-1
HYDRAULIC CONDUCTIVITY SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Exploration Type	Contractor	Testing Date	Depth Interval (ft bgs)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/min)
PZ-1D	Piezometer	URSGWC	Aug-92	24-34	3E-03	6E-03
PZ-4D	Piezometer	URSGWC	Aug-92	29-39	1E-04	3E-04
PZ-5D	Piezometer	URSGWC	Aug-92	33-43	5E-04	9E-04
PZ-7D	Piezometer	URSGWC	Aug-92	22-32	2E-02	4E-02
PZ-8D	Piezometer	URSGWC	Aug-92	23.5-33.5	2E-03	4E-03
PZ-9D	Piezometer	URSGWC	Aug-92	24-34	2E-04	3E-04
PZ-11D	Piezometer	URSGWC	Aug-92	24-34	4E-04	9E-04
PZ-16D	Piezometer	URSGWC	Aug-92	21-31	3E-02	6E-02
PZ-17D	Piezometer	URSGWC	Aug-92	29-39	3E-04	5E-04
WC-4S	Monitoring Well	URSGWC	Aug-92	3-13	3E-03	6E-03
WC-5S	Monitoring Well	URSGWC	Aug-92	3-13	8E-03	2E-02
WC-8S	Monitoring Well	URSGWC	Aug-92	3-13	2E-02	3E-02
WC-9D2	Monitoring Well	URSGWC	May-95	145-155	8E-05	1E-04
WC-18S	Monitoring Well	URSGWC	May-95	3.5-13.5	3E-03	5E-03
WC-18D1	Monitoring Well	URSGWC	May-95	35-45	1E-05	2E-05
WC1-1S	Monitoring Well	URSGWC	Nov-99	2-12	2E-02	4E-02
WC2-1D	Monitoring Well	URSGWC	Nov-99	140-150	1E-03	3E-03
WC2-1I	Monitoring Well	URSGWC	Nov-99	45-55	4E-03	8E-03
WC2-1S	Monitoring Well	URSGWC	Nov-99	2-12	4E-02	8E-02
WC2-2I	Monitoring Well	URSGWC	Nov-99	45-55	9E-03	2E-02
WC2-2D	Monitoring Well	URSGWC	Nov-99	51.5-61.5	1E-02	3E-02
WC2-3I	Monitoring Well	URSGWC	Nov-99	45-55	8E-03	2E-02
WC2-3S	Monitoring Well	URSGWC	Nov-99	2-12	5E-02	9E-02
WC2-3D	Monitoring Well	URSGWC	Nov-99	74.5-84.5	7E-03	1E-02
WC2-4S	Monitoring Well	URSGWC	Nov-99	2-12	2E-02	5E-02
WC2-4I	Monitoring Well	URSGWC	Nov-99	25-35	2E-02	3E-02
WC2-5S	Monitoring Well	URSGWC	Nov-99	2-12	3E-02	6E-02
WC2-5I	Monitoring Well	URSGWC	Nov-99	30-40	5E-02	1E-01
WC6-1I	Monitoring Well	URSGWC	Nov-99	40-50	8E-02	2E-01
WC3-1D	Monitoring Well	URSGWC	Nov-99	75-85	1E-03	3E-03
WC3-1I	Monitoring Well	URSGWC	Nov-99	30-40	3E-04	5E-04
WC3-2D	Monitoring Well	URSGWC	Nov-99	53-63	8E-03	2E-02
WC3-2I	Monitoring Well	URSGWC	Nov-99	30-40	2E-03	3E-03
WC5-1S	Monitoring Well	URSGWC	Nov-99	1.5-11.5	2E-02	3E-02
WC5-2S	Monitoring Well	URSGWC	Nov-99	2-12	4E-02	8E-02
WC2-6I	Monitoring Well	URSGWC	Nov-99	40-50	6E-02	1E-01
WC5-1D	Monitoring Well	URSGWC	Nov-99	74.5-84.5	3E-03	6E-03
WC5-2I	Monitoring Well	URSGWC	Nov-99	30-40	2E-02	3E-02
WC5-3S	Monitoring Well	URSGWC	Nov-99	2-12	6E-02	1E-01
MWCD-99-01A	Monitoring Well	URSGWC	Nov-99	5-10	3E-03	5E-03
MWCD-99-01B	Monitoring Well	URSGWC	Nov-99	50-60	8E-03	2E-02
MWCD-99-02A	Monitoring Well	URSGWC	Nov-99	5-10	4E-02	7E-02
MWCD-99-02B	Monitoring Well	URSGWC	Nov-99	50-60	3E-02	6E-02

TABLE 6-1
HYDRAULIC CONDUCTIVITY SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Exploration Type	Contractor	Testing Date	Depth Interval (ft bgs)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/min)
SP-PILOT-04	Soil Boring[3]	HLA	Jan-99	4-8	7E-02	1E-01
PZ-99-01	Soil Boring[3]	HLA	Aug-99	10-12	3E-02	6E-02
PZ-99-02	Soil Boring[3]	HLA	Aug-99	25-27	4E-03	7E-03
	Soil Boring[3]	HLA	Aug-99	30-32	2E-03	4E-03
	Soil Boring[3]	HLA	Aug-99	50-52	3E-03	7E-03
PZ-99-03	Soil Boring[3]	HLA	Aug-99	10-12	4E-02	9E-02
	Soil Boring[3]	HLA	Aug-99	30-32	2E-03	4E-03
PZ-PILOT-06	Soil Boring[3]	HLA	Jan-99	0-4	3E-03	6E-03
	Soil Boring[3]	HLA	Jan-99	4-8	1E-01	2E-01
	Soil Boring[3]	HLA	Jan-99	10-12	6E-02	1E-01
CP-99-01	Cone Penetrometer	HLA	May-99	79.4	2E-04	4E-04
				92.4	1E-04	2E-04
				104.3	1E-04	2E-04
CP-99-02	Cone Penetrometer	HLA	May-99	27.1	6E-04	1E-03
				34.2	1E-03	2E-03
				47.8	4E-04	8E-04
				50.1	2E-04	4E-04
				57.3	4E-04	8E-04
				66.8	2E-04	4E-04
				69.6	2E-04	4E-04
				97	2E-03	4E-03
				99.1	2E-03	4E-03
CP-99-03	Cone Penetrometer	HLA	May-99	21.5	2E-03	4E-03
				27	5E-04	1E-03
				30.3	1E-03	2E-03
				63.9	3E-04	6E-04
				66.3	9E-05	2E-04
				72.8	2E-04	4E-04
				92.4	3E-04	6E-04
				102.2	2E-04	4E-04
CP-99-04	Cone Penetrometer	HLA	May-99	20.8	4E-04	8E-04
				125.8	2E-04	4E-04
CP-99-05	Cone Penetrometer	HLA	May-99	71.2	3E-04	6E-04
CP-99-06	Cone Penetrometer	HLA	May-99	30.5	4E-04	8E-04
				42.6	2E-04	4E-04
				60.1	8E-04	2E-03
				115.9	9E-05	2E-04
				125.8	4E-04	8E-04
CP-99-08	Cone Penetrometer	HLA	May-99	40.2	1E-04	2E-04
CP-99-09	Cone Penetrometer	HLA	May-99	44.6	3E-05	6E-05
				92.5	1E-04	2E-04

TABLE 6-1
HYDRAULIC CONDUCTIVITY SUMMARY

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

Exploration ID	Exploration Type	Contractor	Testing Date	Depth Interval (ft bgs)	Hydraulic Conductivity (cm/sec)	Hydraulic Conductivity (ft/min)
CP-99-10	Cone Penetrometer	HLA	May-99	30.2	4E-03	8E-03
				38	7E-04	1E-03
CP-99-13	Cone Penetrometer	HLA	May-99	49.7	5E-04	1E-03
				53	2E-04	4E-04
				56.2	7E-05	1E-04
				86	2E-04	4E-04
				89.9	3E-04	6E-04

Notes:
1) August 1992 hydraulic conductivity results are for risng head tests
2) May 1995 hydraulic conductivity test results are for rising head tests
3) Hydraulic conductivity estimated from grain size analysis

HLA - Harding Lawson Associates
URSGWC - URS Greiner Woodward-Clyde
ft - feet
bgs - below ground surface

cm/sec - centimeters per second
ft/min - feet per minute

TABLE 6-2
PLATING FACILITY DECONTAMINATION SAMPLING RESULTS

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

FLOOR WIPE SAMPLE DATA

Locate ID	Lab Number	Collection Date	Parameter	Units	Result	Exceeds Cleanup Goal?*
WS-011-F	AEL98015290	12/17/98	Chromium, Hexavalent	mg/m^2	84.25	Yes
WS-011-F	AEL98015290	12/17/98	Chromium, Total	mg/m^2	220.75	No
WS-012-F	AEL98015294	12/17/98	Chromium, Hexavalent	mg/m^2	12.425	Yes
WS-012-F	AEL98015294	12/17/98	Chromium, Total	mg/m^2	81.25	No
WS-013-F	AEL98015295	12/17/98	Chromium, Hexavalent	mg/m^2	0.625	Yes
WS-013-F	AEL98015295	12/17/98	Chromium, Total	mg/m^2	21.15	No
WS-014-F	AEL98015296	12/17/98	Chromium, Hexavalent	mg/m^2	1.5	Yes
WS-014-F	AEL98015296	12/17/98	Chromium, Total	mg/m^2	29.75	No
WS-015-F	AEL98015300	12/17/98	Chromium, Hexavalent	mg/m^2	96	Yes
WS-015-F	AEL98015300	12/17/98	Chromium, Total	mg/m^2	300	No
WS-016-F	AEL98015301	12/17/98	Chromium, Hexavalent	mg/m^2	0.425	No
WS-016-F	AEL98015301	12/17/98	Chromium, Total	mg/m^2	13.75	No
WS-017-F	AEL98015302	12/17/98	Chromium, Hexavalent	mg/m^2	0.975	Yes
WS-017-F	AEL98015302	12/17/98	Chromium, Total	mg/m^2	15.575	No
WS-018-F	AEL98015303	12/17/98	Chromium, Hexavalent	mg/m^2	0.55	Yes
WS-018-F	AEL98015303	12/17/98	Chromium, Total	mg/m^2	38.75	No
WS-019-F	AEL98015304	12/17/98	Chromium, Hexavalent	mg/m^2	<0.05	No
WS-019-F	AEL98015304	12/17/98	Chromium, Total	mg/m^2	3.675	No
WS-020-F	AEL98015305	12/17/98	Chromium, Hexavalent	mg/m^2	0.275	No
WS-020-F	AEL98015305	12/17/98	Chromium, Total	mg/m^2	8.175	No
WS-021-F	AEL98015347	12/18/98	Chromium, Hexavalent	mg/m^2	0.2	No
WS-021-F	AEL98015347	12/18/98	Chromium, Total	mg/m^2	26	No
WS-022-F	AEL98015348	12/18/98	Chromium, Hexavalent	mg/m^2	0.85	Yes
WS-022-F	AEL98015348	12/18/98	Chromium, Total	mg/m^2	8.95	No
WS-023-F	AEL98015349	12/18/98	Chromium, Hexavalent	mg/m^2	0.275	No
WS-023-F	AEL98015349	12/18/98	Chromium, Total	mg/m^2	9.8	No
WS-024-F	AEL98015350	12/18/98	Chromium, Hexavalent	mg/m^2	0.175	No
WS-024-F	AEL98015350	12/18/98	Chromium, Total	mg/m^2	8.375	No
WS-025-F	AEL98015351	12/18/98	Chromium, Hexavalent	mg/m^2	0.15	No
WS-025-F	AEL98015351	12/18/98	Chromium, Total	mg/m^2	13.625	No
WS-026-F	AEL98015352	12/18/98	Chromium, Hexavalent	mg/m^2	91.25	Yes
WS-026-F	AEL98015352	12/18/98	Chromium, Total	mg/m^2	91.5	No
WS-027-F	AEL98015353	12/18/98	Chromium, Hexavalent	mg/m^2	10.875	Yes
WS-027-F	AEL98015353	12/18/98	Chromium, Total	mg/m^2	23.55	No
WS-028-F	AEL98015354	12/18/98	Chromium, Hexavalent	mg/m^2	0.175	No
WS-028-F	AEL98015354	12/18/98	Chromium, Total	mg/m^2	24.175	No

*Cleanup Goal for Hexavalent Chromium is 0.53 mg/m^2, and Total Chromium is 210,000 mg/m^2 .

TABLE 6-2
PLATING FACILITY DECONTAMINATION SAMPLING RESULTS

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

WALL WIPE SAMPLE DATA

Locate ID	Lab Number	Collection Date	Parameter	Units	Result	Exceeds Cleanup Goal?*
WS-029-W	AEL98015281	12/17/98	Chromium, Hexavalent	mg/m^2	<0.05	No
WS-029-W	AEL98015281	12/17/98	Chromium, Total	mg/m^2	7.575	No
WS-030-W	AEL98015285	12/17/98	Chromium, Hexavalent	mg/m^2	0.125	No
WS-030-W	AEL98015285	12/17/98	Chromium, Total	mg/m^2	8.05	No
WS-031-W	AEL98015286	12/17/98	Chromium, Hexavalent	mg/m^2	<0.05	No
WS-031-W	AEL98015286	12/17/98	Chromium, Total	mg/m^2	1.025	No
WS-032-W	AEL98015287	12/17/98	Chromium, Hexavalent	mg/m^2	<0.05	No
WS-032-W	AEL98015287	12/17/98	Chromium, Total	mg/m^2	10.7	No
WS-033-W	AEL98015288	12/17/98	Chromium, Total	mg/m^2	144.25	No
WS-033-W	AEL98015288	12/17/98	Chromium, Hexavalent	mg/m^2	58.25	Yes

*Cleanup Goal for Hexavalent Chromium is 0.53 mg/m^2, and Total Chromium is 210,000 mg/m^2 .

TABLE 6-2
PLATING FACILITY DECONTAMINATION SAMPLING RESULTS

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

BEAM WIPE SAMPLE DATA

Locate ID	Lab Number	Collection Date	Parameter	Units	Result	Exceeds Cleanup Goal?*
WS-001-B	AEL98015132	12/15/98	Chromium, Hexavalent	mg/m^2	0.250	No
WS-001-B	AEL98015132	12/15/98	Chromium, Total	mg/m^2	5.375	No
WS-002-B	AEL98015133	12/15/98	Chromium, Hexavalent	mg/m^2	<0.05	No
WS-002-B	AEL98015133	12/15/98	Chromium, Total	mg/m^2	2.2	No
WS-003-B	AEL98015134	12/15/98	Chromium, Hexavalent	mg/m^2	0.175	No
WS-003-B	AEL98015134	12/15/98	Chromium, Total	mg/m^2	8.85	No
WS-004-B	AEL98015135	12/15/98	Chromium, Hexavalent	mg/m^2	0.175	No
WS-004-B	AEL98015135	12/15/98	Chromium, Total	mg/m^2	9.975	No
WS-005-B	AEL98015189	12/16/98	Chromium, Hexavalent	mg/m^2	0.175	No
WS-005-B	AEL98015189	12/16/98	Chromium, Total	mg/m^2	7.775	No
WS-006-B	AEL98015190	12/16/98	Chromium, Hexavalent	mg/m^2	0.15	No
WS-006-B	AEL98015190	12/16/98	Chromium, Total	mg/m^2	3.45	No
WS-007-B	AEL98015191	12/16/98	Chromium, Hexavalent	mg/m^2	0.55	Yes
WS-007-B	AEL98015191	12/16/98	Chromium, Total	mg/m^2	11.975	No
WS-008-B	AEL98015192	12/16/98	Chromium, Hexavalent	mg/m^2	0.325	No
WS-008-B	AEL98015192	12/16/98	Chromium, Total	mg/m^2	12.125	No
WS-009-B	AEL98015193	12/16/98	Chromium, Hexavalent	mg/m^2	2.675	Yes
WS-009-B	AEL98015193	12/16/98	Chromium, Total	mg/m^2	77.25	No
WS-010-B	AEL98015194	12/16/98	Chromium, Hexavalent	mg/m^2	1.925	Yes
WS-010-B	AEL98015194	12/16/98	Chromium, Total	mg/m^2	417.5	No

*Cleanup Goal for Hexavalent Chromium is 0.53 mg/m^2, and Total Chromium is 210,000 mg/m^2 .

TABLE 6-2
PLATING FACILITY DECONTAMINATION SAMPLING RESULTS

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

CONCRETE SAMPLE DATA						
Locate ID	**Lab Number**	**Collection Date**	**Parameter**	**Units**	**Result**	**Exceeds CTDEP I/C DEC***
CD-98-03	AEL98015187	12/16/98	Chromium, Hexavalent	mg/kg	4110	Yes
CD-98-03	AEL98015187	12/16/98	Chromium, Total	mg/kg	5720	-
CD-98-03	AEL98015187	12/16/98	Total Solids, %	Percent	95.7	-
CD-98-04	AEL98015188	12/16/98	Chromium, Hexavalent	mg/kg	1.93	No
CD-98-04	AEL98015188	12/16/98	Chromium, Total	mg/kg	34.4	-
CD-98-04	AEL98015188	12/16/98	Total Solids, %	Percent	96.9	-
CD-98-05	AEL98015341	12/17/98	Chromium, Hexavalent	mg/kg	156	Yes
CD-98-05	AEL98015341	12/17/98	Chromium, Total	mg/kg	353	-
CD-98-05	AEL98015341	12/17/98	Total Solids, %	Percent	97.1	-
CD-98-06	AEL98015342	12/17/98	Chromium, Hexavalent	mg/kg	3490	Yes
CD-98-06	AEL98015342	12/17/98	Chromium, Total	mg/kg	5150	-
CD-98-06	AEL98015342	12/17/98	Total Solids, %	Percent	96.4	-
CD-98-07	AEL98015343	12/17/98	Chromium, Hexavalent	mg/kg	970	Yes
CD-98-07	AEL98015343	12/17/98	Chromium, Total	mg/kg	1260	-
CD-98-07	AEL98015343	12/17/98	Total Solids, %	Percent	96.9	-

*Industrial/Commercial Direct Exposure Criteria (I/C DEC) for Hexavalent Chromium is 100 mg/kg.

Note: There is no I/C DEC for Total Chromium; however, the I/C DEC fro Trivalent Chromium is 51,000 mg/kg.

TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-98-01				SP-98-02				SP-98-03				SP-98-04			
					Samp Id	SP0100		SP0107		SP0200		SP0207		SP0300		SP0307		SP0400		SP0407	
					Samp Date	8/20/98		8/20/98		8/20/98		8/20/98		8/20/98		8/20/98		8/20/98		8/20/98	
					Start Depth	0.25		7		0.33		7		0.25		7		0.4		7	
					End Depth	2		9		2		9		2		9		2		9	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100	1.1	U	80.4		72.7		35.7		3.7		59.2		8.9		41.9	
	57-12-5	Cyanide	MG/KG		41,000	0.55	U			0.55	U			230				0.55	U		
	7439-96-5	Manganese	MG/KG			174				156				152				234			
	7440-02-0	Nickel	MG/KG		7,500	8.4				6.9				4.6	U			71.8			
	7440-44-0	Total Organic Carbon	MG/KG			110	U			110	U			120	U			140			
	7440-47-3	Total Chromium	MG/KG			705		586		279		162		910		1,380		46.8		252	
	FE2	Ferrous Iron	MG/KG																		
SPLP	7439-96-5	Manganese	MG/L																		
Inorganics	7440-47-3	Total Chromium	MG/L	0.5																	
TCLP	57-12-5	Cyanide	MG/L	2		0.01	U			0.01	U			0.01	U			0.01	U		
Inorganics	7440-47-3	Total Chromium	MG/L	0.5		**7.3**				**3.7**				**1.1**				0.1	U		

Notes:
Bold and shaded values indicate exceedance of CTDEP criteria
PMC = CTDEP Pollutant Mobility Criteria for GB aquifer
I/C DEC = CTDEP Industrial/Commercial Direct Exposure Criteria
Q = qualifier
U = not detected at a concentration above the reported value
J = reported value is estimated
MG/KG = milligrams per kilogram
MG/L = milligrams per Liter

TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-98-05				SP-98-06				SP-99-01				SP-99-02	
					Samp Id	SP0500		SP0507		SP0600		SP0607		SP9901000XX		SP9901004XX		SP9902000XX	
					Samp Date	8/20/98		8/20/98		8/20/98		8/20/98		1/6/99		1/6/99		1/6/99	
					Start Depth	0.33		7		0.33		7		0		4		4	
					End Depth	2		9		2		9		4		8		8	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100	11.9		5.9		1.6		1.2	U	0.85	U	0.894	U	1.222	J
	57-12-5	Cyanide	MG/KG		41,000	0.55	U			19				0.267	U	0.279	U		
	7439-96-5	Manganese	MG/KG			215				123				203					
	7440-02-0	Nickel	MG/KG		7,500	29.9				223									
	7440-44-0	Total Organic Carbon	MG/KG			110	U			120	U								
	7440-47-3	Total Chromium	MG/KG			1,380		15.3		574		6.6		7.01		6.01		13.5	
	FE2	Ferrous Iron	MG/KG																
SPLP	7439-96-5	Manganese	MG/L																
Inorganics	7440-47-3	Total Chromium	MG/L	0.5										0.05	U				
TCLP	57-12-5	Cyanide	MG/L	2		0.01	U			0.01	U								
Inorganics	7440-47-3	Total Chromium	MG/L	0.5		**21.8**				0.2									

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TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-99-03				SP-99-04				SP-99-05				SP-99-07			
					Samp Id	SP9903000XX		SP9903005XX		SP9904000XX		SP9904005XX		SP9905000XX		SP9905005XX		SP9907000XX		SP9907005XX	
					Samp Date	1/7/99		1/7/99		1/7/99		1/7/99		1/11/99		1/11/99		1/8/99		1/8/99	
					Start Depth	0		5		0		5		0		5		0		5	
					End Depth	2		7		2		7		4		7		2		7	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100	0.888	U, UJ	0.95	U, UJ	1.61	J	0.934	U, UJ	79.6		4.92	J	0.876	U, UJ	0.912	U, UJ
	57-12-5	Cyanide	MG/KG		41,000	0.278	U	0.299	U	0.291	U	0.292	U	0.416		0.287	U	0.495		0.285	U
	7439-96-5	Manganese	MG/KG			87.4				192				157				237			
	7440-02-0	Nickel	MG/KG		7,500																
	7440-44-0	Total Organic Carbon	MG/KG																		
	7440-47-3	Total Chromium	MG/KG			5.69		4.52	U	16.4		9.31		75.8		8.7		9.61		8.44	
	FE2	Ferrous Iron	MG/KG																		
SPLP	7439-96-5	Manganese	MG/L																		
Inorganics	7440-47-3	Total Chromium	MG/L	0.5		0.05	U			0.05	U			**1.31**				0.05	U		
TCLP	57-12-5	Cyanide	MG/L	2																	
Inorganics	7440-47-3	Total Chromium	MG/L	0.5																	

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MG/KG = milligrams per kilogram
MG/L = milligrams per Liter

TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-99-08				SP-99-09				SP-99-11				SP-99-12			
					Samp Id	SP9908002XX		SP9908007XX		SP9909000XX		SP9909005XX		SP9911000XX		SP9911006XX		SP9912000XX		SP9912005XX	
					Samp Date	2/7/99		2/7/99		1/9/99		1/9/99		1/5/99		1/6/99		1/12/99		1/12/99	
					Start Depth	0		5		0		5		0		6		0		5	
					End Depth	2		7		4		7		2		8		2		7	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100					16.58	J	1.708	J	**1,280**	J	**1,026**	J	**102.4**		7.1	J
	57-12-5	Cyanide	MG/KG		41,000	0.278	U	0.278	U	0.277	U	0.299	U	0.272	U	0.266	U	0.282	U	0.283	U
	7439-96-5	Manganese	MG/KG			238								224				238			
	7440-02-0	Nickel	MG/KG		7,500																
	7440-44-0	Total Organic Carbon	MG/KG																		
	7440-47-3	Total Chromium	MG/KG			31.8		7.47		49.9		21		888		504		56.3		12.5	
	FE2	Ferrous Iron	MG/KG																		
SPLP	7439-96-5	Manganese	MG/L							233											
Inorganics	7440-47-3	Total Chromium	MG/L	0.5		0.314				**0.865**				**25.5**				**1.82**			
TCLP	57-12-5	Cyanide	MG/L	2																	
Inorganics	7440-47-3	Total Chromium	MG/L	0.5																	

Notes:
Bold and shaded values indicate exceedance of CTDEP criteria
PMC = CTDEP Pollutant Mobility Criteria for GB aquifer
I/C DEC = CTDEP Industrial/Commercial Direct Exposure Criteria
Q = qualifier
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J = reported value is estimated
MG/KG = milligrams per kilogram
MG/L = milligrams per Liter

TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-99-13				SP-99-14				SP-99-17				SP-99-18			
					Samp Id	SP9913000XX		SP9913005XX		SP9914002XX		SP9914007XX		SP9917000XX		SP9917005XX		SP9918000XX		SP9918005XX	
					Samp Date	1/12/99		1/12/99		2/7/99		2/7/99		1/7/99		1/7/99		1/7/99		1/7/99	
					Start Depth	0		5		0		5		0		5		0		5	
					End Depth	2		7		2		7		2		7		2		7	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100	**160.2**		4.5	J					38	J	45.8		0.916	U	1.164	J
	57-12-5	Cyanide	MG/KG		41,000	0.281	U	0.287	U	0.278	U	1.43		5.91		0.294	U	0.286	U	0.298	U
	7439-96-5	Manganese	MG/KG					90.2				111		264				157			
	7440-02-0	Nickel	MG/KG		7,500																
	7440-44-0	Total Organic Carbon	MG/KG																		
	7440-47-3	Total Chromium	MG/KG			109		14.5		814		1,880		61.7		71.8		7.39		7.67	
	FE2	Ferrous Iron	MG/KG																		
SPLP Inorganics	7439-96-5	Manganese	MG/L																		
	7440-47-3	Total Chromium	MG/L	0.5				0.067				**2.09**		0.269				0.05	U		
TCLP Inorganics	57-12-5	Cyanide	MG/L	2																	
	7440-47-3	Total Chromium	MG/L	0.5																	

Notes:
Bold and shaded values indicate exceedance of CTDEP criteria
PMC = CTDEP Pollutant Mobility Criteria for GB aquifer
I/C DEC = CTDEP Industrial/Commercial Direct Exposure Criteria
Q = qualifier
U = not detected at a concentration above the reported value
J = reported value is estimated
MG/KG = milligrams per kilogram
MG/L = milligrams per Liter

TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-99-19				SP-99-20				SP-PILOT-01				SP-PILOT-02			
					Samp Id	SP9919000XX		SP9919005XX		SP9920000XX		SP9920005XX		SPP1A000XX		SPP1A005XX		SPP2A000XX		SPP2A005XX	
					Samp Date	1/7/99		1/7/99		1/7/99		1/10/99		1/10/99		1/10/99		1/10/99		1/10/99	
					Start Depth	0		5		0		5		2		2		2		2	
					End Depth	2		7		2		7		7		7		7		7	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100	2.8	J	9.84		1.068	J	0.946	U, UJ	43		9.95		48		4.33	
	57-12-5	Cyanide	MG/KG		41,000	11.2		0.302	U	0.288	U	3.93									
	7439-96-5	Manganese	MG/KG					140		205											
	7440-02-0	Nickel	MG/KG		7,500																
	7440-44-0	Total Organic Carbon	MG/KG																		
	7440-47-3	Total Chromium	MG/KG			127		48.4		19.6		6.83		67.1		19.5		85.2		13.5	
	FE2	Ferrous Iron	MG/KG											43	J	9.95	J	48	J	4.33	J
SPLP	7439-96-5	Manganese	MG/L																		
Inorganics	7440-47-3	Total Chromium	MG/L	0.5				0.05	U	0.05	U			**1.6**						0.161	
TCLP	57-12-5	Cyanide	MG/L	2																	
Inorganics	7440-47-3	Total Chromium	MG/L	0.5																	

Notes:
Bold and shaded values indicate exceedance of CTDEP criteria
PMC = CTDEP Pollutant Mobility Criteria for GB aquifer
I/C DEC = CTDEP Industrial/Commercial Direct Exposure Criteria
Q = qualifier
U = not detected at a concentration above the reported value
J = reported value is estimated
MG/KG = milligrams per kilogram
MG/L = milligrams per Liter

TABLE 6-3
INORGANICS IN SOIL EXCEEDING CTDEP CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

					Loc Id	SP-PILOT-03				SP-PILOT-04				SP-PILOT-05			
					Samp Id	SPP3A000XX		SPP3A005XX		SPP4A000XX		SPP4A004XX		SPP5A000XX		SPP5A005XX	
					Samp Date	1/10/99		1/10/99		1/10/99		1/10/99		1/10/99		1/10/99	
					Start Depth	3		3		4		4		6		6	
					End Depth	8		8		9		9		11		11	
Class	**CAS #**	**PARAMETER**	**UNITS**	**PMC**	**I/C DEC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	18540-29-9	Hexavalent Chromium	MG/KG		100	46.1		21.5		37.8		6.25		69.9		8.48	
	57-12-5	Cyanide	MG/KG		41,000												
	7439-96-5	Manganese	MG/KG														
	7440-02-0	Nickel	MG/KG		7,500												
	7440-44-0	Total Organic Carbon	MG/KG														
	7440-47-3	Total Chromium	MG/KG			69.3		38.7		58.4		17.5		79.2		23.5	
	FE2	Ferrous Iron	MG/KG			46.1	J	21.5	J	37.8		6.25	J	69.9		8.48	
SPLP Inorganics	7439-96-5	Manganese	MG/L														
	7440-47-3	Total Chromium	MG/L	0.5		**2.01**				**1.6**						0.301	
TCLP Inorganics	57-12-5	Cyanide	MG/L	2													
	7440-47-3	Total Chromium	MG/L	0.5													

Notes:
Bold and shaded values indicate exceedance of CTDEP criteria
PMC = CTDEP Pollutant Mobility Criteria for GB aquifer
I/C DEC = CTDEP Industrial/Commercial Direct Exposure Criteria
Q = qualifier
U = not detected at a concentration above the reported value
J = reported value is estimated
MG/KG = milligrams per kilogram
MG/L = milligrams per Liter

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-98-01				WP-98-02				WP-99-01								WP-99-02	
				Samp Id	WP01XX		WP9801007XX		WP02XX		WP9802007XX		WP9901008XX		WP9901020XX		WP9901025XX		WP9902012XX	
				Samp Date	8/20/98		8/20/98		8/20/98		8/20/98		1/6/99		1/24/99		1/24/99		1/21/99	
				Start Depth	6.5		5		7		5		8		16		21		8	
				End Depth	11.5		7		12		7		10		20		25		12	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006									0.0029							
	7440-47-3	Chromium	MG/L	1.2	5.2		5.2		0.026		0.026		0.079		0.1	U	0.1	U	1	
	7440-50-8	Copper	MG/L	0.048									0.061							
	57-12-5	Cyanide	MG/L	0.052	0.01	U			0.01	U			0.005	U						
		Cyanide, Reactive	MG/L		0.01	U	0.01	U	0.01	U	0.01	U	0.005	U						
		Ferrous Iron	MG/L		10.4		0.05	U	0.05	U	0.05	U			0.4		0.7		0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.05	U	10.4		0.02	U	0.02	U	0.02	U	0.1	U	0.1	U	1	
	7439-89-6	Iron	MG/L		4.4		4.4		0.05	U	0.05	U								
	7440-02-0	Nickel	MG/L	0.88	0.04	U	0.04	U	0.04	U	0.04	U	0.1	U						

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-02										WP-99-02			
				Samp Id	WP9902020XX		WP9902028XX		WP9902034XX		WP9902041XX		WP9902051XX		WP9902061XX		WP9902071XX	
				Samp Date	1/21/99		1/21/99		1/22/99		1/22/99		1/22/99		1/22/99		1/22/99	
				Start Depth	16		24		30		37		47		57		67	
				End Depth	20		28		34		41		51		61		71	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	1.5		350		75		0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
		Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	1.4		1		1.8		2.2	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	1.5		350		75		0.1	U	0.1	U	0.1	U	0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-02										WP-99-03			
				Samp Id	WP990234XX		WP990241XX		WP990251XX		WP990261XX		WP990271XX		WP9903009XX		WP9903015XX	
				Samp Date	1/22/99		1/22/99		1/22/99		1/22/99		1/22/99		1/24/99		1/24/99	
				Start Depth	30		37		47		57		67		5		11	
				End Depth	34		41		51		61		71		9		15	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006	0.001	U	0.0015		0.0014		0.0027		0.003					
	7440-47-3	Chromium	MG/L	1.2	53.1		0.015	U	0.015	U	0.015	U	0.015	U	7		9	
	7440-50-8	Copper	MG/L	0.048	0.04	U	0.04	U	0.04	U	0.04	U	0.04	U				
	57-12-5	Cyanide	MG/L	0.052	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U				
		Cyanide, Reactive	MG/L		0.005	U	0.005	U	0.005	U	0.005	U	0.005	U				
		Ferrous Iron	MG/L												0.1	U	0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	101.8		0.02	U	0.02	U	0.02	U	0.02	U	7		9	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U				

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-03													
				Samp Id	WP9903020XX		WP9903025XX		WP9903026XX		WP9903030XX		WP9903034XX		WP9903044XX		WP9903049XX	
				Samp Date	1/24/99		1/24/99		1/11/99		1/24/99		1/24/99		1/24/99		1/24/99	
				Start Depth	16		21		21		26		30		40		45	
				End Depth	20		25		25		30		34		44		49	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006					0.001	U								
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	7.17		8		0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048					0.04	U								
	57-12-5	Cyanide	MG/L	0.052					0.005	U								
		Cyanide, Reactive	MG/L						0.005	U								
		Ferrous Iron	MG/L		0.15		0.1	U			0.1	U	0.4		0.6		0.8	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	16.78		8		0.1	U	0.1	U	0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88					0.1	U								

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-04													
				Samp Id	WP9904010XX		WP9904020XX		WP9904026XX		WP9904034XX		WP9904044XX		WP9904054XX		WP9904066XX	
				Samp Date	1/22/99		1/22/99		1/22/99		1/22/99		1/22/99		1/22/99		1/22/99	
				Start Depth	6		16		22		30		40		50		62	
				End Depth	10		20		26		34		44		54		66	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	4.5		95		700		0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
		Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	1.2	F	1.2		1.2		0.6	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	4.5		95		700		0.1	U	0.1	U	0.1	U	0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-05												WP-99-06	
				Samp Id	WP9905010XX		WP9905020XX		WP9905030XX		WP9905040XX		WP9905050XX		WP9905060XX		WP9906012XX	
				Samp Date	1/23/99		1/23/99		1/23/99		1/23/99		1/23/99		1/23/99		1/23/99	
				Start Depth	6		16		26		36		46		56		8	
				End Depth	10		20		30		40		50		60		12	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.15		0.1	U
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
		Ferrous Iron	MG/L		0.6		0.8		1.6		1.4		1		0.6		1	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.15		0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-06												WP-99-07	
				Samp Id	WP9906020XX		WP9906030XX		WP9906036XX		WP9906046XX		WP9906056XX		WP9906066XX		WP9907007XX	
				Samp Date	1/23/99		1/23/99		1/23/99		1/23/99		1/23/99		1/23/99		1/7/99	
				Start Depth	16		26		32		42		52		62		7	
				End Depth	20		30		36		46		56		66		9	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006													0.001	U
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	13.8	
	7440-50-8	Copper	MG/L	0.048													0.04	U
	57-12-5	Cyanide	MG/L	0.052													0.005	U
		Cyanide, Reactive	MG/L														0.005	U
		Ferrous Iron	MG/L		0.2		1		0.8		1.2		1.2		0.8			
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	26.4	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88													0.1	U

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-08													
				Samp Id	WP9908012XX		WP9908019XX		WP9908025XX		WP9908030XX		WP9908035XX		WP9908040XX		WP9908045XX	
				Samp Date	2/9/99		2/9/99		2/9/99		2/9/99		2/9/99		2/9/99		2/9/99	
				Start Depth	8		15		21		26		31		36		41	
				End Depth	12		19		25		30		35		40		45	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	7		5		500		300		300		500		16	
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
		Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	7		5		500		300		300		500		16	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-08								WP-99-08		WP-99-09			
				Samp Id	WP9908050XX		WP9908055XX		WP9908060XX		WP9908065XX		WP9908070XX		WP9909007XX		WP9909019XX	
				Samp Date	2/9/99		2/9/99		2/9/99		2/9/99		2/9/99		1/8/99		1/27/99	
				Start Depth	46		51		56		61		66		7		15	
				End Depth	50		55		60		65		70		11		19	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006	0.0042										0.0044			
	7440-47-3	Chromium	MG/L	1.2	0.117	U	0.1	U	0.1	U	0.1	U	0.1	U	0.689		0.1	U
	7440-50-8	Copper	MG/L	0.048	0.04	U									0.085			
	57-12-5	Cyanide	MG/L	0.052	0.005	U									0.044			
		Cyanide, Reactive	MG/L												0.044			
		Ferrous Iron	MG/L		1		1		1		1		1				1	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	1.338		0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88	0.1	U									0.1	U		

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-09										WP-99-09		WP-99-10	
				Samp Id	WP9909024XX		WP9909029XX		WP9909034XX		WP9909040XX		WP9909050XX		WP9909060XX		WP9910012XX	
				Samp Date	1/27/99		1/27/99		1/27/99		1/27/99		1/27/99		1/27/99		1/25/99	
				Start Depth	20		25		30		36		46		56		8	
				End Depth	24		29		34		40		50		60		12	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006			0.001	U										
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.115	U	0.1	U	0.1	U	0.1	U	0.1	U	0.6	
	7440-50-8	Copper	MG/L	0.048			0.04	U										
	57-12-5	Cyanide	MG/L	0.052			0.011											
		Cyanide, Reactive	MG/L				0.011											
		Ferrous Iron	MG/L		0.8		0.8		0.8		1		1		0.6		0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.6	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88			0.1	U										

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-10												WP-99-11	
				Samp Id	WP9910019XX		WP9910024XX		WP9910029XX		WP9910034XX		WP9910040XX		WP9910050XX		WP9911007XX	
				Samp Date	1/25/99		1/25/99		1/25/99		1/25/99		1/25/99		1/25/99		1/8/99	
				Start Depth	15		20		25		30		36		46		7	
				End Depth	19		24		29		34		40		50		9	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006													0.001	U
	7440-47-3	Chromium	MG/L	1.2	0.9		4		4.5		0.1	U	0.1	U	0.1	U	0.249	
	7440-50-8	Copper	MG/L	0.048													0.04	U
	57-12-5	Cyanide	MG/L	0.052													0.008	
		Cyanide, Reactive	MG/L														0.008	
		Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	0.4		0.8		0.7			
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.9		4		4.5		0.1	U	0.1	U	0.1	U	0.5	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88													0.1	U

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-11													
				Samp Id	WP9911015XX		WP9911024XX				WP9911028XX		WP9911034XX		WP9911040XX		WP9911051XX	
				Samp Date	1/21/99		1/12/99		1/21/99		1/21/99		1/21/99		1/21/99		1/21/99	
				Start Depth	11		24		20		24		30		36		47	
				End Depth	15		28		24		28		34		40		51	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006			0.001	U										
	7440-47-3	Chromium	MG/L	1.2	0.1	U	55.2				50		60		0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048			0.04	U										
	57-12-5	Cyanide	MG/L	0.052			0.005	U										
		Cyanide, Reactive	MG/L				0.005	U										
		Ferrous Iron	MG/L						2.5		0.1	U	0.1	U	0.8		2	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	54.2		0.1	U	50		60		0.1	U	0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88			0.1	U										

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-11						WP-99-12				WP-99-12			
				Samp Id	WP991134MS		WP991134XX		WP991151XX		WP9912007XX		WP9912019XX		WP9912024XX			
				Samp Date	1/21/99		1/21/99		1/21/99		1/7/99		2/3/99		1/12/99		2/3/99	
				Start Depth	30		30		47		7		15		20		20	
				End Depth	34		34		51		9		19		24		24	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006	0.001	U	0.001	U	0.0066		0.0056				0.0018			
	7440-47-3	Chromium	MG/L	1.2	41.2		42.1		0.081		0.015	U	0.1	U	0.022		0.1	U
	7440-50-8	Copper	MG/L	0.048	0.04	U	0.04	U	0.04	U	0.423				0.047			
	57-12-5	Cyanide	MG/L	0.052	0.091		0.005	U	0.005	U	0.013				0.182			
		Cyanide, Reactive	MG/L		0.091		0.005	U	0.005	U	0.013				0.182			
		Ferrous Iron	MG/L										0.8				0.2	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	135		84.2		0.02	U	0.02	U	0.1	U	0.02	U	0.1	U
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88	0.1	U	0.1	U	0.1	U	0.1	U			0.17			

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-12								WP-99-13		WP-99-14		WP-99-15	
				Samp Id	WP9912028XX		WP9912034XX		WP9912040XX		WP9912050XX		WP9913007XX		WP9914007XX		WP9915009XX	
				Samp Date	2/3/99		2/3/99		2/3/99		2/3/99		1/8/99		1/8/99		1/20/99	
				Start Depth	24		30		36		46		7		7		7	
				End Depth	28		34		40		50		9		9		9	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006									0.001	U	0.001	U		
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.015	U	0.015	U	17	
	7440-50-8	Copper	MG/L	0.048									0.04	U	0.04	U		
	57-12-5	Cyanide	MG/L	0.052									0.005	U	0.005	U		
		Cyanide, Reactive	MG/L										0.005	U	0.005	U		
		Ferrous Iron	MG/L		0.2		0.8		1.6		2.2						0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.02	U	0.02	U	17	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88									0.1	U	0.1	U		

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-15													
				Samp Id	WP9915011XX		WP9915015XX		WP9915020XX		WP9915025XX		WP9915026XX		WP9915030XX		WP9915034XX	
				Samp Date	1/20/99		1/20/99		1/20/99		1/20/99		1/11/99		1/20/99		1/20/99	
				Start Depth	9		11		16		21		26		26		30	
				End Depth	11		15		20		25		30		30		34	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006									0.0173					
	7440-47-3	Chromium	MG/L	1.2	4		3		8		150		433		360		950	
	7440-50-8	Copper	MG/L	0.048									0.04	U				
	57-12-5	Cyanide	MG/L	0.052									0.535					
		Cyanide, Reactive	MG/L										0.535					
		Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	0.1	U			0.1	U	0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	4		3		8		150		694		360		950	
	7439-89-6	Iron	MG/L															
	7440-02-0	Nickel	MG/L	0.88									0.25					

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-15									
				Samp Id	WP9915040XX		WP9915044XX		WP9915050XX		WP9915060XX		WP991560XX	
				Samp Date	1/20/99		1/20/99		1/20/99		1/20/99		1/20/99	
				Start Depth	36		40		46		56		56	
				End Depth	40		44		50		60		60	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006									0.0029	
	7440-47-3	Chromium	MG/L	1.2	900		700		13		0.1	U	0.015	U
	7440-50-8	Copper	MG/L	0.048									0.04	U
	57-12-5	Cyanide	MG/L	0.052									0.005	U
		Cyanide, Reactive	MG/L										0.005	U
		Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	0.8			
	18540-29-9	Hexavalent Chromium	MG/L	0.11	900		700		13		0.1	U	0.02	U
	7439-89-6	Iron	MG/L											
	7440-02-0	Nickel	MG/L	0.88									0.1	U

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-16								WP-99-16					
				Samp Id	WP9916012XX		WP9916019XX		WP9916024XX		WP9916029XX		WP9916034XX		WP9916040XX		WP9916050XX	
				Samp Date	1/26/99		1/26/99		1/26/99		1/26/99		1/26/99		1/26/99		1/26/99	
				Start Depth	8		15		20		25		30		36		46	
				End Depth	12		19		24		29		34		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
	FE2	Ferrous Iron	MG/L		0.4		0.2		0.2		0.6		0.4		1		1	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-17													
				Samp Id	WP9917012XX		WP9917019XX		WP9917024XX		WP9917029XX		WP9917034XX		WP9917040XX		WP9917050XX	
				Samp Date	1/26/99		1/26/99		1/26/99		1/26/99		1/26/99		1/26/99		1/26/99	
				Start Depth	8		15		20		25		30		36		46	
				End Depth	12		19		24		29		34		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006									0.001	U				
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.115	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048									0.04	U				
	57-12-5	Cyanide	MG/L	0.052									0.005	U				
		Cyanide, Reactive	MG/L										0.005	U				
	FE2	Ferrous Iron	MG/L		0.3		0.2		0.2		1		0.2		0.3		0.2	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88									0.1	U				

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-18													
				Samp Id	WP9918012XX		WP9918019XX		WP9918024XX		WP9918029XX		WP9918034XX		WP9918040XX		WP9918050XX	
				Samp Date	1/27/99		1/27/99		1/27/99		1/27/99		1/27/99		1/27/99		1/27/99	
				Start Depth	8		15		20		25		30		36		46	
				End Depth	12		19		24		29		34		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006			0.001	U										
	7440-47-3	Chromium	MG/L	1.2	2.25		2.76		0.25		0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048			0.04	U										
	57-12-5	Cyanide	MG/L	0.052			0.009											
		Cyanide, Reactive	MG/L				0.009											
	FE2	Ferrous Iron	MG/L		0.1	U			0.1	U	0.8		1.4		0.8		0.6	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	2.25		2.87	U	0.25		0.1	U	0.1	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88			0.1	U										

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-19						WP-99-20							
				Samp Id	WP9919014XX		WP9919024XX		WP9919034XX		WP9920012XX		WP9920019XX		WP9920024XX		WP9920029XX	
				Samp Date	1/26/99		1/26/99		1/26/99		1/28/99		1/28/99		1/28/99		1/28/99	
				Start Depth	10		20		30		8		15		20		25	
				End Depth	14		24		34		12		19		24		29	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006													0.001	U
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	35		300		20.94	
	7440-50-8	Copper	MG/L	0.048													0.04	U
	57-12-5	Cyanide	MG/L	0.052													0.005	U
		Cyanide, Reactive	MG/L														0.005	U
	FE2	Ferrous Iron	MG/L		0.3		0.2		0.2		0.1	U	0.1	U	0.1	U	0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	35		300		21.32	
	7440-02-0	Nickel	MG/L	0.88													0.1	U

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-20								WP-99-21					
				Samp Id	WP9920034XX		WP9920040XX		WP9920050XX		WP9920060XX		WP9921014XX		WP9921024XX		WP9921029XX	
				Samp Date	1/28/99		1/28/99		1/28/99		1/28/99		1/28/99		1/28/99		1/28/99	
				Start Depth	30		36		46		56		10		20		25	
				End Depth	34		40		50		60		14		24		29	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	450		95		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
	FE2	Ferrous Iron	MG/L		0.1	U	0.1	U	0.4		0.4		0.6		0.6		1	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	450		95		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-21						WP-99-22							
				Samp Id	WP9921034XX		WP9921040XX		WP9921050XX		WP9922012XX		WP9922019XX		WP9922024MD		WP9922024MS	
				Samp Date	1/28/99		1/28/99		1/28/99		1/29/99		1/29/99		1/29/99		1/29/99	
				Start Depth	30		36		46		8		15		20		20	
				End Depth	34		40		50		12		19		24		24	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006											0.001	U		
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.015	U		
	7440-50-8	Copper	MG/L	0.048											0.04	U		
	57-12-5	Cyanide	MG/L	0.052											0.005	U	0.005	U
		Cyanide, Reactive	MG/L												0.005	U	0.005	U
	FE2	Ferrous Iron	MG/L		0.6		0.8		0.8		0.6		0.8					
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.02	U	0.02	U
	7440-02-0	Nickel	MG/L	0.88											0.1	U		

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-22										WP-99-23			
				Samp Id	WP9922024XD		WP9922024XX		WP9922029XX		WP9922034XX		WP9922040XX		WP9923012XX		WP9923019XX	
				Samp Date	1/29/99		1/29/99		1/29/99		1/29/99		1/29/99		2/3/99		2/3/99	
				Start Depth	20		20		25		30		36		8		15	
				End Depth	24		24		29		34		40		12		19	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006			0.001	U										
	7440-47-3	Chromium	MG/L	1.2			0.119	U	0.1	U	0.1	U	0.1	U	0.1	U	0.15	
	7440-50-8	Copper	MG/L	0.048			0.04	U										
	57-12-5	Cyanide	MG/L	0.052	0.005	U	0.005	U										
		Cyanide, Reactive	MG/L		0.005	U	0.005	U										
	FE2	Ferrous Iron	MG/L				1		0.4		0.8		0.4		1		0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.02	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.15	
	7440-02-0	Nickel	MG/L	0.88			0.1	U										

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-23		WP-99-24											
				Samp Id	WP9923025XX		WP9924015XX		WP9924024XX		WP9924029XX		WP9924034XX		WP9924040XX		WP9924050XX	
				Samp Date	2/3/99		2/4/99		2/4/99		2/4/99		2/4/99		2/4/99		2/4/99	
				Start Depth	21		11		20		25		30		36		46	
				End Depth	25		15		24		29		34		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006									0.001	U				
	7440-47-3	Chromium	MG/L	1.2	40		0.1	U	0.1	U	0.1	U	0.115	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048									0.04	U				
	57-12-5	Cyanide	MG/L	0.052									0.005	U				
		Cyanide, Reactive	MG/L										0.005	U				
	FE2	Ferrous Iron	MG/L		0.1	U	1.2		1		0.6		0.8		0.8		2.5	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	40		0.1	U	0.1	U	0.1	U	0.11	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88									0.1	U				

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-25								WP-99-25					
				Samp Id	WP9925012XX		WP9925019XX		WP9925024XX		WP9925029XX		WP9925034XX		WP9925040XX		WP9925050XX	
				Samp Date	2/6/99		2/6/99		2/6/99		2/6/99		2/6/99		2/6/99		2/6/99	
				Start Depth	8		15		20		25		30		36		46	
				End Depth	12		19		24		29		34		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
	FE2	Ferrous Iron	MG/L		0.6		0.4		0.1	U	1.2		0.6		0.6		0.2	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-26						WP-99-27							
				Samp Id	WP9926012XX		WP9926019XX		WP9926026XX		WP9927012XX		WP9927016XX		WP9927024XX		WP9927029XX	
				Samp Date	2/6/99		2/6/99		2/6/99		2/5/99		2/5/99		2/5/99		2/5/99	
				Start Depth	8		15		22		8		12		20		25	
				End Depth	12		19		26		12		16		24		29	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006													0.001	U
	7440-47-3	Chromium	MG/L	1.2	0.3		0.6		12		3.2		4.5		0.1	U	0.115	U
	7440-50-8	Copper	MG/L	0.048													0.04	U
	57-12-5	Cyanide	MG/L	0.052													0.005	U
		Cyanide, Reactive	MG/L														0.005	U
	FE2	Ferrous Iron	MG/L		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.8		1	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.3		0.6		12		3.2		4.5		0.1	U	0.11	U
	7440-02-0	Nickel	MG/L	0.88													0.1	U

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-27						WP-99-28						WP-99-28	
				Samp Id	WP9927034XX		WP9927040XX		WP9927050XX		WP9928012XX		WP9928019XX		WP9928024XX		WP9928029XX	
				Samp Date	2/5/99		2/5/99		2/5/99		2/4/99		2/4/99		2/4/99		2/4/99	
				Start Depth	30		36		46		8		15		20		25	
				End Depth	34		40		50		12		19		24		29	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006											0.001			
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.115	U	0.1	U
	7440-50-8	Copper	MG/L	0.048											0.04	U		
	57-12-5	Cyanide	MG/L	0.052											0.009			
		Cyanide, Reactive	MG/L												0.009			
	FE2	Ferrous Iron	MG/L		0.4		0.8		0.4		0.8		1		0.8		0.6	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88											0.1	U		

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-28				WP-99-29										
				Samp Id	WP9928034XX		WP9928040XX		WP9929012XX		WP9929017XX		WP9929022XX		WP9929029XX		WP9929040XX	
				Samp Date	2/4/99		2/4/99		2/4/99		2/4/99		2/4/99		2/4/99		2/4/99	
				Start Depth	30		37		8		13		18		25		36	
				End Depth	34		40		12		17		22		29		40	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	11	
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
	FE2	Ferrous Iron	MG/L				1.1		0.8		1.8		0.8		0.4		1	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	11	
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-29		WP-99-30								WP-99-31			
				Samp Id	WP9929050XX		WP9930012XX		WP9930019XX		WP9930024XX		WP9930030XX		WP9931012XX		WP9931019XX	
				Samp Date	2/4/99		2/6/99		2/6/99		2/6/99		2/6/99		2/5/99		2/5/99	
				Start Depth	46		8		15		21		28		8		15	
				End Depth	50		12		19		24		30		12		19	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006														
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	2.5		4.5	
	7440-50-8	Copper	MG/L	0.048														
	57-12-5	Cyanide	MG/L	0.052														
		Cyanide, Reactive	MG/L															
	FE2	Ferrous Iron	MG/L		1.8		0.4				0.6		1.8		0.1	U	0.1	U
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	2.5		4.5	
	7440-02-0	Nickel	MG/L	0.88														

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-31		WP-99-32								WP-99-32	
				Samp Id	WP9931024XX		WP9932012XX		WP9932019XX		WP9932025XX		WP9932031XX		WP9932040XX	
				Samp Date	2/5/99		2/8/99		2/8/99		2/8/99		2/8/99		2/8/99	
				Start Depth	20		8		15		21		27		36	
				End Depth	24		12		19		25		31		40	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
Inorganics	7440-43-9	Cadmium	MG/L	0.006												
	7440-47-3	Chromium	MG/L	1.2	0.15		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-50-8	Copper	MG/L	0.048												
	57-12-5	Cyanide	MG/L	0.052												
		Cyanide, Reactive	MG/L													
	FE2	Ferrous Iron	MG/L		0.2		0.2		0.6		0.4		0.2		0.2	
	18540-29-9	Hexavalent Chromium	MG/L	0.11	0.15		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	7440-02-0	Nickel	MG/L	0.88												

TABLE 6-4
INORGANICS IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	PZ-8D				PZ-PILOT-03	
				Samp Id	PZ8D034XX		WCPZ8D000XX		PZPILOT03008XX	
				Samp Date	1/13/99		1/13/99		1/10/99	
				Start Depth	24		24		6	
				End Depth	34		34		8	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q
	7440-43-9	Cadmium	MG/L	0.006			0.0019			
	7440-47-3	Chromium	MG/L	1.2	0.1	U	0.015	U	22.5	
	7440-50-8	Copper	MG/L	0.048			0.04	U		
	57-12-5	Cyanide	MG/L	0.052			0.005	U		
		Cyanide, Reactive	MG/L				0.005	U		
	FE2	Ferrous Iron	MG/L		0.1	U	0.01	U		
	18540-29-9	Hexavalent Chromium	MG/L	0.11			0.01	U	22.5	
	7440-02-0	Nickel	MG/L	0.88			0.1	U		
	7440-66-6	Zinc	MG/L	0.123			0.05	U		

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-01										CP-99-02					
				Samp Id	CP9901080XX		CP9901098XX		CP9901130XX		CP990142XX		CP990156XX		CP9902006XX		CP9902020XX		CP9902032XX	
				Samp Date	5/5/99		5/5/99		5/5/99		5/5/99		5/5/99		5/6/99		5/6/99		5/6/99	
				Start Depth	78		96		128		40		54		4		18		30	
				End Depth	80		98		130		42		56		6		20		32	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.0078		0.0014	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
	79-01-6	Trichloroethene	MG/L	2.34	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.0015		0.015		0.0077	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001		0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-02												CP-99-03			
				Samp Id	CP9902044XX		CP9902096XX		CP9902133MD		CP9902133MS		CP9902133XD		CP9902133XX		CP9903039XX		CP9903056XX	
				Samp Date	5/6/99		5/6/99		5/6/99		5/6/99		5/6/99		5/6/99		5/10/99		5/10/99	
				Start Depth	42		94		131		131		131		131		37		54	
				End Depth	44		96		133		133		133		133		39		56	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.0058		0.0057		0.001	U	0.001	U	0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	0.0046		0.0044		0.001	U	0.001	U	0.001	U	0.001	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	0.0045		0.0052		0.001	U	0.001	U	0.001	U	0.001	U
	79-01-6	Trichloroethene	MG/L	2.34	0.001	U	0.001	U	0.0043		0.0042		0.001	U	0.001	U	0.001	U	0.001	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-03						CP-99-04									
				Samp Id	CP9903076XX		CP9903097XX		CP9903114XX		CP9904034XX		CP9904045XX		CP9904088XX		CP9904112XX		CP9904159XX	
				Samp Date	5/10/99		5/10/99		5/10/99		5/7/99		5/7/99		5/7/99		5/7/99		5/7/99	
				Start Depth	74		95		112		32		43		86		110		157	
				End Depth	76		97		114		34		45		88		112		159	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.001	U	0.0016		0.0011		0.0015		0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	0.001	U	0.013		0.0054		0.003		0.0012		0.001	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	0.001	U	0.001		0.001	U	0.001	U	0.001	U	0.001	U
	79-01-6	Trichloroethene	MG/L	2.34	0.001	U	0.001	U	0.001	U	0.091		0.089		0.03		0.039		0.081	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.0036		0.0034		0.001	U	0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-05										CP-99-06					
				Samp Id	CP9905032XX		CP9905057XX		CP9905074XX		CP9905099XX		CP9905131XX		CP9906030XX		CP9906052XX		CP9906080MD	
				Samp Date	5/7/99		5/7/99		5/7/99		5/7/99		5/7/99		5/9/99		5/9/99		5/9/99	
				Start Depth	30		55		72		97		129		28		50		78	
				End Depth	32		57		74		99		131		30		52		80	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.023	E	0.012		0.02	E
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.76		0.001	U	0.0047	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.0048		0.001	U	0.0042	
	79-01-6	Trichloroethene	MG/L	2.34	0.001	U	0.001	U	0.0015		0.0012		0.017	E	1.6		0.0012		0.0059	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.014		0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-06										CP-99-07					
				Samp Id	CP9906080MS		CP9906080XD		CP9906080XX		CP9906114XX		CP9906128XX		CP9907020XX		CP9907039XX		CP9907070XX	
				Samp Date	5/9/99		5/9/99		5/9/99		5/9/99		5/9/99		5/11/99		5/11/99		5/11/99	
				Start Depth	78		78		78		112		126		18		37		68	
				End Depth	80		80		80		114		128		20		39		70	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.025	E	0.024		0.014		0.0079		0.036		0.001	U	0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.0048		0.001	U	0.001	U	0.001	U	0.001	U	0.0017		0.0054		0.001	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.0041		0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.0021		0.001	U
	79-01-6	Trichloroethene	MG/L	2.34	0.006		0.0017		0.0015		0.001	U	0.004		0.0017		0.0019		0.001	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-07				CP-99-08								CP-99-08			
				Samp Id	CP9907086XX		CP9907115XX		CP9908034XX		CP9908046XX		CP9908062XX		CP9908073MD		CP9908073MS		CP9908073XD	
				Samp Date	5/11/99		5/11/99		5/19/99		5/19/99		5/19/99		5/19/99		5/19/99		5/19/99	
				Start Depth	84		113		32		44		60		71		71		71	
				End Depth	86		115		34		46		62		73		73		73	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	280	E	170	E	13	E	4.6		4.3		4.5	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	9		7.5		0.71		0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	5	U	5	U	0.5	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.001	U	0.001	U	28		19		1.6		0.46		0.48		0.47	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	5	U	5	U	0.5	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-08								CP-99-09						CP-99-10	
				Samp Id	CP9908073XX		CP9908101XX		CP9908135XX		CP9908158XX		CP9909011XX		CP9909035XX		CP9909090XX		CP9910029XX	
				Samp Date	5/19/99		5/19/99		5/8/99		5/8/99		5/9/99		5/9/99		5/9/99		5/18/99	
				Start Depth	71		99		133		156		9		33		88		27	
				End Depth	73		101		135		158		11		35		90		29	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	3	E	3.3	E	160		210		0.0034		0.027	E	12	E	0.03	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.075		0.13		2.2		3.1		0.011		0.074	E	0.5	U	0.06	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	1	U	1	U	0.001	U	0.0043		0.5	U	0.046	
	79-01-6	Trichloroethene	MG/L	2.34	0.53	E	0.81	E	19	E	20	E	0.0018		0.0098		0.5	U	21	E
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	1	U	1	U	0.054	E	0.35	E	0.5	U	0.01	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-10										CP-99-11					
				Samp Id	CP9910036XX		CP9910043XX		CP9910050XX		CP9910060XX		CP9910075XX		CP9911016XX		CP9911047XX		CP9911060XX	
				Samp Date	5/18/99		5/18/99		5/18/99		5/18/99		5/18/99		5/12/99		5/12/99		5/12/99	
				Start Depth	34		41		48		58		73		14		45		58	
				End Depth	36		43		50		60		75		16		47		60	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.0046		0.0099		0.001	U	0.0016		0.059		0.001	U	0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.24		0.67		0.0081		0.018	E	0.55	E	0.001	U	0.001	U	0.001	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.039	E	0.054	E	0.0023		0.0015		0.025	U	0.001	U	0.0027		0.001	U
	79-01-6	Trichloroethene	MG/L	2.34	1.4		1.4		1		0.05		0.065		0.0021		0.019	E	0.0052	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.001	U	0.025	U	0.0038		0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-11				CP-99-12										CP-99-14	
				Samp Id	CP9911078XD		CP9911078XX		CP9912011XX		CP9912021XX		CP9912056XX		CP9912092XX		CP9912122XX		CP9914018XX	
				Samp Date	5/12/99		5/12/99		5/10/99		5/10/99		5/10/99		5/10/99		5/10/99		5/19/99	
				Start Depth	76		76		9		19		54		90		120		16	
				End Depth	78		78		11		21		56		92		122		18	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	0.0023		0.0058		0.001	U	0.001	U	0.001	U	0.0056	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0.0067	
	79-01-6	Trichloroethene	MG/L	2.34	0.001	U	0.001	U	0.003		0.0065		0.0011		0.001		0.001	U	0.0066	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.047	EJ	0.16	EJ	0.003		0.001	U	0.001	U	0.0057	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-14				CP-99-17								CP-99-18			
				Samp Id	CP9914031XX		CP9914042XX		CP9917032XX		CP9917046XX		CP9917063XX		CP99170XXXX		CP9918013MD		CP9918013MS	
				Samp Date	5/19/99		5/19/99		5/26/99		5/26/99		5/26/99		5/26/99		5/25/99		5/25/99	
				Start Depth	29		40		30		44		61		18		11		11	
				End Depth	31		42		32		46		63		20		13		13	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.01	U	0.01	U	97	E	0.73		0.74		93	E	0.0021		0.0022	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.07		0.066		8.1	E	0.5	U	0.012		8.9	E	0.0041		0.0041	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.013		0.012		0.5	U	0.5	U	0.01	U	0.5	U	0.003		0.0032	
	79-01-6	Trichloroethene	MG/L	2.34	0.015		0.044		92	E	10	E	0.6		94	E	0.035		0.041	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.065		0.067		0.5	U	0.5	U	0.01	U	0.5	U	0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-18															
				Samp Id	CP9918013XD		CP9918013XX		CP9918035XX		CP9918046XX		CP9918073XX		CP9918100XX		CP9918134XX		CP9918148XX	
				Samp Date	5/25/99		5/25/99		5/25/99		5/25/99		5/25/99		5/25/99		5/25/99		5/25/99	
				Start Depth	11		11		33		44		71		98		132		146	
				End Depth	13		13		35		46		73		100		134		148	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.0022		0.0023		0.075		0.041		0.0034		0.016		0.01	U	0.01	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.004		0.0045		0.01	U	0.0012		0.0016		0.097		0.11		0.11	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.0036		0.0033		0.01	U	0.001	U	0.001	U	0.01	U	0.01	U	0.01	U
	79-01-6	Trichloroethene	MG/L	2.34	0.037		0.035		0.034		0.0086		0.02		0.03		0.018		0.025	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.01	U	0.001	U	0.001	U	0.01	U	0.01	U	0.01	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	CP-99-18		ECD-4		EW-99-01		MW-1		MW-2		MW-4	
				Samp Id	CP991861XX		WCECD4000XX		EW01090199XX		MW-1		MW-2		MW-4	
				Samp Date	5/25/99		2/11/99		9/1/99		7/12/99		7/12/99		7/12/99	
				Start Depth	59		8		20		2		2		5	
				End Depth	61		18		40		15		15		15	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.0018		0.0038		12	U	0.0012	J	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.0042		12	U	0.0016	J	0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.024		12	U	0.069		0	U	0	U
	79-01-6	Trichloroethene	MG/L	2.34	0.0028		0.112		400		0.083		0	U	0	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.002	U	12	U	0	U	0.0022	J	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP2-1										DP2-2									
				Samp Id	DP21-07		DP21-15		DP21-30		DP21-50		DP21-60		DP22-08		DP22-20		DP22-30		DP22-40		DP22-50	
				Samp Date	5/4/99		5/4/99		5/4/99		5/3/99		5/3/99		5/5/99		5/5/99		5/5/99		5/4/99		5/4/99	
				Start Depth	4		12		27		47		57		5		17		27		37		47	
				End Depth	7		15		30		50		60		8		20		30		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.005	U	0.0025	U	0.005	U	0.001	U	0.001	U	0.48		0.001	U	0.001	UJ	0.001	U	0.001	UJ
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.005	U	0.0025	U	0.005	U	0.001	U	0.001	U	0.22		0.0029		0.0083	J	0.036		0.014	J
	127-18-4	Tetrachloroethene	MG/L	0.088	0.005	U	0.0025	U	0.0012	J	0.001	U	0.001	U	0.0062		0.0002	J	0.0007	J	0.032		0.031	J
	79-01-6	Trichloroethene	MG/L	2.34	0.005	U	0.0025	U	0.0013	J	0.001	U	0.0003	J	0.04	J	0.011		0.058	J	1.4		1.6	J
	75-01-4	Vinyl Chloride	MG/L	15.75	0.005	U	0.0025	U	0.011		0.001	U	0.001	U	0.02		0.62		1.4	J	0.097	J	0.025	J

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP2-2		DP2-3										DP2-4					
				Samp Id	DP22-60		DP23-08		DP23-15		DP23-30		DP23-50		DP23-60		DP24-08		DP24-15		DP24-25	
				Samp Date	5/4/99		5/5/99		5/5/99		5/5/99		5/5/99		5/5/99		5/6/99		5/6/99		5/6/99	
				Start Depth	57		5		12		27		47		57		5		12		22	
				End Depth	60		8		15		30		50		60		8		15		25	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.52		0.011		0.11		0.001	UJ	0.001	UJ	0.0058		0.001	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.0012		0.001	U	0.005	U	0.001	UJ	0.002	J	0.001	U	0.0003	J	0.034	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.036		0.0012		0.0021	J	0.0046	J	0.019	J	0.0018		0.0051		0.41	
	79-01-6	Trichloroethene	MG/L	2.34	0.0068		0.0074		0.0005	J	0.0011	J	0.058	J	0.34	J	0.0034		0.0067		0.74	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.001	U	0.013		0.04	J	0.28	J	0.001	U	0.001	U	0.0089	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP2-4						DP2-5										DP2-6			
				Samp Id	DP24-35		DP24-45		DP24-55		C-55-11		C-56-01		C-56-02		C-56-03		C-56-04		C-57-08			
				Samp Date	5/6/99		5/6/99		5/6/99		5/20/99		5/21/99		5/21/99		5/21/99		5/21/99		5/24/99			
				Start Depth	32		42		52		47		37		27		17		5		27		37	
				End Depth	35		45		55		50		40		30		20		8		30		40	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.001	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.04	J	0.068		0.022	J	0.019		0.265		0.029		0.335		0.065		0.27		0.32	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.33		0.39		0.095		0.005		0.025		0	U	0.006		0	U	0.02		0.085	
	79-01-6	Trichloroethene	MG/L	2.34	0.94		1.3		0.37		0.015		0.055		0	U	0.01		0	U	0.038		0.15	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.012		0.019		0.001	U	0.013		0.625		0.014		0.235		0.13		0.11		0.078	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP2-6				DP2-7												DP2-8			
				Samp Id	C-57-12		C-57-13		C-58-03		C-58-04		C-58-06		C-58-07		C-58-08		C-58-09		C-60-07		C-60-08	
				Samp Date	5/24/99		5/24/99		5/25/99		5/25/99		5/25/99		5/25/99		5/25/99		5/25/99		5/27/99		5/27/99	
				Start Depth	17		5		57		47		37		27		17		5		57		47	
				End Depth	20		8		60		50		40		30		20		8		60		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.015		0	U	0	U	0	U	0.013		0.12		0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.21		0.045		0.034		0.03		0.21		0.225		0.05		0.009		0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.013		0	U	0.075		1.6		0.29		0.42		0.275		0.014		0.51		0.24	
	79-01-6	Trichloroethene	MG/L	2.34	0.01		0	U	0.76		3.9		4.1		3.1		0.475		0.012		2.3		1.175	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.09		0.01		0	U	0	U	0.012		0.075		0	U	0.062		0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP2-8								DP2-9			
				Samp Id	C-60-09		C-60-10		C-60-11		C-61-01		C-62-01		C-62-02	
				Samp Date	5/27/99		5/27/99		5/27/99		5/28/99		6/1/99		6/1/99	
				Start Depth	37		27		17		5		20		5	
				End Depth	40		30		20		8		23		8	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0.13		0.005	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.091		0.155		0.175		0	U	0.41		0.07	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.585		0.75		0.35		0.005		0.165		0.015	
	79-01-6	Trichloroethene	MG/L	2.34	2.045		2.4		1.05		0.017		0.333		0.058	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.065		0.107		0.175		0.021		0.15		0.03	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-1												DP5-10							
				Samp Id	C-47-01		C-47-02		C-47-03		C-47-04		C-47-05		C-47-06		C-56-05		C-56-06		C-56-07		C-56-09	
				Samp Date	5/7/99		5/7/99		5/7/99		5/7/99		5/7/99		5/7/99		5/21/99		5/21/99		5/21/99		5/21/99	
				Start Depth	28		17		5		57		47		37		57		47		37		27	
				End Depth	31		20		8		60		50		40		60		50		40		30	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.102		0.056		0.244		0.096		0.015		0.035		0	U	0.034		0.165		0.033	
	79-01-6	Trichloroethene	MG/L	2.34	0.176		0.094		0.071		0.195		0.064		0.044		0.007		0.205		0.31		0.055	
	75-01-4	Vinyl Chloride	MG/L	15.75													0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-10										DP5-11						DP5-11			
				Samp Id	DP510-20		DP510-30		DP510-30R2		C-56-10		C-56-11		C-63-05		C-63-06		C-63-07		C-63-08		C-63-09	
				Samp Date	5/21/99		5/21/99		5/21/99		5/21/99		5/21/99		6/1/99		6/1/99		6/1/99		6/1/99		6/1/99	
				Start Depth	18		28		28		17		5		57		47		37		27		17	
				End Depth	20		30		30		20		8		60		50		40		30		20	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0.00028	J	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0.001		0	U	0	U	0	U	0.01		0.035		0.009		0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0	U	0	U	0	U	0.019		0.081		0	U	0	U	0.088		0.007		0.009	
	79-01-6	Trichloroethene	MG/L	2.34	0	U	0	U	0	U	0.02		0.05		0.038		0.06		0.17		0.014		0.014	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-11		DP5-12										DP5-2						DP5-3	
				Samp Id	C-63-10		DP5-12A		DP5-12B		DP5-12C		DP5-12D		DP5-12E		C-48-01		C-48-02		C-48-03		C-40-01	
				Samp Date	6/1/99		11/5/99		11/5/99		11/5/99		11/5/99		11/5/99		5/10/99		5/10/99		5/10/99		5/11/99	
				Start Depth	5		17		27		37		47		57		27		17		5		37	
				End Depth	8		20		30		40		50		60		30		20		8		40	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U											0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0	U	0	U	0	U	0.0038		0	U	0.034		0	U	0	U	0.016	
	127-18-4	Tetrachloroethene	MG/L	0.088	0	U	0	U	0	U	0	U	0.12		0.0042		0.45		0.14		0.069		0.12	
	79-01-6	Trichloroethene	MG/L	2.34	0	U	0	U	0	U	0	U	0.0015		0	U	0.65		0.2		0.066		1.1	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U											0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-3								DP5-4								DP5-5			
				Samp Id	C-40-02		C-40-03		C-40-04		C-48-04		C-49-05		C-50-01		C-50-02		C-50-03		C-50-04		C-50-05	
				Samp Date	5/11/99		5/11/99		5/11/99		5/10/99		5/11/99		5/12/99		5/12/99		5/12/99		5/12/99		5/12/99	
				Start Depth	27		17		7		47		57		47		37		27		57		47	
				End Depth	30		20		10		50		60		50		40		30		60		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0	U	0	U	0	U	0	U	0.005		0.165		0.025		0	U	0.04	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.16		0.02		0.08		0.03		0.05		0.015		0.04		0.41		0	U	0.1	
	79-01-6	Trichloroethene	MG/L	2.34	0.35		0.055		0.11		0.115		0.27		0.11		0.087		0.53		0	U	0.135	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0	U	0.024		0	U	0	U	0.005		0.035		0.005		0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-5								DP5-6											
				Samp Id	C-51-01		C-51-02		C-51-03		C-51-04		C-53-03		C-53-04		C-53-05		C-54-02		C-54-05		C-54-07	
				Samp Date	5/13/99		5/13/99		5/13/99		5/13/99		5/18/99		5/18/99		5/18/99		5/19/99		5/19/99		5/19/99	
				Start Depth	37		27		17		7		57		47		37		27		17		5	
				End Depth	40		30		20		10		60		50		40		30		20		8	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.175		0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.15		0.02		0.015		0	U	0.35		0	U	0	U	0	U	0.026		0.012	
	79-01-6	Trichloroethene	MG/L	2.34	0.24		0.017		0.017		0	U	0.83		0.063		0.028		0.005		0.028		0.012	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.035		0	U	0	U	0	U	0.015		0	U	0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-7												DP5-8							
				Samp Id	C-55-05		C-55-06		C-55-07		C-55-08		C-55-09		C-56-08		C-54-12		C-54-13		C-55-01		C-55-02	
				Samp Date	5/20/99		5/20/99		5/20/99		5/20/99		5/20/99		5/21/99		5/19/99		5/19/99		5/20/99		5/20/99	
				Start Depth	57		47		37		27		17		5		57		47		37		27	
				End Depth	60		50		40		30		20		8		60		50		40		30	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0	U	0.025		0	U	0	U	0	U	0	U	0	U	0.015		0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.05		0.033		0.34		0.125		0.019		0	U	0.01		0.01		0.18		0.05	
	79-01-6	Trichloroethene	MG/L	2.34	0.12		0.14		0.7		0.23		0.018		0	U	0.009		0.17		0.685		0.098	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP5-8				DP5-9												DP6-1			
				Samp Id	C-55-03		C-55-04		C-55-12		C-55-13		C-55-14		C-55-15		C-55-16		C-55-17		C-52-01		C-52-02	
				Samp Date	5/20/99		5/20/99		5/20/99		5/20/99		5/20/99		5/20/99		5/20/99		5/20/99		5/25/99		5/25/99	
				Start Depth	17		5		57		47		37		27		17		5		57		47	
				End Depth	20		8		60		50		40		30		20		8		60		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0	U	0	U	0	U	0.007		0	U	0	U	0	U	0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.025		0.008		0	U	0	U	0.215		0.023		0.035		0.035		0	U	0	U
	79-01-6	Trichloroethene	MG/L	2.34	0.043		0.036		0	U	0.11		0.365		0.04		0.063		0.005		0.016		0.016	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0.04		0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP6-1								DP6-2											
				Samp Id	C-52-03		C-59-02		C-59-03		C-59-04		C-59-05		C-59-06		C-59-07		C-59-08		C-59-09		C-59-10	
				Samp Date	5/25/99		5/26/99		5/26/99		5/26/99		5/26/99		5/26/99		5/26/99		5/26/99		5/26/99		5/26/99	
				Start Depth	37		27		17		5		57		47		37		27		17		5	
				End Depth	40		30		20		8		60		50		40		30		20		8	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0	U	0.009		0	U	0	U	0	U	0.028		0	U	0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0	U	0	U	0	U	0	U	0	U	0.011		0.325		0.02		0.012		0.008	
	79-01-6	Trichloroethene	MG/L	2.34	0.008		0.008		0	U	0.005		0.038		0.1		0.67		0.026		0.011		0.014	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0	U	0.016		0	U	0	U	0	U	0.005		0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP6-3												DP6-4							
				Samp Id	C-60-01		C-60-02		C-60-03		C-60-04		C-60-05		C-61-02		C-62-03		C-62-04		C-63-01		C-63-02	
				Samp Date	5/27/99		5/27/99		5/27/99		5/27/99		5/27/99		5/28/99		6/1/99		6/1/99		6/2/99		6/2/99	
				Start Depth	57		47		37		27		17		5		57		47		37		27	
				End Depth	60		50		40		30		20		8		60		50		40		30	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0	U	0	U	0	U	0	U	0.675		0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0.11		0.035		0	U	0.027		3.9		0	U	0	U	0.055		0.124	
	127-18-4	Tetrachloroethene	MG/L	0.088	0	U	0	U	0	U	0	U	0	U	0.038		0	U	0	U	0	U	0.034	
	79-01-6	Trichloroethene	MG/L	2.34	0.038		0.008		0	U	0	U	0	U	0.15		0.005		0	U	0.015		0.027	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0.048		0.063		0	U	0.02		0.97		0	U	0	U	0.33		0.2	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	DP6-4			
				Samp Id	C-63-03		C-63-04	
				Samp Date	6/2/99		6/2/99	
				Start Depth	17		5	
				End Depth	20		8	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.057		0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.088		0.012	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.027		0	U
	79-01-6	Trichloroethene	MG/L	2.34	0.05		0	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.065		0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-08						WP-99-09		WP-99-33					
				Samp Id	WP9908012XX		WP9908030XX		WP9908050XX		WP9909029XX		WP9933030XX		WP9933040XX		WP9933050XX	
				Samp Date	2/9/99		2/9/99		2/9/99		1/27/99		3/8/99		3/8/99		3/8/99	
				Start Depth	8		26		46		25		26		36		46	
				End Depth	12		30		50		29		30		40		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.02	H	1	U	0.001	U	0.1	U	100	U	5	U	0.5	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.017	H	1	U	0.001	U	0.1	U	100	U	5	U	0.5	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.0048		1	U	0.001	U	0.12		100	U	5	U	0.5	U
	79-01-6	Trichloroethene	MG/L	2.34	0.11	H	110	H	0.17		130	H	830		12		2.9	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	1	U	0.001	U	0.1	U	100	U	5	U	0.5	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-33				WP-99-34								WP-99-35	
				Samp Id	WP9933066XX		WP9933080XX		WP99034040XX		WP9934020XX		WP9934030XX		WP9934040XX		WP9935026XX	
				Samp Date	3/8/99		3/9/99		3/9/99		3/9/99		3/9/99		3/9/99		3/9/99	
				Start Depth	62		76		36		16		26		36		22	
				End Depth	66		80		40		20		30		40		26	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	1	U	0.056	U	1	U	0.2	U	25	U	2	U	0.023	E
	75-35-4	1,1-Dichloroethene	MG/L	0.096	1	U	0.34		1	U	0.2	U	25	U	2	U	2.5	
	127-18-4	Tetrachloroethene	MG/L	0.088	1	U	0.055	U	1	U	0.2	U	25	U	2	U	0.022	E
	79-01-6	Trichloroethene	MG/L	2.34	1.4		0.72		29	E	1.23		390	E	31		12	
	75-01-4	Vinyl Chloride	MG/L	15.75	1	U	0.051	U	1	U	0.2	U	25	U	2	U	0.004	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-36								WP-99-37					
				Samp Id	WP9936022XX		WP9936034XX		WP9936048XD		WP9936048XX		WP9937020XX		WP9937030XX		WP9937044XX	
				Samp Date	3/9/99		3/9/99		3/9/99		3/9/99		3/9/99		3/9/99		3/9/99	
				Start Depth	18		30		44		44		16		26		40	
				End Depth	22		34		48		48		20		30		44	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	1	U	10	U	1	U	0.1	U	1	J	10	U	10	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	1	U	10	U	1	U	0.1	U	1	J	10	U	10	U
	127-18-4	Tetrachloroethene	MG/L	0.088	1	U	10	U	1	U	0.26		1	J	10	U	10	U
	79-01-6	Trichloroethene	MG/L	2.34	1.4		23		10		11		1	J	18		17	
	75-01-4	Vinyl Chloride	MG/L	15.75	1	U	10	U	1	U	0.1	U	1	J	10	U	10	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-38		WP-99-39		WP-99-40				WP-99-41					
				Samp Id	WP9938026XX		WP9939027XX		WP9940020XX		WP9940031XX		WP9941010XX		WP9941022XX		WP9941030XX	
				Samp Date	3/10/99		3/10/99		3/11/99		3/11/99		3/11/99		3/11/99		3/11/99	
				Start Depth	22		23		16		27		6		18		26	
				End Depth	26		27		20		31		10		22		30	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	1	U	0.1	U	1	U	2	U	0.44		5.1		10.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	1	U	0.1	U	1	U	2	U	1.4		3.7		10.11	U
	127-18-4	Tetrachloroethene	MG/L	0.088	1	U	0.1	U	1	U	2	U	0.1	U	0.1	U	10.42	U
	79-01-6	Trichloroethene	MG/L	2.34	5		0.27		1.1		29		0.98		1.9		71	
	75-01-4	Vinyl Chloride	MG/L	15.75	1	U	0.1	U	1	U	2	U	0.1	U	0.1	U	10.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-41								WP-99-42		WP-99-43			
				Samp Id	WP9941040XX		WP9941060XX		WP9941081XD		WP9941081XX		WP9942023XX		WP9943010XX		WP9943020XX	
				Samp Date	3/11/99		3/11/99		3/11/99		3/11/99		3/11/99		3/11/99		3/11/99	
				Start Depth	36		56		77		77		19		6		16	
				End Depth	40		60		81		81		23		10		20	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.01	U	0.01	U	0.007		0.0127		0.1	U	0.31		0.99	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.065		0.01	U	0.01		0.0202		0.16		1.5		2.4	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.3		0.013		0.002		0.007	U	0.1	U	0.1	U	0.12	
	79-01-6	Trichloroethene	MG/L	2.34	7.6		0.1		0.02		0.046		0.4		1.2		1.8	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.013		0.01	U	0.001	U	0.006	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-43										WP-99-44			
				Samp Id	WP9943030XD		WP9943030XX		WP9943040XX		WP9943060XX		WP9943082XX		WP9944029XX		WP9944050XX	
				Samp Date	3/11/99		3/11/99		3/11/99		3/11/99		3/11/99		3/12/99		3/12/99	
				Start Depth	26		26		36		56		78		25		46	
				End Depth	30		30		40		60		82		29		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U	0.1	U	0.004		0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.43		0.44		0.1	U	0.017		0.05		0.2		0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.48		0.42		0.12		0.1	U	0.005		0.58		0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	1.8		1.7		0.75		0.05		0.1		4.9		0.64	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	0.1	U	0.1	U	0.1	U	0.001	U	0.11		0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-44		WP-99-45								WP-99-46		WP-99-46	
				Samp Id	WP9944069XX		WP9945015XX		WP9945030XX		WP9945040XX		WP9945060XX		WP9946035XD		WP9946035XX	
				Samp Date	3/12/99		3/16/99		3/16/99		3/16/99		3/16/99		3/17/99		3/17/99	
				Start Depth	65		11		26		36		56		31		31	
				End Depth	69		15		30		40		60		35		35	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	1.5		0	U	0	U	0.001	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	4.5		0	U	0	U	0.002		0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.1	U	1.9		0	U	0	U	0.002		0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.13		5.9		4		6		0.008		0.34		0.33	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	1	U	0	U	0	U	0.001		1		1.1	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-47				WP-99-48				WP-99-49					
				Samp Id	WP9947010XX		WP9947021XX		WP9948009XX		WP9948019XX		WP9949008XX		WP9949021XX		WP9949043XX	
				Samp Date	3/17/99		3/17/99		3/18/99		3/18/99		3/18/99		3/18/99		3/18/99	
				Start Depth	6		17		5		15		4		17		39	
				End Depth	10		21		9		19		8		21		43	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	7.7		18.4		100		2		0.01	U	0.06		1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	4.2		8.7		8.5		4		0.01	U	0.25		1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.63	U	2.1	U	1	U	1	U	0.01	U	0.015		1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.68	U	2.9	U	1.5		5.9		0.028		0.16		7.1	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.6	U	2	U	1	U	1	U	0.01	U	0.01	U	1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-50						WP-99-53				WP-99-53		WP-99-54	
				Samp Id	WP9950013XX		WP9950054XX		WP9950055XX		WP9953010XX		WP9953020XX		WP9953032XX		WP9954010XX	
				Samp Date	3/18/99		3/18/99		3/18/99		3/22/99		3/22/99		3/22/99		3/23/99	
				Start Depth	9		50		51		6		16		28		6	
				End Depth	13		54		55		10		20		32		10	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	1	U	0.1	U	0.1	U	0.27		2.5		0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	1	U	0.1	U	0.1	U	0.41		4.4		0.11		0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	1	U	0.16		0.16		0.1	U	1	U	0.67		0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	8.4		44		0.27		0.17		1.3		7.9		0.1	U
	75-01-4	Vinyl Chloride	MG/L	15.75	1	U	0.1	U	0.1	U	0.1	U	1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-54						WP-99-54				WP-99-55			
				Samp Id	WP9954020XX		WP9954030XX		WP9954050XX		WP9954062XD		WP9954062XX		WP9955010XX		WP9955020XX	
				Samp Date	3/23/99		3/23/99		3/23/99		3/23/99		3/23/99		3/23/99		3/23/99	
				Start Depth	16		26		46		58		58		6		16	
				End Depth	20		30		50		62		62		10		20	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U	0.101	U	0.101	U	0.67		0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	0.1	U	0.1	U	0.1026	U	0.1024	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.21		0.4		0.1	U	0.101	U	0.101	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.25		0.5		3		0.77		0.76		0.27		0.1	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	0.1	U	0.1	U	0.101	U	0.101	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-55								WP-99-56					
				Samp Id	WP9955030XX		WP9955050XX		WP9955070XD		WP9955070XX		WP9956010XX		WP9956020XX		WP9956050XX	
				Samp Date	3/23/99		3/23/99		3/23/99		3/23/99		3/23/99		3/23/99		3/23/99	
				Start Depth	26		46		66		66		6		16		46	
				End Depth	30		50		70		70		10		20		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U	0.101	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	0.1	U	0.1	U	0.101	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.1	U	0.1	U	0.1	U	0.101	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.1	U	0.1	U	0.1	U	0.101	U	0.1	U	0.1	U	0.15	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	0.1	U	0.1	U	0.101	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-56		WP-99-57										WP-99-58	
				Samp Id	WP9956052XX		WP9957010XX		WP9957020XX		WP9957030XX		WP9957050XD		WP9957050XX		WP9958010XX	
				Samp Date	3/23/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99	
				Start Depth	48		6		16		26		46		46		6	
				End Depth	52		10		20		30		50		50		10	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.14		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.17		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-58		WP-99-59										WP-99-60	
				Samp Id	WP9958020XX		WP9959010XX		WP9959020XX		WP9959030XX		WP9959040XX		WP9959054XX		WP9960010XX	
				Samp Date	3/24/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99		3/24/99	
				Start Depth	16		6		16		26		36		50		6	
				End Depth	20		10		20		30		40		54		10	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.35		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-60					
				Samp Id	WP9960020XX		WP9960030XX		WP9960044XX	
				Samp Date	3/24/99		3/24/99		3/24/99	
				Start Depth	16		26		40	
				End Depth	20		30		44	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	2.34	0.101	U	0.1	U	0.1	U
	75-01-4	Vinyl Chloride	MG/L	15.75	0.15		0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WP-99-61						WP-99-62						WP-99-62	
				Samp Id	WP9961010XX		WP9961020XX		WP9961028XX		WP9962010XX		WP9962020XX		WP9962030XD		WP9962030XX	
				Samp Date	3/25/99		3/25/99		3/25/99		3/25/99		3/25/99		3/25/99		3/25/99	
				Start Depth	6		16		24		6		16		26		26	
				End Depth	10		20		28		10		20		30		30	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.1	U	0.16		0.53		0.1	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.1	U	0.1	U	0.1		0.1	U	0.13		0.18		0.15	
	79-01-6	Trichloroethene	MG/L	2.34	0.1	U	0.15		0.3		0.1	U	0.16		0.22		0.21	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

								WP-99-63								WP-99-64			
				WP9962050XX		WP9962063XX		WP9963010XX		WP9963020XX		WP9963030XX		WP9963040XX		WP9964010XX		WP9964020XX	
				3/25/99		3/25/99		3/26/99		3/26/99		3/26/99		3/26/99		3/29/99		3/29/99	
				46		59		6		16		26		36		6		16	
				50		63		10		20		30		40		10		20	
Class	**CAS #**	**PARAMETER**	**UNITS**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.12		0.1	U	0.1	U	0.1	U	0.1	U	1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	1.1		0.1	U	0.1	U	0.1	U	0.1	U	1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	11		0.57		0.1	U	0.1	U	4.4		1.6		0.1	U	0.1	U
	75-01-4	Vinyl Chloride	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

						WP-99-65						WP-99-66	
				WP9964030XX		WP9965010XX		WP9965020XX		WP9965035XX		WP9966010XX	
				3/29/99		3/30/99		3/30/99		3/30/99		3/30/99	
				26		6		16		31		6	
				30		10		20		35		10	
Class	**CAS #**	**PARAMETER**	**UNITS**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	0.12		0.1	U	0.1	U	0.16		0.1	U
	75-01-4	Vinyl Chloride	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				WP-99-66								WP-99-66		WP-99-67				WP-99-68	
				WP9966020XX		WP9966030XX		WP9966050XX		WP9966063XX		WP9966D050XD		WP9967010XX		WP9967020XX		WP9968010XX	
				3/30/99		3/30/99		3/30/99		3/30/99		3/30/99		3/31/99		3/31/99		3/31/99	
				16		26		46		59		46		6		16		6	
				20		30		50		63		50		10		20		10	
Class	**CAS #**	**PARAMETER**	**UNITS**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.2	
	75-35-4	1,1-Dichloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.21	
	127-18-4	Tetrachloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	0.1	U	0.1	U	0.29		0.1	U	0.26		0.1	U	0.1	U	0.32	
	75-01-4	Vinyl Chloride	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				WP9968020XX		WP9968030XX		WP9968050XD		WP9968050XX		WP9968070XX		WP9968080XX	
				3/31/99		3/31/99		3/31/99		3/31/99		3/31/99		3/31/99	
				16		26		46		46		66		76	
				20		30		50		50		70		80	
Class	**CAS #**	**PARAMETER**	**UNITS**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	0.12		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.74		0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	0.38		0.61		0.18		0.18		0.1	U	0.1	U
	75-01-4	Vinyl Chloride	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				WP-99-69						WP-99-70						WP-99-71			
				WP9969010XX		WP9969020XX		WP9969030XX		WP9970010XX		WP9970020XX		WP9970030XX		WP9971010XX		WP9971020XX	
				3/31/99		3/31/99		3/31/99		3/31/99		3/31/99		3/31/99		4/1/99		4/1/99	
				6		16		26		6		16		26		6		16	
				10		20		30		10		20		30		10		20	
Class	**CAS #**	**PARAMETER**	**UNITS**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.34		0.64		0.75		0.1	U	0.1	U	0.85		0.1	U	1.2	
	127-18-4	Tetrachloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	0.27		2.3		2.5		0.1	U	0.2		1.4		0.42		0.25	
	75-01-4	Vinyl Chloride	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

								WP-99-72					
				WP9971030XX		WP9971040XX		WP9972010XX		WP9972020XX		WP9972034XX	
				4/1/99		4/1/99		4/1/99		4/1/99		4/1/99	
				26		36		6		16		30	
				30		40		10		20		34	
Class	**CAS #**	**PARAMETER**	**UNITS**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	75-35-4	1,1-Dichloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	127-18-4	Tetrachloroethene	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
	79-01-6	Trichloroethene	MG/L	0.44		0.1	U	0.1	U	0.1	U	28	
	75-01-4	Vinyl Chloride	MG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	PZ-11D						PZ-13D				PZ-16D						PZ-17D	
				Samp Id	PZ-11D		PZ11D034XD		PZ11D034XX		PZ-13D		PZ13D032XX		PZ-16D		PZ-16DR2		PZ16D028XX		PZ-17D	
				Samp Date	7/1/99		4/1/99		4/1/99		7/7/99		3/30/99		7/1/99		7/1/99		3/29/99		7/2/99	
				Start Depth	24		24		24		21.5		22		21		19		21		22	
				End Depth	34		34		34		31.5		32		31		29		31		32	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.049	J	0.1	U	0.1	U	0.013	U	0.1	U	0.001	U	0	U	0.1	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.57		0.26		0.26		0.041	J	0.1	U	0.111		0.065		0.1		0.091	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.69		0.42		0.43		1.23		0.49		0.0048		0	U	0.1	U	0.008	
	79-01-6	Trichloroethene	MG/L	2.34	0.44		0.28		0.28		1.76		0.5		0.0111		0.0069	J	0.1	U	0.75	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.1	U	0.1	U	0.004	U	0.1	U	0.17		0.092		0.13		0.0219	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	PZ-17D		PZ-1D				PZ-4D						PZ-5D						PZ-7D		PZ-8D	
				Samp Id	PZ-17DR2		PZ-1D		PZ-1DR2		PZ-4D		PZ-4DR2		PZ4D031799		PZ-5D		PZ-5DR2		PZ5D040XX		PZ-7D		PZ-8D	
				Samp Date	7/2/99		7/6/99		7/6/99		7/6/99		7/6/99		3/17/99		7/6/99		7/6/99		3/30/99		7/2/99		7/7/99	
				Start Depth	29		24		24		29		29		29		33		33		30		19		23.5	
				End Depth	39		34		34		39		39		39		43		43		40		29		33.5	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0.0028	U	0	U	0.0013	U	0	U	0.01	U	0.001	U	0	U	0.1	U	0	U	3.386	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.045		0.236	JE	0.11		0.0045		0	U	0.013		0.001	U	0	U	0.1	U	0	U	3.66	
	127-18-4	Tetrachloroethene	MG/L	0.088	0	U	1.51		0.79		0.001	U	0	U	0.01	U	0.001	U	0	U	0.1	U	0	U	0.142	J
	79-01-6	Trichloroethene	MG/L	2.34	0.64		4.9		2.3		0.0042	U	0	U	0.022		0.0017	J, U	0	U	0.1	U	0	U	6.02	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0.047		0	U	3.63		2.7		2.6		0.00044	J, U	0	U	0.1	U	0	U	0.0251	

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	PZ-8D						PZ-99-01I		PZ-99-02		PZ-99-02B		PZ-99-03		PZ-99-04I		PZ-99-12I		PZ-9D	
				Samp Id	PZ-8DR2		PZ8D030XX		PZ8D031699		PZ9901I000XX		PZ2B081999		PZ2B081999		PZ03081899XX		PZ9904I000XX		PZ9912I000XX		PZ-9D	
				Samp Date	7/7/99		3/29/99		3/16/99		2/11/99		8/19/99		8/19/99		8/18/99		2/11/99		2/11/99		7/1/99	
				Start Depth	23.5		20		23		14		25		25		4		30		16		27	
				End Depth	33.5		30		33		19		30		30		9		35		21		37	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	2.1		0.83		0.001	U	0.001	U	5	U			34		0.013		0.21		0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	3.7		1.9		0.001	U	0.0076		5	U			9.4		0.32		1.2		0.056	J
	127-18-4	Tetrachloroethene	MG/L	0.088	0.11	J	0.19		0.001	U	0.016		5	U			1	U	0.093		0.0072		0.0025	U
	79-01-6	Trichloroethene	MG/L	2.34	6.8		2.5		0.001	U	2.2				82		1.7		45		0.2	U	2.8	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0.006		0.001	U	0.001	U	5	U			1	U	0.0023		0.025		0.0032	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WC-10S		WC-12S		WC-14S		WC-18D3		WC-19D1		WC-19S				WC-1S		WC-20D1	
				Samp Id	WC-10S		WC-12S		WC-14S		WC-18D3		WC-19D1		WC-19S		WC-19SR2		WC-1S		WC-20D1	
				Samp Date	7/7/99		7/8/99		7/13/99		11/18/99		6/30/99		6/29/99		6/29/99		7/8/99		11/9/99	
				Start Depth	3		3		3		30		30		5		5		4		30	
				End Depth	13		13		13		50		50		15		15		14		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.015	U	1.8		0.00051	J	0.001	U	0.0033	U	0.034		0.015	J	0	U	0.001	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.329		0.96		0	U	0.00077	J	0.039	J	0.0159	J	0.0068	J	0.052		0.003	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.0107	J	0	U	0	U	0.35		0.88		0.96		0.29		0.011		0.0013	
	79-01-6	Trichloroethene	MG/L	2.34	0.279		0.14		0.021		0.67		0.056	J	0.028		0.0088	J	0.012		0.18	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.00099	J, U	0	U	0	U	0.0013		0.001	U	0.0233	J	0	U	0.037		0.00059	J

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WC-20D2		WC-20S		WC-21D1		WC-21D2		WC-21S		WC-2D				WC-3S		WC-4S	
				Samp Id	WC-20D2		WC-20S		WC-21D1		WC-21D2		WC-21S		WC-2D		WC-2DR2		WC-3S		WC-4S	
				Samp Date	11/9/99		11/9/99		11/10/99		11/10/99		11/10/99		7/7/99		7/7/99		7/12/99		7/8/99	
				Start Depth	30		5		30		140		5		24.5		24.5		3		3	
				End Depth	50		15		50		150		15		34.5		34.5		13		13	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U	0.001	U	0.001	U	0.001	U	0.001	U	0	U	0	U	0.001	U	0.77	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.001	U	0.001	U	0.017		0.001	U	0.001	U	0	U	0	U	0.001	U	0.73	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U	0.001	U	0.018		0.001	U	0.001	U	0	U	0	U	0.001	U	0	U
	79-01-6	Trichloroethene	MG/L	2.34	0.00059	J	0.001	U	0.06		0.045		0.001	U	0.015	J	0.018	J	0.001	U	0.067	J
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U	0.001	U	0.0031		0.001	U	0.001	U	1.8		1.9		0.001	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WC-5S				WC-9D2		WC-9S		WC1-1S		WC2-1D		WC2-1I		WC2-1S			
				Samp Id	WC-5S		WC-5SR2		WC-9D2		WC-9S		WC1-1S		WC2-1D		WC2-1I		WC2-1S		WC2-1SR2	
				Samp Date	7/8/99		7/8/99		7/1/99		6/30/99		7/2/99		7/6/99		7/2/99		7/7/99		7/7/99	
				Start Depth	3		3		140		3		2		140		45		2		2	
				End Depth	13		13		150		13		12		150		55		12		12	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.01	U	0	U	0.001	U	0	U	0	U	0	U	0	U	0	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.01	U	0	U	0.001	U	0.0033		0	U	0	U	0	U	0	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0.01	U	0	U	0.001	U	0.00072	J	0.00088	J	0	U	0	U	0	U	0	U
	79-01-6	Trichloroethene	MG/L	2.34	0.0065	J, U	0	U	0.001	U	0.0025		0	U	0	U	0	U	0.0039		0	U
	75-01-4	Vinyl Chloride	MG/L	15.75	3.01	U	3		0.001	U	0	U	0	U	0	U	0	U	0	U	0	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WC2-2D		WC2-2I		WC2-3D				WC2-3I		WC2-3S					
				Samp Id	WC2-2D		WC2-2I		WC2-3D		WC2-3DR2		WC2-3I		WC2-3S		WC2-3SDL1		WC2-3SR2	
				Samp Date	7/8/99		7/8/99		7/7/99		7/7/99		7/13/99		7/13/99		11/12/99		7/13/99	
				Start Depth	51.5		45		74.5		74.5		45		2		2		2	
				End Depth	61.5		55		84.5		84.5		55		12		12		12	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.001	U, UJ	0.001	U	0.001	U	0	U	0.001	U	0.0051		0.0033		0	UJ
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.00169	J, UJ	0.0018	U	0.0049		0	U	0.0099	U	0	U	0.001	U	0	UJ
	127-18-4	Tetrachloroethene	MG/L	0.088	0.001	U, UJ	0.0205	J	0.09		0.099	J	0.039	J	0	U	0.001	U	0	UJ
	79-01-6	Trichloroethene	MG/L	2.34	0.0042	UJ	0.344		0.78		3.1		0.72		0	U	0.00036	J	0	UJ
	75-01-4	Vinyl Chloride	MG/L	15.75	0.001	U, UJ	0.064		0.0014	U	0	U	0.062	U	0.0021		0.001	U	0	UJ

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WC2-4I		WC2-4S		WC2-5I		WC2-5S		WC2-6I		WC3-1D		WC3-1I		WC3-2D		WC3-2I	
				Samp Id	WC2-4I		WC2-4S		WC2-5I		WC2-5S		WC2-6I		WC3-1D		WC3-1I		WC3-2D		WC3-2I	
				Samp Date	11/15/99		7/13/99		11/15/99		7/13/99		11/15/99		11/18/99		11/17/99		11/17/99		11/17/99	
				Start Depth	25		2		30		2		40		75		30		53		30	
				End Depth	35		12		40		12		50		85		40		63		40	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0.0065		0.0027	U	0.025		0.00387	J	0.001	U	0.001	U	0.25		0.001	U	0.015	
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0.034		0.00159	J, U	0.1		0.01584	J	0.021		0.0008	J	2.8		0.001	U	0.024	
	127-18-4	Tetrachloroethene	MG/L	0.088	0.022		0.01154	J	0.011		0.0137		0.61		0.35		0.59		0.003		0.13	
	79-01-6	Trichloroethene	MG/L	2.34	0.013		0.01563	J	0.053		0.04		3.7		0.68		0.11		0.0039		0.11	
	75-01-4	Vinyl Chloride	MG/L	15.75	0.037		0.001	U	0.086		0.012	U	0.021		0.0013		0.0033		0.001	U	0.001	U

TABLE 6-5
SELECTED VOCs IN GROUNDWATER EXCEEDING CTDEP SWPC

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

				Loc Id	WC5-1D								WC5-2I		WC5-2S		WC5-3S		WC6-1I	
				Samp Id	WC5-1D				WC5-1S		WC5-1SR2		WC5-2I		WC5-2S		WC5-3S		WC6-1I	
				Samp Date	7/13/99		11/8/99		7/6/99		7/6/99		6/30/99		7/1/99		7/1/99		6/30/99	
				Start Depth	74.5		74.5		1.5		1.5		30		2		2		40	
				End Depth	84.5		84.5		11.5		11.5		40		12		12		50	
Class	**CAS #**	**PARAMETER**	**UNITS**	**SWPC**	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
VOA	71-55-6	1,1,1-Trichloroethane	MG/L	62	0	U	0.001	U	0.001	U	0	U	0.0013	U	0	U	0.001	U	0	U
	75-35-4	1,1-Dichloroethene	MG/L	0.096	0	U	0.001	U	0.05741	J	0.057		0.0022	U	0	U	0.001	U	0	U
	127-18-4	Tetrachloroethene	MG/L	0.088	0	U	0.001	U	0.0024	U	0.0017	J	0.0118		0	U	0.001	U	0.00028	J
	79-01-6	Trichloroethene	MG/L	2.34	0	U	0.001	U	0.1629		0.15		0.0059		0	U	0.001	U	0.0074	
	75-01-4	Vinyl Chloride	MG/L	15.75	0	U	0.001	U	0.001	U	0	U	0.001	U	0	U	0.001	U	0	U

TABLE 6-6
VOCs IN GROUNDWATER EXCEEDING CTDEP I/C VOLATILIZATION CRITERIA

OU 2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

SITE ID	SAMPLE ID	START DEPTH (feet,bgs)	END DEPTH (feet,bgs)	SAMPLE DATE	CLASS	MATRIX	PARAMETER	VALUE	QUAL	CTDEP I/C VC	UNITS
CP-99-09	CP9909011XX	9	11	5/9/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.011		0.006	MG/L
CP-99-09	CP9909011XX	9	11	5/9/99	VOA	GROUNDWATER	Vinyl Chloride	0.054	E	0.002	MG/L
CP-99-12	CP9912011XX	9	11	5/10/99	VOA	GROUNDWATER	Vinyl Chloride	0.047	EJ	0.002	MG/L
DP2-2	DP22-08	5	8	5/5/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.22		0.006	MG/L
DP2-2	DP22-08	5	8	5/5/99	VOA	GROUNDWATER	Vinyl Chloride	0.02		0.002	MG/L
DP2-5	C-56-04	5	8	5/21/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.065		0.006	MG/L
DP2-5	C-56-04	5	8	5/21/99	VOA	GROUNDWATER	Vinyl Chloride	0.13		0.002	MG/L
DP2-6	C-57-13	5	8	5/24/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.045		0.006	MG/L
DP2-6	C-57-13	5	8	5/24/99	VOA	GROUNDWATER	Vinyl Chloride	0.01		0.002	MG/L
DP2-7	C-58-09	5	8	5/25/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.009		0.006	MG/L
DP2-7	C-58-09	5	8	5/25/99	VOA	GROUNDWATER	Vinyl Chloride	0.062		0.002	MG/L
DP2-8	C-61-01	5	8	5/28/99	VOA	GROUNDWATER	Vinyl Chloride	0.021		0.002	MG/L
DP2-9	C-62-02	5	8	6/1/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.07		0.006	MG/L
DP2-9	C-62-02	5	8	6/1/99	VOA	GROUNDWATER	Vinyl Chloride	0.03		0.002	MG/L
DP5-3	C-40-04	7	10	5/11/99	VOA	GROUNDWATER	Vinyl Chloride	0.024		0.002	MG/L
DP5-8	C-55-04	5	8	5/20/99	VOA	GROUNDWATER	Vinyl Chloride	0.04		0.002	MG/L
DP6-3	C-61-02	5	8	5/28/99	VOA	GROUNDWATER	1,1-Dichloroethene	3.9		0.006	MG/L
DP6-3	C-61-02	5	8	5/28/99	VOA	GROUNDWATER	Vinyl Chloride	0.97		0.002	MG/L
DP6-4	C-63-04	5	8	6/2/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.012		0.006	MG/L
MW-2	MW-2	2	15	7/12/99	VOA	GROUNDWATER	Vinyl Chloride	0.0022	J	0.002	MG/L
WC-10S	WC-10S	3	13	7/7/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.28		0.006	MG/L
WC-12S	WC-12S	3	13	7/8/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.96		0.006	MG/L
WC-1S	WC-1S	4	14	7/8/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.052		0.006	MG/L
WC-1S	WC-1S	4	14	7/8/99	VOA	GROUNDWATER	Vinyl Chloride	0.037		0.002	MG/L
WC2-3S	WC2-3S	2	12	7/13/99	VOA	GROUNDWATER	Vinyl Chloride	0.0021		0.002	MG/L
WC2-5S	WC2-5S	2	12	7/13/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.015		0.006	MG/L
WC-4S	WC-4S	3	13	7/8/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.73		0.006	MG/L
WC5-1S	WC5-1S	1.5	11.5	7/6/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.057		0.006	MG/L
WC-5S	WC-5S	3	13	7/8/99	VOA	GROUNDWATER	Vinyl Chloride	3		0.002	MG/L
WP-99-08	WP9908012XX	8	12	2/9/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.017	E	0.006	MG/L
WP-99-41	WP9941010XX	6	10	3/11/99	VOA	GROUNDWATER	1,1-Dichloroethene	1.4		0.006	MG/L
WP-99-41	WP9941010XX	6	10	3/11/99	VOA	GROUNDWATER	Trichloroethene	0.98		0.54	MG/L
WP-99-43	WP9943010XX	6	10	3/11/99	VOA	GROUNDWATER	1,1-Dichloroethene	1.5		0.006	MG/L
WP-99-43	WP9943010XX	6	10	3/11/99	VOA	GROUNDWATER	Trichloroethene	1.2		0.54	MG/L
WP-99-45	WP9945015XX	11	15	3/16/99	VOA	GROUNDWATER	1,1-Dichloroethene	4.5		0.006	MG/L
WP-99-45	WP9945015XX	11	15	3/16/99	VOA	GROUNDWATER	Trichloroethene	5.9		0.54	MG/L
WP-99-47	WP9947010XX	6	10	3/17/99	VOA	GROUNDWATER	1,1-Dichloroethene	2.2		0.006	MG/L
WP-99-48	WP9948009XX	5	9	3/18/99	VOA	GROUNDWATER	1,1,1-Trichloroethane	100		50	MG/L
WP-99-48	WP9948009XX	5	9	3/18/99	VOA	GROUNDWATER	1,1-Dichloroethene	8.5		0.006	MG/L
WP-99-48	WP9948009XX	5	9	3/18/99	VOA	GROUNDWATER	Trichloroethene	1.5		0.54	MG/L
WP-99-50	WP9950013XX	9	13	3/18/99	VOA	GROUNDWATER	Trichloroethene	8.4		0.54	MG/L
WP-99-53	WP9953010XX	6	10	3/22/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.41		0.006	MG/L
WP-99-68	WP9968010XX	6	10	3/31/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.21		0.006	MG/L
WP-99-69	WP9969010XX	6	10	3/31/99	VOA	GROUNDWATER	1,1-Dichloroethene	0.34		0.006	MG/L

TABLE 6-7
VOCs IN SOIL VAPOR EXCEEDING CTDEP I/C VOLATILIZATION CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

SAMPLE ID:			SG9901003XF	SG9902003XF	SG9903003XF	SG9904003XF	SG99040032F	SG9905003XF	SG9906003XF	SG9906003XD
SITE ID:			SG-99-01	SG-99-02	SG-99-03	SG-99-04	SG-99-04	SG-99-05	SG-99-06	SG-99-06
DATE SAMPLED:			8/4/99	8/4/99	8/4/99	8/4/99	8/9/99	8/4/99	8/4/99	8/4/99
DATE ANALYZED:			8/5/99	8/5/99	8/5/99	8/5/99	8/9/99	8/5/99	8/5/99	8/5/99
UNITS:			ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.05	0.03	0.03	0.14	0.27	0.04	0.02	0.02
1,1-Dichloroethene	0.01	1	0.47	0.07	0.01 U	**1.4**	**4.4**	0.19	0.04	0.01 U
Trichloroethene	0.02	16	1.6	0.08	0.13	**100**	**210**	0.34	**65**	**57**
Tetrachloroethene	0.03	27	0.04	0.03 U	0.03 U	0.03 U	0.03 U	0.05	0.08	0.04

SAMPLE ID:			SG9907003XF	SG9908003XF	SG9909003XF	SG9910003XF	SG99100032F	SG9911003XF	SG9912003XF	SG9913003XF
SITE ID:			SG-99-07	SG-99-08	SG-99-09	SG-99-10	SG-99-10	SG-99-11	SG-99-12	SG-99-13
DATE SAMPLED:			8/4/99	8/4/99	8/5/99	8/5/99	8/9/99	8/5/99	8/5/99	8/5/99
DATE ANALYZED:			8/5/99	8/5/99	8/5/99	8/5/99	8/9/99	8/5/99	8/5/99	8/5/99
UNITS:			ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.01 U	0.01 U	0.01	0.14	0.77	0.01 U	0.01 U	0.01
1,1-Dichloroethene	0.01	1	0.01 U	0.01 U	0.01 U	0.80	**3.9**	0.01 U	0.01 U	0.01 U
Trichloroethene	0.02	16	0.25	0.06	0.07	**20**	**130**	0.02	0.02 U	0.16
Tetrachloroethene	0.03	27	0.03 U	0.03 U	0.03 U	0.03	0.13	0.03 U	0.03 U	0.03 U

SAMPLE ID:			SG9914003XF	SG9915003XF	SG9916003XF	SG9917003XF	SG9918003XF	SG9919003XF	SG9920003XF	SG9921003XF
SITE ID:			SG-99-14	SG-99-15	SG-99-16	SG-99-17	SG-99-18	SG-99-19	SG-99-20	SG-99-21
DATE SAMPLED:			8/5/99	8/5/99	8/5/99	8/5/99	8/5/99	8/6/99	8/6/99	8/6/99
DATE ANALYZED:			8/5/99	8/5/99	8/5/99	8/5/99	8/5/99	8/6/99	8/6/99	8/6/99
UNITS:			ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.01 U	**1.0**	0.02	0.03	0.02	0.01	0.01 U	0.01 U
1,1-Dichloroethene	0.01	1	0.01 U	0.01 U	0.06	**2.1**	**1.4**	0.01 U	0.01 U	0.01 U
Trichloroethene	0.02	16	0.02	0.24	0.17	1.0	1.5	1.4	3.8	0.04
Tetrachloroethene	0.03	27	0.03 U	0.18	0.03 U	0.04	0.03	0.23	0.12	0.03

TABLE 6-7
VOCs IN SOIL VAPOR EXCEEDING CTDEP I/C VOLATILIZATION CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

		SAMPLE ID:	SG9922003XF	SG9922003XD	SG9923003XF	SG9924003XF	SG9925003XF	SG9925003XD	SG9926003XF	SG9927003XF
		SITE ID:	SG-99-22	SG-99-22	SG-9923	SG-99-24	SG-99-25	SG-99-25	SG-99-26	SG-99-27
		DATE SAMPLED:	8/6/99	8/6/99	8/6/99	8/6/99	8/9/99	8/9/99	8/9/99	8/9/99
		DATE ANALYZED:	8/6/99	8/6/99	8/6/99	8/6/99	8/9/99	8/9/99	8/9/99	8/9/99
		UNITS:	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.01	0.01	0.01 U	0.01	0.01 U	0.01 U	0.01 U	0.01 U
1,1-Dichloroethene	0.01	1	0.07	0.07	0.01 U	0.01 U	0.01 U	0.02	0.01 U	0.01 U
Trichloroethene	0.02	16	1.7	1.7	0.33	0.20	3.0	2.9	0.05	0.52
Tetrachloroethene	0.03	27	3.5	3.5	0.33	0.11	3.5	3.3	1.9	0.03 U

		SAMPLE ID:	SG9928003XF	SG9929003XF	SG9930003XF	SG9931003XF	SG9932003XF	SG9933003XF	SG9934003XF	SG9935003XF
		SITE ID:	SG-99-28	SG-99-29	SG-99-30	SG-99-31	SG-99-32	SG-99-33	SG-99-34	SG-99-35
		DATE SAMPLED:	8/9/99	8/9/99	8/9/99	8/9/99	8/10/99	8/10/99	8/10/99	8/10/99
		DATE ANALYZED:	8/9/99	8/9/99	8/9/99	8/9/99	8/10/99	8/10/99	8/10/99	8/10/99
		UNITS:	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
1,1-Dichloroethene	0.01	1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Trichloroethene	0.02	16	0.02 U	1.1	0.51	0.02 U	1.1	2.3	0.11	0.02 U
Tetrachloroethene	0.03	27	0.03 U	0.05	0.03 U	0.03 U	0.21	1.1	0.13	0.03 U

		SAMPLE ID:	SG9936003XF	SG9937003XF	SG9937003XD	SG9938003XF	SG9939003XF	SG9940003XF	SG9941003XF	SG9942003XF
		SITE ID:	SG-99-36	SG-99-37	SG-99-37	SG-99-38	SG-99-39	SG-99-40	SG-99-41	SG-99-42
		DATE SAMPLED:	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99
		DATE ANALYZED:	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99
		UNITS:	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.06	0.01 U
1,1-Dichloroethene	0.01	1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.15	**2.1**	0.01 U
Trichloroethene	0.02	16	0.03	0.02 U	0.02 U	0.02 U	0.02 U	1.3	5.7	0.02 U
Tetrachloroethene	0.03	27	0.09	0.03 U	0.03 U	0.05	0.03 U	0.03	1.1	0.03 U

TABLE 6-7
VOCs IN SOIL VAPOR EXCEEDING CTDEP I/C VOLATILIZATION CRITERIA

OU2 NCRA PRE-DESIGN INVESTIGATION REPORT
STRATFORD ARMY ENGINE PLANT

		SAMPLE ID:	SG9943003XF	SG9944003XF	SG9945003XF	SG9946003XF	SG9947003XF	SG9948003XF	SG9948003XD	SG9949003XF
		SITE ID:	SG-99-43	SG-99-44	SG-99-45	SG-99-46	SG-99-47	SG-99-48	SG-99-48	SG-99-49
		DATE SAMPLED:	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99
		DATE ANALYZED:	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99	8/10/99
		UNITS:	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**								
Vinyl chloride	0.01	1	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**1.7**	**1.6**	0.11
1,1-Dichloroethene	0.01	1	0.10	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**5.1**
Trichloroethene	0.02	16	0.54	0.27	0.22	0.09	16.00	1.2	1.1	14
Tetrachloroethene	0.03	27	0.08	0.03 U	0.03 U	0.03 U	0.16	0.46	0.42	0.63

		SAMPLE ID:	SG9950003XF	SG9951003XF	SG9951003XD	SG9952003XF
		SITE ID:	SG-99-50	SG-99-51	SG-99-51	SG-99-52
		DATE SAMPLED:	8/10/99	8/10/99	8/10/99	8/10/99
		DATE ANALYZED:	8/10/99	8/10/99	8/10/99	8/10/99
		UNITS:	ppmv	ppmv	ppmv	ppmv
Compound	**RL**	**I/C VC**				
Vinyl chloride	0.01	1	0.01 U	0.01 U	0.01 U	0.01 U
1,1-Dichloroethene	0.01	1	**4.2**	0.01 U	0.01 U	0.01 U
Trichloroethene	0.02	16	8.1	**110**	**120**	0.02 U
Tetrachloroethene	0.03	27	0.86	0.32	0.33	0.03 U

NOTES:

RL = REPORTING LIMIT (ppmv)
I/C VC = INDUSTRIAL/COMMERCIAL VOLATILIZATION CRITERIA FOR SOIL VAPOR (ppmv)
U = NOT DETECTED ABOVE REPORTING LIMIT
RESULTS IN BOLD AND SHADED EXCEED THE CTDEP INDUSTRIAL/COMMERCIAL VOLATILIZATION CRITERIA FOR SOIL VAPOR